Prepared for:

San Bernardino Associated Governments

1170 W. 3rd Street, 2nd Floor

San Bernardino, CA 92410-1702

Governments SANBAG Working Together

Ontario Airport Rail Access Study

FINAL REPORT

Appendices

November 2014

Prepared by:

HDR Engineering Inc.

In Association with:

Fehr & Peers

Rail Surveyors and Engineers

HDR

Appendix A
FAA 2012 Terminal Area Forecast

print close

APO TAF Quick Data Summary - Facility

For National Forecast 2012 -- 2012 Scenario

Region State: AWP-CA **LOCID: BUR Limited Radar Towers**

City: BURBANK **Airport: BOB HOPE** **2011 Based Aircraft: 91**

	-- ENPLANEMENTS --			-- AIRPORT OPERATIONS --									-- TRACON --
				-- Itinerant Operations --					-- Local Operations --				
Fiscal Year	Air Carrier	Commuter	Total	Air Carrier	AT & Comm	GA	Military	Total	Civil	Military	Total	Total OPS	Total OPS
Historical													
2008	2,511,176	273,057	2,784,233	60,347	26,955	28,225	216	115,743	7,008	38	7,046	122,789	-
2009	2,027,447	285,223	2,312,670	54,374	21,371	23,533	171	99,449	11,948	69	12,017	111,466	-
2010	1,986,884	267,100	2,253,984	51,332	22,130	25,169	227	98,858	12,928	29	12,957	111,815	-
2011	1,881,053	283,161	2,164,214	46,818	21,309	33,385	284	101,796	17,028	0	17,028	118,824	-
Forecast													
2012 *	1,753,144	316,554	2,069,698	45,603	21,067	36,911	561	104,142	29,738	0	29,738	133,880	-
2013 *	1,623,938	324,737	1,948,675	42,909	20,885	38,678	561	103,033	34,241	0	34,241	137,274	-
2014 *	1,643,750	331,426	1,975,176	43,743	20,575	39,220	561	104,099	34,294	0	34,294	138,393	-
2015 *	1,663,803	338,219	2,002,022	44,592	20,253	39,770	561	105,176	34,347	0	34,347	139,523	-
2016 *	1,684,101	345,153	2,029,254	45,457	19,920	40,327	561	106,265	34,400	0	34,400	140,665	-
2017 *	1,704,647	352,228	2,056,875	46,338	19,576	40,892	561	107,367	34,453	0	34,453	141,820	-
2018 *	1,725,443	359,449	2,084,892	46,894	19,554	41,465	561	108,474	34,506	0	34,506	142,980	-
2019 *	1,746,493	366,817	2,113,310	47,456	19,532	42,045	561	109,594	34,559	0	34,559	144,153	-
2020 *	1,767,800	374,299	2,142,099	48,025	19,510	42,634	561	110,730	34,612	0	34,612	145,342	-
2021 *	1,789,367	381,934	2,171,301	48,601	19,488	43,231	561	111,881	34,665	0	34,665	146,546	-
2022 *	1,811,018	389,725	2,200,743	49,183	19,466	43,836	561	113,046	34,718	0	34,718	147,764	-
2023 *	1,832,930	397,676	2,230,606	49,773	19,444	44,450	561	114,228	34,771	0	34,771	148,999	-
2024 *	1,855,108	405,788	2,260,896	50,370	19,422	45,072	561	115,425	34,824	0	34,824	150,249	-
2025 *	1,877,554	414,066	2,291,620	50,974	19,401	45,703	561	116,639	34,877	0	34,877	151,516	-
2026 *	1,900,273	422,471	2,322,744	51,585	19,380	46,343	561	117,869	34,931	0	34,931	152,800	-
2027 *	1,923,266	431,046	2,354,312	52,203	19,359	46,992	561	119,115	34,985	0	34,985	154,100	-
2028 *	1,946,537	439,795	2,386,332	52,829	19,338	47,650	561	120,378	35,039	0	35,039	155,417	-
2029 *	1,970,089	448,723	2,418,812	53,462	19,317	48,318	561	121,658	35,093	0	35,093	156,751	-
2030 *	1,993,927	457,831	2,451,758	54,103	19,296	48,995	561	122,955	35,147	0	35,147	158,102	-
2031 *	2,018,053	467,125	2,485,178	54,752	19,275	49,680	561	124,268	35,201	0	35,201	159,469	-
2032 *	2,042,471	476,608	2,519,079	55,408	19,254	50,375	561	125,598	35,255	0	35,255	160,853	-
2033 *	2,066,980	486,235	2,553,215	56,073	19,233	51,080	561	126,947	35,309	0	35,309	162,256	-
2034 *	2,091,783	496,056	2,587,839	56,745	19,212	51,795	561	128,313	35,363	0	35,363	163,676	-
2035 *	2,116,884	506,077	2,622,961	57,424	19,191	52,519	561	129,695	35,417	0	35,417	165,112	-
2036 *	2,142,286	516,299	2,658,585	58,112	19,170	53,255	561	131,098	35,471	0	35,471	166,569	-
2037 *	2,167,993	526,728	2,694,721	58,808	19,149	54,000	561	132,518	35,525	0	35,525	168,043	-

2038	*	2,194,009	537,368	2,731,377	59,513	19,128	54,756	561	133,958	35,579	0	35,579	169,537	-
2039	*	2,220,337	548,223	2,768,560	60,226	19,107	55,523	561	135,417	35,633	0	35,633	171,050	-
2040	*	2,246,980	559,297	2,806,277	60,948	19,086	56,300	561	136,895	35,687	0	35,687	172,582	-
GR1		0.61	2.37	0.89	0.91	-0.37	1.81	2.37	1.02	2.58	0.00	2.58	1.29	0.00
GR2		0.89	2.05	1.09	1.04	-0.35	1.51	0.00	0.98	0.65	0.00	0.65	0.91	0.00

GR1: Growth Rate from 2011 to 2040

GR2: Growth Rate from 2012 to 2040

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APO TAF Quick Data Summary - Facility

For National Forecast 2012 -- 2012 Scenario

Region State: AWP-CA **LOCID: LAX Limited Radar Towers**

City: LOS ANGELES **Airport: LOS ANGELES INTL** **2011 Based Aircraft: 2**

	-- ENPLANEMENTS --			-- AIRPORT OPERATIONS --									-- TRACON --
				-- Itinerant Operations --					-- Local Operations --				
Fiscal Year	Air Carrier	Commuter	Total	Air Carrier	AT & Comm	GA	Military	Total	Civil	Military	Total	Total OPS	Total OPS
Historical													
2008	26,949,572	2,502,778	29,452,350	461,528	177,712	17,489	2,492	659,221	0	0	0	659,221	-
2009	25,268,960	1,969,028	27,237,988	436,149	89,916	15,813	2,736	544,614	0	0	0	544,614	-
2010	26,135,833	2,394,595	28,530,428	452,918	95,187	20,039	2,829	570,973	10	0	10	570,983	-
2011	27,239,557	2,737,634	29,977,191	468,763	106,471	18,549	2,411	596,194	0	0	0	596,194	-
Forecast													
2012 *	27,765,921	2,859,948	30,625,869	481,325	106,722	18,165	2,634	608,846	0	0	0	608,846	-
2013 *	27,000,436	2,933,523	29,933,959	475,068	98,504	18,009	2,623	594,204	0	0	0	594,204	-
2014 *	27,797,836	2,983,201	30,781,037	488,845	95,549	18,163	2,612	605,169	0	0	0	605,169	-
2015 *	28,594,150	3,035,764	31,629,914	502,043	93,447	18,318	2,601	616,409	0	0	0	616,409	-
2016 *	29,481,216	3,101,273	32,582,489	516,100	92,512	18,475	2,590	629,677	0	0	0	629,677	-
2017 *	30,323,762	3,157,376	33,481,138	529,518	91,217	18,633	2,579	641,947	0	0	0	641,947	-
2018 *	31,031,452	3,210,353	34,241,805	540,108	90,214	18,792	2,568	651,682	0	0	0	651,682	-
2019 *	31,755,820	3,264,219	35,020,039	550,910	89,222	18,953	2,557	661,642	0	0	0	661,642	-
2020 *	32,497,260	3,318,988	35,816,248	561,928	88,240	19,115	2,546	671,829	0	0	0	671,829	-
2021 *	33,256,181	3,374,676	36,630,857	573,167	87,269	19,279	2,535	682,250	0	0	0	682,250	-
2022 *	34,032,998	3,431,299	37,464,297	584,631	86,309	19,444	2,524	692,908	0	0	0	692,908	-
2023 *	34,828,138	3,488,872	38,317,010	596,324	85,360	19,611	2,513	703,808	0	0	0	703,808	-
2024 *	35,642,036	3,547,411	39,189,447	608,251	84,421	19,779	2,502	714,953	0	0	0	714,953	-
2025 *	36,475,141	3,606,932	40,082,073	620,416	83,493	19,948	2,491	726,348	0	0	0	726,348	-
2026 *	37,327,910	3,667,452	40,995,362	632,825	82,575	20,119	2,480	737,999	0	0	0	737,999	-
2027 *	38,200,812	3,728,987	41,929,799	645,482	81,666	20,291	2,469	749,908	0	0	0	749,908	-
2028 *	39,094,328	3,791,555	42,885,883	658,391	80,768	20,465	2,458	762,082	0	0	0	762,082	-
2029 *	40,008,948	3,855,172	43,864,120	671,558	79,879	20,640	2,447	774,524	0	0	0	774,524	-
2030 *	40,945,176	3,919,857	44,865,033	684,989	79,001	20,816	2,436	787,242	0	0	0	787,242	-
2031 *	41,903,528	3,985,627	45,889,155	698,688	78,132	20,994	2,426	800,240	0	0	0	800,240	-
2032 *	42,884,533	4,052,501	46,937,034	712,662	77,272	21,173	2,416	813,523	0	0	0	813,523	-
2033 *	43,888,731	4,120,497	48,009,228	726,915	76,422	21,354	2,406	827,097	0	0	0	827,097	-
2034 *	44,916,677	4,189,634	49,106,311	741,453	75,581	21,536	2,396	840,966	0	0	0	840,966	-
2035 *	45,968,937	4,259,931	50,228,868	756,282	74,750	21,720	2,386	855,138	0	0	0	855,138	-
2036 *	47,046,093	4,331,407	51,377,500	771,408	73,928	21,905	2,376	869,617	0	0	0	869,617	-
2037 *	48,148,740	4,404,082	52,552,822	786,836	73,115	22,092	2,366	884,409	0	0	0	884,409	-

2038	*	49,277,487	4,477,977	53,755,464	802,573	72,311	22,281	2,356	899,521	0	0	0	899,521	-
2039	*	50,432,958	4,553,112	54,986,070	818,625	71,516	22,471	2,346	914,958	0	0	0	914,958	-
2040	*	51,615,793	4,629,507	56,245,300	834,998	70,729	22,663	2,336	930,726	0	0	0	930,726	-
GR1		2.22	1.82	2.19	2.01	-1.40	0.69	-0.10	1.54	0.00	0.00	0.00	1.54	0.00
GR2		2.23	1.73	2.19	1.98	-1.45	0.79	-0.42	1.52	0.00	0.00	0.00	1.52	0.00

GR1: Growth Rate from 2011 to 2040

GR2: Growth Rate from 2012 to 2040

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APO TAF Quick Data Summary - Facility

For National Forecast 2012 -- 2012 Scenario

Region State: AWP-CA **LOCID: LGB VFR Towers**

City: LONG BEACH **Airport: LONG BEACH /DAUGHERTY FIELD/** **2011 Based Aircraft: 435**

	-- ENPLANEMENTS --			-- AIRPORT OPERATIONS --									-- TRACON --
				-- Itinerant Operations --					-- Local Operations --				
Fiscal Year	Air Carrier	Commuter	Total	Air Carrier	AT & Comm	GA	Military	Total	Civil	Military	Total	Total OPS	Total OPS
Historical													
2008	1,178,867	217,078	1,395,945	29,205	15,063	139,262	446	183,976	176,877	921	177,798	361,774	-
2009	1,230,587	184,593	1,415,180	30,362	7,619	124,074	798	162,853	140,986	44	141,030	303,883	-
2010	1,169,073	250,714	1,419,787	29,354	9,248	127,926	842	167,370	140,784	60	140,844	308,214	-
2011	1,246,279	252,342	1,498,621	28,910	8,157	113,419	952	151,438	136,503	25	136,528	287,966	-
Forecast													
2012 *	1,376,339	230,164	1,606,503	30,197	5,411	103,095	850	139,553	132,201	17	132,218	271,771	-
2013 *	1,201,993	218,283	1,420,276	27,892	4,700	97,204	850	130,646	117,948	17	117,965	248,611	-
2014 *	1,232,976	227,452	1,460,428	28,557	4,763	98,196	850	132,366	117,957	17	117,974	250,340	-
2015 *	1,267,109	237,713	1,504,822	29,301	4,830	99,198	850	134,179	117,966	17	117,983	252,162	-
2016 *	1,299,736	247,687	1,547,423	30,001	4,896	100,212	850	135,959	117,975	17	117,992	253,951	-
2017 *	1,330,591	257,267	1,587,858	30,649	4,960	101,236	850	137,695	117,984	17	118,001	255,696	-
2018 *	1,364,318	267,893	1,632,211	31,366	5,032	102,270	850	139,518	117,993	17	118,010	257,528	-
2019 *	1,398,857	278,943	1,677,800	32,100	5,105	103,314	850	141,369	118,002	17	118,019	259,388	-
2020 *	1,434,226	290,435	1,724,661	32,850	5,179	104,369	850	143,248	118,011	17	118,028	261,276	-
2021 *	1,470,444	302,386	1,772,830	33,618	5,255	105,435	850	145,158	118,020	17	118,037	263,195	-
2022 *	1,507,530	314,813	1,822,343	34,404	5,331	106,512	850	147,097	118,029	17	118,046	265,143	-
2023 *	1,545,503	327,734	1,873,237	35,209	5,409	107,599	850	149,067	118,038	17	118,055	267,122	-
2024 *	1,584,384	341,170	1,925,554	36,033	5,488	108,698	850	151,069	118,047	17	118,064	269,133	-
2025 *	1,624,192	355,137	1,979,329	36,876	5,569	109,808	850	153,103	118,056	17	118,073	271,176	-
2026 *	1,664,948	369,658	2,034,606	37,739	5,651	110,929	850	155,169	118,065	17	118,082	273,251	-
2027 *	1,706,672	384,754	2,091,426	38,621	5,733	112,062	850	157,266	118,074	17	118,091	275,357	-
2028 *	1,749,385	400,446	2,149,831	39,525	5,816	113,206	850	159,397	118,083	17	118,100	277,497	-
2029 *	1,793,110	416,757	2,209,867	40,450	5,901	114,362	850	161,563	118,092	17	118,109	279,672	-
2030 *	1,837,869	433,710	2,271,579	41,396	5,987	115,530	850	163,763	118,101	17	118,118	281,881	-
2031 *	1,883,684	451,328	2,335,012	42,364	6,074	116,710	850	165,998	118,110	17	118,127	284,125	-
2032 *	1,930,579	469,637	2,400,216	43,355	6,162	117,902	850	168,269	118,119	17	118,136	286,405	-
2033 *	1,978,578	488,663	2,467,241	44,369	6,251	119,106	850	170,576	118,128	17	118,145	288,721	-
2034 *	2,027,704	508,434	2,536,138	45,407	6,342	120,322	850	172,921	118,137	17	118,154	291,075	-
2035 *	2,077,980	528,976	2,606,956	46,469	6,435	121,550	850	175,304	118,146	17	118,163	293,467	-
2036 *	2,129,432	550,319	2,679,751	47,556	6,529	122,791	850	177,726	118,155	17	118,172	295,898	-
2037 *	2,182,086	572,492	2,754,578	48,668	6,624	124,044	850	180,186	118,164	17	118,181	298,367	-

2038	*	2,235,967	595,527	2,831,494	49,806	6,721	125,311	850	182,688	118,173	17	118,190	300,878	-
2039	*	2,291,102	619,455	2,910,557	50,971	6,819	126,591	850	185,231	118,182	17	118,199	303,430	-
2040	*	2,347,517	644,310	2,991,827	52,163	6,919	127,884	850	187,816	118,191	17	118,208	306,024	-
GR1		2.20	3.28	2.41	2.05	-0.56	0.41	-0.39	0.74	-0.49	-1.32	-0.49	0.20	0.00
GR2		1.92	3.74	2.24	1.97	0.88	0.77	0.00	1.06	-0.39	0.00	-0.39	0.42	0.00

GR1: Growth Rate from 2011 to 2040

GR2: Growth Rate from 2012 to 2040

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APO TAF Quick Data Summary - Facility

For National Forecast 2012 -- 2012 Scenario

Region State: AWP-CA **LOCID: ONT Limited Radar Towers**

City: ONTARIO **Airport: ONTARIO INTL** **2011 Based Aircraft: 35**

	-- ENPLANEMENTS --			-- AIRPORT OPERATIONS --									-- TRACON --
				-- Itinerant Operations --					-- Local Operations --				
Fiscal Year	Air Carrier	Commuter	Total	Air Carrier	AT & Comm	GA	Military	Total	Civil	Military	Total	Total OPS	Total OPS
Historical													
2008	2,753,668	466,697	3,220,365	79,852	39,329	14,397	64	133,642	1,919	18	1,937	135,579	-
2009	2,235,188	202,293	2,437,481	65,200	21,671	10,727	71	97,669	2,876	37	2,913	100,582	-
2010	2,158,685	217,383	2,376,068	61,128	19,123	11,371	223	91,845	3,879	19	3,898	95,743	-
2011	2,089,274	214,037	2,303,311	58,907	16,686	10,970	73	86,636	4,971	1	4,972	91,608	-
Forecast													
2012 *	1,933,299	202,260	2,135,559	55,990	14,254	10,931	173	81,348	3,953	2	3,955	85,303	-
2013 *	1,821,617	187,692	2,009,309	52,443	14,204	10,841	173	77,661	4,173	2	4,175	81,836	-
2014 *	1,840,436	191,013	2,031,449	53,043	14,084	10,953	173	78,253	4,177	2	4,179	82,432	-
2015 *	1,858,495	194,217	2,052,712	53,620	13,958	11,066	173	78,817	4,181	2	4,183	83,000	-
2016 *	1,875,235	197,201	2,072,436	54,157	13,823	11,180	173	79,333	4,185	2	4,187	83,520	-
2017 *	1,890,474	199,928	2,090,402	54,647	13,682	11,295	173	79,797	4,189	2	4,191	83,988	-
2018 *	1,904,135	202,382	2,106,517	54,878	13,711	11,412	173	80,174	4,193	2	4,195	84,369	-
2019 *	1,917,895	204,863	2,122,758	55,110	13,740	11,530	173	80,553	4,197	2	4,199	84,752	-
2020 *	1,931,756	207,370	2,139,126	55,343	13,769	11,649	173	80,934	4,201	2	4,203	85,137	-
2021 *	1,945,719	209,903	2,155,622	55,578	13,798	11,769	173	81,318	4,206	2	4,208	85,526	-
2022 *	1,959,783	212,464	2,172,247	55,814	13,827	11,890	173	81,704	4,211	2	4,213	85,917	-
2023 *	1,973,947	215,051	2,188,998	56,051	13,857	12,013	173	82,094	4,216	2	4,218	86,312	-
2024 *	1,988,216	217,664	2,205,880	56,289	13,887	12,137	173	82,486	4,221	2	4,223	86,709	-
2025 *	2,002,587	220,304	2,222,891	56,528	13,917	12,262	173	82,880	4,226	2	4,228	87,108	-
2026 *	2,017,065	222,971	2,240,036	56,768	13,947	12,389	173	83,277	4,231	2	4,233	87,510	-
2027 *	2,031,648	225,665	2,257,313	57,009	13,977	12,517	173	83,676	4,236	2	4,238	87,914	-
2028 *	2,046,336	228,387	2,274,723	57,251	14,007	12,646	173	84,077	4,241	2	4,243	88,320	-
2029 *	2,061,130	231,136	2,292,266	57,494	14,037	12,777	173	84,481	4,246	2	4,248	88,729	-
2030 *	2,076,034	233,913	2,309,947	57,738	14,067	12,909	173	84,887	4,251	2	4,253	89,140	-
2031 *	2,091,046	236,716	2,327,762	57,983	14,097	13,042	173	85,295	4,256	2	4,258	89,553	-
2032 *	2,106,167	239,548	2,345,715	58,229	14,127	13,177	173	85,706	4,261	2	4,263	89,969	-
2033 *	2,121,398	242,407	2,363,805	58,476	14,157	13,313	173	86,119	4,266	2	4,268	90,387	-
2034 *	2,136,741	245,293	2,382,034	58,724	14,187	13,450	173	86,534	4,271	2	4,273	90,807	-
2035 *	2,152,196	248,207	2,400,403	58,973	14,217	13,588	173	86,951	4,276	2	4,278	91,229	-
2036 *	2,167,763	251,149	2,418,912	59,223	14,247	13,727	173	87,370	4,281	2	4,283	91,653	-
2037 *	2,183,443	254,119	2,437,562	59,475	14,277	13,868	173	87,793	4,286	2	4,288	92,081	-

2038	*	2,199,239	257,117	2,456,356	59,728	14,307	14,010	173	88,218	4,291	2	4,293	92,511	-
2039	*	2,215,149	260,143	2,475,292	59,982	14,339	14,154	173	88,648	4,296	2	4,298	92,946	-
2040	*	2,231,174	263,196	2,494,370	60,237	14,371	14,299	173	89,080	4,301	2	4,303	93,383	-
GR1		0.22	0.71	0.27	0.07	-0.51	0.91	3.01	0.09	-0.49	2.41	-0.49	0.06	0.00
GR2		0.51	0.94	0.55	0.26	0.02	0.96	0.00	0.32	0.30	0.00	0.30	0.32	0.00

GR1: Growth Rate from 2011 to 2040

GR2: Growth Rate from 2012 to 2040

Report created 3/1/2013 19:51

APO TAF Quick Data Summary - Facility

For National Forecast 2012 -- 2012 Scenario

Region State: AWP-CA **LOCID: SNA Limited Radar Towers**

City: SANTA ANA **Airport: JOHN WAYNE AIRPORT-ORANGE COUNTY** **2011 Based Aircraft: 481**

	-- ENPLANEMENTS --			-- AIRPORT OPERATIONS --									-- TRACON --
				-- Itinerant Operations --					-- Local Operations --				
Fiscal Year	Air Carrier	Commuter	Total	Air Carrier	AT & Comm	GA	Military	Total	Civil	Military	Total	Total OPS	Total OPS
Historical													
2008	4,366,418	233,034	4,599,452	88,985	27,739	120,219	65	237,008	91,946	0	91,946	328,954	-
2009	3,985,852	264,441	4,250,293	87,439	14,749	101,963	83	204,234	84,000	0	84,000	288,234	-
2010	4,116,638	194,575	4,311,213	88,133	10,423	104,680	65	203,301	83,387	0	83,387	286,688	-
2011	4,121,466	113,718	4,235,184	83,172	9,346	97,975	172	190,665	74,394	0	74,394	265,059	-
Forecast													
2012 *	4,100,774	116,972	4,217,746	82,675	9,083	96,949	464	189,171	71,342	0	71,342	260,513	-
2013 *	4,104,478	159,205	4,263,683	82,913	9,174	96,769	464	189,320	68,443	0	68,443	257,763	-
2014 *	4,287,598	168,725	4,456,323	86,211	9,265	97,969	464	193,909	68,765	0	68,765	262,674	-
2015 *	4,429,193	176,194	4,605,387	88,629	9,357	99,184	464	197,634	69,088	0	69,088	266,722	-
2016 *	4,528,711	181,500	4,710,211	90,167	9,450	100,413	464	200,494	69,413	0	69,413	269,907	-
2017 *	4,603,107	185,496	4,788,603	91,180	9,544	101,658	464	202,846	69,740	0	69,740	272,586	-
2018 *	4,705,583	191,029	4,896,612	92,744	9,639	102,918	464	205,765	70,068	0	70,068	275,833	-
2019 *	4,810,340	196,727	5,007,067	94,335	9,735	104,195	464	208,729	70,397	0	70,397	279,126	-
2020 *	4,917,428	202,596	5,120,024	95,954	9,832	105,487	464	211,737	70,728	0	70,728	282,465	-
2021 *	5,026,901	208,639	5,235,540	97,601	9,930	106,794	464	214,789	71,060	0	71,060	285,849	-
2022 *	5,138,811	214,859	5,353,670	99,276	10,029	108,118	464	217,887	71,394	0	71,394	289,281	-
2023 *	5,253,212	221,264	5,474,476	100,979	10,129	109,459	464	221,031	71,730	0	71,730	292,761	-
2024 *	5,370,158	227,861	5,598,019	102,711	10,230	110,817	464	224,222	72,067	0	72,067	296,289	-
2025 *	5,489,708	234,652	5,724,360	104,473	10,332	112,190	464	227,459	72,406	0	72,406	299,865	-
2026 *	5,611,916	241,648	5,853,564	106,266	10,435	113,580	464	230,745	72,747	0	72,747	303,492	-
2027 *	5,736,843	248,851	5,985,694	108,089	10,539	114,988	464	234,080	73,089	0	73,089	307,169	-
2028 *	5,864,551	256,267	6,120,818	109,943	10,644	116,414	464	237,465	73,433	0	73,433	310,898	-
2029 *	5,995,099	263,904	6,259,003	111,829	10,750	117,857	464	240,900	73,779	0	73,779	314,679	-
2030 *	6,128,551	271,768	6,400,319	113,748	10,858	119,318	464	244,388	74,126	0	74,126	318,514	-
2031 *	6,264,971	279,867	6,544,838	115,699	10,967	120,797	464	247,927	74,475	0	74,475	322,402	-
2032 *	6,404,425	288,206	6,692,631	117,684	11,077	122,295	464	251,520	74,825	0	74,825	326,345	-
2033 *	6,546,980	296,792	6,843,772	119,704	11,188	123,811	464	255,167	75,177	0	75,177	330,344	-
2034 *	6,692,705	305,633	6,998,338	121,758	11,300	125,346	464	258,868	75,530	0	75,530	334,398	-
2035 *	6,841,670	314,736	7,156,406	123,847	11,413	126,900	464	262,624	75,885	0	75,885	338,509	-
2036 *	6,993,947	324,109	7,318,056	125,972	11,527	128,474	464	266,437	76,242	0	76,242	342,679	-
2037 *	7,149,608	333,762	7,483,370	128,133	11,642	130,067	464	270,306	76,601	0	76,601	346,907	-

2038	*	7,308,728	343,701	7,652,429	130,332	11,759	131,680	464	274,235	76,962	0	76,962	351,197	-
2039	*	7,471,385	353,936	7,825,321	132,568	11,877	133,312	464	278,221	77,324	0	77,324	355,545	-
2040	*	7,637,657	364,474	8,002,131	134,843	11,996	134,964	464	282,267	77,688	0	77,688	359,955	-
GR1		2.14	4.09	2.21	1.68	0.86	1.11	3.48	1.36	0.14	0.00	0.14	1.06	0.00
GR2		2.24	4.14	2.31	1.76	0.99	1.18	0.00	1.43	0.30	0.00	0.30	1.16	0.00

GR1: Growth Rate from 2011 to 2040

GR2: Growth Rate from 2012 to 2040

Report created 3/1/2013 19:51

Appendix B
Existing Omnitrans and Metrolink Schedule

RIVERSIDE LINE • 400 SERIES Riverside-Downtown to L.A.

MONDAY THROUGH FRIDAY

Metrolink Service No.	401	403	405	407	409	411
Riverside-Downtown	4:42	5:42	6:15	6:50	8:15	3:07
Pedley	4:53	5:53	6:26	7:01	8:26	3:18
East Ontario	5:03	6:03	6:36	7:11	8:36	3:28
Downtown Pomona	•5:15	•6:15	•6:48	•7:23	•8:48	•3:40
Industry	5:24	6:24	6:57	7:32	8:57	3:49
Montebello/Commerce	•5:42	•6:42	•7:15	•7:50	•9:15	•4:07
L.A. Union Station ★	»6:05	7:07	»7:38	8:15	9:40	4:35

» Train 401 continues as 91 Line train 702 to Riverside-Downtown. See pg. 23 in the All Lines Timetable for details.

» Train 405 continues as Burbank Airport Line train 903 to Burbank-Bob Hope Airport. See pg. 9 in the All Lines Timetable for details.

L.A. to Riverside-Downtown

MONDAY THROUGH FRIDAY

Metrolink Service No.	402	404	406	408	410	412
L.A. Union Station ★	1:15	4:15	4:55	5:32	6:05	6:35
Montebello/Commerce	•1:32	•4:32	•5:12	•5:49	•6:22	•6:52
Industry	•1:50	•4:50	5:30	•6:07	•6:40	•7:10
Downtown Pomona	•1:59	•4:59	•5:39	•6:16	•6:49	•7:19
East Ontario	•2:11	•5:12	•5:51	•6:28	•7:01	•7:31
Pedley	•2:23	•5:24	•6:03	•6:40	•7:13	•7:43
Riverside-Downtown	2:43	5:42	6:22	7:00	7:30	8:02

Check 91 Line schedule for additional trains to Riverside-Downtown via Fullerton.

NOTES: See reverse side

91 LINE • 700 SERIES Riverside-Downtown to L.A. (via Fullerton)

MONDAY THROUGH FRIDAY

Metrolink Service No.	701	703	705	707
Riverside-Downtown	5:27	6:29	2:30	5:52
Riverside-La Sierra	5:37	6:39	2:40	6:02
North Main Corona	5:45	6:47	2:48	6:10
West Corona	5:51	6:53	2:54	6:16
Fullerton ★	•6:16	•7:18	•3:19	•6:41
Buena Park	•6:23	•7:25	•3:27	•6:49
Norwalk/Santa Fe Springs	•6:31	•7:33	•3:34	•6:56
L.A. Union Station ★	7:05	8:07	4:05	7:25

L.A. to Riverside-Downtown (via Fullerton)

MONDAY THROUGH FRIDAY

Metrolink Service No.	700	702	704	706	708
L.A. Union Station ★	5:45	6:25	12:45	4:20	5:25
Norwalk/Santa Fe Springs	6:06	6:46	1:06	4:41	5:46
Buena Park	6:12	6:52	1:12	4:47	5:52
Fullerton ★	•6:19	•6:59	•1:19	•4:54	•5:59
West Corona	•6:43	•7:23	•1:43	•5:18	•6:23
North Main Corona	•6:50	•7:30	•1:50	•5:25	•6:30
Riverside-La Sierra	•6:59	•7:39	•1:59	•5:34	•6:39
Riverside-Downtown	7:15	8:05	2:20	5:55	7:00

Check Orange County Line and Inland Empire-Orange County Line schedules for additional trains along this corridor.
Check Riverside Line schedule for additional trains to Riverside-Downtown.

NOTES: See reverse side

TICKET INFORMATION
INFORMACIÓN DE BOLETOS

- Passengers must have a valid ticket prior to boarding the train. Tickets may be purchased at the vending machines located at each station with cash, debit card, Visa®, MasterCard®, American Express®, or Discover®.

Los pasajeros deben tener un boleto válido antes de subir a bordo del tren. Los boletos se pueden adquirir en las máquinas automáticas de venta que se encuentran en cada estación. La forma de pago es en efectivo, tarjeta de débito, Visa®, MasterCard®, American Express®, o Discover®.

- Use your Metrolink ticket to transfer to most connecting buses, shuttles, or rail lines for free.

Use su boleto de Metrolink para trasbordar gratis a la mayoría de las líneas de autobuses, microbuses y trenes.

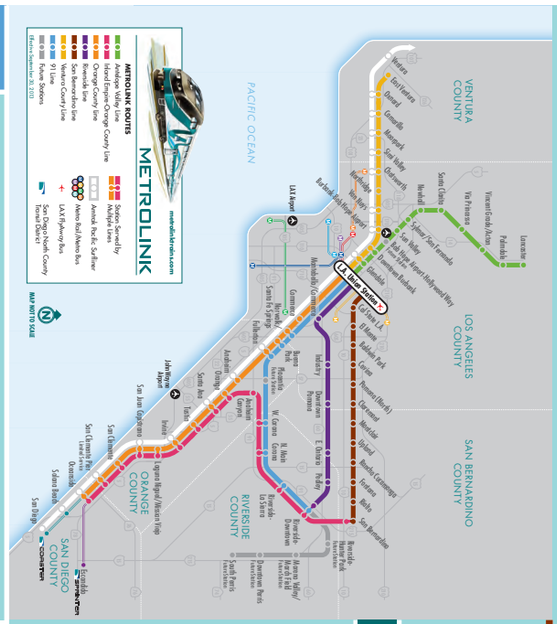
HOLIDAY SERVICE *DÍAS DE SERVICIO*

- Limited train service on the days New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day and Christmas Day are observed.

Se ofrece servicio limitado los días que se observan el Día de Año Nuevo, el Día de Conmemoración, el Día de Independencia, el Día del Trabajo, el Día de Acción de Gracias y el Día de Navidad.

CONTACT INFORMATION
INFORMACIÓN DE CONTACTO

- Phone *Teléfono*
  800-371-5465 (LINK)
- For speech and hearing impaired
  Para las personas con problemas auditivos y del habla
  800-698-4833 (4TDD)
- **metrolinktrains.com**



METROLINK

TIMETABLE

EFFECTIVE SEPTEMBER 30, 2013

SAN BERNARDINO LINE
Monday through Sunday service

RIVERSIDE LINE
Monday through Friday service

91 LINE
Monday through Friday service

METROLINK

SAN BERNARDINO LINE • 300 SERIES — San Bernardino to L.A.

MONDAY THROUGH FRIDAY

Metrolink Service No.	301	303	305	383	307	309	311	313	315	317	319	800	321	325	327	385	329	331	333	335	337	387
Riverside-Downtown												•10:24										
San Bernardino	4:06	4:52	5:10	5:40	5:52	6:12	6:30	6:52	7:10	8:15	9:40	10:50➤	11:00	1:00	2:00	2:30	3:00	4:00	5:10	6:25	7:28	9:05
Rialto	4:12	4:58	5:17	↓	5:58	6:18	6:36	6:58	7:16	8:21	9:46		11:06	1:06	2:06	2:36	3:06	4:06	5:15	•6:31	7:34	9:11
Fontana	4:17	5:03	5:23	↓	6:03	6:23	6:41	7:03	7:21	8:26	9:51		11:11	1:11	2:11	2:41	3:11	4:11	5:20	•6:45	7:39	9:16
Rancho Cucamonga	4:24	5:11	5:32	5:53	6:11	6:31	6:49	7:11	7:29	8:34	9:59		11:19	1:19	2:19	2:49	3:19	•4:19	•5:32	•6:56	7:47	9:24
Upland	4:31	5:18	5:39	↓	6:18	6:38	6:56	7:18	7:36	8:41	10:06		11:26	1:26	2:26	2:56	3:26	•4:26	•5:46	•7:03	7:54	9:36
Montclair	4:36	5:23	5:44	↓	6:23	6:43	7:01	7:23	7:41	8:46	10:11		11:31	1:31	2:31	3:01	3:31	•4:31	•5:56	•7:08	7:59	9:41
Claremont	4:39	5:26	5:47	↓	6:26	6:46	7:04	7:26	7:44	8:49	10:14		11:34	1:34	2:34	3:04	3:34	4:34	5:59	7:11	8:02	9:44
Pomona (North)	4:43	5:30	5:52	↓	6:30	6:50	7:08	7:30	7:48	8:53	10:18		11:38	1:38	2:38	3:08	3:38	4:38	6:05	7:15	8:06	9:48
Covina	4:52	5:39	•6:08	•6:14	6:39	7:01	7:17	7:39	7:57	9:02	10:27		11:47	1:47	2:47	3:17	3:47	4:47	6:17	7:24	8:15	9:57
Baldwin Park	4:58	5:45	6:22	↓	6:45	7:07	7:23	7:45	8:03	9:08	10:33		11:53	1:53	2:53	3:23	3:53	4:53	6:23	7:30	8:21	10:03
El Monte	•5:07	•5:54	•6:32	↓	•6:54	•7:16	•7:32	•7:54	•8:12	•9:20	•10:42		•12:02	•2:02	•3:02	•3:41	•4:12	•5:21	•6:40	•7:38	•8:29	•10:11
Cal State L.A.	•5:17	•6:05	•6:43	↓	•7:05	•7:27	•7:43	•8:05	•8:23	•9:31	•10:54		•12:13	•2:13	•3:13	•3:49	•4:37	•5:41	•6:51	•7:49	•8:48	•10:22
L.A. Union Station ★	5:30	»6:20	7:00	6:45	7:20	7:42	8:00	»8:20	8:40	9:45	11:15		12:30	2:30	3:30	4:05	4:50	6:05	7:05	8:15	9:15	10:40

» Train 303 continues as Orange County Line train 682 to Laguna Niguel/Mission Viejo. See pg. 25 in the All Lines Timetable for details.
» Train 313 continues as Burbank Airport Line train 907 to Burbank-Bob Hope Airport. See pg. 9 in the All Lines Timetable for details.

NOTES: See below

SAN BERNARDINO LINE • 300 SERIES — L.A. to San Bernardino

MONDAY THROUGH FRIDAY

Metrolink Service No.	300	302	304	308	310	382	312	314	316	318	320	322	324	384	326	328	330	332	334	336	386
L.A. Union Station ★	5:45	7:45	9:02	11:20	12:20	12:50	1:20	2:20	3:20	3:45	4:20	4:38	5:00	5:15	5:25	5:45	6:20	7:20	8:30	9:30	11:00
Cal State L.A.	•5:56	7:55	9:11	11:30	12:30	1:00	1:30	2:30	3:30	3:55	4:30	4:48	5:10	↓	5:35	5:55	6:30	7:30	8:40	9:40	11:10
El Monte	•6:10	8:09	9:21	11:40	12:40	1:10	1:40	2:40	3:40	4:05	4:40	4:58	5:20	↓	5:45	6:05	6:40	7:39	8:49	9:49	11:19
Baldwin Park	•6:31	8:22	9:29	11:48	12:48	1:18	1:48	2:48	3:48	4:13	4:48	5:06	5:28	↓	5:53	6:13	6:48	7:47	8:57	9:57	11:27
Covina	•6:42	8:29	9:35	11:55	12:55	1:25	1:55	2:55	3:55	4:20	4:55	5:13	5:48	5:44	6:00	6:20	6:55	7:54	9:03	10:03	11:33
Pomona (North)	•6:52	8:39	9:45	12:05	1:05	1:35	2:05	3:05	4:05	4:30	5:05	5:23	5:59	↓	6:10	6:30	7:05	8:04	9:13	10:13	11:43
Claremont	•6:56	8:43	9:49	12:09	1:09	1:39	2:09	3:09	4:09	4:34	5:09	5:27	6:03	↓	6:14	6:34	7:09	8:08	9:17	10:17	11:47
Montclair	•6:59	8:46	9:52	12:12	1:12	1:42	2:12	3:12	4:12	4:37	5:12	5:30	6:06	↓	6:17	6:37	7:12	8:11	9:20	10:20	11:50
Upland	•7:07	8:51	9:57	12:17	1:17	1:47	2:17	3:17	4:17	4:42	5:17	5:35	6:11	↓	6:22	6:42	7:17	8:16	9:25	10:25	11:55
Rancho Cucamonga	•7:15	•8:58	•10:04	•12:24	•1:24	•1:54	•2:24	•3:24	•4:24	•4:49	•5:24	•5:42	•6:18	•6:04	•6:31	•6:49	•7:24	•8:23	•9:32	•10:32	•12:02
Fontana	•7:30	•9:07	•10:13	•12:33	•1:33	•2:03	•2:33	•3:33	•4:33	•4:58	•5:33	•5:50	•6:27	↓	•6:40	•6:58	•7:33	•8:32	•9:41	•10:41	•12:11
Rialto	•7:35	•9:13	•10:19	•12:39	•1:39	•2:09	•2:41	•3:39	•4:39	•5:04	•5:39	•5:55	•6:35	↓	•6:46	•7:04	•7:39	•8:38	•9:47	•10:47	•12:17
San Bernardino	7:50	9:30	10:35	12:50	1:50	2:20	2:50	3:50	4:50	5:25	5:55	6:10	6:45	6:20	7:05	7:20	7:50	8:50	10:00	11:00	12:30

NOTES: See below

SAN BERNARDINO LINE • 300 SERIES — San Bernardino to L.A.

SATURDAY

Metrolink Service No.	351	353	357	359	363	367	369	373	377	379
Riverside-Downtown	6:20					1:25				
San Bernardino	7:00	8:25	9:50	11:30	1:05	2:07	3:35	4:55	6:30	9:15
Rialto	7:07	8:32	9:57	11:37	1:12	2:14	3:42	5:02	6:37	9:22
Fontana	7:12	8:37	10:02	11:42	1:17	2:19	3:47	5:07	6:42	9:27
Rancho Cucamonga	7:21	8:46	10:11	11:50	1:26	2:28	3:56	5:16	6:51	9:36
Upland	7:28	8:53	10:20	11:59	1:35	2:36	4:04	5:25	7:00	9:45
Montclair	7:34	8:59	10:26	12:05	1:41	2:42	4:10	5:31	7:06	9:51
Claremont	7:37	9:02	10:29	12:08	1:44	2:45	4:13	5:34	7:09	9:56
Pomona (North)	7:41	9:06	10:34	12:13	1:49	2:49	4:18	5:39	7:14	10:00
Covina	7:51	9:16	10:44	12:23	1:59	2:59	4:28	5:49	7:24	10:10
Baldwin Park	7:57	9:21	10:50	12:29	2:05	3:05	4:39	5:55	7:30	10:16
El Monte	•8:07	•9:35	•11:01	•12:43	•2:19	•3:14	•4:49	•6:09	•7:44	•10:30
Cal State L.A.	•8:19	•9:48	•11:14	•12:55	•2:32	•3:27	•5:01	•6:22	•7:56	•10:42
L.A. Union Station ★	8:35	10:05	11:30	1:15	2:50	3:40	5:15	6:40	8:15	10:55

SUNDAY

351	357	359	361	367	369	377
6:20				1:25		
7:00	9:50	11:30	12:30	2:07	3:35	6:30
7:07	9:57	11:37	12:36	2:14	3:42	6:37
7:12	10:02	11:42	12:41	2:19	3:47	6:42
7:21	10:11	11:50	12:49	2:28	3:56	6:51
7:28	10:20	11:59	12:56	2:36	4:04	7:00
7:34	10:26	12:05	1:01	2:42	4:10	7:06
7:37	10:29	12:08	1:04	2:45	4:13	7:09
7:41	10:34	12:13	1:08	2:49	4:18	7:14
7:51	10:44	12:23	1:17	2:59	4:28	7:24
7:57	10:50	12:29	1:23	3:05	4:39	7:30
•8:07	•11:01	•12:43	•1:32	•3:14	•4:49	•7:44
•8:19	•11:14	•12:55	•1:43	•3:27	•5:01	•7:56
8:35	11:30	1:15	2:00	3:40	5:15	8:15

NOTES:
↓ Train does not stop at this station
↓ Express Train
• Train may leave up to five minutes ahead of schedule
➤ Transfer trains at San Bernardino Station
Ⱶ LAX FlyAway Bus
Special Bike Car on this train can accommodate up to 18 bicycles on the lower level.
AM times **PM** times
Boarding information is available at each station.

SAN BERNARDINO LINE • 300 SERIES — L.A. to San Bernardino

SATURDAY

Metrolink Service No.	352	354	358	362	364	366	368	372	376	378
L.A. Union Station ★	6:15	9:00	10:35	12:10	1:45	4:00	5:35	7:10	9:00	11:30
Cal State L.A.	6:25	9:10	10:46	12:21	1:56	4:11	5:46	7:21	9:10	11:40
El Monte	6:35	9:20	10:57	12:32	2:07	4:21	5:57	7:32	9:21	11:50
Baldwin Park	6:43	9:30	11:07	12:42	2:17	4:29	6:07	7:42	9:31	11:58
Covina	•6:51	•9:38	•11:15	•12:50	•2:25	•4:38	•6:15	•7:50	•9:39	•12:05
Pomona (North)	7:02	9:50	11:27	1:02	2:36	4:49	6:27	8:02	9:50	12:16
Claremont	7:06	9:54	11:31	1:06	2:40	4:54	6:31	8:06	9:54	12:20
Montclair	7:10	9:58	11:35	1:10	2:44	4:58	6:35	8:10	9:58	12:24
Upland	7:15	10:03	11:40	1:15	2:50	5:04	6:40	8:16	10:04	12:29
Rancho Cucamonga	•7:24	•10:14	•11:51	•1:26	•2:58	•5:15	•6:51	•8:23	•10:11	•12:36
Fontana	•7:33	•10:23	•12:00	•1:35	•3:07	•5:24	•7:00	•8:32	•10:20	•12:45
Rialto	•7:39	•10:29	•12:06	•1:41	•3:13	•5:30	•7:06	•8:38	•10:26	•12:51
San Bernardino	7:54	10:45	12:22	2:00	3:40	5:45	7:22	8:54	10:50	1:05
Riverside-Downtown					4:05				11:15	

SUNDAY

354	356	362	364	366	368	376
9:00	10:10	12:10	1:45	4:00	5:35	9:00
9:10	10:21	12:21	1:56	4:11	5:46	9:10
9:20	10:31	12:32	2:07	4:21	5:57	9:21
9:30	10:40	12:42	2:17	4:29	6:07	9:31
•9:38	•10:48	•12:50	•2:25	•4:38	•6:15	•9:39
9:50	10:59	1:02	2:36	4:49	6:27	9:50
9:54	11:03	1:06	2:40	4:54	6:31	9:54
9:58	11:07	1:10	2:44	4:58	6:35	9:58
10:03	11:12	1:15	2:50	5:04	6:40	10:04
•10:14	•11:19	•1:26	•2:58	•5:15	•6:51	•10:11
•10:23	•11:28	•1:35	•3:07	•5:24	•7:00	•10:20
•10:29	•11:40	•1:41	•3:13	•5:30	•7:06	•10:26
10:45	11:52	2:00	3:40	5:45	7:22	10:50
			4:05			11:15

NOTES: See above

ROUTE 61: MONDAY - FRIDAY

EASTBOUND

A Pomona Transit Center	B Holt & Mills	C Holt & Vineyard	D Ontario Mills	E Fontana Metrolink
4:48	4:56	5:13	5:36	6:05
5:21	5:29	5:46	6:06	6:35
5:45	5:56	6:18	6:31	7:03
6:00	6:11	6:36	6:59	7:33
6:15	6:26	6:51	7:14	7:48
6:30	6:41	7:06	7:29	8:03
6:45	6:56	7:21	7:44	8:18
7:05	7:16	7:41	8:04	8:38
7:16	7:27	7:52	8:15	8:49
7:30	7:41	8:02	8:35	9:06
7:45	7:56	8:17	8:50	9:21
8:00	8:11	8:32	9:05	9:36
8:15	8:26	8:47	9:20	9:51
8:30	8:41	9:02	9:35	10:06
8:45	8:56	9:17	9:50	10:21
9:00	9:11	9:32	10:05	10:36
9:15	9:26	9:47	10:20	10:51
9:30	9:41	10:02	10:35	11:06
9:45	9:56	10:17	10:50	11:21
10:00	10:11	10:32	11:05	11:36
10:15	10:26	10:47	11:20	11:51
10:30	10:41	11:02	11:35	**12:06**
10:45	10:56	11:17	11:50	**12:21**
11:00	11:11	11:32	**12:05**	**12:36**
11:15	11:26	11:47	**12:20**	**12:51**
11:30	11:41	**12:02**	**12:35**	**1:06**
11:45	11:56	**12:17**	**12:50**	**1:21**
12:00	**12:11**	**12:32**	**1:05**	**1:36**
12:15	**12:26**	**12:47**	**1:20**	**1:51**
12:30	**12:41**	**1:02**	**1:35**	**2:06**
12:45	**12:56**	**1:17**	**1:50**	**2:21**
1:00	**1:11**	**1:32**	**2:05**	**2:36**
1:15	**1:26**	**1:47**	**2:20**	**2:51**
1:30	**1:41**	**2:02**	**2:35**	**3:06**
1:45	**1:56**	**2:17**	**2:50**	**3:21**
2:00	**2:11**	**2:32**	**3:05**	**3:36**
2:15	**2:26**	**2:47**	**3:20**	**3:51**
2:30	**2:41**	**3:02**	**3:35**	**4:06**
2:45	**2:56**	**3:17**	**3:50**	**4:21**
3:00	**3:11**	**3:32**	**4:05**	**4:36**
3:15	**3:26**	**3:51**	**4:19**	**4:50**
3:30	**3:41**	**4:06**	**4:34**	**5:05**
3:45	**3:56**	**4:21**	**4:49**	**5:20**
4:00	**4:11**	**4:36**	**5:04**	**5:35**
4:15	**4:26**	**4:51**	**5:19**	**5:50**
4:30	**4:41**	**5:06**	**5:34**	**6:05**
4:48	**4:59**	**5:24**	**5:52**	**6:23**
5:00	**5:11**	**5:36**	**6:04**	**6:35**
5:15	**5:26**	**5:51**	**6:19**	**6:50**
5:30	**5:41**	**6:06**	**6:34**	**7:05**
5:45	**5:56**	**6:21**	**6:49**	**7:20**
6:00	**6:11**	**6:36**	**7:04**	**7:35**
6:30	**6:41**	**7:06**	**7:34**	**8:05**
7:00	**7:08**	**7:26**	**7:54**	**8:26**
7:30	**7:38**	**7:56**	**8:24**	**8:56**
8:00	**8:08**	**8:26**	**8:44**	**9:14**
8:30	**8:38**	**8:56**	**9:24**	**9:56**
9:05	**9:13**	**9:31**	**9:44**	**10:16**

WESTBOUND

E Fontana Metrolink	D Ontario Mills	C Holt & Vineyard	B Holt & Mills	A Pomona Transit Center
4:20	4:50	5:04	5:22	5:31
4:57	5:24	5:37	5:55	6:05
5:28	6:00	6:14	6:39	6:50
5:52	6:25	6:40	7:03	7:15
6:25	6:57	7:13	7:30	7:45
6:50	7:27	7:43	8:08	8:20
7:14	7:51	8:07	8:29	8:41
7:33	8:10	8:26	8:51	9:03
7:48	8:25	8:41	9:06	9:18
8:03	8:40	8:56	9:16	9:28
8:18	8:55	9:11	9:31	9:43
8:33	9:10	9:26	9:46	9:58
8:48	9:25	9:41	10:01	10:13
9:03	9:40	9:56	10:16	10:28
9:18	9:55	10:11	10:31	10:43
9:33	10:10	10:26	10:46	10:58
9:48	10:25	10:41	11:01	11:13
10:03	10:40	10:56	11:16	11:28
10:18	10:55	11:11	11:31	11:43
10:33	11:10	11:26	11:46	11:58
10:48	11:25	11:41	**12:01**	**12:13**
11:03	11:40	11:56	**12:16**	**12:28**
11:18	11:55	**12:11**	**12:31**	**12:43**
11:33	**12:10**	**12:26**	**12:46**	**12:58**
11:48	**12:25**	**12:41**	**1:01**	**1:13**
12:03	**12:40**	**12:56**	**1:16**	**1:28**
12:18	**12:55**	**1:11**	**1:31**	**1:43**
12:35	**1:12**	**1:28**	**1:48**	**2:00**
12:50	**1:27**	**1:43**	**2:03**	**2:15**
1:05	**1:42**	**1:58**	**2:18**	**2:30**
1:20	**1:57**	**2:13**	**2:33**	**2:45**
1:35	**2:12**	**2:28**	**2:48**	**3:00**
1:50	**2:27**	**2:43**	**3:03**	**3:15**
2:05	**2:42**	**2:58**	**3:18**	**3:30**
2:20	**2:57**	**3:13**	**3:33**	**3:45**
2:35	**3:12**	**3:28**	**3:48**	**4:00**
2:50	**3:27**	**3:43**	**4:03**	**4:15**
3:05	**3:42**	**3:58**	**4:23**	**4:35**
3:20	**3:57**	**4:13**	**4:38**	**4:50**
3:35	**4:12**	**4:28**	**4:53**	**5:05**
3:50	**4:27**	**4:43**	**5:08**	**5:20**
4:05	**4:42**	**4:58**	**5:23**	**5:35**
4:20	**4:57**	**5:13**	**5:38**	**5:50**
4:35	**5:12**	**5:28**	**5:53**	**6:05**
4:50	**5:27**	**5:43**	**6:08**	**6:20**
5:05	**5:42**	**5:58**	**6:23**	**6:35**
5:20	**5:57**	**6:13**	**6:38**	**6:50**
5:35	**6:12**	**6:28**	**6:53**	**7:05**
5:50	**6:27**	**6:43**	**7:08**	**7:20**
6:05	**6:42**	**6:58**	**7:23**	**7:35**
6:20	**6:57**	**7:13**	**7:38**	**7:50**
6:50	**7:27**	**7:43**	**8:08**	**8:20**
7:20	**7:57**	**8:13**	**8:38**	**8:50**
7:55	**8:32**	**8:48**	**9:06**	**9:17**
8:20	**8:57**	**9:13**	**9:31**	**9:42**
8:50	**9:27**	**9:43**	**10:01**	**10:12**
9:29	**9:57**	**10:09**	**10:24**	**10:33**
10:20	**10:46**	**10:58**	**11:13**	

ROUTE 61: SATURDAY

EASTBOUND

A Pomona Transit Center	B Holt & Mills	C Holt & Vineyard	D Ontario Mills	E Fontana Metrolink
6:15	6:26	6:48	7:01	7:34
7:00	7:11	7:33	7:46	8:19
7:30	7:41	8:03	8:16	8:49
7:45	7:56	8:18	8:31	9:04
8:00	8:11	8:33	8:46	9:19
8:15	8:26	8:48	9:01	9:34
8:30	8:41	9:03	9:16	9:49
8:45	8:56	9:18	9:31	10:04
9:00	9:11	9:33	9:46	10:19
9:15	9:26	9:48	10:01	10:34
9:30	9:41	10:03	10:16	10:49
9:45	9:56	10:18	10:31	11:04
10:00	10:11	10:33	10:46	11:19
10:15	10:26	10:48	11:01	11:34
10:30	10:41	11:03	11:16	11:51
10:45	10:56	11:18	11:31	**12:06**
11:00	11:11	11:33	11:46	**12:21**
11:15	11:26	11:48	**12:01**	**12:36**
11:30	11:41	**12:03**	**12:16**	**12:51**
11:45	11:56	**12:18**	**12:31**	**1:06**
12:00	**12:11**	**12:33**	**12:46**	**1:21**
12:15	**12:26**	**12:48**	**1:01**	**1:36**
12:30	**12:41**	**1:03**	**1:16**	**1:51**
12:45	**12:56**	**1:18**	**1:31**	**2:06**
1:00	**1:11**	**1:33**	**1:46**	**2:21**
1:15	**1:26**	**1:48**	**2:01**	**2:36**
1:30	**1:41**	**2:03**	**2:16**	**2:51**
1:45	**1:56**	**2:18**	**2:31**	**3:06**
2:00	**2:11**	**2:33**	**2:46**	**3:21**
2:15	**2:26**	**2:48**	**3:01**	**3:36**
2:30	**2:41**	**3:03**	**3:16**	**3:51**
2:45	**2:56**	**3:18**	**3:31**	**4:06**
3:00	**3:11**	**3:33**	**3:46**	**4:21**
3:15	**3:26**	**3:48**	**4:01**	**4:36**
3:30	**3:41**	**4:03**	**4:16**	**4:51**
3:45	**3:56**	**4:18**	**4:31**	**5:06**
4:00	**4:11**	**4:33**	**4:46**	**5:19**
4:15	**4:26**	**4:48**	**5:01**	**5:34**
4:30	**4:41**	**5:03**	**5:16**	**5:49**
4:45	**4:56**	**5:18**	**5:31**	**6:04**
5:00	**5:11**	**5:33**	**5:46**	**6:19**
5:15	**5:26**	**5:48**	**6:01**	**6:34**
5:30	**5:41**	**6:03**	**6:16**	**6:49**
5:45	**5:56**	**6:18**	**6:31**	**7:04**
6:00	**6:11**	**6:33**	**6:46**	**7:19**
6:15	**6:26**	**6:48**	**7:01**	**7:34**
6:45	**6:56**	**7:18**	**7:31**	**8:04**
7:15	**7:26**	**7:48**	**8:01**	**8:34**
7:45	**7:56**	**8:18**	**8:31**	**9:04**
8:15	**8:26**	**8:48**	**9:01**	**9:34**
8:45	**8:56**	**9:18**	**9:31**	**10:04**

WESTBOUND

E Fontana Metrolink	D Ontario Mills	C Holt & Vineyard	B Holt & Mills	A Pomona Transit Center
5:55	6:28	6:41	7:04	7:17
6:55	7:28	7:41	8:04	8:17
7:25	7:58	8:11	8:34	8:47
7:40	8:13	8:26	8:49	9:02
7:55	8:28	8:41	9:04	9:17
8:10	8:43	8:56	9:19	9:32
8:25	8:58	9:11	9:34	9:47
8:40	9:13	9:26	9:49	10:02
8:55	9:28	9:41	10:04	10:17
9:10	9:43	9:56	10:19	10:32
9:25	9:58	10:11	10:34	10:47
9:40	10:13	10:26	10:49	11:02
9:55	10:28	10:41	11:04	11:17
10:10	10:43	10:56	11:19	11:32
10:25	10:58	11:11	11:34	11:47
10:40	11:13	11:26	11:49	**12:02**
10:55	11:28	11:41	**12:04**	**12:17**
11:10	11:43	11:56	**12:19**	**12:32**
11:25	11:58	**12:11**	**12:34**	**12:47**
11:40	**12:13**	**12:26**	**12:49**	**1:02**
11:55	**12:28**	**12:41**	**1:04**	**1:17**
12:10	**12:43**	**12:56**	**1:19**	**1:32**
12:25	**12:58**	**1:11**	**1:34**	**1:47**
12:40	**1:13**	**1:27**	**1:49**	**2:02**
12:55	**1:28**	**1:42**	**2:04**	**2:17**
1:10	**1:43**	**1:57**	**2:19**	**2:32**
1:25	**1:58**	**2:12**	**2:34**	**2:47**
1:40	**2:13**	**2:27**	**2:49**	**3:02**
1:55	**2:28**	**2:42**	**3:04**	**3:17**
2:10	**2:43**	**2:57**	**3:19**	**3:32**
2:25	**2:58**	**3:12**	**3:34**	**3:47**
2:40	**3:13**	**3:27**	**3:49**	**4:02**
2:55	**3:28**	**3:42**	**4:04**	**4:17**
3:10	**3:43**	**3:57**	**4:19**	**4:32**
3:25	**3:58**	**4:12**	**4:34**	**4:47**
3:40	**4:13**	**4:27**	**4:49**	**5:02**
3:55	**4:28**	**4:42**	**5:04**	**5:17**
4:10	**4:43**	**4:57**	**5:19**	**5:32**
4:25	**4:58**	**5:12**	**5:34**	**5:47**
4:40	**5:13**	**5:27**	**5:49**	**6:02**
4:55	**5:28**	**5:42**	**6:04**	**6:17**
5:10	**5:43**	**5:57**	**6:19**	**6:32**
5:25	**5:58**	**6:12**	**6:34**	**6:47**
5:40	**6:13**	**6:27**	**6:49**	**7:02**
5:55	**6:28**	**6:42**	**7:04**	**7:17**
6:10	**6:43**	**6:57**	**7:19**	**7:32**
6:40	**7:13**	**7:27**	**7:49**	**8:02**
7:10	**7:43**	**7:57**	**8:19**	**8:32**
7:40	**8:13**	**8:27**	**8:49**	**9:02**
8:25	**8:58**	**9:12**	**9:34**	**9:47**
9:12	**9:45**	**9:59**	**10:21**	**10:34**

ROUTE 61: SUNDAY

EASTBOUND

A Pomona Transit Center	B Holt & Mills	C Holt & Vineyard	D Ontario Mills	E Fontana Metrolink
6:28	6:39	7:01	7:16	7:49
7:13	7:24	7:46	8:01	8:34
7:28	7:39	8:01	8:16	8:49
7:43	7:54	8:16	8:31	9:04
7:58	8:09	8:31	8:46	9:19
8:13	8:24	8:46	9:01	9:34
8:28	8:39	9:01	9:16	9:49
8:43	8:54	9:16	9:31	10:04
8:58	9:09	9:31	9:46	10:19
9:13	9:24	9:46	10:01	10:34
9:28	9:39	10:01	10:16	10:49
9:43	9:54	10:16	10:31	11:04
9:58	10:09	10:31	10:46	11:19
10:13	10:24	10:46	11:01	11:34
10:28	10:39	11:01	11:16	11:49
10:43	10:54	11:16	11:31	**12:04**
10:58	11:09	11:31	11:46	**12:19**
11:13	11:24	11:46	**12:01**	**12:34**
11:28	11:39	**12:01**	**12:16**	**12:49**
11:43	11:54	**12:16**	**12:31**	**1:04**
11:58	**12:09**	**12:31**	**12:46**	**1:19**
12:13	**12:24**	**12:46**	**1:01**	**1:34**
12:28	**12:39**	**1:01**	**1:16**	**1:49**
12:43	**12:54**	**1:16**	**1:31**	**2:04**
12:58	**1:09**	**1:31**	**1:46**	**2:19**
1:13	**1:24**	**1:46**	**2:01**	**2:34**
1:28	**1:39**	**2:01**	**2:16**	**2:49**
1:43	**1:54**	**2:16**	**2:31**	**3:04**
1:58	**2:09**	**2:31**	**2:46**	**3:19**
2:13	**2:24**	**2:46**	**3:01**	**3:34**
2:28	**2:39**	**3:01**	**3:16**	**3:49**
2:43	**2:54**	**3:16**	**3:31**	**4:04**
2:58	**3:09**	**3:31**	**3:46**	**4:19**
3:13	**3:24**	**3:46**	**4:01**	**4:34**
3:28	**3:39**	**4:01**	**4:16**	**4:49**
3:43	**3:54**	**4:16**	**4:31**	**5:04**
3:58	**4:09**	**4:31**	**4:46**	**5:19**
4:13	**4:24**	**4:46**	**5:01**	**5:34**
4:28	**4:39**	**5:01**	**5:16**	**5:49**
4:43	**4:54**	**5:16**	**5:31**	**6:04**
4:58	**5:09**	**5:31**	**5:46**	**6:19**
5:13	**5:24**	**5:46**	**6:01**	**6:34**
5:28	**5:39**	**6:01**	**6:16**	**6:49**
5:43	**5:54**	**6:16**	**6:31**	**7:04**
5:58	**6:09**	**6:31**	**6:46**	**7:19**
6:13	**6:24**	**6:46**	**7:01**	**7:34**
6:28	**6:39**	**7:01**	**7:16**	**7:49**

WESTBOUND

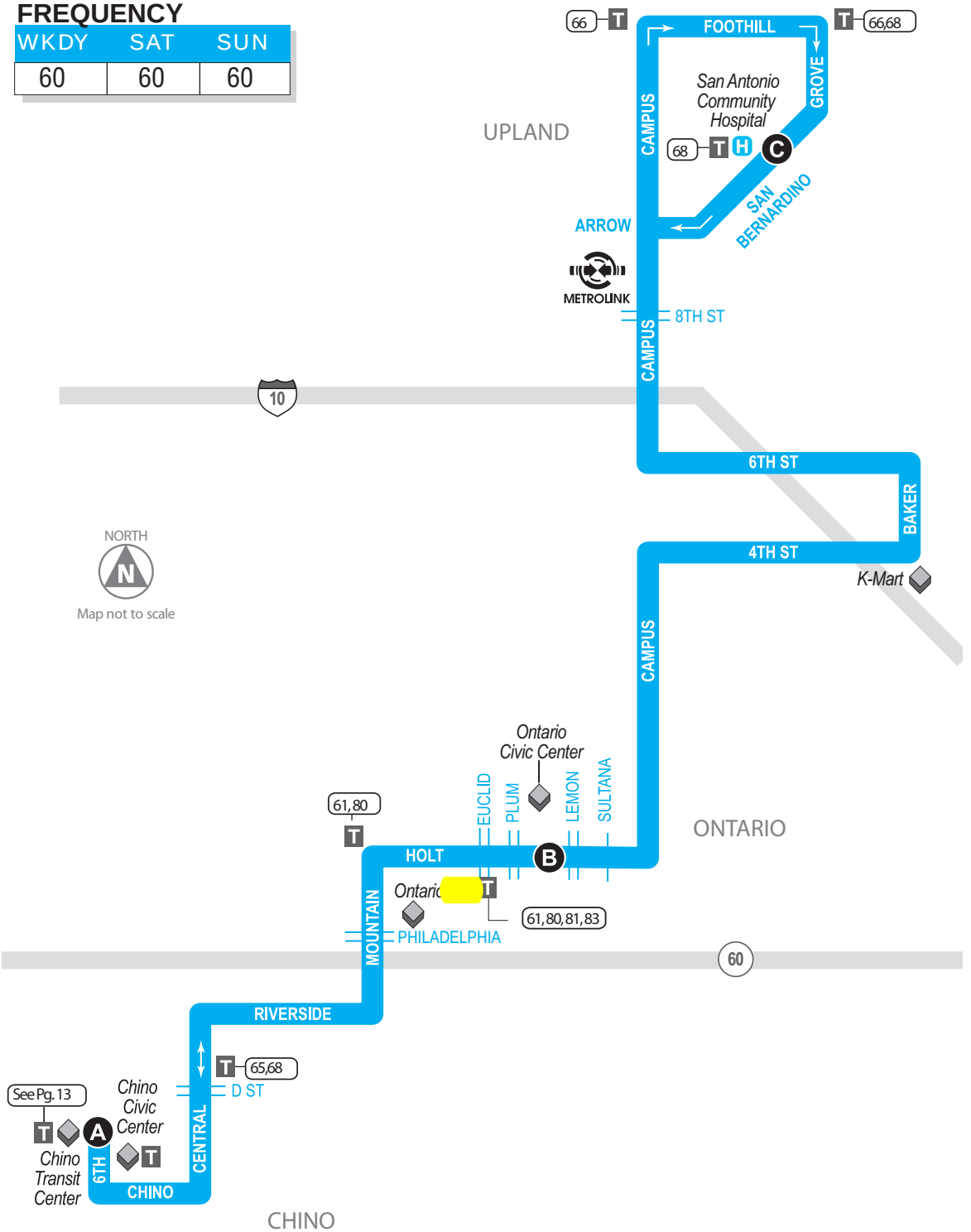
E Fontana Metrolink	D Ontario Mills	C Holt & Vineyard	B Holt & Mills	A Pomona Transit Center
6:05	6:39	6:53	7:16	7:31
6:50	7:24	7:38	8:01	8:16
7:05	7:39	7:53	8:16	8:31
7:20	7:54	8:08	8:31	8:46
7:35	8:09	8:23	8:46	9:01
7:50	8:24	8:38	9:01	9:16
8:05	8:39	8:53	9:16	9:31
8:20	8:54	9:08	9:31	9:46
8:35	9:09	9:23	9:46	10:01
8:50	9:24	9:38	10:01	10:16
9:05	9:39	9:53	10:16	10:31
9:20	9:54	10:08	10:31	10:46
9:35	10:09	10:23	10:46	11:01
9:50	10:24	10:38	11:01	11:16
10:05	10:39	10:53	11:16	11:31
10:20	10:54	11:08	11:31	11:46
10:35	11:09	11:23	11:46	**12:01**
10:50	11:24	11:38	**12:01**	**12:16**
11:05	11:39	11:53	**12:16**	**12:31**
11:20	11:54	**12:08**	**12:31**	**12:46**
11:35	**12:09**	**12:23**	**12:46**	**1:01**
11:50	**12:24**	**12:38**	**1:01**	**1:16**
12:05	**12:39**	**12:53**	**1:16**	**1:31**
12:20	**12:54**	**1:08**	**1:31**	**1:46**
12:35	**1:09**	**1:23**	**1:46**	**2:01**
12:50	**1:24**	**1:38**	**2:01**	**2:16**
1:05	**1:39**	**1:53**	**2:16**	**2:31**
1:20	**1:54**	**2:08**	**2:31**	**2:46**
1:35	**2:09**	**2:23**	**2:46**	**3:01**
1:50	**2:24**	**2:38**	**3:01**	**3:16**
2:05	**2:39**	**2:53**	**3:16**	**3:31**
2:20	**2:54**	**3:08**	**3:31**	**3:46**
2:35	**3:09**	**3:23**	**3:46**	**4:01**
2:50	**3:24**	**3:38**	**4:01**	**4:16**
3:05	**3:39**	**3:53**	**4:16**	**4:31**
3:20	**3:54**	**4:08**	**4:31**	**4:46**
3:35	**4:09**	**4:23**	**4:46**	**5:01**
3:50	**4:24**	**4:38**	**5:01**	**5:16**
4:05	**4:39**	**4:53**	**5:16**	**5:31**
4:20	**4:54**	**5:08**	**5:31**	**5:46**
4:35	**5:09**	**5:23**	**5:46**	**6:01**
4:50	**5:24**	**5:38**	**6:01**	**6:16**
5:05	**5:39**	**5:53**	**6:16**	**6:31**
5:20	**5:54**	**6:08**	**6:31**	**6:46**
5:35	**6:09**	**6:23**	**6:46**	**7:01**
5:50	**6:24**	**6:38**	**7:01**	**7:16**
6:05	**6:39**	**6:53**	**7:16**	**7:31**

63 CHINO - ONTARIO - UPLAND

Bus Route
Tripper Service
A Timepoint—Look for the matching symbol in the timetable section.
METROLINK Metrolink Station
Point of interest
H Medical Center
T Transfer Point
1,2 Connecting Route(s)

FREQUENCY

WKDY	SAT	SUN
60	60	60



ROUTE 63: MONDAY – FRIDAY

A Chino Transit Center	B Holt & Plum	C San Antonio Hospital	C San Antonio Hospital	B Holt & Lemon	A Chino Transit Center
NORTHBOUND			SOUTHBOUND		
			5:45	6:07	6:27
5:50	6:09	6:36	6:45	7:09	7:32
6:50	7:09	7:36	7:47	8:11	8:34
7:50	8:14	8:44	8:47	9:11	9:34
8:50	9:14	9:44	9:47	10:11	10:34
9:50	10:14	10:44	10:47	11:11	11:34
10:50	11:14	11:44	11:47	**12:11**	**12:34**
11:50	**12:14**	**12:44**	**12:47**	**1:11**	**1:34**
12:50	**1:14**	**1:44**	**1:47**	**2:11**	**2:34**
1:50	**2:14**	**2:44**	**2:47**	**3:11**	**3:34**
2:50	**3:14**	**3:44**	**3:47**	**4:11**	**4:34**
3:50	**4:14**	**4:44**	**4:47**	**5:11**	**5:31**
4:50	**5:14**	**5:44**	**5:47**	**6:11**	**6:31**
5:50	**6:14**	**6:44**	**6:47**	**7:11**	**7:31**
6:50	**7:14**	**7:41**	**7:43**	**8:07**	**8:27**
7:50	**8:09**	**8:36**			

ROUTE 63: SATURDAY

A	B	C	C	B	A
NORTHBOUND			SOUTHBOUND		
			6:43	7:04	7:30
6:50	7:11	7:41	7:43	8:04	8:30
7:50	8:11	8:41	8:43	9:04	9:30
8:50	9:11	9:41	9:43	10:04	10:30
9:50	10:11	10:41	10:43	11:04	11:30
10:50	11:11	11:41	11:43	**12:04**	**12:30**
11:50	**12:11**	**12:41**	**12:43**	**1:04**	**1:30**
12:50	**1:11**	**1:41**	**1:43**	**2:04**	**2:30**
1:50	**2:11**	**2:41**	**2:43**	**3:04**	**3:30**
2:50	**3:11**	**3:41**	**3:43**	**4:04**	**4:30**
3:50	**4:11**	**4:41**	**4:43**	**5:04**	**5:30**
4:50	**5:11**	**5:41**	**5:43**	**6:04**	**6:30**
5:50	**6:11**	**6:41**			

ROUTE 63: SUNDAY

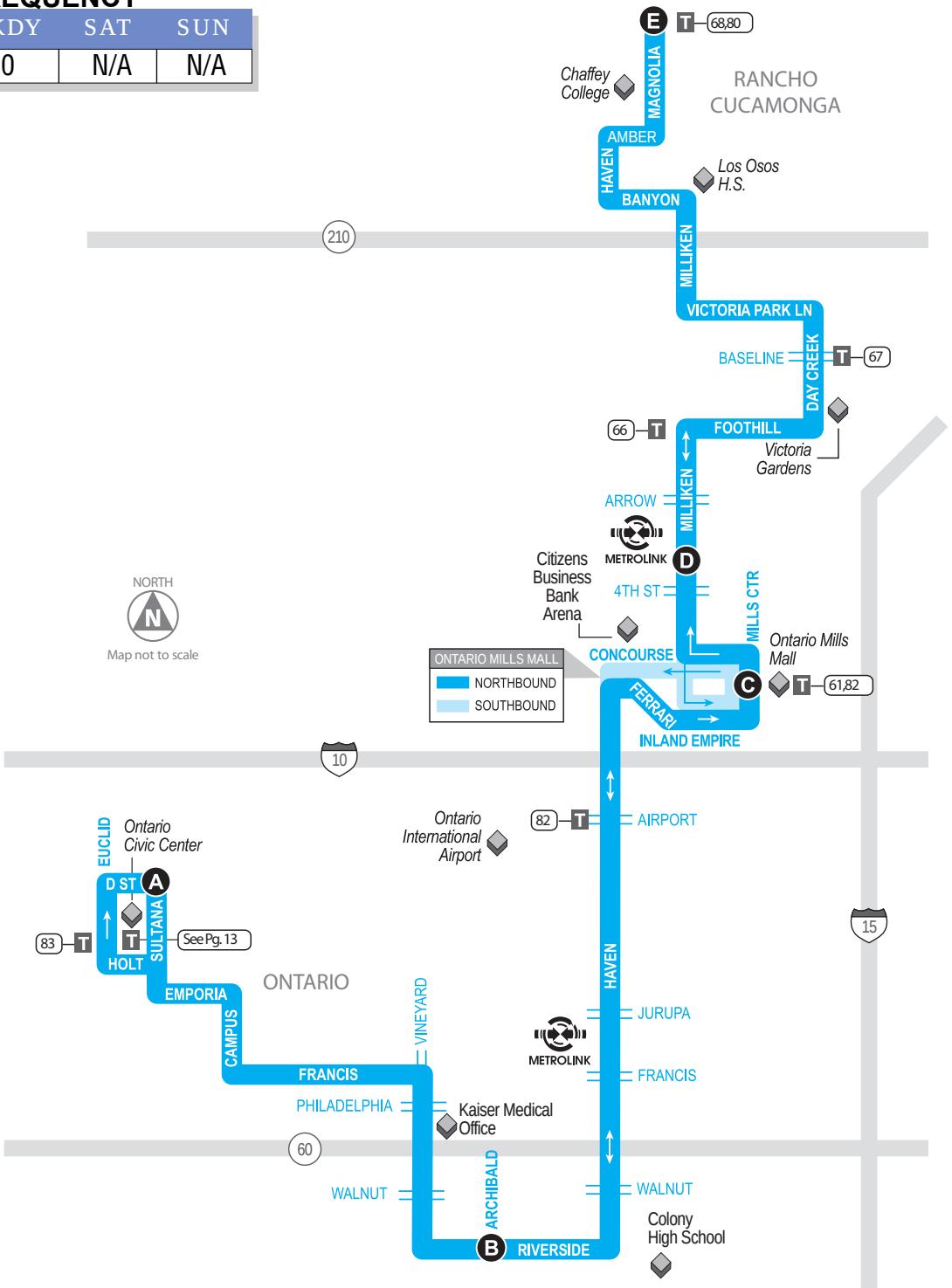
A	B	C	C	B	A
NORTHBOUND			SOUTHBOUND		
			6:38	6:59	7:25
6:50	7:11	7:41	7:43	8:04	8:30
7:50	8:11	8:41	8:43	9:04	9:30
8:50	9:11	9:41	9:43	10:04	10:30
9:50	10:11	10:41	10:43	11:04	11:30
10:50	11:11	11:41	11:43	**12:04**	**12:30**
11:50	**12:11**	**12:41**	**12:43**	**1:04**	**1:30**
12:50	**1:11**	**1:41**	**1:43**	**2:04**	**2:30**
1:50	**2:11**	**2:41**	**2:43**	**3:04**	**3:30**
2:50	**3:11**	**3:41**	**3:43**	**4:04**	**4:30**
3:50	**4:11**	**4:41**	**4:43**	**5:04**	**5:30**
4:50	**5:11**	**5:41**	**5:43**	**6:04**	**6:26**
5:50	**6:11**	**6:41**	**6:43**	**7:04**	**7:26**

81 ONTARIO - ONTARIO MILLS - CHAFFEY COLLEGE

Bus Route
Tripper Service
A Timepoint—Look for the matching symbol in the timetable section.
METROLINK Metrolink Station
Point of interest
H Medical Center
T Transfer Point
1,2 Connecting Route(s)

FREQUENCY

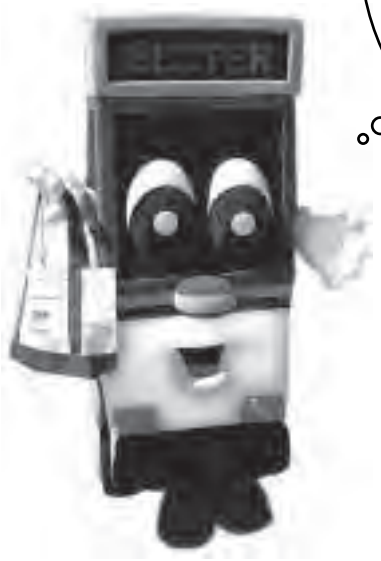
WKDY	SAT	SUN
60	N/A	N/A



ROUTE 81: MONDAY – FRIDAY

SOUTHBOUND					NORTHBOUND				
(E) Chaffey College	(D) Rancho Cucamonga Metrolink	(C) Ontario Miills	(B) Archibald & Riverside	(A) Sultana & D	(A) Sultana & D	(B) Archibald & Riverside	(C) Ontario Miills	(D) Rancho Cucamonga Metrolink	(E) Chaffey College
					4:12	4:37	4:57	5:03	5:30
					5:14	5:37	5:57	6:03	6:30
					6:26	6:49	7:09	7:15	7:42
5:38	6:05	6:12	6:32	6:57	7:26	7:49	8:09	8:15	8:42
6:38	7:05	7:12	7:32	7:57	8:26	8:49	9:09	9:15	9:42
8:03	8:30	8:37	8:57	9:22	9:26	9:49	10:09	10:15	10:42
9:03	9:30	9:37	9:57	10:22	10:26	10:49	11:09	11:15	11:42
10:03	10:30	10:37	10:57	11:22	11:26	11:49	**12:09**	**12:15**	**12:42**
11:03	11:30	11:37	11:57	**12:22**	**12:26**	**12:49**	**1:09**	**1:15**	**1:42**
12:03	**12:30**	**12:37**	**12:57**	**1:22**	**1:26**	**1:49**	**2:09**	**2:15**	**2:42**
1:03	**1:30**	**1:37**	**1:57**	**2:22**	**2:26**	**2:49**	**3:09**	**3:15**	**3:42**
2:03	**2:30**	**2:37**	**2:57**	**3:22**	**3:26**	**3:49**	**4:09**	**4:15**	**4:42**
3:03	**3:30**	**3:37**	**3:57**	**4:22**	**4:26**	**4:49**	**5:09**	**5:15**	**5:42**
4:03	**4:30**	**4:37**	**4:57**	**5:22**	**5:26**	**5:49**	**6:09**	**6:15**	**6:42**
5:03	**5:30**	**5:37**	**5:57**	**6:22**	**6:26**	**6:49**	**7:07**	**7:13**	**7:40**
6:03	**6:30**	**6:37**	**6:55**	**7:20**	**7:26**	**7:49**	**8:07**	**8:13**	**8:40**
7:03	**7:30**	**7:37**	**7:55**	**8:20**	**8:26**	**8:49**	**9:07**	**9:13**	**9:40**
8:03	**8:30**	**8:37**	**8:55**	**9:20**					
9:03	**9:30**	**9:37**	**9:55**	**10:20**					

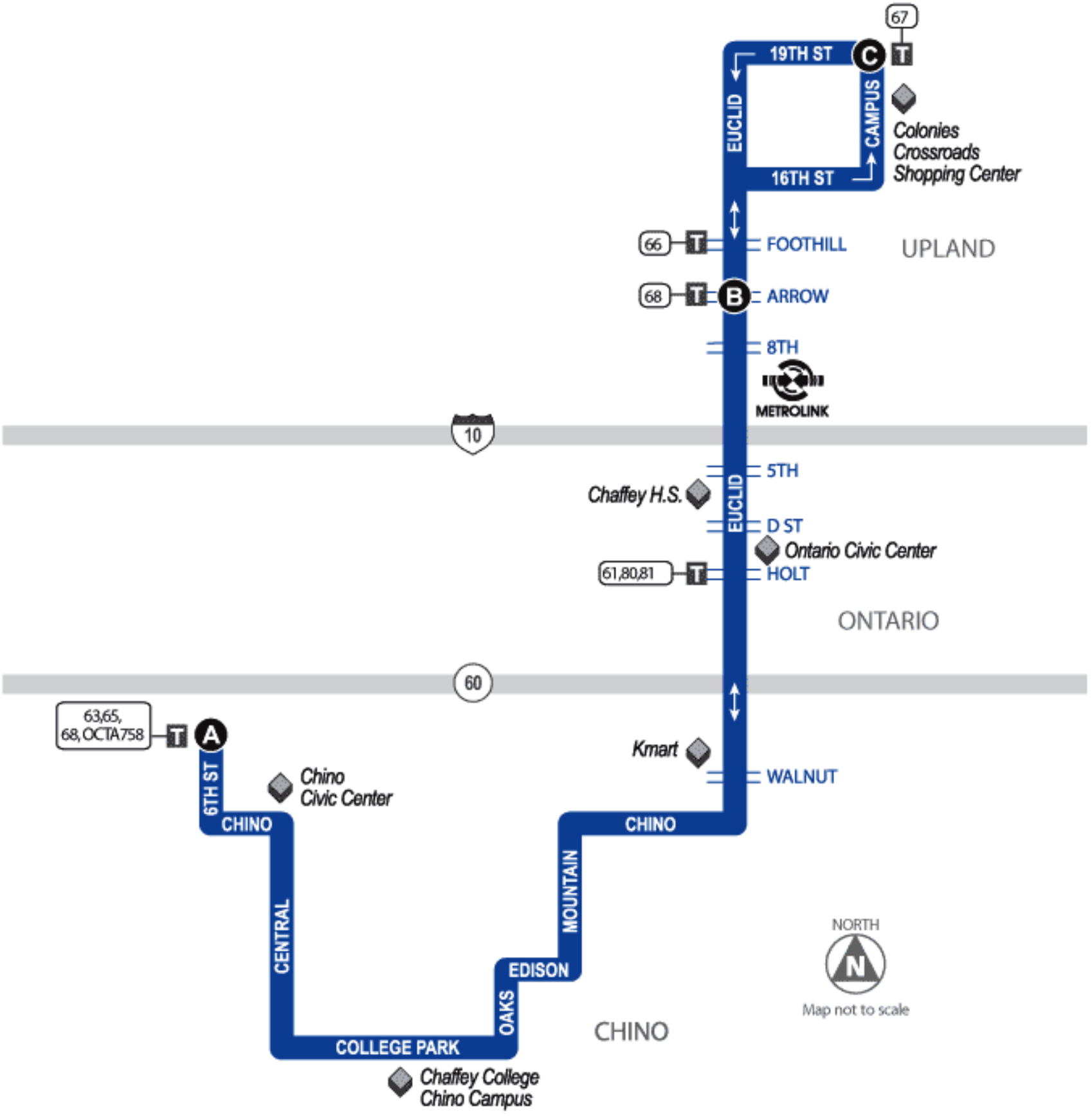
No Weekend service.



It's ok to shop till you drop, but please limit your bags to modest sized ones that weigh no more than 15 lbs. Bags must fit on either your lap or directly in front of your seat on the floor, not in the aisle. We're sorry, but oversized (and leaking bags) will not be allowed on the bus.

83 UPLAND - EUCLID - CHINO

Bus Route
Tripper Service
Timepoint—Look for the matching symbol in the timetable section.
Metrolink Station
Point of interest
Medical Center
Transfer Point
Connecting Route(s)



ROUTE 83: MONDAY – FRIDAY

A Chino Transit Center	B Euclid & Arrow	C 19th & Campus	C 19th & Campus	B Euclid & Arrow	A Chino Transit Center
NORTHBOUND			**SOUTHBOUND**		
			5:49	6:00	6:40
5:55	6:33	6:42	6:46	6:54	7:33
6:55	7:41	7:52	7:53	8:03	8:43
8:00	8:42	8:52	8:53	9:01	9:38
9:00	9:44	9:54	9:55	10:05	10:45
10:00	10:40	10:49	10:50	10:59	11:37
11:00	11:44	11:54	11:55	**12:04**	**12:48**
12:00	**12:42**	**12:52**	**12:53**	**1:03**	**1:43**
1:00	**1:46**	**1:55**	**1:56**	**2:06**	**2:47**
2:00	**2:45**	**2:55**	**2:56**	**3:06**	**3:51**
3:00	**3:46**	**3:56**	**3:57**	**4:06**	**4:49**
4:00	**4:47**	**4:58**	**4:59**	**5:09**	**5:50**
5:00	**5:44**	**5:54**	**5:55**	**6:04**	**6:44**
6:00	**6:39**	**6:48**	**7:00**	**7:08**	**7:43**
7:00	**7:37**	**7:47**	**7:48**	**7:57**	**8:45**
8:00	**8:34**	**8:42**	**8:43**	**8:50**	**9:20**
9:00	**9:36**	**9:44**			

ROUTE 83: SATURDAY

A Chino Transit Center	B Euclid & Arrow	C 19th & Campus	C 19th & Campus	B Euclid & Arrow	A Chino Transit Center
NORTHBOUND			**SOUTHBOUND**		
			5:51	6:01	6:41
6:00	6:40	6:50	6:51	7:01	7:41
7:00	7:40	7:50	7:51	8:01	8:41
8:00	8:40	8:50	8:51	9:01	9:41
9:00	9:40	9:50	9:51	10:01	10:41
10:00	10:40	10:50	10:51	11:01	11:41
11:00	11:40	11:50	11:51	**12:01**	**12:41**
12:00	**12:40**	**12:50**	**12:51**	**1:01**	**1:41**
1:00	**1:40**	**1:50**	**1:51**	**2:01**	**2:41**
2:00	**2:40**	**2:50**	**2:51**	**3:01**	**3:41**
3:00	**3:40**	**3:50**	**3:51**	**4:01**	**4:41**
4:00	**4:40**	**4:50**	**4:51**	**5:01**	**5:41**
5:00	**5:40**	**5:50**	**5:51**	**6:01**	**6:41**
6:00	**6:40**	**6:50**	**6:51**	**7:01**	**7:36**
7:00	**7:40**	**7:50**	**7:51**	**8:01**	**8:36**

ROUTE 83: SUNDAY

A Chino Transit Center	B Euclid & Arrow	C 19th & Campus	C 19th & Campus	B Euclid & Arrow	A Chino Transit Center
NORTHBOUND			**SOUTHBOUND**		
			5:51	6:01	6:41
6:00	6:40	6:50	6:51	7:01	7:41
7:00	7:40	7:50	7:51	8:01	8:41
8:00	8:40	8:50	8:51	9:01	9:41
9:00	9:40	9:50	9:51	10:01	10:41
10:00	10:40	10:50	10:51	11:01	11:41
11:00	11:40	11:50	11:51	**12:01**	**12:41**
12:00	**12:40**	**12:50**	**12:51**	**1:01**	**1:41**
1:00	**1:40**	**1:50**	**1:51**	**2:01**	**2:41**
2:00	**2:40**	**2:50**	**2:51**	**3:01**	**3:41**
3:00	**3:40**	**3:50**	**3:51**	**4:01**	**4:41**
4:00	**4:40**	**4:50**	**4:51**	**5:01**	**5:41**
5:00	**5:40**	**5:50**	**5:51**	**6:01**	**6:41**
6:00	**6:40**	**6:50**	**6:51**	**7:02**	**7:32**
7:00	**7:27**	**7:37**			

Appendix C
Screening Analysis for each Evaluation Criteria

Table 1: Qualitative Summary Evaluation Legend

Screening Criteria	Description	Criteria Ratings				
1	Walk Time to Terminals	Average of 0-3 minutes	Average of 3-5 minutes	Average of 5-10 minutes	Average of 10-20 minutes	Average of >20 minutes
2	Improving Transit Travel Time to ONT	≥ 8 factors improve travel time	6 - 7 factors improve travel time	4 - 5 factors improve travel time	3 factors improve travel time	<3 factor improve travel time
3	Number of Mode Transfers	Average Transfer = 1-2 Min Transfer =1	Average Transfer = 2 – 2.5 Min Transfer =1	Average Transfer = 2 – 2.5 Min Transfer =2	Average Transfer = 2.5 – 3.0 Min Transfer =2	Average Transfer ≥ 3 Min Transfer =3
4	Service for Peak Flight Times	Connects to ≥ 24 peak hours (EB+WB)	Connects to 20 - 24 peak hours (EB+WB)	Connects to 15 - 20 peak hours (EB+WB)	Connects to 10 - 15 peak hours (EB+WB)	Connects to ≤10 peak hours (EB+WB)
5	Ridership Potential	Very high	High	Medium	Low	Very Low
6	Capital and Operating Cost	Very Low (C/O&M: VL/VL)	Low (C/O&M: M/M)	Medium (C/O&M: H/M)	High (C/O&M: H/H)	Very High (C/O&M: VH/VH)
7	Impact on Metrolink Operations	Significant Enhancement	Moderate Enhancement	Little/No Disruption	Moderate Disruption	Significant Disruption
8	Potential for Serving Intermediate Activity Centers	Very High (>4 centers)	High (3 centers)	Medium (2 centers)	Low (1 center)	None (0 centers)
9	Potential Impact on Regional Transit	Supports/ enhances	Possible enhancement	Little/no effect	Possible conflict	Competes/ conflicts

Table 2: Screening Criterion #1 - Walk Time to Terminals

Alternative	Evaluation Results	Estimated walk time (in minutes)	Overall Result
A-1	☐ Bus route stops at shuttle island in front of terminals ☒ Rail line stations in the vicinity of the shuttle island in front of terminals ☐ Rail line stations within the Ontario Multimodal Center	1-3	●
A-2	☐ Bus route stops at shuttle island in front of terminals ☒ Rail line stations in the vicinity of the shuttle island in front of terminals ☐ Rail line stations within the Ontario Multimodal Center	1-3	●
A-3	☐ Bus route stops at shuttle island in front of terminals ☒ Rail line stations in the vicinity of the shuttle island in front of terminals ☐ Rail line stations within the Ontario Multimodal Center	1-3	●
A-4	☐ Bus route stops at shuttle island in front of terminals ☒ Rail line stations in the vicinity of the shuttle island in front of terminals ☐ Rail line stations within the Ontario Multimodal Center	1-3	●
A-5	☐ Bus route stops at shuttle island in front of terminals ☒ Rail line stations in the vicinity of the shuttle island in front of terminals ☐ Rail line stations within the Ontario Multimodal Center	1-3	●
A-6	☐ Bus route stops at shuttle island in front of terminals ☒ Rail line stations in the vicinity of the shuttle island in front of terminals ☐ Rail line stations within the Ontario Multimodal Center	1-3	●
A-7	☐ Bus route stops at shuttle island in front of terminals ☒ Rail line stations in the vicinity of the shuttle island in front of terminals ☐ Rail line stations within the Ontario Multimodal Center	1-3	●
A-8	☐ Bus route stops at shuttle island in front of terminals ☒ Rail line stations in the vicinity of the shuttle island in front of terminals ☐ Rail line stations within the Ontario Multimodal Center	1-3	●
A-9	☐ Bus route stops at shuttle island in front of terminals ☒ Rail line stations in the vicinity of the shuttle island in front of terminals ☐ Rail line stations within the Ontario Multimodal Center	1-3	●
A-10	☐ Bus route stops at shuttle island in front of terminals ☒ Rail line stations in the vicinity of the shuttle island in front of terminals ☐ Rail line stations within the Ontario Multimodal Center	1-3	●

Table 2: Screening Criterion #1 - Walk Time to Terminals (continued)

Alternative	Evaluation Results	Estimated walk time (in minutes)	Overall Result
A-11	☐ Bus route stops at shuttle island in front of terminals ☒ Rail line stations in the vicinity of the shuttle island in front of terminals ☐ Rail line stations within the Ontario Multimodal Center	1-3	●
A-12	☐ Bus route stops at shuttle island in front of terminals ☒ Rail line stations in the vicinity of the shuttle island in front of terminals ☐ Rail line stations within the Ontario Multimodal Center	1-3	●
B-1	☒ Bus route stops at shuttle island in front of terminals ☐ Rail line stations in the vicinity of the shuttle island in front of terminals ☐ Rail line stations within the Ontario Multimodal Center	<1	●
B-2	☒ Bus route stops at shuttle island in front of terminals ☐ Rail line stations in the vicinity of the shuttle island in front of terminals ☐ Rail line stations within the Ontario Multimodal Center	<1	●
B-3	☒ Bus route stops at shuttle island in front of terminals ☐ Rail line stations in the vicinity of the shuttle island in front of terminals ☐ Rail line stations within the Ontario Multimodal Center	<1	●
B-4	☒ Bus route stops at shuttle island in front of terminals ☐ Rail line stations in the vicinity of the shuttle island in front of terminals ☐ Rail line stations within the Ontario Multimodal Center	<1	●
C-1	☐ Bus route stops at shuttle island in front of terminals ☒ Rail line stations in the vicinity of the shuttle island in front of terminals ☐ Rail line stations within the Ontario Multimodal Center	1-3	●
C-2	☐ Bus route stops at shuttle island in front of terminals ☒ Rail line stations in the vicinity of the shuttle island in front of terminals ☐ Rail line stations within the Ontario Multimodal Center	1-3	●
C-3	☐ Bus route stops at shuttle island in front of terminals ☒ Rail line stations in the vicinity of the shuttle island in front of terminals ☐ Rail line stations within the Ontario Multimodal Center	1-3	●
C-4	☐ Bus route stops at shuttle island in front of terminals ☒ Rail line stations in the vicinity of the shuttle island in front of terminals ☐ Rail line stations within the Ontario Multimodal Center	1-3	●

Table 2: Screening Criterion #1 - Walk Time to Terminals (continued)

Alternative	Evaluation Results	Estimated walk time (in minutes)	Overall Result
C-5	☐ Bus route stops at shuttle island in front of terminals ☒ Rail line stations in the vicinity of the shuttle island in front of terminals ☐ Rail line stations within the Ontario Multimodal Center	1-3	●
C-6	☐ Bus route stops at shuttle island in front of terminals ☒ Rail line stations in the vicinity of the shuttle island in front of terminals ☐ Rail line stations within the Ontario Multimodal Center	1-3	●
C-7	☐ Bus route stops at shuttle island in front of terminals ☒ Rail line stations in the vicinity of the shuttle island in front of terminals ☐ Rail line stations within the Ontario Multimodal Center	1-3	●
C-8	☐ Bus route stops at shuttle island in front of terminals ☒ Rail line stations in the vicinity of the shuttle island in front of terminals ☐ Rail line stations within the Ontario Multimodal Center	1-3	●
C-9	☐ Bus route stops at shuttle island in front of terminals ☒ Rail line stations in the vicinity of the shuttle island in front of terminals ☐ Rail line stations within the Ontario Multimodal Center	1-3	●
C-10	☐ Bus route stops at shuttle island in front of terminals ☒ Rail line stations in the vicinity of the shuttle island in front of terminals ☐ Rail line stations within the Ontario Multimodal Center	1-3	●
C-11	☐ Bus route stops at shuttle island in front of terminals ☒ Rail line stations in the vicinity of the shuttle island in front of terminals ☐ Rail line stations within the Ontario Multimodal Center	1-3	●
C-12	☐ Bus route stops at shuttle island in front of terminals ☒ Rail line stations in the vicinity of the shuttle island in front of terminals ☐ Rail line stations within the Ontario Multimodal Center	1-3	●
C-13	☐ Bus route stops at shuttle island in front of terminals ☒ Rail line stations in the vicinity of the shuttle island in front of terminals ☐ Rail line stations within the Ontario Multimodal Center	1-3	●
D-1	☐ Bus route stops at shuttle island in front of terminals ☐ Rail line stations in the vicinity of the shuttle island in front of terminals ☒ Rail line stations within the Ontario Multimodal Center	5-10	●

Table 2: Screening Criterion #1 - Walk Time to Terminals (continued)

Alternative	Evaluation Results	Estimated walk time (in minutes)	Overall Result
D-2	☐ Bus route stops at shuttle island in front of terminals ☐ Rail line stations in the vicinity of the shuttle island in front of terminals ☒ Rail line stations within the Ontario Multimodal Center	5-10	●
D-3	☐ Bus route stops at shuttle island in front of terminals ☐ Rail line stations in the vicinity of the shuttle island in front of terminals ☒ Rail line stations within the Ontario Multimodal Center	5-10	●

Table 3: Screening Criterion #2 - Improving Transit Travel Time to ONT

Alternative	Evaluation Results	# of factors that improve travel time	Overall Result
A-1	☒ Provides direct service connecting a regional rail station to ONT terminals ☒ Connects to regional rail service with all-day weekday service both directions ☒ Connects to regional rail service with all-day weekend service both directions ☐ Provides one-seat ride to ONT terminals from distant regional rail stations ☐ Increases service frequency along Metrolink San Bernardino line ☐ Increases service frequency along Metrolink Riverside line ☐ Provides high frequency regional rail service to ONT (15 minute headways) ☒ Operates in its own right-of-way (not on-street in mixed traffic) ☒ Route not on streets, hence, not affected by traffic signals and congestion ☒ Double-track operation possible, avoiding operational delays of single track	6	
A-2	☒ Provides direct service connecting a regional rail station to ONT terminals ☒ Connects to regional rail service with all-day weekday service both directions ☒ Connects to regional rail service with all-day weekend service both directions ☐ Provides one-seat ride to ONT terminals from distant regional rail stations ☐ Increases service frequency along Metrolink San Bernardino line ☐ Increases service frequency along Metrolink Riverside line ☐ Provides high frequency regional rail service to ONT (15 minute headways) ☒ Operates in its own right-of-way (not on-street in mixed traffic) ☒ Route not on streets, hence, not affected by traffic signals and congestion ☒ Double-track operation possible, avoiding operational delays of single track	6	
A-3	☒ Provides direct service connecting a regional rail station to ONT terminals ☒ Connects to regional rail service with all-day weekday service both directions ☒ Connects to regional rail service with all-day weekend service both directions ☐ Provides one-seat ride to ONT terminals from distant regional rail stations ☐ Increases service frequency along Metrolink San Bernardino line ☐ Increases service frequency along Metrolink Riverside line ☐ Provides high frequency regional rail service to ONT (15 minute headways) ☒ Operates in its own right-of-way (not on-street in mixed traffic) ☐ Route not on streets, hence, not affected by traffic signals and congestion ☒ Double-track operation possible, avoiding operational delays of single track	5	

Table 3: Screening Criterion #2 - Improving Transit Travel Time to ONT (continued)

Alternative	Evaluation Results	# of factors that improve travel time	Overall Result
A-4	☒ Provides direct service connecting a regional rail station to ONT terminals ☒ Connects to regional rail service with all-day weekday service both directions ☒ Connects to regional rail service with all-day weekend service both directions ☐ Provides one-seat ride to ONT terminals from distant regional rail stations ☐ Increases service frequency along Metrolink San Bernardino line ☐ Increases service frequency along Metrolink Riverside line ☐ Provides high frequency regional rail service to ONT (15 minute headways) ☒ Operates in its own right-of-way (not on-street in mixed traffic) ☒ Route not on streets, hence, not affected by traffic signals and congestion ☒ Double-track operation possible, avoiding operational delays of single track	6	
A-5	☒ Provides direct service connecting a regional rail station to ONT terminals ☒ Connects to regional rail service with all-day weekday service both directions ☒ Connects to regional rail service with all-day weekend service both directions ☐ Provides one-seat ride to ONT terminals from distant regional rail stations ☐ Increases service frequency along Metrolink San Bernardino line ☐ Increases service frequency along Metrolink Riverside line ☐ Provides high frequency regional rail service to ONT (15 minute headways) ☒ Operates in its own right-of-way (not on-street in mixed traffic) ☐ Route not on streets, hence, not affected by traffic signals and congestion ☒ Double-track operation possible, avoiding operational delays of single track	5	
A-6	☒ Provides direct service connecting a regional rail station to ONT terminals ☒ Connects to regional rail service with all-day weekday service both directions ☒ Connects to regional rail service with all-day weekend service both directions ☐ Provides one-seat ride to ONT terminals from distant regional rail stations ☐ Increases service frequency along Metrolink San Bernardino line ☐ Increases service frequency along Metrolink Riverside line ☐ Provides high frequency regional rail service to ONT (15 minute headways) ☒ Operates in its own right-of-way (not on-street in mixed traffic) ☒ Route not on streets, hence, not affected by traffic signals and congestion ☒ Double-track operation possible, avoiding operational delays of single track	6	

Table 3: Screening Criterion #2 - Improving Transit Travel Time to ONT (continued)

Alternative	Evaluation Results	# of factors that improve travel time	Overall Result
A-7	☒ Provides direct service connecting a regional rail station to ONT terminals ☒ Connects to regional rail service with all-day weekday service both directions ☒ Connects to regional rail service with all-day weekend service both directions ☐ Provides one-seat ride to ONT terminals from distant regional rail stations ☐ Increases service frequency along Metrolink San Bernardino line ☐ Increases service frequency along Metrolink Riverside line ☐ Provides high frequency regional rail service to ONT (15 minute headways) ☒ Operates in its own right-of-way (not on-street in mixed traffic) ☒ Route not on streets, hence, not affected by traffic signals and congestion ☒ Double-track operation possible, avoiding operational delays of single track	6	
A-8	☒ Provides direct service connecting a regional rail station to ONT terminals ☒ Connects to regional rail service with all-day weekday service both directions ☒ Connects to regional rail service with all-day weekend service both directions ☐ Provides one-seat ride to ONT terminals from distant regional rail stations ☐ Increases service frequency along Metrolink San Bernardino line ☐ Increases service frequency along Metrolink Riverside line ☐ Provides high frequency regional rail service to ONT (15 minute headways) ☒ Operates in its own right-of-way (not on-street in mixed traffic) ☐ Route not on streets, hence, not affected by traffic signals and congestion ☒ Double-track operation possible, avoiding operational delays of single track	5	
A-9	☒ Provides direct service connecting a regional rail station to ONT terminals ☒ Connects to regional rail service with all-day weekday service both directions ☒ Connects to regional rail service with all-day weekend service both directions ☐ Provides one-seat ride to ONT terminals from distant regional rail stations ☐ Increases service frequency along Metrolink San Bernardino line ☐ Increases service frequency along Metrolink Riverside line ☐ Provides high frequency regional rail service to ONT (15 minute headways) ☒ Operates in its own right-of-way (not on-street in mixed traffic) ☒ Route not on streets, hence, not affected by traffic signals and congestion ☒ Double-track operation possible, avoiding operational delays of single track	6	

Table 3: Screening Criterion #2 - Improving Transit Travel Time to ONT (continued)

Alternative	Evaluation Results	# of factors that improve travel time	Overall Result
A-10	☒ Provides direct service connecting a regional rail station to ONT terminals ☒ Connects to regional rail service with all-day weekday service both directions ☒ Connects to regional rail service with all-day weekend service both directions ☐ Provides one-seat ride to ONT terminals from distant regional rail stations ☐ Increases service frequency along Metrolink San Bernardino line ☐ Increases service frequency along Metrolink Riverside line ☐ Provides high frequency regional rail service to ONT (15 minute headways) ☒ Operates in its own right-of-way (not on-street in mixed traffic) ☐ Route not on streets, hence, not affected by traffic signals and congestion ☒ Double-track operation possible, avoiding operational delays of single track	5	
A-11	☒ Provides direct service connecting a regional rail station to ONT terminals ☒ Connects to regional rail service with all-day weekday service both directions ☒ Connects to regional rail service with all-day weekend service both directions ☐ Provides one-seat ride to ONT terminals from distant regional rail stations ☐ Increases service frequency along Metrolink San Bernardino line ☐ Increases service frequency along Metrolink Riverside line ☐ Provides high frequency regional rail service to ONT (15 minute headways) ☒ Operates in its own right-of-way (not on-street in mixed traffic) ☐ Route not on streets, hence, not affected by traffic signals and congestion ☐ Double-track operation possible, avoiding operational delays of single track	4	
A-12	☒ Provides direct service connecting a regional rail station to ONT terminals ☒ Connects to regional rail service with all-day weekday service both directions ☒ Connects to regional rail service with all-day weekend service both directions ☐ Provides one-seat ride to ONT terminals from distant regional rail stations ☐ Increases service frequency along Metrolink San Bernardino line ☐ Increases service frequency along Metrolink Riverside line ☐ Provides high frequency regional rail service to ONT (15 minute headways) ☒ Operates in its own right-of-way (not on-street in mixed traffic) ☒ Route not on streets, hence, not affected by traffic signals and congestion ☐ Double-track operation possible, avoiding operational delays of single track	5	

Table 3: Screening Criterion #2 - Improving Transit Travel Time to ONT (continued)

Alternative	Evaluation Results	# of factors that improve travel time	Overall Result
B-1	☒ Provides direct service connecting a regional rail station to ONT terminals ☒ Connects to regional rail service with all-day weekday service both directions ☒ Connects to regional rail service with all-day weekend service both directions ☐ Provides one-seat ride to ONT terminals from distant regional rail stations ☐ Increases service frequency along Metrolink San Bernardino line ☐ Increases service frequency along Metrolink Riverside line ☐ Provides high frequency regional rail service to ONT (15 minute headways) ☐ Operates in its own right-of-way (not on-street in mixed traffic) ☐ Route not on streets, hence, not affected by traffic signals and congestion ☐ Double-track operation possible, avoiding operational delays of single track	3	
B-2	☒ Provides direct service connecting a regional rail station to ONT terminals ☒ Connects to regional rail service with all-day weekday service both directions ☒ Connects to regional rail service with all-day weekend service both directions ☐ Provides one-seat ride to ONT terminals from distant regional rail stations ☐ Increases service frequency along Metrolink San Bernardino line ☐ Increases service frequency along Metrolink Riverside line ☐ Provides high frequency regional rail service to ONT (15 minute headways) ☐ Operates in its own right-of-way (not on-street in mixed traffic) ☐ Route not on streets, hence, not affected by traffic signals and congestion ☐ Double-track operation possible, avoiding operational delays of single track	3	
B-3	☒ Provides direct service connecting a regional rail station to ONT terminals ☒ Connects to regional rail service with all-day weekday service both directions ☒ Connects to regional rail service with all-day weekend service both directions ☐ Provides one-seat ride to ONT terminals from distant regional rail stations ☐ Increases service frequency along Metrolink San Bernardino line ☐ Increases service frequency along Metrolink Riverside line ☐ Provides high frequency regional rail service to ONT (15 minute headways) ☐ Operates in its own right-of-way (not on-street in mixed traffic) ☐ Route not on streets, hence, not affected by traffic signals and congestion ☐ Double-track operation possible, avoiding operational delays of single track	3	

Table 3: Screening Criterion #2 - Improving Transit Travel Time to ONT (continued)

Alternative	Evaluation Results	# of factors that improve travel time	Overall Result
B-4	☒ Provides direct service connecting a regional rail station to ONT terminals ☒ Connects to regional rail service with all-day weekday service both directions ☒ Connects to regional rail service with all-day weekend service both directions ☐ Provides one-seat ride to ONT terminals from distant regional rail stations ☐ Increases service frequency along Metrolink San Bernardino line ☐ Increases service frequency along Metrolink Riverside line ☐ Provides high frequency regional rail service to ONT (15 minute headways) ☐ Operates in its own right-of-way (not on-street in mixed traffic) ☐ Route not on streets, hence, not affected by traffic signals and congestion ☐ Double-track operation possible, avoiding operational delays of single track	3	
C-1	☒ Provides direct service connecting a regional rail station to ONT terminals ☒ Connects to regional rail service with all-day weekday service both directions ☒ Connects to regional rail service with all-day weekend service both directions ☒ Provides one-seat ride to ONT terminals from distant regional rail stations ☒ Increases service frequency along Metrolink San Bernardino line ☐ Increases service frequency along Metrolink Riverside line ☐ Provides high frequency regional rail service to ONT (15 minute headways) ☒ Operates in its own right-of-way (not on-street in mixed traffic) ☒ Route not on streets, hence, not affected by traffic signals and congestion ☒ Double-track operation possible, avoiding operational delays of single track	8	
C-2	☒ Provides direct service connecting a regional rail station to ONT terminals ☒ Connects to regional rail service with all-day weekday service both directions ☒ Connects to regional rail service with all-day weekend service both directions ☒ Provides one-seat ride to ONT terminals from distant regional rail stations ☒ Increases service frequency along Metrolink San Bernardino line ☐ Increases service frequency along Metrolink Riverside line ☐ Provides high frequency regional rail service to ONT (15 minute headways) ☒ Operates in its own right-of-way (not on-street in mixed traffic) ☒ Right-of-Way not along arterials, hence, not affected by traffic signals and congestion ☒ Double-track operation possible, avoiding operational delays of single track	8	

Table 3: Screening Criterion #2 - Improving Transit Travel Time to ONT (continued)

Alternative	Evaluation Results	# of factors that improve travel time	Overall Result
C-3	☒ Provides direct service connecting a regional rail station to ONT terminals ☒ Connects to regional rail service with all-day weekday service both directions ☒ Connects to regional rail service with all-day weekend service both directions ☒ Provides one-seat ride to ONT terminals from distant regional rail stations ☒ Increases service frequency along Metrolink San Bernardino line ☐ Increases service frequency along Metrolink Riverside line ☐ Provides high frequency regional rail service to ONT (15 minute headways) ☒ Operates in its own right-of-way (not on-street in mixed traffic) ☐ Route not on streets, hence, not affected by traffic signals and congestion ☒ Double-track operation possible, avoiding operational delays of single track	7	
C-4	☒ Provides direct service connecting a regional rail station to ONT terminals ☒ Connects to regional rail service with all-day weekday service both directions ☒ Connects to regional rail service with all-day weekend service both directions ☒ Provides one-seat ride to ONT terminals from distant regional rail stations ☒ Increases service frequency along Metrolink San Bernardino line ☐ Increases service frequency along Metrolink Riverside line ☐ Provides high frequency regional rail service to ONT (15 minute headways) ☒ Operates in its own right-of-way (not on-street in mixed traffic) ☒ Route not on streets, hence, not affected by traffic signals and congestion ☒ Double-track operation possible, avoiding operational delays of single track	8	
C-5	☒ Provides direct service connecting a regional rail station to ONT terminals ☒ Connects to regional rail service with all-day weekday service both directions ☒ Connects to regional rail service with all-day weekend service both directions ☒ Provides one-seat ride to ONT terminals from distant regional rail stations ☒ Increases service frequency along Metrolink San Bernardino line ☐ Increases service frequency along Metrolink Riverside line ☐ Provides high frequency regional rail service to ONT (15 minute headways) ☒ Operates in its own right-of-way (not on-street in mixed traffic) ☐ Route not on streets, hence, not affected by traffic signals and congestion ☒ Double-track operation possible, avoiding operational delays of single track	7	

Table 3: Screening Criterion #2 - Improving Transit Travel Time to ONT (continued)

Alternative	Evaluation Results	# of factors that improve travel time	Overall Result
C-6	☒ Provides direct service connecting a regional rail station to ONT terminals ☒ Connects to regional rail service with all-day weekday service both directions ☒ Connects to regional rail service with all-day weekend service both directions ☒ Provides one-seat ride to ONT terminals from distant regional rail stations ☒ Increases service frequency along Metrolink San Bernardino line ☐ Increases service frequency along Metrolink Riverside line ☐ Provides high frequency regional rail service to ONT (15 minute headways) ☒ Operates in its own right-of-way (not on-street in mixed traffic) ☒ Route not on streets, hence, not affected by traffic signals and congestion ☒ Double-track operation possible, avoiding operational delays of single track	8	
C-7	☒ Provides direct service connecting a regional rail station to ONT terminals ☒ Connects to regional rail service with all-day weekday service both directions ☒ Connects to regional rail service with all-day weekend service both directions ☒ Provides one-seat ride to ONT terminals from distant regional rail stations ☒ Increases service frequency along Metrolink San Bernardino line ☐ Increases service frequency along Metrolink Riverside line ☐ Provides high frequency regional rail service to ONT (15 minute headways) ☒ Operates in its own right-of-way (not on-street in mixed traffic) ☒ Route not on streets, hence, not affected by traffic signals and congestion ☒ Double-track operation possible, avoiding operational delays of single track	8	
C-8	☒ Provides direct service connecting a regional rail station to ONT terminals ☒ Connects to regional rail service with all-day weekday service both directions ☒ Connects to regional rail service with all-day weekend service both directions ☒ Provides one-seat ride to ONT terminals from distant regional rail stations ☒ Increases service frequency along Metrolink San Bernardino line ☐ Increases service frequency along Metrolink Riverside line ☐ Provides high frequency regional rail service to ONT (15 minute headways) ☒ Operates in its own right-of-way (not on-street in mixed traffic) ☐ Route not on streets, hence, not affected by traffic signals and congestion ☒ Double-track operation possible, avoiding operational delays of single track	7	

Table 3: Screening Criterion #2 - Improving Transit Travel Time to ONT (continued)

Alternative	Evaluation Results	# of factors that improve travel time	Overall Result
C-9	☒ Provides direct service connecting a regional rail station to ONT terminals ☒ Connects to regional rail service with all-day weekday service both directions ☒ Connects to regional rail service with all-day weekend service both directions ☒ Provides one-seat ride to ONT terminals from distant regional rail stations ☒ Increases service frequency along Metrolink San Bernardino line ☐ Increases service frequency along Metrolink Riverside line ☐ Provides high frequency regional rail service to ONT (15 minute headways) ☒ Operates in its own right-of-way (not on-street in mixed traffic) ☒ Right-of-Way not along arterials, hence, not affected by traffic signals and congestion ☒ Double-track operation possible, avoiding operational delays of single track	8	
C-10	☒ Provides direct service connecting a regional rail station to ONT terminals ☒ Connects to regional rail service with all-day weekday service both directions ☒ Connects to regional rail service with all-day weekend service both directions ☒ Provides one-seat ride to ONT terminals from distant regional rail stations ☒ Increases service frequency along Metrolink San Bernardino line ☐ Increases service frequency along Metrolink Riverside line ☐ Provides high frequency regional rail service to ONT (15 minute headways) ☒ Operates in its own right-of-way (not on-street in mixed traffic) ☐ Route not on streets, hence, not affected by traffic signals and congestion ☒ Double-track operation possible, avoiding operational delays of single track	7	
C-11	☒ Provides direct service connecting a regional rail station to ONT terminals ☒ Connects to regional rail service with all-day weekday service both directions ☒ Connects to regional rail service with all-day weekend service both directions ☒ Provides one-seat ride to ONT terminals from distant regional rail stations ☒ Increases service frequency along Metrolink San Bernardino line ☐ Increases service frequency along Metrolink Riverside line ☐ Provides high frequency regional rail service to ONT (15 minute headways) ☒ Operates in its own right-of-way (not on-street in mixed traffic) ☒ Route not on streets, hence, not affected by traffic signals and congestion ☒ Double-track operation possible, avoiding operational delays of single track	8	

Table 4: Screening Criterion #2 - Improving Transit Travel Time to ONT (continued)

Alternative	Evaluation Results	# of factors that improve travel time	Overall Result
C-12	☒ Provides direct service connecting a regional rail station to ONT terminals ☒ Connects to regional rail service with all-day weekday service both directions ☒ Connects to regional rail service with all-day weekend service both directions ☒ Provides one-seat ride to ONT terminals from distant regional rail stations ☐ Increases service frequency along Metrolink San Bernardino line ☒ Increases service frequency along Metrolink Riverside line ☐ Provides high frequency regional rail service to ONT (15 minute headways) ☒ Operates in its own right-of-way (not on-street in mixed traffic) ☒ Route not on streets, hence, not affected by traffic signals and congestion ☐ Double-track operation possible, avoiding operational delays of single track	7	
C-13	☒ Provides direct service connecting a regional rail station to ONT terminals ☒ Connects to regional rail service with all-day weekday service both directions ☒ Connects to regional rail service with all-day weekend service both directions ☒ Provides one-seat ride to ONT terminals from distant regional rail stations ☐ Increases service frequency along Metrolink San Bernardino line ☒ Increases service frequency along Metrolink Riverside line ☐ Provides high frequency regional rail service to ONT (15 minute headways) ☒ Operates in its own right-of-way (not on-street in mixed traffic) ☒ Right-of-Way not along arterials, hence, not affected by traffic signals and congestion ☐ Double-track operation possible, avoiding operational delays of single track	7	
D-1	☒ Provides direct service connecting a regional rail station to ONT terminals ☒ Connects to regional rail service with all-day weekday service both directions ☒ Connects to regional rail service with all-day weekend service both directions ☒ Provides one-seat ride to ONT terminals from distant regional rail stations ☐ Increases service frequency along Metrolink San Bernardino line ☐ Increases service frequency along Metrolink Riverside line ☒ Provides high frequency regional rail service to ONT (15 minute headways) ☒ Operates in its own right-of-way (not on-street in mixed traffic) ☒ Route not on streets, hence, not affected by traffic signals and congestion ☒ Double-track operation possible, avoiding operational delays of single track	8	

Table 3: Screening Criterion #2 - Improving Transit Travel Time to ONT (continued)

Alternative	Evaluation Results	# of factors that improve travel time	Overall Result
D-2	☒ Provides direct service connecting a regional rail station to ONT terminals ☒ Connects to regional rail service with all-day weekday service both directions ☒ Connects to regional rail service with all-day weekend service both directions ☒ Provides one-seat ride to ONT terminals from distant regional rail stations ☐ Increases service frequency along Metrolink San Bernardino line ☐ Increases service frequency along Metrolink Riverside line ☒ Provides high frequency regional rail service to ONT (15 minute headways) ☒ Operates in its own right-of-way (not on-street in mixed traffic) ☐ Route not on streets, hence, not affected by traffic signals and congestion ☒ Double-track operation possible, avoiding operational delays of single track	7	
D-3	☒ Provides direct service connecting a regional rail station to ONT terminals ☒ Connects to regional rail service with all-day weekday service both directions ☒ Connects to regional rail service with all-day weekend service both directions ☒ Provides one-seat ride to ONT terminals from distant regional rail stations ☐ Increases service frequency along Metrolink San Bernardino line ☐ Increases service frequency along Metrolink Riverside line ☒ Provides high frequency regional rail service to ONT (15 minute headways) ☒ Operates in its own right-of-way (not on-street in mixed traffic) ☒ Route not on streets, hence, not affected by traffic signals and congestion ☒ Double-track operation possible, avoiding operational delays of single track	8	

Table 4: Screening Criterion #3 - Number of Mode Transfers

Alternative	Evaluation Results	Summary Results	Overall Result
A-1	Number of mode transfers for trip to/from: Redlands: 2 Moreno Valley: 3 Claremont: 2	Max: 3, Min: 2, Average: 2.33	
A-2	Number of mode transfers for trip to/from: Redlands: 2 Moreno Valley: 3 Claremont: 2	Max: 3, Min: 2, Average: 2.33	
A-3	Number of mode transfers for trip to/from: Redlands: 2 Moreno Valley: 3 Claremont: 2	Max: 3, Min: 2, Average: 2.33	
A-4	Number of mode transfers for trip to/from: Redlands: 2 Moreno Valley: 3 Claremont: 2	Max: 3, Min: 2, Average: 2.33	
A-5	Number of mode transfers for trip to/from: Redlands: 2 Moreno Valley: 3 Claremont: 2	Max: 3, Min: 2, Average: 2.33	
A-6	Number of mode transfers for trip to/from: Redlands: 2 Moreno Valley: 3 Claremont: 2	Max: 3, Min: 2, Average: 2.33	
A-7	Number of mode transfers for trip to/from: Redlands: 2 Moreno Valley: 3 Claremont: 2	Max: 3, Min: 2, Average: 2.33	
A-8	Number of mode transfers for trip to/from: Redlands: 2 Moreno Valley: 3 Claremont: 2	Max: 3, Min: 2, Average: 2.33	
A-9	Number of mode transfers for trip to/from: Redlands: 2 Moreno Valley: 3 Claremont: 2	Max: 3, Min: 2, Average: 2.33	
A-10	Number of mode transfers for trip to/from: Redlands: 2 Moreno Valley: 3 Claremont: 2	Max: 3, Min: 2, Average: 2.33	
A-11	Number of mode transfers for trip to/from: Redlands: 3 Moreno Valley: 2 Claremont: 3	Max: 3, Min: 2, Average: 2.66	
A-12	Number of mode transfers for trip to/from: Redlands: 3 Moreno Valley: 2 Claremont: 3	Max: 3, Min: 2, Average: 2.66	
B-1	Number of mode transfers for trip to/from: Redlands: 2 Moreno Valley: 3 Claremont: 2	Max: 3, Min: 2, Average: 2.33	
B-2	Number of mode transfers for trip to/from: Redlands: 2 Moreno Valley: 3 Claremont: 2	Max: 3, Min: 2, Average: 2.33	
B-3	Number of mode transfers for trip to/from: Redlands: 2 Moreno Valley: 3 Claremont: 2	Max: 3, Min: 2, Average: 2.33	
B-4	Number of mode transfers for trip to/from: Redlands: 3 Moreno Valley: 2 Claremont: 3	Max: 3, Min: 2, Average: 2.66	

Table 4: Screening Criterion #3 - Number of Mode Transfers (continued)

Alternative	Evaluation Results	Summary Results	Overall Result
C-1	Number of mode transfers for trip to/from: Redlands: 1 Moreno Valley: 3 Claremont: 2	Max: 3, Min: 1, Average: 2	
C-2	Number of mode transfers for trip to/from: Redlands: 1 Moreno Valley: 3 Claremont: 2	Max: 3, Min: 1, Average: 2	
C-3	Number of mode transfers for trip to/from: Redlands: 1 Moreno Valley: 3 Claremont: 2	Max: 3, Min: 1, Average: 2	
C-4	Number of mode transfers for trip to/from: Redlands: 1 Moreno Valley: 3 Claremont: 2	Max: 3, Min: 1, Average: 2	
C-5	Number of mode transfers for trip to/from: Redlands: 1 Moreno Valley: 3 Claremont: 2	Max: 3, Min: 1, Average: 2	
C-6	Number of mode transfers for trip to/from: Redlands: 1 Moreno Valley: 3 Claremont: 2	Max: 3, Min: 1, Average: 2	
C-7	Number of mode transfers for trip to/from: Redlands: 1 Moreno Valley: 3 Claremont: 2	Max: 3, Min: 1, Average: 2	
C-8	Number of mode transfers for trip to/from: Redlands: 1 Moreno Valley: 3 Claremont: 2	Max: 3, Min: 1, Average: 2	
C-9	Number of mode transfers for trip to/from: Redlands: 1 Moreno Valley: 3 Claremont: 2	Max: 3, Min: 1, Average: 2	
C-10	Number of mode transfers for trip to/from: Redlands: 1 Moreno Valley: 3 Claremont: 2	Max: 3, Min: 1, Average: 2	
C-11	Number of mode transfers for trip to/from: Redlands: 2 Moreno Valley: 3 Claremont: 1	Max: 3, Min: 1, Average: 2	
C-12	Number of mode transfers for trip to/from: Redlands: 3 Moreno Valley: 1 Claremont: 3	Max: 3, Min: 1, Average: 2.33	
C-13	Number of mode transfers for trip to/from: Redlands: 3 Moreno Valley: 1 Claremont: 3	Max: 3, Min: 1, Average: 2.33	
D-1	Number of mode transfers for trip to/from: Redlands: 2 Moreno Valley: 3 Claremont: 1	Max: 3, Min: 1, Average: 2	
D-2	Number of mode transfers for trip to/from: Redlands: 2 Moreno Valley: 3 Claremont: 1	Max: 3, Min: 1, Average: 2	
D-3	Number of mode transfers for trip to/from: Redlands: 2 Moreno Valley: 3 Claremont: 1	Max: 3, Min: 1, Average: 2	

Table 5: Screening Criterion #4 - Service for Peak Flight Times

Alternative	Evaluation Results	# of peak flight times served	Overall Result
A-1	EB | WB | Weekday | EB | WB | Weekend | | 5-6 am departure | | | 5-6 am departure X | X | 3-4 pm departure | X | X | 3-4 pm departure X | X | 3-4 pm arrival | X | X | 3-4 pm arrival X | X | 7-8 pm departure | | X | 7-8 pm departure X | X | 7-8 pm arrival | X | | 7-8 pm arrival X | | 10-11 pm arrival | | | 10-11 pm arrival	15	
A-2	EB | WB | Weekday | EB | WB | Weekend | | 5-6 am departure | | | 5-6 am departure X | X | 3-4 pm departure | X | X | 3-4 pm departure X | X | 3-4 pm arrival | X | X | 3-4 pm arrival X | X | 7-8 pm departure | | X | 7-8 pm departure X | X | 7-8 pm arrival | X | | 7-8 pm arrival X | | 10-11 pm arrival | | | 10-11 pm arrival	15	
A-3	EB | WB | Weekday | EB | WB | Weekend | | 5-6 am departure | | | 5-6 am departure X | X | 3-4 pm departure | X | X | 3-4 pm departure X | X | 3-4 pm arrival | X | X | 3-4 pm arrival X | X | 7-8 pm departure | | X | 7-8 pm departure X | X | 7-8 pm arrival | X | | 7-8 pm arrival X | | 10-11 pm arrival | | | 10-11 pm arrival	15	
A-4	EB | WB | Weekday | EB | WB | Weekend | | 5-6 am departure | | | 5-6 am departure X | X | 3-4 pm departure | X | X | 3-4 pm departure X | X | 3-4 pm arrival | X | X | 3-4 pm arrival X | X | 7-8 pm departure | | X | 7-8 pm departure X | X | 7-8 pm arrival | X | | 7-8 pm arrival X | | 10-11 pm arrival | | | 10-11 pm arrival	15	

Table 5: Screening Criterion #4 - Service for Peak Flight Times (continued)

Alternative	Evaluation Results	# of peak flight times served	Overall Result
A-5	EB / WB / Weekday: 5-6 am departure; X / X / 3-4 pm departure; X / X / 3-4 pm arrival; X / X / 7-8 pm departure; X / X / 7-8 pm arrival; X / X / 10-11 pm arrival EB / WB / Weekend: 5-6 am departure; X / X / 3-4 pm departure; X / X / 3-4 pm arrival; X / X / 7-8 pm departure; X / X / 7-8 pm arrival; X / X / 10-11 pm arrival	15	●
A-6	EB / WB / Weekday: 5-6 am departure; X / X / 3-4 pm departure; X / X / 3-4 pm arrival; X / X / 7-8 pm departure; X / X / 7-8 pm arrival; X / X / 10-11 pm arrival EB / WB / Weekend: 5-6 am departure; X / X / 3-4 pm departure; X / X / 3-4 pm arrival; X / X / 7-8 pm departure; X / X / 7-8 pm arrival; X / X / 10-11 pm arrival	15	●
A-7	EB / WB / Weekday: 5-6 am departure; X / X / 3-4 pm departure; X / X / 3-4 pm arrival; X / X / 7-8 pm departure; X / X / 7-8 pm arrival; X / X / 10-11 pm arrival EB / WB / Weekend: 5-6 am departure; X / X / 3-4 pm departure; X / X / 3-4 pm arrival; X / X / 7-8 pm departure; X / X / 7-8 pm arrival; X / X / 10-11 pm arrival	15	●
A-8	EB / WB / Weekday: 5-6 am departure; X / X / 3-4 pm departure; X / X / 3-4 pm arrival; X / X / 7-8 pm departure; X / X / 7-8 pm arrival; X / X / 10-11 pm arrival EB / WB / Weekend: 5-6 am departure; X / X / 3-4 pm departure; X / X / 3-4 pm arrival; X / X / 7-8 pm departure; X / X / 7-8 pm arrival; X / X / 10-11 pm arrival	15	●

Table 5: Screening Criterion #4 - Service for Peak Flight Times (continued)

Alternative	Evaluation Results	# of peak flight times served	Overall Result
A-9	EB / WB / Weekday / EB / WB / Weekend 5-6 am departure X X 3-4 pm departure X X 3-4 pm departure X X 3-4 pm arrival X X 3-4 pm arrival X X 7-8 pm departure X 7-8 pm departure X X 7-8 pm arrival X 7-8 pm arrival X 10-11 pm arrival 10-11 pm arrival	15	
A-10	EB / WB / Weekday / EB / WB / Weekend 5-6 am departure X X 3-4 pm departure X X 3-4 pm departure X X 3-4 pm arrival X X 3-4 pm arrival X X 7-8 pm departure X 7-8 pm departure X X 7-8 pm arrival X 7-8 pm arrival X 10-11 pm arrival 10-11 pm arrival	15	
A-11	EB / WB / Weekday / EB / WB / Weekend 5-6 am departure 3-4 pm departure 3-4 pm arrival X 7-8 pm departure 7-8 pm arrival 10-11 pm arrival	1	
A-12	EB / WB / Weekday / EB / WB / Weekend 5-6 am departure 3-4 pm departure 3-4 pm arrival X 7-8 pm departure 7-8 pm arrival 10-11 pm arrival	1	

Table 5: Screening Criterion #4 - Service for Peak Flight Times (continued)

Alternative	Evaluation Results	# of peak flight times served	Overall Result
B-1	EB / WB / Weekday / EB / WB / Weekend 5-6 am departure X X 3-4 pm departure X X 3-4 pm departure X X 3-4 pm arrival X X 3-4 pm arrival X X 7-8 pm departure X 7-8 pm departure X X 7-8 pm arrival X 7-8 pm arrival X 10-11 pm arrival 10-11 pm arrival	15	
B-2	EB / WB / Weekday / EB / WB / Weekend 5-6 am departure X X 3-4 pm departure X X 3-4 pm departure X X 3-4 pm arrival X X 3-4 pm arrival X X 7-8 pm departure X 7-8 pm departure X X 7-8 pm arrival X 7-8 pm arrival X 10-11 pm arrival 10-11 pm arrival	15	
B-3	EB / WB / Weekday / EB / WB / Weekend 5-6 am departure X X 3-4 pm departure X X 3-4 pm departure X X 3-4 pm arrival X X 3-4 pm arrival X X 7-8 pm departure X 7-8 pm departure X X 7-8 pm arrival X 7-8 pm arrival X 10-11 pm arrival 10-11 pm arrival	15	
B-4	EB / WB / Weekday / EB / WB / Weekend 5-6 am departure 3-4 pm departure 3-4 pm arrival X 7-8 pm departure 7-8 pm arrival 10-11 pm arrival	1	

Table 5: Screening Criterion #4 - Service for Peak Flight Times (continued)

Alternative	Evaluation Results	# of peak flight times served	Overall Result
C-1	EB: X, X, X, X, X, X, — / WB: —, X, X, X, X, X, X / Weekday: 5-6 am departure; 3-4 pm departure; 3-4 pm arrival; 7-8 pm departure; 7-8 pm arrival; 10-11 pm arrival / EB: —, X, X, X, X, — / WB: X, X, X, X, X, X / Weekend: 5-6 am departure; 3-4pm departure; 3-4 pm arrival; 7-8pm departure; 7-8 pm arrival; 10-11 pm arrival	20	●
C-2	EB: X, X, X, X, X, X, — / WB: —, X, X, X, X, X, X / Weekday: 5-6 am departure; 3-4 pm departure; 3-4 pm arrival; 7-8 pm departure; 7-8 pm arrival; 10-11 pm arrival / EB: —, X, X, X, X, — / WB: X, X, X, X, X, X / Weekend: 5-6 am departure; 3-4pm departure; 3-4 pm arrival; 7-8pm departure; 7-8 pm arrival; 10-11 pm arrival	20	●
C-3	EB: X, X, X, X, X, X, — / WB: —, X, X, X, X, X, X / Weekday: 5-6 am departure; 3-4 pm departure; 3-4 pm arrival; 7-8 pm departure; 7-8 pm arrival; 10-11 pm arrival / EB: —, X, X, X, X, — / WB: X, X, X, X, X, X / Weekend: 5-6 am departure; 3-4pm departure; 3-4 pm arrival; 7-8pm departure; 7-8 pm arrival; 10-11 pm arrival	20	●
C-4	EB: X, X, X, X, X, X, — / WB: —, X, X, X, X, X, X / Weekday: 5-6 am departure; 3-4 pm departure; 3-4 pm arrival; 7-8 pm departure; 7-8 pm arrival; 10-11 pm arrival / EB: —, X, X, X, X, — / WB: X, X, X, X, X, X / Weekend: 5-6 am departure; 3-4pm departure; 3-4 pm arrival; 7-8pm departure; 7-8 pm arrival; 10-11 pm arrival	20	●

Table 5: Screening Criterion #4 - Service for Peak Flight Times (continued)

Alternative	Evaluation Results	# of peak flight times served	Overall Result
C-5	EB: X 3-4 pm departure; X 3-4 pm arrival; X 7-8 pm departure; X 7-8 pm arrival; X 10-11 pm arrival WB: X 5-6 am departure; X 3-4 pm departure; X 3-4 pm arrival; X 7-8 pm departure; X 7-8 pm arrival Weekday: 5-6 am departure; 3-4 pm departure; 3-4 pm arrival; 7-8 pm departure; 7-8 pm arrival; 10-11 pm arrival EB: X 3-4pm departure; X 3-4 pm arrival; X 7-8pm departure; X 7-8 pm arrival; X 10-11 pm arrival WB: X 5-6 am departure; X 3-4pm departure; X 3-4 pm arrival; X 7-8pm departure; X 7-8 pm arrival; X 10-11 pm arrival Weekend: 5-6 am departure; 3-4pm departure; 3-4 pm arrival; 7-8pm departure; 7-8 pm arrival; 10-11 pm arrival	20	●
C-6	EB: X 3-4 pm departure; X 3-4 pm arrival; X 7-8 pm departure; X 7-8 pm arrival; X 10-11 pm arrival WB: X 5-6 am departure; X 3-4 pm departure; X 3-4 pm arrival; X 7-8 pm departure; X 7-8 pm arrival Weekday: 5-6 am departure; 3-4 pm departure; 3-4 pm arrival; 7-8 pm departure; 7-8 pm arrival; 10-11 pm arrival EB: X 3-4pm departure; X 3-4 pm arrival; X 7-8pm departure; X 7-8 pm arrival; X 10-11 pm arrival WB: X 5-6 am departure; X 3-4pm departure; X 3-4 pm arrival; X 7-8pm departure; X 7-8 pm arrival; X 10-11 pm arrival Weekend: 5-6 am departure; 3-4pm departure; 3-4 pm arrival; 7-8pm departure; 7-8 pm arrival; 10-11 pm arrival	20	●
C-7	EB: X 3-4 pm departure; X 3-4 pm arrival; X 7-8 pm departure; X 7-8 pm arrival; X 10-11 pm arrival WB: X 5-6 am departure; X 3-4 pm departure; X 3-4 pm arrival; X 7-8 pm departure; X 7-8 pm arrival Weekday: 5-6 am departure; 3-4 pm departure; 3-4 pm arrival; 7-8 pm departure; 7-8 pm arrival; 10-11 pm arrival EB: X 3-4pm departure; X 3-4 pm arrival; X 7-8pm departure; X 7-8 pm arrival; X 10-11 pm arrival WB: X 5-6 am departure; X 3-4pm departure; X 3-4 pm arrival; X 7-8pm departure; X 7-8 pm arrival; X 10-11 pm arrival Weekend: 5-6 am departure; 3-4pm departure; 3-4 pm arrival; 7-8pm departure; 7-8 pm arrival; 10-11 pm arrival	20	●
C-8	EB: X 3-4 pm departure; X 3-4 pm arrival; X 7-8 pm departure; X 7-8 pm arrival; X 10-11 pm arrival WB: X 5-6 am departure; X 3-4 pm departure; X 3-4 pm arrival; X 7-8 pm departure; X 7-8 pm arrival Weekday: 5-6 am departure; 3-4 pm departure; 3-4 pm arrival; 7-8 pm departure; 7-8 pm arrival; 10-11 pm arrival EB: X 3-4pm departure; X 3-4 pm arrival; X 7-8pm departure; X 7-8 pm arrival; X 10-11 pm arrival WB: X 5-6 am departure; X 3-4pm departure; X 3-4 pm arrival; X 7-8pm departure; X 7-8 pm arrival; X 10-11 pm arrival Weekend: 5-6 am departure; 3-4pm departure; 3-4 pm arrival; 7-8pm departure; 7-8 pm arrival; 10-11 pm arrival	20	●

Table 5: Screening Criterion #4 - Service for Peak Flight Times (continued)

Alternative	Evaluation Results	# of peak flight times served	Overall Result
C-9	EB / WB / Weekday / EB / WB / Weekend — / X / 5-6 am departure / — / X / 5-6 am departure X / X / 3-4 pm departure / X / X / 3-4pm departure X / X / 3-4 pm arrival / X / X / 3-4 pm arrival X / X / 7-8 pm departure / X / X / 7-8pm departure X / X / 7-8 pm arrival / X / X / 7-8 pm arrival X / — / 10-11 pm arrival / — / X / 10-11 pm arrival	20	●
C-10	EB / WB / Weekday / EB / WB / Weekend — / X / 5-6 am departure / — / X / 5-6 am departure X / X / 3-4 pm departure / X / X / 3-4pm departure X / X / 3-4 pm arrival / X / X / 3-4 pm arrival X / X / 7-8 pm departure / X / X / 7-8pm departure X / X / 7-8 pm arrival / X / X / 7-8 pm arrival X / — / 10-11 pm arrival / — / X / 10-11 pm arrival	20	●
C-11	EB / WB / Weekday / EB / WB / Weekend X / — / 5-6 am departure / X / — / 5-6 am departure X / X / 3-4 pm departure / X / X / 3-4 pm departure X / X / 3-4 pm arrival / X / X / 3-4 pm arrival X / X / 7-8 pm departure / X / X / 7-8 pm departure X / X / 7-8 pm arrival / X / — / 7-8 pm arrival X / X / 10-11 pm arrival / X / — / 10-11 pm arrival	20	●
C-12	EB / WB / Weekday / EB / WB / Weekend X / X / 5-6 am departure / X / X / 5-6 am departure X / X / 3-4 pm departure / X / X / 3-4 pm departure X / X / 3-4 pm arrival / X / X / 3-4 pm arrival X / X / 7-8 pm departure / X / X / 7-8 pm departure X / X / 7-8 pm arrival / X / X / 7-8 pm arrival X / X / 10-11 pm arrival / X / X / 10-11 pm arrival	24	●

Table 5: Screening Criterion #4 - Service for Peak Flight Times (continued)

Alternative	Evaluation Results	# of peak flight times served	Overall Result
C-13	EB / WB / Weekday: X / X / 5-6 am departure; EB / WB / Weekend: X / X / 5-6 am departure X / X / 3-4 pm departure; X / X / 3-4 pm departure X / X / 3-4 pm arrival; X / X / 3-4 pm arrival X / X / 7-8 pm departure; X / X / 7-8 pm departure X / X / 7-8 pm arrival; X / X / 7-8 pm arrival X / X / 10-11 pm arrival; X / X / 10-11 pm arrival	24	
D-1	EB / WB / Weekday: / X / 5-6 am departure; EB / WB / Weekend: / X / 5-6 am departure X / X / 3-4 pm departure; X / X / 3-4 pm departure X / X / 3-4 pm arrival; X / X / 3-4 pm arrival X / X / 7-8 pm departure; X / X / 7-8 pm departure X / X / 7-8 pm arrival; X / X / 7-8 pm arrival X / X / 10-11 pm arrival; X / X / 10-11 pm arrival	22	
D-2	EB / WB / Weekday: / X / 5-6 am departure; EB / WB / Weekend: / X / 5-6 am departure X / X / 3-4 pm departure; X / X / 3-4 pm departure X / X / 3-4 pm arrival; X / X / 3-4 pm arrival X / X / 7-8 pm departure; X / X / 7-8 pm departure X / X / 7-8 pm arrival; X / X / 7-8 pm arrival X / X / 10-11 pm arrival; X / X / 10-11 pm arrival	22	
D-3	EB / WB / Weekday: / X / 5-6 am departure; EB / WB / Weekend: / X / 5-6 am departure X / X / 3-4 pm departure; X / X / 3-4 pm departure X / X / 3-4 pm arrival; X / X / 3-4 pm arrival X / X / 7-8 pm departure; X / X / 7-8 pm departure X / X / 7-8 pm arrival; X / X / 7-8 pm arrival X / X / 10-11 pm arrival; X / X / 10-11 pm arrival	22	

Table 6: Screening Criterion #5 - Ridership Potential

Alternative	Evaluation Results						Ridership Score	Overall Result
	Future (2035) Population (in hundred thousands)	Future (2035) Employment (in hundred thousands)	Service Frequency (High=2, Medium =1, Low=0)	Required Transfers (1=(-2), 0=0)	Travel Speed (High=2, Medium =1, Low=0)	Reliability (High=1, Low=0)		
A-1	14.5	6.7	Medium	1	Medium	High	22.2	
A-2	14.5	6.7	Medium	1	Medium	High	22.2	
A-3	14.5	6.7	Medium	1	Medium	High	22.2	
A-4	14.5	6.7	Medium	1	Medium	High	22.2	
A-5	14.5	6.7	Medium	1	Medium	High	22.2	
A-6	18.1	7.2	Medium	1	Medium	High	26.3	
A-7	18.1	7.2	Medium	1	Medium	High	26.3	
A-8	18.1	7.2	Medium	1	Medium	High	26.3	
A-9	18.1	7.2	Medium	1	Medium	High	26.3	
A-10	18.1	7.2	Medium	1	Medium	High	26.3	
A-11	11.7	6.6	Low	1	Medium	High	18.3	
A-12	11.7	6.6	Low	1	Medium	High	18.3	
B-1	14.5	6.7	High	1	Low	Low	21.2	
B-2	14.5	6.7	High	1	Low	Low	21.2	
B-3	18.1	7.2	High	1	Low	Low	25.3	
B-4	11.7	6.6	Low	1	Low	Low	16.3	
C-1	16.1	7.5	Medium	0	High	High	27.6	
C-2	16.1	7.5	Medium	0	High	High	27.6	
C-3	16.1	7.5	Medium	0	High	High	27.6	
C-4	16.1	7.5	Medium	0	High	High	27.6	
C-5	16.1	7.5	Medium	0	High	High	27.6	
C-6	14.5	6.7	Medium	0	High	High	25.2	

Table 6: Screening Criterion #5 - Ridership Potential (continued)

Alternative	Evaluation Results						Ridership Score	Overall Result
	Future (2035) Population (in hundred thousands)	Future (2035) Employment (in hundred thousands)	Service Frequency (High=2, Medium =1, Low=0)	Required Transfers (1=(-2), 0=0)	Travel Speed (High=2, Medium =1, Low=0)	Reliability (High=1, Low=0)		
C-7	14.5	6.7	Medium	0	High	High	25.2	
C-8	14.5	6.7	Medium	0	High	High	25.2	
C-9	14.5	6.7	Medium	0	High	High	25.2	
C-10	14.5	6.7	Medium	0	High	High	25.2	
C-11	18.1	7.2	Medium	0	High	High	29.3	
C-12	11.7	6.6	Low	0	High	High	21.3	
C-13	18.5	7.8	Medium	0	High	High	30.3	
D-1	18.1	7.2	High	0	Medium	High	29.3	
D-2	18.1	7.2	High	0	Medium	High	29.3	
D-3	18.1	7.2	High	0	Medium	High	29.3	

Table 7: Screening Criterion #6 - Capital and Operating Costs

Alternative	Capital Cost Factors	Operations & Maintenance Cost Factors	Overall Result		
			Capital Cost	O&M Cost	Total
A-1	☒ New rail to ONT terminal area ☐ Double track portions of San Bernardino line ☐ New main track for Riverside Line ☐ New light rail from Montclair ☒ Stations ☒ Vehicles (train car/light rail car/bus)	☐ Bus operations (crew of 1) ☐ Light Rail operations (crew of 1) ☐ Commuter rail/DMU operations (crew of 2) ☒ Light rail, DMU, or AGT operations (crew 0-2) ☒ Operation to/from nearby Metrolink stations ☐ Operation to/from distant Metrolink stations ☐ Operation part of Gold Line	Medium	Medium	●
A-2	☒ New rail to ONT terminal area ☐ Double track portions of San Bernardino line ☐ New main track for Riverside Line ☐ New light rail from Montclair ☒ Stations ☒ Vehicles (train car/light rail car/bus)	☐ Bus operations (crew of 1) ☐ Light Rail operations (crew of 1) ☐ Commuter rail/DMU operations (crew of 2) ☒ Light rail, DMU, or AGT operations (crew 0-2) ☒ Operation to/from nearby Metrolink stations ☐ Operation to/from distant Metrolink stations ☐ Operation part of Gold Line	Medium	Medium	●
A-3	☒ New rail to ONT terminal area ☐ Double track portions of San Bernardino line ☐ New main track for Riverside Line ☐ New light rail from Montclair ☒ Stations ☒ Vehicles (train car/light rail car/bus)	☐ Bus operations (crew of 1) ☐ Light Rail operations (crew of 1) ☐ Commuter rail/DMU operations (crew of 2) ☒ Light rail, DMU, or AGT operations (crew 0-2) ☒ Operation to/from nearby Metrolink stations ☐ Operation to/from distant Metrolink stations ☐ Operation part of Gold Line	Medium	Medium	●

Table 7: Screening Criterion #6 - Capital and Operating Costs (continued)

Alternative	Capital Cost Factors	Operations & Maintenance Cost Factors	Overall Result		
			Capital Cost	O&M Cost	Total
A-4	☒ New rail to ONT terminal area ☐ Double track portions of San Bernardino line ☐ New main track for Riverside Line ☐ New light rail from Montclair ☒ Stations ☒ Vehicles (train car/light rail car/bus)	☐ Bus operations (crew of 1) ☐ Light Rail operations (crew of 1) ☐ Commuter rail/DMU operations (crew of 2) ☒ Light rail, DMU, or AGT operations (crew 0-2) ☒ Operation to/from nearby Metrolink stations ☐ Operation to/from distant Metrolink stations ☐ Operation part of Gold Line	Medium	Medium	●
A-5	☒ New rail to ONT terminal area ☐ Double track portions of San Bernardino line ☐ New main track for Riverside Line ☐ New light rail from Montclair ☒ Stations ☒ Vehicles (train car/light rail car/bus)	☐ Bus operations (crew of 1) ☐ Light Rail operations (crew of 1) ☐ Commuter rail/DMU operations (crew of 2) ☒ Light rail, DMU, or AGT operations (crew 0-2) ☒ Operation to/from nearby Metrolink stations ☐ Operation to/from distant Metrolink stations ☐ Operation part of Gold Line	Medium	Medium	●
A-6	☒ New rail to ONT terminal area ☐ Double track portions of San Bernardino line ☐ New main track for Riverside Line ☐ New light rail from Montclair ☒ Stations ☒ Vehicles (train car/light rail car/bus)	☐ Bus operations (crew of 1) ☐ Light Rail operations (crew of 1) ☐ Commuter rail/DMU operations (crew of 2) ☒ Light rail, DMU, or AGT operations (crew 0-2) ☒ Operation to/from nearby Metrolink stations ☐ Operation to/from distant Metrolink stations ☐ Operation part of Gold Line	Medium	Medium	●

Table 7: Screening Criterion #6 - Capital and Operating Costs (continued)

Alternative	Capital Cost Factors	Operations & Maintenance Cost Factors	Overall Result		
			Capital Cost	O&M Cost	Total
A-7	☒ New rail to ONT terminal area ☐ Double track portions of San Bernardino line ☐ New main track for Riverside Line ☐ New light rail from Montclair ☒ Stations ☒ Vehicles (train car/light rail car/bus)	☐ Bus operations (crew of 1) ☐ Light Rail operations (crew of 1) ☐ Commuter rail/DMU operations (crew of 2) ☒ Light rail, DMU, or AGT operations (crew 0-2) ☒ Operation to/from nearby Metrolink stations ☐ Operation to/from distant Metrolink stations ☐ Operation part of Gold Line	Medium	Medium	●
A-8	☒ New rail to ONT terminal area ☐ Double track portions of San Bernardino line ☐ New main track for Riverside Line ☐ New light rail from Montclair ☒ Stations ☒ Vehicles (train car/light rail car/bus)	☐ Bus operations (crew of 1) ☐ Light Rail operations (crew of 1) ☐ Commuter rail/DMU operations (crew of 2) ☒ Light rail, DMU, or AGT operations (crew 0-2) ☒ Operation to/from nearby Metrolink stations ☐ Operation to/from distant Metrolink stations ☐ Operation part of Gold Line	Medium	Medium	●
A-9	☒ New rail to ONT terminal area ☐ Double track portions of San Bernardino line ☐ New main track for Riverside Line ☐ New light rail from Montclair ☒ Stations ☒ Vehicles (train car/light rail car/bus)	☐ Bus operations (crew of 1) ☐ Light Rail operations (crew of 1) ☐ Commuter rail/DMU operations (crew of 2) ☒ Light rail, DMU, or AGT operations (crew 0-2) ☒ Operation to/from nearby Metrolink stations ☐ Operation to/from distant Metrolink stations ☐ Operation part of Gold Line	Medium	Medium	●

Table 7: Screening Criterion #6 - Capital and Operating Costs (continued)

Alternative	Capital Cost Factors	Operations & Maintenance Cost Factors	Overall Result		
			Capital Cost	O&M Cost	Total
A-10	☒ New rail to ONT terminal area ☐ Double track portions of San Bernardino line ☐ New main track for Riverside Line ☐ New light rail from Montclair ☒ Stations ☒ Vehicles (train car/light rail car/bus)	☐ Bus operations (crew of 1) ☐ Light Rail operations (crew of 1) ☐ Commuter rail/DMU operations (crew of 2) ☒ Light rail, DMU, or AGT operations (crew 0-2) ☒ Operation to/from nearby Metrolink stations ☐ Operation to/from distant Metrolink stations ☐ Operation part of Gold Line	Medium	Medium	●
A-11	☒ New rail to ONT terminal area ☐ Double track portions of San Bernardino line ☐ New main track for Riverside Line ☐ New light rail ☒ Stations ☒ Vehicles (train car/light rail car/bus)	☐ Bus operations (crew of 1) ☐ Light Rail operations (crew of 1) ☐ Commuter rail/DMU operations (crew of 2) ☒ Light rail, DMU, or AGT operations (crew 0-2) ☒ Operation to/from nearby Metrolink stations ☐ Operation to/from distant Metrolink stations ☐ Operation part of Gold Line	Medium	Medium	●
A-12	☒ New rail to ONT terminal area ☐ Double track portions of San Bernardino line ☐ New main track for Riverside Line ☐ New light rail from Montclair ☒ Stations ☒ Vehicles (train car/light rail car/bus)	☐ Bus operations (crew of 1) ☐ Light Rail operations (crew of 1) ☐ Commuter rail/DMU operations (crew of 2) ☒ Light rail, DMU, or AGT operations (crew 0-2) ☒ Operation to/from nearby Metrolink stations ☐ Operation to/from distant Metrolink stations ☐ Operation part of Gold Line	Medium	Medium	●

Table 7: Screening Criterion #6 - Capital and Operating Costs (continued)

Alternative	Capital Cost Factors	Operations & Maintenance Cost Factors	Overall Result		
			Capital Cost	O&M Cost	Total
B-1	☐ New rail to ONT terminal area ☐ Double track portions of San Bernardino line ☐ New main track for Riverside Line ☐ New light rail from Montclair ☐ Stations ☒ Vehicles (train car/light rail car/bus)	☒ Bus operations (crew of 1) ☐ Light Rail operations (crew of 1) ☐ Commuter rail/DMU operations (crew of 2) ☐ Light rail, DMU, or AGT operations (crew 0-2) ☒ Operation to/from nearby Metrolink stations ☐ Operation to/from distant Metrolink stations ☐ Operation part of Gold Line	Very Low	Very Low	●
B-2	☐ New rail to ONT terminal area ☐ Double track portions of San Bernardino line ☐ New main track for Riverside Line ☐ New light rail from Montclair ☐ Stations ☒ Vehicles (train car/light rail car/bus)	☒ Bus operations (crew of 1) ☐ Light Rail operations (crew of 1) ☐ Commuter rail/DMU operations (crew of 2) ☐ Light rail, DMU, or AGT operations (crew 0-2) ☒ Operation to/from nearby Metrolink stations ☐ Operation to/from distant Metrolink stations ☐ Operation part of Gold Line	Very Low	Very Low	●
B-3	☐ New rail to ONT terminal area ☐ Double track portions of San Bernardino line ☐ New main track for Riverside Line ☐ New light rail ☐ Stations ☒ Vehicles (train car/light rail car/bus)	☒ Bus operations (crew of 1) ☐ Light Rail operations (crew of 1) ☐ Commuter rail/DMU operations (crew of 2) ☐ Light rail, DMU, or AGT operations (crew 0-2) ☒ Operation to/from nearby Metrolink stations ☐ Operation to/from distant Metrolink stations ☐ Operation part of Gold Line	Very Low	Very Low	●

Table 7: Screening Criterion #6 - Capital and Operating Costs (continued)

Alternative	Capital Cost Factors	Operations & Maintenance Cost Factors	Overall Result		
			Capital Cost	O&M Cost	Total
B-4	☐ New rail to ONT terminal area ☐ Double track portions of San Bernardino line ☐ New main track for Riverside Line ☐ New light rail from Montclair ☐ Stations ☒ Vehicles (train car/light rail car/bus)	☒ Bus operations (crew of 1) ☐ Light Rail operations (crew of 1) ☐ Commuter rail/DMU operations (crew of 2) ☐ Light rail, DMU, or AGT operations (crew 0-2) ☒ Operation to/from nearby Metrolink stations ☐ Operation to/from distant Metrolink stations ☐ Operation part of Gold Line	Very Low	Very Low	●
C-1	☒ New rail to ONT terminal area ☒ Double track portions of San Bernardino line ☐ New main track for Riverside Line ☐ New light rail from Montclair ☒ Stations ☒ Vehicles (train car/light rail car/bus)	☐ Bus operations (crew of 1) ☐ Light Rail operations (crew of 1) ☒ Commuter rail/DMU operations (crew of 2) ☒ Light rail, DMU, or AGT operations (crew 0-2) ☒ Operation to/from nearby Metrolink stations ☒ Operation to/from distant Metrolink stations ☐ Operation part of Gold Line	High	High	●
C-2	☒ New rail to ONT terminal area ☒ Double track portions of San Bernardino line ☐ New main track for Riverside Line ☐ New light rail from Montclair ☒ Stations ☒ Vehicles (train car/light rail car/bus)	☐ Bus operations (crew of 1) ☐ Light Rail operations (crew of 1) ☒ Commuter rail/DMU operations (crew of 2) ☒ Light rail, DMU, or AGT operations (crew 0-2) ☒ Operation to/from nearby Metrolink stations ☒ Operation to/from distant Metrolink stations ☐ Operation part of Gold Line	High	High	●

Table 7: Screening Criterion #6 - Capital and Operating Costs (continued)

Alternative	Capital Cost Factors	Operations & Maintenance Cost Factors	Overall Result		
			Capital Cost	O&M Cost	Total
C-3	☒ New rail to ONT terminal area ☒ Double track portions of San Bernardino line ☐ New main track for Riverside Line ☐ New light rail from Montclair ☒ Stations ☒ Vehicles (train car/light rail car/bus)	☐ Bus operations (crew of 1) ☐ Light Rail operations (crew of 1) ☒ Commuter rail/DMU operations (crew of 2) ☒ Light rail, DMU, or AGT operations (crew 0-2) ☒ Operation to/from nearby Metrolink stations ☒ Operation to/from distant Metrolink stations ☐ Operation part of Gold Line	High	High	●
C-4	☒ New rail to ONT terminal area ☒ Double track portions of San Bernardino line ☐ New main track for Riverside Line ☐ New light rail from Montclair ☒ Stations ☒ Vehicles (train car/light rail car/bus)	☐ Bus operations (crew of 1) ☐ Light Rail operations (crew of 1) ☒ Commuter rail/DMU operations (crew of 2) ☒ Light rail, DMU, or AGT operations (crew 0-2) ☒ Operation to/from nearby Metrolink stations ☒ Operation to/from distant Metrolink stations ☐ Operation part of Gold Line	High	High	●
C-5	☒ New rail to ONT terminal area ☒ Double track portions of San Bernardino line ☐ New main track for Riverside Line ☐ New light rail from Montclair ☒ Stations ☒ Vehicles (train car/light rail car/bus)	☐ Bus operations (crew of 1) ☐ Light Rail operations (crew of 1) ☒ Commuter rail/DMU operations (crew of 2) ☒ Light rail, DMU, or AGT operations (crew 0-2) ☒ Operation to/from nearby Metrolink stations ☒ Operation to/from distant Metrolink stations ☐ Operation part of Gold Line	High	High	●
C-6	☒ New rail to ONT terminal area ☒ Double track portions of San Bernardino line ☐ New main track for Riverside Line ☐ New light rail from Montclair ☒ Stations ☒ Vehicles (train car/light rail car/bus)	☐ Bus operations (crew of 1) ☐ Light Rail operations (crew of 1) ☒ Commuter rail/DMU operations (crew of 2) ☒ Light rail, DMU, or AGT operations (crew 0-2) ☒ Operation to/from nearby Metrolink stations ☒ Operation to/from distant Metrolink stations ☐ Operation part of Gold Line	High	High	●

Table 7: Screening Criterion #6 - Capital and Operating Costs (continued)

Alternative	Capital Cost Factors	Operations & Maintenance Cost Factors	Overall Result		
			Capital Cost	O&M Cost	Total
C-7	☒ New rail to ONT terminal area ☒ Double track portions of San Bernardino line ☐ New main track for Riverside Line ☐ New light rail from Montclair ☒ Stations ☒ Vehicles (train car/light rail car/bus)	☐ Bus operations (crew of 1) ☐ Light Rail operations (crew of 1) ☒ Commuter rail/DMU operations (crew of 2) ☒ Light rail, DMU, or AGT operations (crew 0-2) ☒ Operation to/from nearby Metrolink stations ☒ Operation to/from distant Metrolink stations ☐ Operation part of Gold Line	High	High	
C-8	☒ New rail to ONT terminal area ☒ Double track portions of San Bernardino line ☐ New main track for Riverside Line ☐ New light rail from Montclair ☒ Stations ☒ Vehicles (train car/light rail car/bus)	☐ Bus operations (crew of 1) ☐ Light Rail operations (crew of 1) ☒ Commuter rail/DMU operations (crew of 2) ☒ Light rail, DMU, or AGT operations (crew 0-2) ☒ Operation to/from nearby Metrolink stations ☒ Operation to/from distant Metrolink stations ☐ Operation part of Gold Line	High	High	
C-9	☒ New rail to ONT terminal area ☒ Double track portions of San Bernardino line ☐ New main track for Riverside Line ☐ New light rail from Montclair ☒ Stations ☒ Vehicles (train car/light rail car/bus)	☐ Bus operations (crew of 1) ☐ Light Rail operations (crew of 1) ☒ Commuter rail/DMU operations (crew of 2) ☒ Light rail, DMU, or AGT operations (crew 0-2) ☒ Operation to/from nearby Metrolink stations ☒ Operation to/from distant Metrolink stations ☐ Operation part of Gold Line	High	High	
C-10	☒ New rail to ONT terminal area ☒ Double track portions of San Bernardino line ☐ New main track for Riverside Line ☐ New light rail from Montclair ☒ Stations ☒ Vehicles (train car/light rail car/bus)	☐ Bus operations (crew of 1) ☐ Light Rail operations (crew of 1) ☒ Commuter rail/DMU operations (crew of 2) ☒ Light rail, DMU, or AGT operations (crew 0-2) ☒ Operation to/from nearby Metrolink stations ☒ Operation to/from distant Metrolink stations ☐ Operation part of Gold Line	High	High	

Table 7: Screening Criterion #6 - Capital and Operating Costs (continued)

Alternative	Capital Cost Factors	Operations & Maintenance Cost Factors	Overall Result		
			Capital Cost	O&M Cost	Total
C-11	☒ New rail to ONT terminal area ☒ Double track portions of San Bernardino line ☐ New main track for Riverside Line ☐ New light rail from Montclair ☒ Stations ☒ Vehicles (train car/light rail car/bus)	☐ Bus operations (crew of 1) ☐ Light Rail operations (crew of 1) ☒ Commuter rail/DMU operations (crew of 2) ☒ Light rail, DMU, or AGT operations (crew 0-2) ☒ Operation to/from nearby Metrolink stations ☒ Operation to/from distant Metrolink stations ☐ Operation part of Gold Line	High	High	
C-12	☒ New rail to ONT terminal area ☐ Double track portions of San Bernardino line ☒ New main track for Riverside Line ☐ New light rail ☒ Stations ☒ Vehicles (train car/light rail car/bus)	☐ Bus operations (crew of 1) ☐ Light Rail operations (crew of 1) ☒ Commuter rail/DMU operations (crew of 2) ☒ Light rail, DMU, or AGT operations (crew 0-2) ☒ Operation to/from nearby Metrolink stations ☒ Operation to/from distant Metrolink stations ☐ Operation part of Gold Line	Very High	High	
C-13	☒ New rail to ONT terminal area ☐ Double track portions of San Bernardino line ☒ New main track for Riverside Line ☐ New light rail from Montclair ☒ Stations ☒ Vehicles (train car/light rail car/bus)	☐ Bus operations (crew of 1) ☐ Light Rail operations (crew of 1) ☒ Commuter rail/DMU operations (crew of 2) ☒ Light rail, DMU, or AGT operations (crew 0-2) ☒ Operation to/from nearby Metrolink stations ☒ Operation to/from distant Metrolink stations ☐ Operation part of Gold Line	Very High	High	

Table 7: Screening Criterion #6 - Capital and Operating Costs (continued)

Alternative	Capital Cost Factors	Operations & Maintenance Cost Factors	Overall Result		
			Capital Cost	O&M Cost	Total
D-1	☐ New rail to ONT terminal area ☐ Double track portions of San Bernardino line ☐ New main track for Riverside Line ☒ New light rail from Montclair ☒ Stations ☒ Vehicles (train car/light rail car/bus)	☐ Bus operations (crew of 1) ☒ Light Rail operations (crew of 1) ☐ Commuter rail/DMU operations (crew of 2) ☒Light rail, DMU, or AGT operations (crew 0-2) ☐ Operation to/from nearby Metrolink stations ☐ Operation to/from distant Metrolink stations ☒ Operation part of Gold Line	High	Medium	
D-2	☐ New rail to ONT terminal area ☐ Double track portions of San Bernardino line ☐ New main track for Riverside Line ☒ New light rail from Montclair ☒ Stations ☒ Vehicles (train car/light rail car/bus)	☐ Bus operations (crew of 1) ☒ Light Rail operations (crew of 1) ☐ Commuter rail/DMU operations (crew of 2) ☒Light rail, DMU, or AGT operations (crew 0-2) ☐ Operation to/from nearby Metrolink stations ☐ Operation to/from distant Metrolink stations ☒ Operation part of Gold Line	High	Medium	
D-3	☐ New rail to ONT terminal area ☐ Double track portions of San Bernardino line ☐ New main track for Riverside Line ☒ New light rail from Montclair ☒ Stations ☒ Vehicles (train car/light rail car/bus)	☐ Bus operations (crew of 1) ☒ Light Rail operations (crew of 1) ☐ Commuter rail/DMU operations (crew of 2) ☒Light rail, DMU, or AGT operations (crew 0-2) ☐ Operation to/from nearby Metrolink stations ☐ Operation to/from distant Metrolink stations ☒ Operation part of Gold Line	High	Medium	

Table 8: Screening Criterion #7 -Impact on Metrolink Operations

Alternative	Description of Impacts	Summary Result	Overall Result
A-1	☐ Adds trains in a Metrolink corridor (more frequent service) ☐ Double-tracking San Bernardino Line provides opportunity for more frequent passenger train operations ☐ New main track for Riverside Line provides opportunity for substantial increase in Metrolink service frequency ☐ Would compete with Metrolink for passengers in corridor ☒ Crossover maneuvers, as well as use of Metrolink rails and station platform, could cause some interference with Metrolink operations	☐ Significant disruption ☐ Moderate disruption ☒ Little/no disruption ☐ Moderate enhancement ☐ Significant enhancement	
A-2	☐ Adds trains in a Metrolink corridor (more frequent service) ☐ Double-tracking San Bernardino Line provides opportunity for more frequent passenger train operations ☐ New main track for Riverside Line provides opportunity for substantial increase in Metrolink service frequency ☐ Would compete with Metrolink for passengers in corridor ☒ Crossover maneuvers, as well as use of Metrolink rails and station platform, could cause some interference with Metrolink operations	☐ Significant disruption ☐ Moderate disruption ☒ Little/no disruption ☐ Moderate enhancement ☐ Significant enhancement	
A-3	☐ Adds trains in a Metrolink corridor (more frequent service) ☐ Double-tracking San Bernardino Line provides opportunity for more frequent passenger train operations ☐ New main track for Riverside Line provides opportunity for substantial increase in Metrolink service frequency ☐ Would compete with Metrolink for passengers in corridor ☒ Crossover maneuvers, as well as use of Metrolink rails and station platform, could cause some interference with Metrolink operations	☐ Significant disruption ☐ Moderate disruption ☒ Little/no disruption ☐ Moderate enhancement ☐ Significant enhancement	
A-4	☐ Adds trains in a Metrolink corridor (more frequent service) ☐ Double-tracking San Bernardino Line provides opportunity for more frequent passenger train operations ☐ New main track for Riverside Line provides opportunity for substantial increase in Metrolink service frequency ☐ Would compete with Metrolink for passengers in corridor ☒ Crossover maneuvers, as well as use of Metrolink rails and station platform, could cause some interference with Metrolink operations	☐ Significant disruption ☐ Moderate disruption ☒ Little/no disruption ☐ Moderate enhancement ☐ Significant enhancement	

Table 8: Screening Criterion #7 -Impact on Metrolink Operations (continued)

Alternative	Description of Impacts	Summary Result	Overall Result
A-5	☐ Adds trains in a Metrolink corridor (more frequent service) ☒ Double-tracking provides opportunity for more frequent passenger train operations ☐ New main track for Riverside Line provides opportunity for substantial increase in Metrolink service frequency ☐ Would compete with Metrolink for passengers in corridor ☒ Crossover maneuvers, as well as use of Metrolink rails and station platform, could cause some interference with Metrolink operations	☐ Significant disruption ☐ Moderate disruption ☒ Little/no disruption ☐ Moderate enhancement ☐ Significant enhancement	
A-6	☐ Adds trains in a Metrolink corridor (more frequent service) ☐ Double-tracking San Bernardino Line provides opportunity for more frequent passenger train operations ☐ New main track for Riverside Line provides opportunity for substantial increase in Metrolink service frequency ☐ Would compete with Metrolink for passengers in corridor ☒ Crossover maneuvers, as well as use of Metrolink rails and station platform, could cause some interference with Metrolink operations	☐ Significant disruption ☐ Moderate disruption ☒ Little/no disruption ☐ Moderate enhancement ☐ Significant enhancement	
A-7	☐ Adds trains in a Metrolink corridor (more frequent service) ☐ Double-tracking San Bernardino Line provides opportunity for more frequent passenger train operations ☐ New main track for Riverside Line provides opportunity for substantial increase in Metrolink service frequency ☐ Would compete with Metrolink for passengers in corridor ☒ Crossover maneuvers, as well as use of Metrolink rails and station platform, could cause some interference with Metrolink operations	☐ Significant disruption ☐ Moderate disruption ☒ Little/no disruption ☐ Moderate enhancement ☐ Significant enhancement	
A-8	☐ Adds trains in a Metrolink corridor (more frequent service) ☐ Double-tracking San Bernardino Line provides opportunity for more frequent passenger train operations ☐ New main track for Riverside Line provides opportunity for substantial increase in Metrolink service frequency ☐ Would compete with Metrolink for passengers in corridor ☒ Crossover maneuvers, as well as use of Metrolink rails and station platform, could cause some interference with Metrolink operations	☐ Significant disruption ☐ Moderate disruption ☒ Little/no disruption ☐ Moderate enhancement ☐ Significant enhancement	

Table 8: Screening Criterion #7 -Impact on Metrolink Operations (continued)

Alternative	Description of Impacts	Summary Result	Overall Result
A-9	☐ Adds trains in a Metrolink corridor (more frequent service) ☐ Double-tracking San Bernardino Line provides opportunity for more frequent passenger train operations ☐ New main track for Riverside Line provides opportunity for substantial increase in Metrolink service frequency ☐ Would compete with Metrolink for passengers in corridor ☒ Crossover maneuvers, as well as use of Metrolink rails and station platform, could cause some interference with Metrolink operations	☐ Significant disruption ☐ Moderate disruption ☒ Little/no disruption ☐ Moderate enhancement ☐ Significant enhancement	
A-10	☐ Adds trains in a Metrolink corridor (more frequent service) ☐ Double-tracking San Bernardino Line provides opportunity for more frequent passenger train operations ☐ New main track for Riverside Line provides opportunity for substantial increase in Metrolink service frequency ☐ Would compete with Metrolink for passengers in corridor ☒ Crossover maneuvers, as well as use of Metrolink rails and station platform, could cause some interference with Metrolink operations	☐ Significant disruption ☐ Moderate disruption ☒ Little/no disruption ☐ Moderate enhancement ☐ Significant enhancement	
A-11	☐ Adds trains in a Metrolink corridor (more frequent service) ☐ Double-tracking San Bernardino Line provides opportunity for more frequent passenger train operations ☐ New main track for Riverside Line provides opportunity for substantial increase in Metrolink service frequency ☐ Would compete with Metrolink for passengers in corridor ☒ Crossover maneuvers, as well as use of Metrolink rails and station platform, could cause some interference with Metrolink operations	☐ Significant disruption ☐ Moderate disruption ☒ Little/no disruption ☐ Moderate enhancement ☐ Significant enhancement	
A-12	☐ Adds trains in a Metrolink corridor (more frequent service) ☐ Double-tracking San Bernardino Line provides opportunity for more frequent passenger train operations ☐ New main track for Riverside Line provides opportunity for substantial increase in Metrolink service frequency ☐ Would compete with Metrolink for passengers in corridor ☒ Crossover maneuvers, as well as use of Metrolink rails and station platform, could cause some interference with Metrolink operations	☐ Significant disruption ☐ Moderate disruption ☒ Little/no disruption ☐ Moderate enhancement ☐ Significant enhancement	

Table 9: Screening Criterion #7 -Impact on Metrolink Operations (continued)

Alternative	Description of Impacts	Summary Result	Overall Result
B-1	☐ Adds trains in a Metrolink corridor (more frequent service) ☐ Double-tracking San Bernardino Line provides opportunity for more frequent passenger train operations ☐ New main track for Riverside Line provides opportunity for substantial increase in Metrolink service frequency ☐ Would compete with Metrolink for passengers in corridor ☐ Crossover maneuvers, as well as use of Metrolink rails and station platform, could cause some interference with Metrolink operations	☐ Significant disruption ☐ Moderate disruption ☒ Little/no disruption ☐ Moderate enhancement ☐ Significant enhancement	
B-2	☐ Adds trains in a Metrolink corridor (more frequent service) ☐ Double-tracking San Bernardino Line provides opportunity for more frequent passenger train operations ☐ New main track for Riverside Line provides opportunity for substantial increase in Metrolink service frequency ☐ Would compete with Metrolink for passengers in corridor ☐ Crossover maneuvers, as well as use of Metrolink rails and station platform, could cause some interference with Metrolink operations	☐ Significant disruption ☐ Moderate disruption ☒ Little/no disruption ☐ Moderate enhancement ☐ Significant enhancement	
B-3	☐ Adds trains in a Metrolink corridor (more frequent service) ☐ Double-tracking San Bernardino Line provides opportunity for more frequent passenger train operations ☐ New main track for Riverside Line provides opportunity for substantial increase in Metrolink service frequency ☐ Would compete with Metrolink for passengers in corridor ☐ Crossover maneuvers, as well as use of Metrolink rails and station platform, could cause some interference with Metrolink operations	☐ Significant disruption ☐ Moderate disruption ☒ Little/no disruption ☐ Moderate enhancement ☐ Significant enhancement	
B-4	☐ Adds trains in a Metrolink corridor (more frequent service) ☐ Double-tracking San Bernardino Line provides opportunity for more frequent passenger train operations ☐ New main track for Riverside Line provides opportunity for substantial increase in Metrolink service frequency ☐ Would compete with Metrolink for passengers in corridor ☐ Crossover maneuvers, as well as use of Metrolink rails and station platform, could cause some interference with Metrolink operations	☐ Significant disruption ☐ Moderate disruption ☒ Little/no disruption ☐ Moderate enhancement ☐ Significant enhancement	

Table 8: Screening Criterion #7 -Impact on Metrolink Operations (continued)

Alternative	Description of Impacts	Summary Result	Overall Result
C-1	☒ Adds trains in a Metrolink corridor (more frequent service) ☒ Double-tracking San Bernardino Line provides opportunity for more frequent passenger train operations ☐ New main track for Riverside Line provides opportunity for substantial increase in Metrolink service frequency ☐ Would compete with Metrolink for passengers in corridor ☒ Crossover maneuvers, as well as use of Metrolink rails and station platform, could cause some interference with Metrolink operations	☐ Significant disruption ☐ Moderate disruption ☐ Little/no disruption ☒ Moderate enhancement ☐ Significant enhancement	●
C-2	☒ Adds trains in a Metrolink corridor (more frequent service) ☒ Double-tracking San Bernardino Line provides opportunity for more frequent passenger train operations ☐ New main track for Riverside Line provides opportunity for substantial increase in Metrolink service frequency ☐ Would compete with Metrolink for passengers in corridor ☒ Crossover maneuvers, as well as use of Metrolink rails and station platform, could cause some interference with Metrolink operations	☐ Significant disruption ☐ Moderate disruption ☐ Little/no disruption ☒ Moderate enhancement ☐ Significant enhancement	●
C-3	☒ Adds trains in a Metrolink corridor (more frequent service) ☒ Double-tracking San Bernardino Line provides opportunity for more frequent passenger train operations ☐ New main track for Riverside Line provides opportunity for substantial increase in Metrolink service frequency ☐ Would compete with Metrolink for passengers in corridor ☒ Crossover maneuvers, as well as use of Metrolink rails and station platform, could cause some interference with Metrolink operations	☐ Significant disruption ☐ Moderate disruption ☐ Little/no disruption ☒ Moderate enhancement ☐ Significant enhancement	●
C-4	☒ Adds trains in a Metrolink corridor (more frequent service) ☒ Double-tracking San Bernardino Line provides opportunity for more frequent passenger train operations ☐ New main track for Riverside Line provides opportunity for substantial increase in Metrolink service frequency ☐ Would compete with Metrolink for passengers in corridor ☒ Crossover maneuvers, as well as use of Metrolink rails and station platform, could cause some interference with Metrolink operations	☐ Significant disruption ☐ Moderate disruption ☐ Little/no disruption ☒ Moderate enhancement ☐ Significant enhancement	●

Table 8: Screening Criterion #7 -Impact on Metrolink Operations (continued)

Alternative	Description of Impacts	Summary Result	Overall Result
C-5	☒ Adds trains in a Metrolink corridor (more frequent service) ☒ Double-tracking San Bernardino Line provides opportunity for more frequent passenger train operations ☐ New main track for Riverside Line provides opportunity for substantial increase in Metrolink service frequency ☐ Would compete with Metrolink for passengers in corridor ☒ Crossover maneuvers, as well as use of Metrolink rails and station platform, could cause some interference with Metrolink operations	☐ Significant disruption ☐ Moderate disruption ☐ Little/no disruption ☒ Moderate enhancement ☐ Significant enhancement	●
C-6	☒ Adds trains in a Metrolink corridor (more frequent service) ☒ Double-tracking San Bernardino Line provides opportunity for more frequent passenger train operations ☐ New main track for Riverside Line provides opportunity for substantial increase in Metrolink service frequency ☐ Would compete with Metrolink for passengers in corridor ☒ Crossover maneuvers, as well as use of Metrolink rails and station platform, could cause some interference with Metrolink operations	☐ Significant disruption ☐ Moderate disruption ☐ Little/no disruption ☒ Moderate enhancement ☐ Significant enhancement	●
C-7	☒ Adds trains in a Metrolink corridor (more frequent service) ☒ Double-tracking San Bernardino Line provides opportunity for more frequent passenger train operations ☐ New main track for Riverside Line provides opportunity for substantial increase in Metrolink service frequency ☐ Would compete with Metrolink for passengers in corridor ☒ Crossover maneuvers, as well as use of Metrolink rails and station platform, could cause some interference with Metrolink operations	☐ Significant disruption ☐ Moderate disruption ☐ Little/no disruption ☒ Moderate enhancement ☐ Significant enhancement	●
C-8	☒ Adds trains in a Metrolink corridor (more frequent service) ☒ Double-tracking San Bernardino Line provides opportunity for more frequent passenger train operations ☐ New main track for Riverside Line provides opportunity for substantial increase in Metrolink service frequency ☐ Would compete with Metrolink for passengers in corridor ☒ Crossover maneuvers, as well as use of Metrolink rails and station platform, could cause some interference with Metrolink operations	☐ Significant disruption ☐ Moderate disruption ☐ Little/no disruption ☒ Moderate enhancement ☐ Significant enhancement	●

Table 8: Screening Criterion #7 -Impact on Metrolink Operations (continued)

Alternative	Description of Impacts	Summary Result	Overall Result
C-9	☒ Adds trains in a Metrolink corridor (more frequent service) ☒ Double-tracking San Bernardino Line provides opportunity for more frequent passenger train operations ☐ New main track for Riverside Line provides opportunity for substantial increase in Metrolink service frequency ☐ Would compete with Metrolink for passengers in corridor ☒ Crossover maneuvers, as well as use of Metrolink rails and station platform, could cause some interference with Metrolink operations	☐ Significant disruption ☐ Moderate disruption ☐ Little/no disruption ☒ Moderate enhancement ☐ Significant enhancement	●
C-10	☒ Adds trains in a Metrolink corridor (more frequent service) ☒ Double-tracking San Bernardino Line provides opportunity for more frequent passenger train operations ☐ New main track for Riverside Line provides opportunity for substantial increase in Metrolink service frequency ☐ Would compete with Metrolink for passengers in corridor ☒ Crossover maneuvers, as well as use of Metrolink rails and station platform, could cause some interference with Metrolink operations	☐ Significant disruption ☐ Moderate disruption ☐ Little/no disruption ☒ Moderate enhancement ☐ Significant enhancement	●
C-11	☒ Adds trains in a Metrolink corridor (more frequent service) ☒ Double-tracking San Bernardino Line provides opportunity for more frequent passenger train operations ☐ New main track for Riverside Line provides opportunity for substantial increase in Metrolink service frequency ☐ Would compete with Metrolink for passengers in corridor ☒ Crossover maneuvers, as well as use of Metrolink rails and station platform, could cause some interference with Metrolink operations	☐ Significant disruption ☐ Moderate disruption ☐ Little/no disruption ☒ Moderate enhancement ☐ Significant enhancement	●
C-12	☒ Adds trains in a Metrolink corridor (more frequent service) ☐ Double-tracking San Bernardino Line provides opportunity for more frequent passenger train operations ☒ New main track for Riverside Line provides opportunity for substantial increase in Metrolink service frequency ☐ Would compete with Metrolink for passengers in corridor ☒ Crossover maneuvers, as well as use of Metrolink rails and station platform, could cause some interference with Metrolink operations	☐ Significant disruption ☐ Moderate disruption ☐ Little/no disruption ☐ Moderate enhancement ☒ Significant enhancement	●

Table 8: Screening Criterion #7 -Impact on Metrolink Operations (continued)

Alternative	Description of Impacts	Summary Result	Overall Result
C-13	☒ Adds trains in a Metrolink corridor (more frequent service) ☐ Double-tracking San Bernardino Line provides opportunity for more frequent passenger train operations ☒ New main track for Riverside Line provides opportunity for substantial increase in Metrolink service frequency ☐ Would compete with Metrolink for passengers in corridor ☒ Crossover maneuvers, as well as use of Metrolink rails and station platform, could cause some interference with Metrolink operations	☐ Significant disruption ☐ Moderate disruption ☐ Little/no disruption ☐ Moderate enhancement ☒ Significant enhancement	●
D-1	☐ Adds trains in a Metrolink corridor (more frequent service) ☐ Double-tracking San Bernardino Line provides opportunity for more frequent passenger train operations ☐ New main track for Riverside Line provides opportunity for substantial increase in Metrolink service frequency ☒ Would compete with Metrolink for passengers in corridor ☐ Crossover maneuvers, as well as use of Metrolink rails and station platform, could cause some interference with Metrolink operations	☐ Significant disruption ☒ Moderate disruption ☐ Little/no disruption ☐ Moderate enhancement ☐ Significant enhancement	●
D-2	☐ Adds trains in a Metrolink corridor (more frequent service) ☐ Double-tracking San Bernardino Line provides opportunity for more frequent passenger train operations ☐ New main track for Riverside Line provides opportunity for substantial increase in Metrolink service frequency ☒ Would compete with Metrolink for passengers in corridor ☐ Crossover maneuvers, as well as use of Metrolink rails and station platform, could cause some interference with Metrolink operations	☐ Significant disruption ☒ Moderate disruption ☐ Little/no disruption ☐ Moderate enhancement ☐ Significant enhancement	●
D-3	☐ Adds trains in a Metrolink corridor (more frequent service) ☐ Double-tracking San Bernardino Line provides opportunity for more frequent passenger train operations ☐ New main track for Riverside Line provides opportunity for substantial increase in Metrolink service frequency ☒ Would compete with Metrolink for passengers in corridor ☐ Crossover maneuvers, as well as use of Metrolink rails and station platform, could cause some interference with Metrolink operations	☐ Significant disruption ☒ Moderate disruption ☐ Little/no disruption ☐ Moderate enhancement ☐ Significant enhancement	●

Table 9: Screening Criterion #8 - Potential for Serving Intermediate Activity Centers

Alternative	List of Activity Centers	Summary Result	Overall Results
A-1	☒ Route serves Meredith development site ☐ Route serves Ontario Center ☐ Route serves Ontario Mills ☐ Route serves Guasti Center ☒ Route serves multimodal transportation center site	☐ None ☐ Low ☒ Medium ☐ High ☐ Very High	
A-2	☒ Route serves Meredith development site ☐ Route serves Ontario Center ☐ Route serves Ontario Mills ☐ Route serves Guasti Center ☒ Route serves multimodal transportation center site	☐ None ☐ Low ☒ Medium ☐ High ☐ Very High	
A-3	☐ Route serves Meredith development site ☐ Route serves Ontario Center ☐ Route serves Ontario Mills ☒ Route serves Guasti Center ☐ Route serves multimodal transportation center site	☐ None ☒ Low ☐ Medium ☐ High ☐ Very High	
A-4	☒ Route serves Meredith development site ☐ Route serves Ontario Center ☐ Route serves Ontario Mills ☐ Route serves Guasti Center ☒ Route serves multimodal transportation center site	☐ None ☐ Low ☒ Medium ☐ High ☐ Very High	
A-5	☐ Route serves Meredith development site ☒ Route serves Ontario Center ☐ Route serves Ontario Mills ☐ Route serves Guasti Center ☐ Route serves multimodal transportation center site	☐ None ☒ Low ☐ Medium ☐ High ☐ Very High	
A-6	☒ Route serves Meredith development site ☐ Route serves Ontario Center ☐ Route serves Ontario Mills ☐ Route serves Guasti Center ☒ Route serves multimodal transportation center site	☐ None ☐ Low ☒ Medium ☐ High ☐ Very High	

Table 9: Screening Criterion #8 - Potential for Serving Intermediate Activity Centers (continued)

Alternative	List of Activity Centers	Summary Result	Overall Results
A-7	☒ Route serves Meredith development site ☐ Route serves Ontario Center ☐ Route serves Ontario Mills ☐ Route serves Guasti Center ☒ Route serves multimodal transportation center site	☐ None ☐ Low ☒ Medium ☐ High ☐ Very High	
A-8	☐ Route serves Meredith development site ☐ Route serves Ontario Center ☐ Route serves Ontario Mills ☒ Route serves Guasti Center ☐ Route serves multimodal transportation center site	☐ None ☒ Low ☐ Medium ☐ High ☐ Very High	
A-9	☒ Route serves Meredith development site ☐ Route serves Ontario Center ☐ Route serves Ontario Mills ☐ Route serves Guasti Center ☒ Route serves multimodal transportation center site	☐ None ☐ Low ☒ Medium ☐ High ☐ Very High	
A-10	☐ Route serves Meredith development site ☒ Route serves Ontario Center ☐ Route serves Ontario Mills ☐ Route serves Guasti Center ☐ Route serves multimodal transportation center site	☐ None ☒ Low ☐ Medium ☐ High ☐ Very High	
A-11	☐ Route serves Meredith development site ☐ Route serves Ontario Center ☐ Route serves Ontario Mills ☐ Route serves Guasti Center ☐ Route serves multimodal transportation center site	☒ None ☐ Low ☐ Medium ☐ High ☐ Very High	
A-12	☐ Route serves Meredith development site ☐ Route serves Ontario Center ☐ Route serves Ontario Mills ☐ Route serves Guasti Center ☐ Route serves multimodal transportation center site	☒ None ☐ Low ☐ Medium ☐ High ☐ Very High	

Table 9: Screening Criterion #8 - Potential for Serving Intermediate Activity Centers (continued)

Alternative	List of Activity Centers	Summary Result	Overall Results
B-1	☐ Route serves Meredith development site ☒ Route serves Ontario Center ☒ Route serves Ontario Mills ☐ Route serves Guasti Center ☐ Route serves multimodal transportation center site	☐ None ☐ Low ☒ Medium ☐ High ☐ Very High	
B-2	☐ Route serves Meredith development site ☒ Route serves Ontario Center ☒ Route serves Ontario Mills ☒ Route serves Guasti Center ☒ Route serves multimodal transportation center site	☐ None ☐ Low ☐ Medium ☐ High ☒ Very High	
B-3	☒ Route serves Meredith development site ☐ Route serves Ontario Center ☐ Route serves Ontario Mills ☒ Route serves Guasti Center ☒ Route serves multimodal transportation center site	☐ None ☐ Low ☐ Medium ☒ High ☐ Very High	
B-4	☐ Route serves Meredith development site ☐ Route serves Ontario Center ☐ Route serves Ontario Mills ☐ Route serves Guasti Center ☐ Route serves multimodal transportation center site	☒ None ☐ Low ☐ Medium ☐ High ☐ Very High	
C-1	☒ Route serves Meredith development site ☐ Route serves Ontario Center ☐ Route serves Ontario Mills ☐ Route serves Guasti Center ☒ Route serves multimodal transportation center site	☐ None ☐ Low ☒ Medium ☐ High ☐ Very High	
C-2	☒ Route serves Meredith development site ☐ Route serves Ontario Center ☐ Route serves Ontario Mills ☐ Route serves Guasti Center ☒ Route serves multimodal transportation center site	☐ None ☐ Low ☒ Medium ☐ High ☐ Very High	

Table 9: Screening Criterion #8 - Potential for Serving Intermediate Activity Centers (continued)

Alternative	List of Activity Centers	Summary Result	Overall Results
C-3	☐ Route serves Meredith development site ☐ Route serves Ontario Center ☐ Route serves Ontario Mills ☒ Route serves Guasti Center ☐ Route serves multimodal transportation center site	☐ None ☒ Low ☐ Medium ☐ High ☐ Very High	
C-4	☒ Route serves Meredith development site ☐ Route serves Ontario Center ☐ Route serves Ontario Mills ☐ Route serves Guasti Center ☒ Route serves multimodal transportation center site	☐ None ☐ Low ☒ Medium ☐ High ☐ Very High	
C-5	☐ Route serves Meredith development site ☒ Route serves Ontario Center ☐ Route serves Ontario Mills ☐ Route serves Guasti Center ☐ Route serves multimodal transportation center site	☐ None ☒ Low ☐ Medium ☐ High ☐ Very High	
C-6	☒ Route serves Meredith development site ☐ Route serves Ontario Center ☐ Route serves Ontario Mills ☐ Route serves Guasti Center ☒ Route serves multimodal transportation center site	☐ None ☐ Low ☒ Medium ☐ High ☐ Very High	
C-7	☒ Route serves Meredith development site ☐ Route serves Ontario Center ☐ Route serves Ontario Mills ☐ Route serves Guasti Center ☒ Route serves multimodal transportation center site	☐ None ☐ Low ☒ Medium ☐ High ☐ Very High	
C-8	☐ Route serves Meredith development site ☐ Route serves Ontario Center ☐ Route serves Ontario Mills ☒ Route serves Guasti Center ☐ Route serves multimodal transportation center site	☐ None ☒ Low ☐ Medium ☐ High ☐ Very High	

Table 9: Screening Criterion #8 - Potential for Serving Intermediate Activity Centers (continued)

Alternative	List of Activity Centers	Summary Result	Overall Results
C-9	☒ Route serves Meredith development site ☐ Route serves Ontario Center ☐ Route serves Ontario Mills ☐ Route serves Guasti Center ☒ Route serves multimodal transportation center site	☐ None ☐ Low ☒ Medium ☐ High ☐ Very High	
C-10	☐ Route serves Meredith development site ☒ Route serves Ontario Center ☐ Route serves Ontario Mills ☐ Route serves Guasti Center ☐ Route serves multimodal transportation center site	☐ None ☒ Low ☐ Medium ☐ High ☐ Very High	
C-11	☒ Route serves Meredith development site ☐ Route serves Ontario Center ☐ Route serves Ontario Mills ☐ Route serves Guasti Center ☒ Route serves multimodal transportation center site	☐ None ☐ Low ☒ Medium ☐ High ☐ Very High	
C-12	☐ Route serves Meredith development site ☐ Route serves Ontario Center ☐ Route serves Ontario Mills ☐ Route serves Guasti Center ☐ Route serves multimodal transportation center site	☒ None ☐ Low ☐ Medium ☐ High ☐ Very High	
C-13	☐ Route serves Meredith development site ☐ Route serves Ontario Center ☐ Route serves Ontario Mills ☐ Route serves Guasti Center ☐ Route serves multimodal transportation center site	☒ None ☐ Low ☐ Medium ☐ High ☐ Very High	
D-1	☒ Route serves Meredith development site ☐ Route serves Ontario Center ☐ Route serves Ontario Mills ☐ Route serves Guasti Center ☒ Route serves multimodal transportation center site	☐ None ☐ Low ☒ Medium ☐ High ☐ Very High	

Table 10: Screening Criterion #8 - Potential for Serving Intermediate Activity Centers (continued)

Alternative	List of Activity Centers	Summary Result	Overall Results
D-2	☒ Route serves Meredith development site ☐ Route serves Ontario Center ☐ Route serves Ontario Mills ☐ Route serves Guasti Center ☐ Route serves multimodal transportation center site	☐ None ☒ Low ☐ Medium ☐ High ☐ Very High	
D-3	☒ Route serves Meredith development site ☐ Route serves Ontario Center ☐ Route serves Ontario Mills ☐ Route serves Guasti Center ☒ Route serves multimodal transportation center site	☐ None ☐ Low ☒ Medium ☐ High ☐ Very High	

Table 10: Screening Criterion #9 - Potential Impact on Regional Transit

Alternative	Description of Potential Impacts	Summary Result	Overall Result
A-1	☐ Uses Alhambra Sub, possible conflict with HSR ☐ Uses Los Angeles Sub, possible conflict with HSR ☐ Uses San Gabriel Sub east of I-15, possible conflict with HSR ☒ Uses Cucamonga Creek – possible Gold Line enhancement ☐ New rail line would be part of Gold Line	☐ Competes/conflicts ☐ Possible conflict ☐ Little/no effect ☒ Possible enhancement ☐ Supports/enhances	●
A-2	☐ Uses Alhambra Sub, possible conflict with HSR ☐ Uses Los Angeles Sub, possible conflict with HSR ☐ Uses San Gabriel Sub east of I-15, possible conflict with HSR ☒ Uses Cucamonga Creek – possible Gold Line enhancement ☐ New rail line would be part of Gold Line	☐ Competes/conflicts ☐ Possible conflict ☐ Little/no effect ☒ Possible enhancement ☐ Supports/enhances	●
A-3	☐ Uses Alhambra Sub, possible conflict with HSR ☐ Uses Los Angeles Sub, possible conflict with HSR ☐ Uses San Gabriel Sub east of I-15, possible conflict with HSR ☐ Uses Cucamonga Creek – possible Gold Line enhancement ☐ New rail line would be part of Gold Line	☐ Competes/conflicts ☐ Possible conflict ☒ Little/no effect ☐ Possible enhancement ☐ Supports/enhances	●
A-4	☐ Uses Alhambra Sub, possible conflict with HSR ☐ Uses Los Angeles Sub, possible conflict with HSR ☐ Uses San Gabriel Sub east of I-15, possible conflict with HSR ☒ Uses Cucamonga Creek – possible Gold Line enhancement ☐ New rail line would be part of Gold Line	☐ Competes/conflicts ☐ Possible conflict ☐ Little/no effect ☒ Possible enhancement ☐ Supports/enhances	●
A-5	☐ Uses Alhambra Sub, possible conflict with HSR ☐ Uses Los Angeles Sub, possible conflict with HSR ☐ Uses San Gabriel Sub east of I-15, possible conflict with HSR ☐ Uses Cucamonga Creek – possible Gold Line enhancement ☐ New rail line would be part of Gold Line	☐ Competes/conflicts ☐ Possible conflict ☒ Little/no effect ☐ Possible enhancement ☐ Supports/enhances	●
A-6	☐ Uses Alhambra Sub, possible conflict with HSR ☐ Uses Los Angeles Sub, possible conflict with HSR ☐ Uses San Gabriel Sub east of I-15, possible conflict with HSR ☒ Uses Cucamonga Creek – possible Gold Line enhancement ☐ New rail line would be part of Gold Line	☐ Competes/conflicts ☐ Possible conflict ☐ Little/no effect ☒ Possible enhancement ☐ Supports/enhances	●

Table 10: Screening Criterion #9 - Potential Impact on Regional Transit (continued)

Alternative	Description of Potential Impacts	Summary Result	Overall Result
A-7	☐ Uses Alhambra Sub, possible conflict with HSR ☐ Uses Los Angeles Sub, possible conflict with HSR ☐ Uses San Gabriel Sub east of I-15, possible conflict with HSR ☒ Uses Cucamonga Creek – possible Gold Line enhancement ☐ New rail line would be part of Gold Line	☐ Competes/conflicts ☐ Possible conflict ☐ Little/no effect ☒ Possible enhancement ☐ Supports/enhances	
A-8	☐ Uses Alhambra Sub, possible conflict with HSR ☐ Uses Los Angeles Sub, possible conflict with HSR ☐ Uses San Gabriel Sub east of I-15, possible conflict with HSR ☐ Uses Cucamonga Creek – possible Gold Line enhancement ☐ New rail line would be part of Gold Line	☐ Competes/conflicts ☐ Possible conflict ☒ Little/no effect ☐ Possible enhancement ☐ Supports/enhances	
A-9	☐ Uses Alhambra Sub, possible conflict with HSR ☐ Uses Los Angeles Sub, possible conflict with HSR ☐ Uses San Gabriel Sub east of I-15, possible conflict with HSR ☒ Uses Cucamonga Creek – possible Gold Line enhancement ☐ New rail line would be part of Gold Line	☐ Competes/conflicts ☐ Possible conflict ☐ Little/no effect ☒ Possible enhancement ☐ Supports/enhances	
A-10	☐ Uses Alhambra Sub, possible conflict with HSR ☐ Uses Los Angeles Sub, possible conflict with HSR ☐ Uses San Gabriel Sub east of I-15, possible conflict with HSR ☐ Uses Cucamonga Creek – possible Gold Line enhancement ☐ New rail line would be part of Gold Line	☐ Competes/conflicts ☐ Possible conflict ☒ Little/no effect ☐ Possible enhancement ☐ Supports/enhances	
A-11	☐ Uses Alhambra Sub, possible conflict with HSR ☐ Uses Los Angeles Sub, possible conflict with HSR ☐ Uses San Gabriel Sub east of I-15, possible conflict with HSR ☐ Uses Cucamonga Creek – possible Gold Line enhancement ☐ New rail line would be part of Gold Line	☐ Competes/conflicts ☐ Possible conflict ☒ Little/no effect ☐ Possible enhancement ☐ Supports/enhances	
A-12	☐ Uses Alhambra Sub, possible conflict with HSR ☐ Uses Los Angeles Sub, possible conflict with HSR ☐ Uses San Gabriel Sub east of I-15, possible conflict with HSR ☐ Uses Cucamonga Creek – possible Gold Line enhancement ☐ New rail line would be part of Gold Line	☐ Competes/conflicts ☐ Possible conflict ☒ Little/no effect ☐ Possible enhancement ☐ Supports/enhances	

Table 10: Screening Criterion #9 - Potential Impact on Regional Transit (continued)

Alternative	Description of Potential Impacts	Summary Result	Overall Result
B-1	☐ Uses Alhambra Sub, possible conflict with HSR ☐ Uses Los Angeles Sub, possible conflict with HSR ☐ Uses San Gabriel Sub east of I-15, possible conflict with HSR ☐ Uses Cucamonga Creek – possible Gold Line enhancement ☐ New rail line would be part of Gold Line	☐ Competes/conflicts ☐ Possible conflict ☒ Little/no effect ☐ Possible enhancement ☐ Supports/enhances	
B-2	☐ Uses Alhambra Sub, possible conflict with HSR ☐ Uses Los Angeles Sub, possible conflict with HSR ☐ Uses San Gabriel Sub east of I-15, possible conflict with HSR ☐ Uses Cucamonga Creek – possible Gold Line enhancement ☐ New rail line would be part of Gold Line	☐ Competes/conflicts ☐ Possible conflict ☒ Little/no effect ☐ Possible enhancement ☐ Supports/enhances	
B-3	☐ Uses Alhambra Sub, possible conflict with HSR ☐ Uses Los Angeles Sub, possible conflict with HSR ☐ Uses San Gabriel Sub east of I-15, possible conflict with HSR ☐ Uses Cucamonga Creek – possible Gold Line enhancement ☐ New rail line would be part of Gold Line	☐ Competes/conflicts ☐ Possible conflict ☒ Little/no effect ☐ Possible enhancement ☐ Supports/enhances	
B-4	☐ Uses Alhambra Sub, possible conflict with HSR ☐ Uses Los Angeles Sub, possible conflict with HSR ☐ Uses San Gabriel Sub east of I-15, possible conflict with HSR ☐ Uses Cucamonga Creek – possible Gold Line enhancement ☐ New rail line would be part of Gold Line	☐ Competes/conflicts ☐ Possible conflict ☒ Little/no effect ☐ Possible enhancement ☐ Supports/enhances	
C-1	☐ Uses Alhambra Sub, possible conflict with HSR ☐ Uses Los Angeles Sub, possible conflict with HSR ☒ Uses San Gabriel Sub east of I-15, possible conflict with HSR ☐ Uses Cucamonga Creek – possible Gold Line enhancement ☐ New rail line would be part of Gold Line	☐ Competes/conflicts ☒ Possible conflict ☐ Little/no effect ☐ Possible enhancement ☐ Supports/enhances	
C-2	☐ Uses Alhambra Sub, possible conflict with HSR ☐ Uses Los Angeles Sub, possible conflict with HSR ☒ Uses San Gabriel Sub east of I-15, possible conflict with HSR ☐ Uses Cucamonga Creek – possible Gold Line enhancement ☐ New rail line would be part of Gold Line	☐ Competes/conflicts ☒ Possible conflict ☐ Little/no effect ☐ Possible enhancement ☐ Supports/enhances	

Table 10: Screening Criterion #9 - Potential Impact on Regional Transit (continued)

Alternative	Description of Potential Impacts	Summary Result	Overall Result
C-3	☐ Uses Alhambra Sub, possible conflict with HSR ☐ Uses Los Angeles Sub, possible conflict with HSR ☒ Uses San Gabriel Sub east of I-15, possible conflict with HSR ☐ Uses Cucamonga Creek – possible Gold Line enhancement ☐ New rail line would be part of Gold Line	☐ Competes/conflicts ☒ Possible conflict ☐ Little/no effect ☐ Possible enhancement ☐ Supports/enhances	●
C-4	☐ Uses Alhambra Sub, possible conflict with HSR ☐ Uses Los Angeles Sub, possible conflict with HSR ☒ Uses San Gabriel Sub east of I-15, possible conflict with HSR ☐ Uses Cucamonga Creek – possible Gold Line enhancement ☐ New rail line would be part of Gold Line	☐ Competes/conflicts ☒ Possible conflict ☐ Little/no effect ☐ Possible enhancement ☐ Supports/enhances	●
C-5	☐ Uses Alhambra Sub, possible conflict with HSR ☐ Uses Los Angeles Sub, possible conflict with HSR ☒ Uses San Gabriel Sub east of I-15, possible conflict with HSR ☐ Uses Cucamonga Creek – possible Gold Line enhancement ☐ New rail line would be part of Gold Line	☐ Competes/conflicts ☒ Possible conflict ☐ Little/no effect ☐ Possible enhancement ☐ Supports/enhances	●
C-6	☐ Uses Alhambra Sub, possible conflict with HSR ☐ Uses Los Angeles Sub, possible conflict with HSR ☒ Uses San Gabriel Sub east of I-15, possible conflict with HSR ☐ Uses Cucamonga Creek – possible Gold Line enhancement ☐ New rail line would be part of Gold Line	☐ Competes/conflicts ☒ Possible conflict ☐ Little/no effect ☐ Possible enhancement ☐ Supports/enhances	●
C-7	☐ Uses Alhambra Sub, possible conflict with HSR ☐ Uses Los Angeles Sub, possible conflict with HSR ☒ Uses San Gabriel Sub east of I-15, possible conflict with HSR ☐ Uses Cucamonga Creek – possible Gold Line enhancement ☐ New rail line would be part of Gold Line	☐ Competes/conflicts ☒ Possible conflict ☐ Little/no effect ☐ Possible enhancement ☐ Supports/enhances	●
C-8	☐ Uses Alhambra Sub, possible conflict with HSR ☐ Uses Los Angeles Sub, possible conflict with HSR ☒ Uses San Gabriel Sub east of I-15, possible conflict with HSR ☐ Uses Cucamonga Creek – possible Gold Line enhancement ☐ New rail line would be part of Gold Line	☐ Competes/conflicts ☒ Possible conflict ☐ Little/no effect ☐ Possible enhancement ☐ Supports/enhances	●

Table 10: Screening Criterion #9 - Potential Impact on Regional Transit (continued)

Alternative	Description of Potential Impacts	Summary Result	Overall Result
C-9	☐ Uses Alhambra Sub, possible conflict with HSR ☐ Uses Los Angeles Sub, possible conflict with HSR ☒ Uses San Gabriel Sub east of I-15, possible conflict with HSR ☐ Uses Cucamonga Creek – possible Gold Line enhancement ☐ New rail line would be part of Gold Line	☐ Competes/conflicts ☒ Possible conflict ☐ Little/no effect ☐ Possible enhancement ☐ Supports/enhances	
C-10	☐ Uses Alhambra Sub, possible conflict with HSR ☐ Uses Los Angeles Sub, possible conflict with HSR ☒ Uses San Gabriel Sub east of I-15, possible conflict with HSR ☐ Uses Cucamonga Creek – possible Gold Line enhancement ☐ New rail line would be part of Gold Line	☐ Competes/conflicts ☒ Possible conflict ☐ Little/no effect ☐ Possible enhancement ☐ Supports/enhances	
C-11	☐ Uses Alhambra Sub, possible conflict with HSR ☐ Uses Los Angeles Sub, possible conflict with HSR ☐ Uses San Gabriel Sub east of I-15, possible conflict with HSR ☐ Uses Cucamonga Creek – possible Gold Line enhancement ☐ New rail line would be part of Gold Line	☐ Competes/conflicts ☐ Possible conflict ☒ Little/no effect ☐ Possible enhancement ☐ Supports/enhances	
C-12	☒ Uses Alhambra Sub, possible conflict with HSR ☒ Uses Los Angeles Sub, possible conflict with HSR ☐ Uses San Gabriel Sub east of I-15, possible conflict with HSR ☐ Uses Cucamonga Creek – possible Gold Line enhancement ☐ New rail line would be part of Gold Line	☒ Competes/conflicts ☐ Possible conflict ☐ Little/no effect ☐ Possible enhancement ☐ Supports/enhances	
C-13	☒ Uses Alhambra Sub, possible conflict with HSR ☐ Uses Los Angeles Sub, possible conflict with HSR ☐ Uses San Gabriel Sub east of I-15, possible conflict with HSR ☐ Uses Cucamonga Creek – possible Gold Line enhancement ☐ New rail line would be part of Gold Line	☒ Competes/conflicts ☐ Possible conflict ☐ Little/no effect ☐ Possible enhancement ☐ Supports/enhances	
D-1	☐ Uses Alhambra Sub, possible conflict with HSR ☐ Uses Los Angeles Sub, possible conflict with HSR ☐ Uses San Gabriel Sub east of I-15, possible conflict with HSR ☐ Uses Cucamonga Creek – possible Gold Line enhancement ☒ New rail line would be part of Gold Line	☐ Competes/conflicts ☐ Possible conflict ☐ Little/no effect ☐ Possible enhancement ☒ Supports/enhances	

Table 10: Screening Criterion #9 - Potential Impact on Regional Transit (continued)

Alternative	Description of Potential Impacts	Summary Result	Overall Result
D-2	☐ Uses Alhambra Sub, possible conflict with HSR ☐ Uses Los Angeles Sub, possible conflict with HSR ☐ Uses San Gabriel Sub east of I-15, possible conflict with HSR ☐ Uses Cucamonga Creek – possible Gold Line enhancement ☒ New rail line would be part of Gold Line	☐ Competes/conflicts ☐ Possible conflict ☐ Little/no effect ☐ Possible enhancement ☒ Supports/enhances	●
D-3	☐ Uses Alhambra Sub, possible conflict with HSR ☐ Uses Los Angeles Sub, possible conflict with HSR ☐ Uses San Gabriel Sub east of I-15, possible conflict with HSR ☐ Uses Cucamonga Creek – possible Gold Line enhancement ☒ New rail line would be part of Gold Line	☐ Competes/conflicts ☐ Possible conflict ☐ Little/no effect ☐ Possible enhancement ☒ Supports/enhances	●

Appendix D
Metro Grade Crossing Policy for Light Rail Transit

Metro’s Grade Separation Policy and Evaluation Study

MTA Grade Crossing Policy
for
Light Rail Transit

Draft Revised Policy
November 18, 2003

Metropolitan
Transportation
Authority

PURPOSE

The Grade Crossing Policy is intended to provide a structured process for the evaluation of potential grade separations vs. at grade operation along light rail lines. The policy recognizes the operational and safety issues of at-grade versus grade-separated solutions as well as the institutional and monetary implications. It is recognized that local, state and federal government officials are involved in the process as well as the communities along the light rail line and therefore, no rigid MTA policy can dictate the ultimate solution. However, the purpose of the policy is to provide a process that addresses all of the principal concerns and clarifies the trade-offs involved in grade separation decisions. Furthermore, the policy is intended to minimize the up-front costs associated with consideration of grade separations as well as minimizing the likelihood of unanticipated consequences such as budgeting for an at-grade solution when a grade separation would ultimately be required.

This policy prescribes both the overall review process as well as the specific technical studies that would be accomplished within the review process. (Refer to the attached Appendix for a list of definitions of traffic engineering technical terms incorporated in the policy as well as the technical support for the policy.)

This Policy does not address conditions at existing crossings; although some of the analysis procedures and indicated treatments can be applied to existing crossings, the intention of the Policy is to develop assessments of conditions at proposed grade crossings before they are constructed.

GRADE CROSSING REVIEW PROCESS

Figure 1 illustrates the overall review process. The policy includes up to three sequential phases of review and three corresponding Milestones would take place before arriving at the "Final Decision" on a crossing:

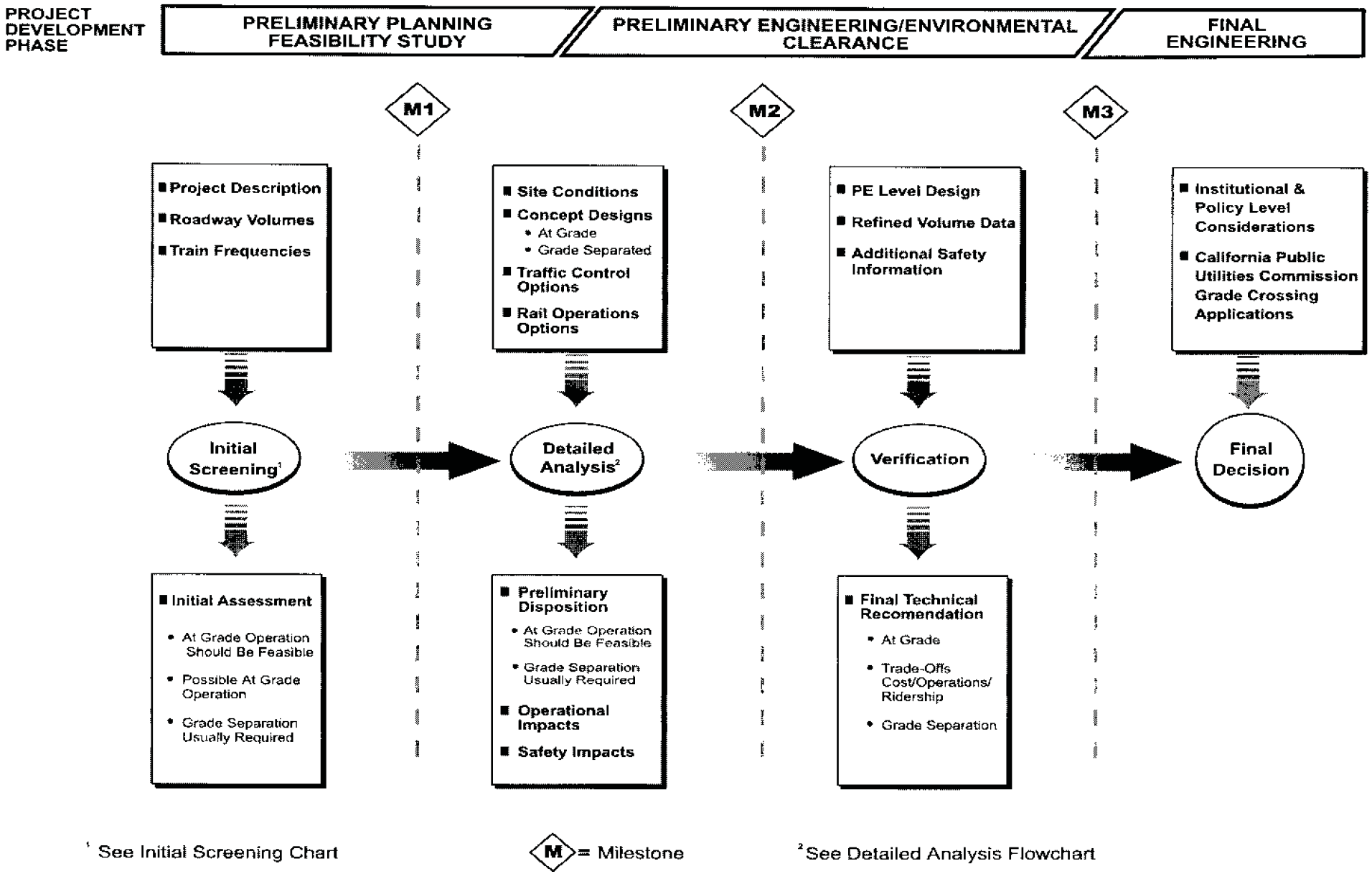
- Milestone 1 – Initial Screening – A preliminary, planning level assessment of the roadway crossings based upon readily-available, planning-level data for roadway volumes and train frequencies leading to an initial categorization of roadway crossings into three groups: "At Grade Should be Feasible", "Possible At Grade Operation", and "Grade Separation Usually Required".

- Milestone 2 – Detailed Analysis – A detailed operational evaluation taking into account peak period, movement-by-movement analysis of roadway traffic in conjunction with assessment of potential impacts to rail operations due to priority control. Provides more refined assessment of feasibility of at grade operation and also identifies operational trade-offs between roadway traffic conditions and rail operations. Also includes initial review of safety issues based upon site-specific evaluation of geometric conditions and observed and/or projected usage of the crossing. Results in a preliminary determination of locations that may be operated at grade versus grade-separated.

- Milestone 3 – Verification – This step includes the process of developing consensus regarding the proposed design solution with local constituencies including other involved agencies and the community as appropriate. This step may include preliminary engineering studies and cost estimates for alternative treatments. It may also include refinement of projected traffic volumes and validation of traffic and rail operations using simulation modeling. Finally, it may include additional effort on safety issues and countermeasures. At the conclusion of this milestone, it is expected that all technical studies will have been completed leading to a final recommendation by MTA for the crossing configuration.

As shown on the flowchart, Milestone 1 effort is usually accomplished during a preliminary planning feasibility study, Milestone 2 and 3 effort is usually accomplished during preliminary engineering and environmental clearance, and a final decision should be secured in conjunction with final engineering of the LRT Project.

Figure 1 – Light Rail Roadway Crossing Review Process



- Final Decision – Final disposition of the crossing configuration based upon all of the preceding technical analysis, engineering studies, and agency consensus building. The California Public Utilities Commission must approve of each grade crossing application under the provisions of General Order 75-C. Other third party agreements and requirements must be met.

The boxes across the top of Figure 1 shows the required inputs for each of the analysis phases and the boxes across the bottom of the chart indicate the information which is available following each step in the process.

The Policy presumes that the technical evaluations that are accomplished will be conducted in a cooperative fashion with involved jurisdictions including the local highway authority and the California Public Utilities Commission (CPUC). This cooperation would include obtaining available data regarding the proposed crossing locations, review of technical studies, and development of technical consensus regarding the issues and results.

In accordance with the degree of project development and the level of detail regarding the proposed LRT project, it is expected that the Initial Assessment (Milestone 1) would be prepared in conjunction with a Preliminary Planning Study or Conceptual Design Feasibility Study, and that the Detailed Analysis (Milestone 2) and Verification (Milestone 3) would be accomplished during the Preliminary Engineering (PE) / Environmental Clearance phase of project development.

In California, formal application under the provisions of General Order 75-C (for grade crossings in general) and in conformity to General Order 143-B (for light rail) needs to be approved prior to construction. This Policy presumes the formal CPUC process constitutes the "Final Decision", however, preliminary informal review of the proposed grade crossings with the CPUC staff should take place during Milestones 2 and 3 if not earlier. Obtaining a technical consensus with involved third parties during preliminary engineering is important so that a firm construction budget can be developed.

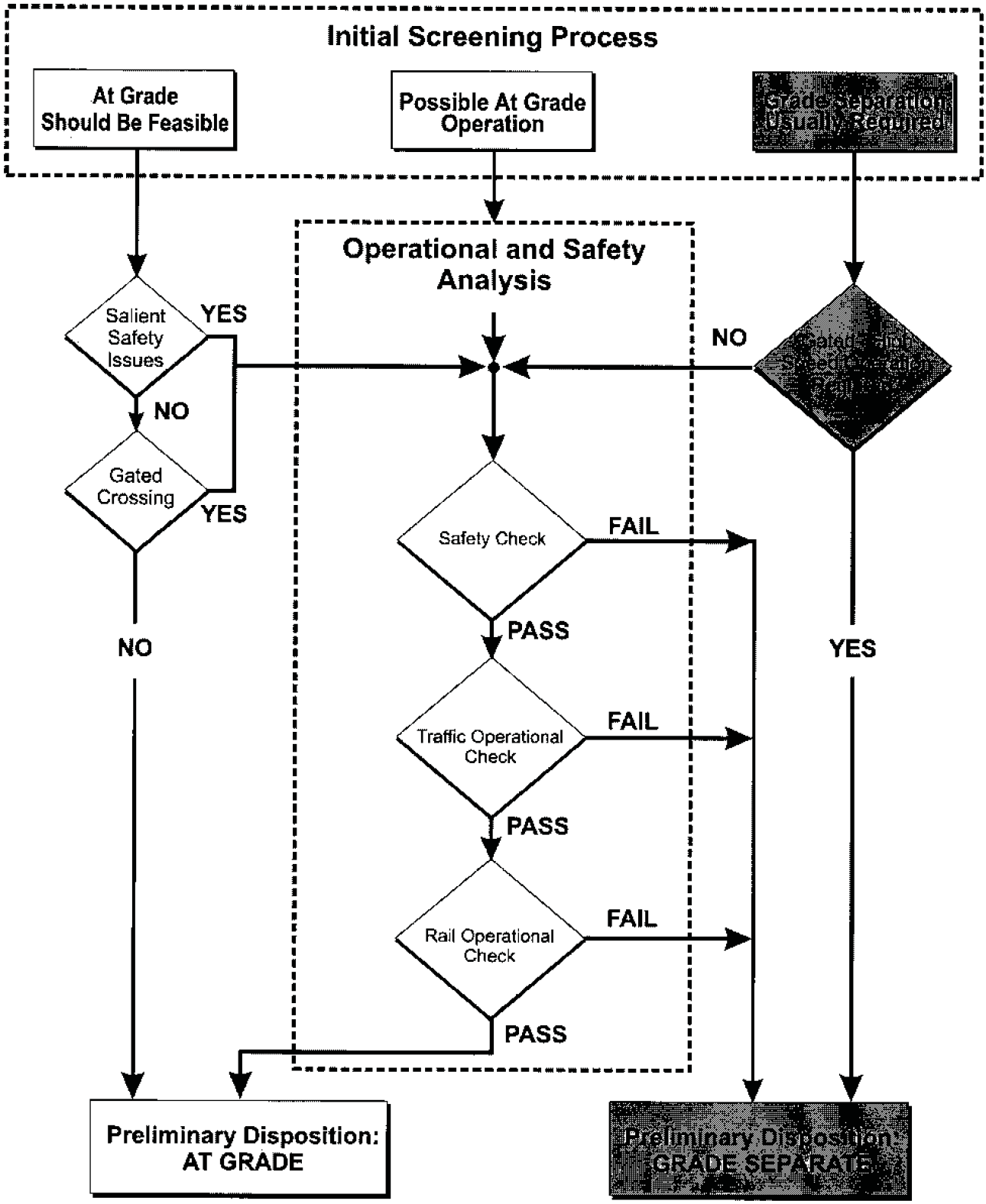
GRADE CROSSING REVIEW METHODOLOGY

Figure 2 provides a diagram that depicts the analysis process incorporated in the policy. As indicated at the top of the flowchart, the Initial Screening conducted as part of Milestone 1 will result in one of three outcomes. In many instances, the initial determinations for crossings screened as "At Grade Should Be Feasible" or "Grade Separation Usually Required" will be confirmed. However, for all crossings initially screened as "Possible At Grade Operation" as well as for certain conditions as depicted in the flowchart, and engineering study of operational and safety issues needs to be conducted as part of the detailed analysis leading up to Milestone 2, and the results of the engineering study may change the resulting outcome. Regardless of the analysis path selected, at the conclusion of the detailed analysis including engineering studies as required, the preliminary disposition of each crossing will be identified as either "At Grade" or "Grade Separate" at the conclusion of Milestone 2.

Specific analysis procedures for each milestone are further described in the text on the following pages.

(Refer to Appendix A for technical support for the methodology.)

Figure 2 – Evaluation Flowchart



MILESTONE 1 – INITIAL SCREENING

Input Data – Initial Screening:

The initial screening is based upon readily available planning-level information regarding the project description, roadway volumes and number of lanes, as well as train frequencies:

- Project Description Data – As a minimum, identifies all of the potential grade crossings or grade separations. (Conceptual designs are not needed for the Initial Screening.)

- Roadway Volumes and Number of Lanes – The Initial Screening is based upon the estimated peak hour per-lane volume of traffic crossing the alignment (highest directional volume). It is preferable to evaluate the year of opening volumes and the 20-year forecast volumes, if available. If these are not available, existing volume data factored to a future year may be used.

- Train Frequencies – The desired headways for train operation need to be identified. If operations planning has not been accomplished, train frequencies should be based upon comparable lines, or 6- minute headways (10 trains per hour each direction) can be assumed as a nominal frequency.

Methodology – Initial Screening:

Plot each roadway crossing on the Initial Screening Chart (Figure 3) to determine which of the three zones the crossing lies within. (Refer to the "Notes on Traffic Turning Data" in Appendix A for recommended handling of left-turn movements, if available.).

In the event a crossing lies very close to one of the two threshold lines, the crossing may be considered in the more restrictive category, since existing traffic counts are subject to day-to-day fluctuation and forecasts are estimates only.

Results – Initial Screening:

After the technical analysis has been completed, each crossing should be assigned to one of three categories:

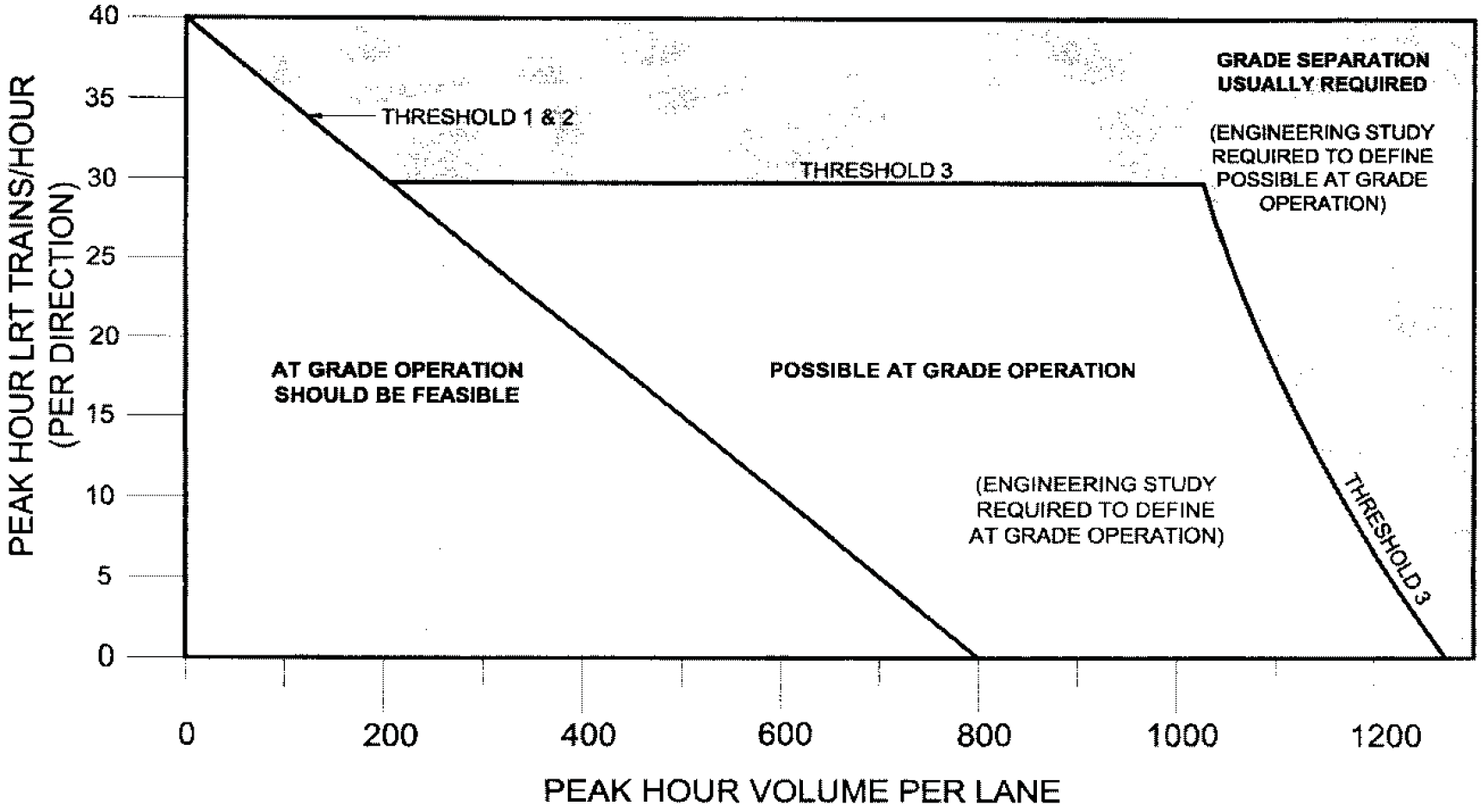
- At Grade Operation Should Be Feasible

- Possible At Grade Operation

- Grade Separation Usually Required

At this point in time MTA should share the results of the Initial Screening with third parties that may have comments on the data and results. Also, MTA should begin to identify and address other issues such as site-specific geometric issues, recurrent traffic queues, accident history, etc., that may indicate safety concerns over and above the traffic operational analysis.

Figure 3 – Nomograph for Initial Screening



NOTES:

- ROADWAY VOLUME IS PEAK HOUR, HIGHEST PER LANE FLOW RATE
- ADAPTED FROM INSTITUTE OF TRANSPORTATION ENGINEERS INFORMATIONAL REPORT, LIGHT RAIL TRANSIT GRADE SEPARATION GUIDELINES, 1992, THRESHOLD 1 AND THRESHOLD 2 COMBINED.

Appendix E
Capital Cost Estimates

Appendix E-1: Alternative A-3

Governments SANBAG Working Together

PROJECT COST ESTIMATE

Project Name: Ontario Airport Access Study - Alternative A3
Design Level: Concept Design (5%)
Last Updated: Jun-14

DESCRIPTION			UNITS	QUANTITY	UNIT COST	TOTAL COST	NOTES
DEMOLITION			LS	1	$370,000	$370,000	
TRACK CONSTRUCTION			T.F.	28,770	$350	$10,100,000	
TRACK CONSTRUCTION, WITHIN ROADWAY			T.F.	12,287	$575	$7,100,000	
TURNOUT INSTALLATION			EACH	1	$175,000	$175,000	
CROSSOVER INSTALLATION			EACH	2	$400,000	$800,000	
AT-GRADE CROSSING IMPROVEMENTS			LS	4	$1,000,000	$4,000,000	
SIGNALS			LS	1	$25,000,000	$25,000,000	
STATION (AT-GRADE)			EACH	1	$4,000,000	$4,000,000	
STATION (ELEVATED)			EACH	4	$30,000,000	$120,000,000	
SCRRA BRIDGE WIDENING			LS	2	$1,000,000	$2,000,000	
BRIDGE CONSTRUCTION			T.F.	0		$0	Not Applicable
CULVERT EXTENSION			LS	1	$100,000	$100,000	
ELEVATED TRACK STRUCTURE (SINGLE TRACK)			T.F.	0	$8,000	$0	Not Applicable
ELEVATED TRACK STRUCTURE (DOUBLE TRACK)			T.F.	12,351	$14,400	$177,900,000	
T-WALL INSTALLATION			AREA	6,816	$75	$600,000	
UTILITY RELOCATION			LS	1	$9,000,000	$9,000,000	
SUB-TOTAL: CONSTRUCTION COSTS						$361,145,000	
		%					
CONSTRUCTION CONTINGENCY	*DPM	15%				$54,171,750	
CIVIL DESIGN & DESIGN SUPPORT	*DPM	10%				$36,114,500	
S&C DESIGN AND DESIGN SUPPORT	*DPM	3%				$10,834,350	
PROJECT MANAGEMENT	*DPM	4%				$14,445,800	
CONSTRUCTION MANAGEMENT	*DPM	8%				$28,891,600	
FLAGGING	*DPM	6%				$21,668,700	
AGENCY COSTS	*DPM	8%				$28,891,600	
UTILITY//ELECTRICAL/LIGHTING CONTINGENCY				1	$10,000,000	$10,000,000	
MATERIAL PROCUREMENT LIST (From DPM -17)						$0	
RIGHT-OF-WAY ACQUISITION				1	$9,000,000	$9,000,000	
OTHERS (PERMITS, FEES, LEGAL)				1	$10,000	$10,000	
SUB-TOTAL: PROJECT RELATED OVERHEAD COSTS						$214,028,300	
		%					
PROJECT RESERVE/CONTINGENCY	DPM	20%				$115,034,660	
						$691,000,000	
LOW RANGE CALCULATION							
CONSTRUCTION COSTS						*$361,145,000*	
CONSTRUCTION CONTINGENCY		*20%*				*$72,229,000*	
SOFT COSTS (ON CONSTRUCTION PLUS CONSTRUCTION CONTINGENCY)		*30%*				*$130,012,200*	
UTILITY/ELECTRICAL/LIGHTING CONTINGENCY, RIGHT-OF-WAY, AND PERMITS/FEES/LEGAL						*$19,010,000*	
LOW RANGE TOTAL						***$582,396,200***	

*Design Procedures Manual (SCRRA)

Quantity Estimate

DESCRIPTION: Quantities - Alternative A3
PROJECT: Ontario Airport Access Study
HDR JOB No: 215728
PREPARED BY: Bob Ryan DATE: 4/29/2014
CHECKED BY: Mike Harrington DATE: 05/02/2014
FILE: TAB:

TRACK WORK QUANTITIES

Track Work Description	From Station	To Station	Quantity	Unit
Alignment A3-1				
Construct Track - 136 lb. Rail, Conc. Ties	0+00	77+83	7,783	T.F.
Remove and Salvage Turnout - No.11 LH			1	EA.
Construct Track - 136 lb. Rail, Conc. Ties	18+25	19+50	125	T.F.
Remove and Salvage Track (Spur)	19+50	20+75	125	T.F.
Construct Track - 136 lb. Rail, Conc. Ties, Street	74+50	77+83	333	T.F.
Install Turnout	77+83	79+43	1	EA.
Construct Track - 136 lb. Rail, Conc. Ties, Street	79+43	116+52	3,709	T.F.
Construct Track - 136 lb. Rail, Conc. Ties	116+52	243+51	12,699	T.F.
Construct Crossover	231+39		1	EA.
Construct Crossover	231+39	239+21	1	EA.
Alignment A3-2				
Construct Track - 136 lb. Rail, Conc. Ties, Street	1+60	84+05	8,245	T.F.
Construct Track - 136 lb. Rail, Conc. Ties	84+05	165+68	8,163	T.F.

Description	**Total**	**Unit**
Remove and Salvage Track (Spur)	125	T.F.
Remove and Salvage Turnout - No.11 LH	1	EA.
Construct Track - 136 lb. Rail, Conc. Ties	**28,770**	T.F.
Construct Track - 136 lb. Rail, Conc. Ties, Street	**12,287**	T.F.
Construct Crossover	**2**	EA.
Install Turnout	**1**	EA.

STRUCTURAL QUANTITIES

Structural Description	From Station	To Station	Quantity	Unit
Elevated Track Structure (Double Track)	120+00	243+51	12,351	T.F.
		Total	**12,351**	**T.F.**

Structural Description	Spanning	Station	Quantity	Unit
SCRRA Bridge Widening	Haven Avenue	45+25	1	EA.
SCRRA Bridge Widening	Deer Creek	66+50	1	EA.
		Total	**2**	**EA.**

Structural Description	Station	Quantity	Unit
T-Wall Construction	116+52	3,408	Area (ft^2)
T-Wall Construction	116+52	3,408	Area (ft^2)
	Total	**6,816**	**Area (ft^2)**

Structural Description	Station	Quantity	Unit
Culvert Extension	60+26	1	EA.
	Total	**1**	**EA.**

Structural Description	Station	Quantity	Unit
Station Platform (Elevated)	138+25	1	EA.
Station Platform (Elevated)	167+75	1	EA.
Station Platform (Elevated)	208+25	1	EA.
Station Platform (Elevated)	240+25	1	EA.
	Total	**4**	**EA.**

Structural Description	Station	Quantity	Unit
Station Platform (At-Grade)	0+00	1	EA.
	Total	**1**	**EA.**

AT-GRADE CROSSING IMPROVEMENTS

Description	Quantity	Unit
6th Street	1	EA.
5th Street	1	EA.
8th Street	1	EA.
Hermosa Avenue	1	EA.
Total	**4**	**EA.**

SIGNALS & COMMUNICATIONS QUANTITIES

Description	Cost	Unit
Train Control and Signals (Includes Wayside & PTC)	$15,000,000	L.S.
Communications	$9,000,000	L.S.
Central Control (Integrate into Metrolink Operations)	$1,000,000	L.S.
Total	**$25,000,000**	**L.S.**

UTILITY RELOCATION QUANTITIES

Description	Unit	Unit Cost	Quantity	Cost
8'x8' RCB on Hermosa Ave. - Storm Drain	L.F.	$338	9,600	$3,244,800
Minor Fiber Optic - Hermosa Ave.	L.S.	$1,000,000	1	$1,000,000
Sewer Line	L.F.	$200	8,940	$1,788,000
Water Line	L.F.	$173	5,100	$882,300
Major Fiber Optic	L.S.	$2,000,000	1	$2,000,000
			Total	**$9,000,000**

BUILDING DEMOLITION			
Description	Station	Cost	Unit
Single Family - Single Story Residential Building	70+50	$30,000	EA.
Single Family - Single Story Residential Building	70+50	$30,000	EA.
Single Family - Single Story Residential Building	70+50	$30,000	EA.
Single Family - Single Story Residential Building	72+25	$30,000	EA.
Commercial Building	73+50	$250,000	EA.
	Total	**$370,000**	**L.S.**

RIGHT-OF-WAY AQCUISITION			
Description	Area	Cost	Unit
Partial Parcel Acquisition - Land	7,100	$142,000	ft^2
Full Parcel Acquisition - Land	9,000	$180,000	ft^2
Full Parcel Acquisition - Residential	3,000	$645,000	ft^2
Easement	175,560	$3,600,000	ft^2
Aerial Easement	238,000	$2,380,000	ft^2
Residential Relocation	2,500	$625,000	L.S.
Business Relocation	1,800	$500,000	L.S.
	Total	**$9,000,000**	**L.S.**

Alternative A3: LRT option

Governments SANBAG Working Together

PROJECT COST ESTIMATE

Project Name: Ontario Airport Access Study - Alternative A3 - LRT
Design Level: Concept Design (5%)
Last Updated: May-14

DESCRIPTION			UNITS	QUANTITY	UNIT COST	TOTAL COST	NOTES
DEMOLITION			LS	1	$0	$0	Not Applicable
TRACK CONSTRUCTION			T.F.	28,597	$350	$10,100,000	
TRACK CONSTRUCTION, WITHIN ROADWAY			T.F.	12,672	$575	$7,300,000	
TURNOUT INSTALLATION			EACH	1	$175,000	$175,000	
CROSSOVER INSTALLATION			EACH	2	$400,000	$800,000	
AT-GRADE CROSSING IMPROVEMENTS			LS	4	$1,000,000	$4,000,000	
TRACTION POWER SUBSTATION			EACH	5	$2,000,000	$10,000,000	
OVERHEAD CATENARY SYSTEM (SINGLE TRACK)			T.F.	15600	$500	$7,800,000	
OVERHEAD CATENARY SYSTEM (DOUBLE TRACK)			T.F.	15850	$600	$9,510,000	
SIGNALS			LS	1	$25,000,000	$25,000,000	
STATION (AT-GRADE)			EACH	1	$4,000,000	$4,000,000	
STATION (ELEVATED)			EACH	4	$30,000,000	$120,000,000	
SCRRA BRIDGE WIDENING			LS	2	$1,000,000	$2,000,000	
BRIDGE CONSTRUCTION			T.F.	0		$0	Not Applicable
CULVERT EXTENSION			LS	1	$100,000	$100,000	
ELEVATED TRACK STRUCTURE (SINGLE TRACK)			T.F.	0	$8,000	$0	Not Applicable
ELEVATED TRACK STRUCTURE (DOUBLE TRACK)			T.F.	12,351	$14,400	$177,900,000	
T-WALL INSTALLATION			AREA	6,816	$75	$600,000	
UTILITY RELOCATION			LS	1	$9,000,000	$9,000,000	
SUB-TOTAL: CONSTRUCTION COSTS						$388,285,000	
		%					
CONSTRUCTION CONTINGENCY	*DPM	15%				$54,936,178	
CIVIL DESIGN & DESIGN SUPPORT	*DPM	10%				$36,624,119	
S&C DESIGN AND DESIGN SUPPORT	*DPM	3%				$10,987,236	
PROJECT MANAGEMENT	*DPM	4%				$14,649,647	
CONSTRUCTION MANAGEMENT	*DPM	8%				$29,299,295	
FLAGGING	*DPM	6%				$21,974,471	
AGENCY COSTS	*DPM	8%				$29,299,295	
UTILITY//ELECTRICAL/LIGHTING CONTINGENCY				1	10,000,000	$10,000,000	
MATERIAL PROCUREMENT LIST (From DPM -17)						$0	
RIGHT-OF-WAY ACQUISITION				1	$6,000,000	$6,000,000	
OTHERS (PERMITS, FEES, LEGAL)				1	$10,000	$10,000	
SUB-TOTAL: PROJECT RELATED OVERHEAD COSTS						$213,780,241	
		%					
PROJECT RESERVE/CONTINGENCY	DPM	20%				$113,902,286	
						$716,000,000	

*Design Procedures Manual (SCRRA)

Quantity Estimate

DESCRIPTION: Quantities - Alternative A3 - LRT
PROJECT: Ontario Airport Access Study
HDR JOB No: 215728
PREPARED BY: Bob Ryan DATE: 4/29/2014
CHECKED BY: Mike Harrington DATE: 05/02/2014
FILE: TAB:

TRACK WORK QUANTITIES

Track Work Description	From Station	To Station	Quantity	Unit
Alignment A3-1				
Construct Track - 136 lb. Rail, Conc. Ties	0+00	77+83	7,610	T.F.
Construct Track - 136 lb. Rail, Conc. Ties, Street			385	T.F.
Remove and Salvage Turnout - No.11 LH			1	EA.
Construct Track - 136 lb. Rail, Conc. Ties	18+25	19+50	125	T.F.
Remove and Salvage Track (Spur)	19+50	20+75	125	T.F.
Construct Track - 136 lb. Rail, Conc. Ties, Street	74+50	77+83	333	T.F.
Install Turnout	77+83	79+43	1	EA.
Construct Track - 136 lb. Rail, Conc. Ties, Street	79+43	116+52	3,709	T.F.
Construct Track - 136 lb. Rail, Conc. Ties	116+52	243+51	12,699	T.F.
Construct Crossover	231+39		1	EA.
Construct Crossover	231+39	239+21	1	EA.
Alignment A3-2				
Construct Track - 136 lb. Rail, Conc. Ties, Street	1+60	84+05	8,245	T.F.
Construct Track - 136 lb. Rail, Conc. Ties	84+05	165+68	8,163	T.F.
Description			**Total**	**Unit**
Remove and Salvage Track (Spur)			125	T.F.
Remove and Salvage Turnout - No.11 LH			1	EA.
Construct Track - 136 lb. Rail, Conc. Ties			**28,597**	T.F.
Construct Track - 136 lb. Rail, Conc. Ties, Street			**12,672**	T.F.
Construct Crossover			**2**	EA.
Install Turnout			**1**	EA.

STRUCTURAL QUANTITIES

Structural Description	From Station	To Station	Quantity	Unit
Elevated Track Structure (Double Track)	120+00	243+51	12,351	T.F.
		Total	**12,351**	**T.F.**

Structural Description	Spanning	Station	Quantity	Unit
SCRRA Bridge Widening	Haven Avenue	45+25	1	EA.
SCRRA Bridge Widening	Deer Creek	66+50	1	EA.
		Total	**2**	**EA.**

Structural Description	Station	Quantity	Unit
T-Wall Construction	116+52	3,408	Area (ft^2)
T-Wall Construction	116+52	3,408	Area (ft^2)
	Total	**6,816**	**Area (ft^2)**

Structural Description	Station	Quantity	Unit
Culvert Extension	60+26	1	EA.
	Total	**1**	**EA.**

Structural Description	Station	Quantity	Unit
Station Platform (Elevated)	138+25	1	EA.
Station Platform (Elevated)	167+75	1	EA.
Station Platform (Elevated)	208+25	1	EA.
Station Platform (Elevated)	240+25	1	EA.
	Total	**4**	**EA.**

Structural Description	Station	Quantity	Unit
Station Platform (At-Grade)	0+00	1	EA.
	Total	**1**	**EA.**

AT-GRADE CROSSING IMPROVEMENTS

Description	Quantity	Unit
6th Street	1	EA.
5th Street	1	EA.
8th Street	1	EA.
Hermosa Avenue	1	EA.
Total	**4**	**EA.**

SIGNALS & COMMUNICATIONS QUANTITIES

Description	Cost	Unit
Train Control and Signals (Includes Wayside & PTC)	$15,000,000	L.S.
Communications	$9,000,000	L.S.
Central Control (Integrate into Metrolink Operations)	$1,000,000	L.S.
Total	**$25,000,000**	**L.S.**

UTILITY RELOCATION QUANTITIES				
Description	Unit	Unit Cost	Quantity	Cost
8'x8' RCB on Hermosa Ave. - Storm Drain	L.F.	$338	9,600	$3,244,800
Minor Fiber Optic - Hermosa Ave.	L.S.	$1,000,000	1	$1,000,000
Sewer Line	L.F.	$200	8,940	$1,788,000
Water Line	L.F.	$173	5,100	$882,300
Major Fiber Optic	L.S.	$2,000,000	1	$2,000,000
			Total	**$9,000,000**

BUILDING DEMOLITION			
Description	Station	Cost	Unit
None			EA.
	Total	**$0**	**L.S.**

RIGHT-OF-WAY AQCUISITION			
Description	Area	Cost	Unit
Easement	175,560	$3,600,000	ft^2
Aerial Easement	238,000	$2,380,000	ft^2
	Total	**$6,000,000**	**L.S.**

Appendix E-2: Alternative A-4

Governments SANBAG Working Together

PROJECT COST ESTIMATE

Project Name: Ontario Airport Access Study - Alternative A4
Design Level: Concept Design (5%)
Last Updated: Jun-14

DESCRIPTION			UNITS	QUANTITY	UNIT COST	TOTAL COST	NOTES
DEMOLITION			LS	1	$1,050,000	$1,050,000	
TRACK CONSTRUCTION			T.F.	43,370	$350	$15,200,000	
TRACK CONSTRUCTION, WITHIN ROADWAY			T.F.	0	$575	$0	Not Applicable
TURNOUT INSTALLATION			EACH	2	$175,000	$350,000	
CROSSOVER INSTALLATION			EACH	3	$400,000	$1,200,000	
AT-GRADE CROSSING IMPROVEMENTS			LS	2	$1,000,000	$2,000,000	
SIGNALS			LS	1	$23,000,000	$23,000,000	
STATION (AT-GRADE)			EACH	1	$4,000,000	$4,000,000	
STATION (ELEVATED)			EACH	4	$30,000,000	$120,000,000	
SCRRA BRIDGE WIDENING			LS	1	$1,000,000	$1,000,000	
BRIDGE CONSTRUCTION			T.F.	423	$8,000	$3,400,000	
CULVERT EXTENSION			LS	1	$100,000	$100,000	
ELEVATED TRACK STRUCTURE (SINGLE TRACK)			T.F.	4,139	$8,000	$33,200,000	
ELEVATED TRACK STRUCTURE (DOUBLE TRACK)			T.F.	11,719	$14,400	$168,800,000	
T-WALL INSTALLATION			AREA	14,320	$75	$1,100,000	
UTILITY RELOCATION			LS	1	$300,000	$300,000	
SUB-TOTAL: CONSTRUCTION COSTS						$374,700,000	
		%					
CONSTRUCTION CONTINGENCY	*DPM	15%				$56,205,000	
CIVIL DESIGN & DESIGN SUPPORT	*DPM	10%				$37,470,000	
S&C DESIGN AND DESIGN SUPPORT	*DPM	3%				$11,241,000	
PROJECT MANAGEMENT	*DPM	4%				$14,988,000	
CONSTRUCTION MANAGEMENT	*DPM	8%				$29,976,000	
FLAGGING	*DPM	6%				$22,482,000	
AGENCY COSTS	*DPM	8%				$29,976,000	
UTILITY//ELECTRICAL/LIGHTING CONTINGENCY				1	10,000,000	$10,000,000	
MATERIAL PROCUREMENT LIST (From DPM -17)						$0	
RIGHT-OF-WAY ACQUISITION				1	$29,000,000	$29,000,000	
OTHERS (PERMITS, FEES, LEGAL)				1	$10,000	$10,000	
SUB-TOTAL: PROJECT RELATED OVERHEAD COSTS						$241,348,000	
		%					
PROJECT RESERVE/CONTINGENCY	DPM	20%				$123,209,600	
						$740,000,000	
LOW RANGE CALCULATION							
CONSTRUCTION COSTS						*$374,700,000*	
CONSTRUCTION CONTINGENCY		*20%*				*$74,940,000*	
SOFT COSTS (ON CONSTRUCTION PLUS CONSTRUCTION CONTINGENCY)		*30%*				*$134,892,000*	
UTILITY/ELECTRICAL/LIGHTING CONTINGENCY, RIGHT-OF-WAY, AND PERMITS/FEES/LEGAL						*$39,010,000*	
LOW RANGE TOTAL						***$623,542,000***	

*Design Procedures Manual (SCRRA)

Quantity Estimate

DESCRIPTION: Quantities - Alternative A4
PROJECT: Ontario Airport Access Study
HDR JOB No: 215728
PREPARED BY: Bob Ryan DATE: 4/29/2014
CHECKED BY: Mike Harrington DATE: 05/02/2014
FILE: TAB:

TRACK WORK QUANTITIES

Track Work Description	From Station	To Station	Quantity	Unit
Alignment A4-1				
Construct Track - 136 lb. Rail, Conc. Ties	0+00	70+73	7,073	T.F.
Construct Crossover		17+04	1	EA.
Install Turnout	18+04		1	EA.
Construct Track - 136 lb. Rail, Conc. Ties	18+25	19+50	125	T.F.
Remove and Salvage Track (Spur)	19+50	20+75	125	T.F.
Install Turnout	70+73	72+33	1	EA.
Construct Track - 136 lb. Rail, Conc. Ties	72+33	253+19	18,086	T.F.
Construct Crossover	241+07		1	EA.
Construct Crossover		248+89	1	EA.
Alignment A4-2				
Construct Track - 136 lb. Rail, Conc. Ties	72+33	253+19	18,086	T.F.

Description	**Total**	**Unit**
Remove and Salvage Track (Spur)	125	T.F.
Remove and Salvage Turnout - No.11 LH	0	EA.
Construct Track - 136 lb. Rail, Conc. Ties	**43,370**	T.F.
Construct Track - 136 lb. Rail, Conc. Ties, Street	**0**	T.F.
Construct Crossover	**3**	EA.
Install Turnout	**2**	EA.

STRUCTURAL QUANTITIES

Structural Description	From Station	To Station	Quantity	Unit
Overhead Track Structure (Double Track)	136+00	253+19	11,719	T.F.
		Total	**11,719**	**T.F.**

Structural Description	Spanning	Station	Quantity	Unit
SCRRA Bridge Widening	Haven Ave.	45+25	1	EA.
				EA.
		Total	**1**	**EA.**

Structural Description	Station	Quantity	Unit
T-Wall Construction	111+23	3,580	Area (ft^2)
T-Wall Construction	111+23	3,580	Area (ft^2)
T-Wall Construction	111+23	3,580	Area (ft^2)
T-Wall Construction	111+23	3,580	Area (ft^2)
Total		**14,320**	**Area (ft^2)**

Structural Description	Station	Quantity	Unit
Culvert Extension	60+26	1	EA.
Total		**1**	**EA.**

Structural Description	From Station	To Station	Quantity	Unit
Elevated Track Structure (Single Track)	115+31	136+00	2,069	T.F.
Elevated Track Structure (Single Track)	115+31	136+00	2,069	T.F.
Total			**4,139**	**T.F.**

Structural Description	From Station	To Station	Quantity	Unit
Single Track Bridge - Deer Creek	73+25	77+48	423	T.F.
Total			**423**	**T.F.**

Structural Description	Station	Quantity	Unit
Station Platform (Elevated)	174+75	1	EA.
Station Platform (Elevated)	217+75	1	EA.
Station Platform (Elevated)	249+75	1	EA.
Total		**3**	**EA.**

Structural Description	Station	Quantity	Unit
Station Platform (At-Grade)	0+00	1	EA.
Total		**1**	**EA.**

AT-GRADE CROSSING IMPROVEMENTS

Description	Quantity	Unit
8th Street	1	EA.
6th Street	1	EA.
Total	**2**	**EA.**

SIGNALS & COMMUNICATIONS QUANTITIES

Description	Cost	Unit
Train Control and Signals (Includes Wayside & PTC)	$15,000,000	L.S.
Communications	$7,000,000	L.S.
Central Control (Integrate into Metrolink Operations)	$1,000,000	L.S.
Total	**$23,000,000**	**L.S.**

UTILITY RELOCATION QUANTITIES

Description	Unit	Unit Cost	Quantity	Cost
Encasements	L.F.	$203	260	$52,780
Sewer Line	EA.	$200	850	$170,000
			Total	**$300,000**

BUILDING DEMOLITION

Description	Station	Cost	Unit
Industrial Building	64+25	$150,000	EA.
Industrial Building - Lab	65+75	$300,000	EA.
Industrial Building	67+25	$600,000	EA.
	Total	**$1,050,000**	**EA.**

RIGHT-OF-WAY AQCUISITION

Description		Area	Cost	Unit
Full Parcel Acquisition - Industrial		112,500	$11,250,000	ft^2
Easement		318,000	$6,360,000	ft^2
Aerial Easement		228,000	$2,280,000	ft^2
Business Relocation		12,500	$100,000	L.S.
Business Relocation		30,000	$4,000,000	L.S.
Business Relocation		68,000	$5,000,000	L.S.
		Total	**$28,990,000**	**L.S.**

Alternative A4: LRT option

Governments SANBAG Working Together

PROJECT COST ESTIMATE

Project Name: Ontario Airport Access Study - Alternative A4 - LRT
Design Level: Concept Design (5%)
Last Updated: May-14

DESCRIPTION			UNITS	QUANTITY	UNIT COST	TOTAL COST	NOTES
DEMOLITION			LS	1	$0	$0	Not Applicable
TRACK CONSTRUCTION			T.F.	43,584	$350	$15,300,000	
TRACK CONSTRUCTION, WITHIN ROADWAY			T.F.	0	$575	$0	Not Applicable
TURNOUT INSTALLATION			EACH	2	$175,000	$350,000	
CROSSOVER INSTALLATION			EACH	3	$400,000	$1,200,000	
AT-GRADE CROSSING IMPROVEMENTS			LS	2	$1,000,000	$2,000,000	
TRACTION POWER SUBSTATION			EACH	5	$2,000,000	$10,000,000	
OVERHEAD CATENARY SYSTEM (SINGLE TRACK)			T.F.	20150	$500	$10,075,000	
OVERHEAD CATENARY SYSTEM (DOUBLE TRACK)			T.F.	11720	$600	$7,032,000	
SIGNALS			LS	1	$23,000,000	$23,000,000	
STATION (AT-GRADE)			EACH	2	$4,000,000	$8,000,000	
STATION (ELEVATED)			EACH	3	$30,000,000	$90,000,000	
SCRRA BRIDGE WIDENING			LS	1	$1,000,000	$1,000,000	
BRIDGE CONSTRUCTION			T.F.	698	$8,000	$5,600,000	
CULVERT EXTENSION			LS	1	$100,000	$100,000	
ELEVATED TRACK STRUCTURE (SINGLE TRACK)			T.F.	1,333	$8,000	$10,700,000	
ELEVATED TRACK STRUCTURE (DOUBLE TRACK)			T.F.	6,189	$14,400	$89,200,000	
T-WALL INSTALLATION			AREA	55,540	$75	$4,200,000	
UTILITY RELOCATION			LS	1	$2,300,000	$2,300,000	
SUB-TOTAL: CONSTRUCTION COSTS						$280,057,000	
		%					
CONSTRUCTION CONTINGENCY	*DPM	15%				$54,936,178	
CIVIL DESIGN & DESIGN SUPPORT	*DPM	10%				$36,624,119	
S&C DESIGN AND DESIGN SUPPORT	*DPM	3%				$10,987,236	
PROJECT MANAGEMENT	*DPM	4%				$14,649,647	
CONSTRUCTION MANAGEMENT	*DPM	8%				$29,299,295	
FLAGGING	*DPM	6%				$21,974,471	
AGENCY COSTS	*DPM	8%				$29,299,295	
UTILITY//ELECTRICAL/LIGHTING CONTINGENCY				1	10,000,000	$10,000,000	
MATERIAL PROCUREMENT LIST (From DPM -17)						$0	
RIGHT-OF-WAY ACQUISITION				1	$11,900,000	$11,900,000	
OTHERS (PERMITS, FEES, LEGAL)				1	$10,000	$10,000	
SUB-TOTAL: PROJECT RELATED OVERHEAD COSTS						$219,680,241	
		%					
PROJECT RESERVE/CONTINGENCY	DPM	20%				$113,902,286	
INFLATION		Rate:			# Years:	$0	
						$614,000,000	

*Design Procedures Manual (SCRRA)

Quantity Estimate

DESCRIPTION: Quantities - Alternative A4 - LRT
PROJECT: Ontario Airport Access Study
HDR JOB No: 215728
PREPARED BY: Bob Ryan DATE: 4/29/2014
CHECKED BY: Mike Harrington DATE: 05/02/2014
FILE: TAB:

TRACK WORK QUANTITIES

Track Work Description	From Station	To Station	Quantity	Unit
Alignment A4-1				
Construct Track - 136 lb. Rail, Conc. Ties	0+00	70+73	7,073	T.F.
Construct Track - 136 lb. Rail, Conc. Ties			214	T.F.
Construct Crossover		17+04	1	EA.
Install Turnout	18+04		1	EA.
Construct Track - 136 lb. Rail, Conc. Ties	18+25	19+50	125	T.F.
Remove and Salvage Track (Spur)	19+50	20+75	125	T.F.
Install Turnout	70+73	72+33	1	EA.
Construct Track - 136 lb. Rail, Conc. Ties	72+33	253+19	18,086	T.F.
Construct Crossover	241+07		1	EA.
Construct Crossover		248+89	1	EA.
Alignment A4-2				
Construct Track - 136 lb. Rail, Conc. Ties	72+33	253+19	18,086	T.F.

Description	**Total**	**Unit**
Remove and Salvage Track (Spur)	125	T.F.
Remove and Salvage Turnout - No.11 LH	0	EA.
Construct Track - 136 lb. Rail, Conc. Ties	**43,584**	T.F.
Construct Track - 136 lb. Rail, Conc. Ties, Street	**0**	T.F.
Construct Crossover	**3**	EA.
Install Turnout	**2**	EA.

STRUCTURAL QUANTITIES

Structural Description	From Station	To Station	Quantity	Unit
Overhead Track Structure (Double Track)	145+02	150+14	512	T.F.
Overhead Track Structure (Double Track)	173+30	235+19	6,189	T.F.
		Total	**6,189**	**T.F.**

Structural Description	Spanning	Station	Quantity	Unit
SCRRA Bridge Widening	Haven Ave.	45+25	1	EA.
				EA.
		Total	**1**	**EA.**

Structural Description	Station	Quantity	Unit
T-Wall Construction	113+21	13,200	Area (ft^2)
T-Wall Construction	123+00	16,340	Area (ft^2)
T-Wall Construction	141+16	9,600	Area (ft^2)
T-Wall Construction	150+10	7,600	Area (ft^2)
T-Wall Construction	169+17	8,800	Area (ft^2)
	Total	**55,540**	**Area (ft^2)**

Structural Description	Station	Quantity	Unit
Culvert Extension	60+26	1	EA.
	Total	**1**	**EA.**

Structural Description	From Station	To Station	Quantity	Unit
Elevated Track Structure (Single Track)	116+31	122+97	666	T.F.
Elevated Track Structure (Single Track)	116+31	122+97	666	T.F.
		Total	**1,333**	**T.F.**

Structural Description	From Station	To Station	Quantity	Unit
Single Track Bridge - Deer Creek	73+25	77+48	423	T.F.
Single Track Bridge - Deer Creek	131+75	134+50	275	T.F.
		Total	**698**	**T.F.**

Structural Description	Station	Quantity	Unit
Station Platform (Elevated)	174+75	1	EA.
Station Platform (Elevated)	217+75	1	EA.
Station Platform (Elevated)	249+75	1	EA.
	Total	**3**	**EA.**

Structural Description	Station	Quantity	Unit
Station Platform (At-Grade)	0+00	1	EA.
	Total	**1**	**EA.**

AT-GRADE CROSSING IMPROVEMENTS

Description	Quantity	Unit
8th Street	1	EA.
6th Street	1	EA.
Total	**2**	**EA.**

SIGNALS & COMMUNICATIONS QUANTITIES		
Description	Cost	Unit
Train Control and Signals (Includes Wayside & PTC)	$15,000,000	L.S.
Communications	$7,000,000	L.S.
Central Control (Integrate into Metrolink Operations)	$1,000,000	L.S.
Total	**$23,000,000**	**L.S.**

UTILITY RELOCATION QUANTITIES				
Description	Unit	Unit Cost	Quantity	Cost
Encasements	L.F.	$203	260	$52,780
Sewer Line	EA.	$200	850	$170,000
Major Fiber Optic	L.S.	$2,000,000	1	$2,000,000
			Total	**$2,300,000**

BUILDING DEMOLITION			
Description	Station	Cost	Unit
None			EA.
	Total	**$0**	**EA.**

RIGHT-OF-WAY AQCUISITION			
Description	Area	Cost	Unit
Easement	500,000	$10,000,000	ft^2
Aerial Easement	185,600	$1,856,000	ft^2
	Total	**$11,856,000**	**L.S.**

Appendix E-3: Alternative A-7

Governments SANBAG Working Together

PROJECT COST ESTIMATE

Project Name: Ontario Airport Access Study - Alternative A7
Design Level: Concept Design (5%)
Last Updated: Jun-14

DESCRIPTION			UNITS	QUANTITY	UNIT COST	TOTAL COST	NOTES
DEMOLITION			LS	0	$0	$0	Not Applicable
TRACK CONSTRUCTION			T.F.	51,702	$350	$18,100,000	
TRACK CONSTRUCTION, WITHIN ROADWAY			T.F.	0	$575	$0	Not Applicable
TURNOUT INSTALLATION			EACH	4	$175,000	$700,000	
CROSSOVER INSTALLATION			EACH	5	$400,000	$2,000,000	
AT-GRADE CROSSING IMPROVEMENTS			LS	5	$1,000,000	$5,000,000	
SIGNALS			LS	1	$31,000,000	$31,000,000	
STATION (AT-GRADE)			EACH	1	$4,000,000	$4,000,000	
STATION (ELEVATED)			EACH	4	$30,000,000	$120,000,000	
SCRRA BRIDGE WIDENING			LS	2	$2,500,000	$5,000,000	
BRIDGE CONSTRUCTION			T.F.	420	$10,000	$4,300,000	
CULVERT EXTENSION			LS	1	$100,000	$100,000	
ELEVATED TRACK STRUCTURE (SINGLE TRACK)			T.F.		$8,000	$0	Not Applicable
ELEVATED TRACK STRUCTURE (DOUBLE TRACK)			T.F.	9,417	$14,400	$135,700,000	
T-WALL INSTALLATION			AREA	65,196	$75	$4,900,000	
UTILITY RELOCATION			LS	1	$1,300,000	$1,300,000	
GRADE SEPARATION			LS	1	$35,000,000	$35,000,000	
SUB-TOTAL: CONSTRUCTION COSTS						$367,100,000	
		%					
CONSTRUCTION CONTINGENCY	*DPM	15%				$55,065,000	
CIVIL DESIGN & DESIGN SUPPORT	*DPM	10%				$36,710,000	
S&C DESIGN AND DESIGN SUPPORT	*DPM	3%				$11,013,000	
PROJECT MANAGEMENT	*DPM	4%				$14,684,000	
CONSTRUCTION MANAGEMENT	*DPM	8%				$29,368,000	
FLAGGING	*DPM	6%				$22,026,000	
AGENCY COSTS	*DPM	8%				$29,368,000	
UTILITY//ELECTRICAL/LIGHTING CONTINGENCY				1	10,000,000	$10,000,000	
MATERIAL PROCUREMENT LIST (From DPM -17)						$0	
RIGHT-OF-WAY ACQUISITION				1	$7,000,000	$7,000,000	
OTHERS (PERMITS, FEES, LEGAL)				1	$10,000	$10,000	
SUB-TOTAL: PROJECT RELATED OVERHEAD COSTS						$215,244,000	
		%					
PROJECT RESERVE/CONTINGENCY	DPM	20%				$116,468,800	
						$699,000,000	
LOW RANGE CALCULATION							
CONSTRUCTION COSTS						*$367,100,000*	
CONSTRUCTION CONTINGENCY		*20%*				*$73,420,000*	
SOFT COSTS (ON CONSTRUCTION PLUS CONSTRUCTION CONTINGENCY)		*30%*				*$132,156,000*	
UTILITY/ELECTRICAL/LIGHTING CONTINGENCY, RIGHT-OF-WAY, AND PERMITS/FEES/LEGAL						*$17,010,000*	
LOW RANGE TOTAL						***$589,686,000***	

*Design Procedures Manual (SCRRA)

Quantity Estimate

DESCRIPTION: Quantities - Alternative A7
PROJECT: Ontario Airport Access Study
HDR JOB No: 215728
PREPARED BY: Bob Ryan DATE: 4/29/2014
CHECKED BY: Mike Harrington DATE: 05/02/2014
FILE: TAB:

TRACK WORK QUANTITIES

Track Work Description	From Station	To Station	Quantity	Unit
Alignment A7-1				
Construct Track - 136 lb. Rail, Conc. Ties	0+00	170+40	17,040	T.F.
Construct Crossover	6+67	10+83	1	EA.
Construct Crossover	167+90	172+48	1	EA.
Construct Track - 136 lb. Rail, Conc. Ties	172+48	185+67	1,319	T.F.
Install Turnout	185+67	186+37	1	EA.
Construct Track - 136 lb. Rail, Conc. Ties			350	T.F.
Construct Track - 136 lb. Rail, Conc. Ties	186+37	188+04	167	T.F.
Install Turnout	188+04	189+64	1	EA.
Construct Track - 136 lb. Rail, Conc. Ties	189+64	211+96	2,232	T.F.
Construct Crossover	211+96	213+56	1	EA.
Construct Track - 136 lb. Rail, Conc. Ties	213+56	356+17	14,261	T.F.
Construct Crossover	342+54		1	EA.
Construct Crossover		350+36	1	EA.
Alignment A7-2				
Construct Track - 136 lb. Rail, Conc. Ties	189+64	212+50	2,286	T.F.
Install Turnout	216+55		1	EA.
Install Turnout			1	EA.
Construct Track - 136 lb. Rail, Conc. Ties	214+10	216+55	245	T.F.
Construct Track - 136 lb. Rail, Conc. Ties	218+15	356+17	13,802	T.F.
Description			**Total**	**Unit**
Remove and Salvage Track (Spur)			0	T.F.
Remove and Salvage Turnout - No.11 LH			0	EA.
Construct Track - 136 lb. Rail, Conc. Ties			**51,702**	T.F.
Construct Track - 136 lb. Rail, Conc. Ties, Street			**0**	T.F.
Construct Crossover			**5**	EA.
Install Turnout			**4**	EA.

STRUCTURAL QUANTITIES

Structural Description	From Station	To Station	Quantity	Unit
Elevated Track Structure (Double Track)	243+90	253+89	1,000	T.F.
Elevated Track Structure (Double Track)	272+00	356+17	8,417	T.F.
		Total	**9,417**	**T.F.**

Structural Description	Spanning	Station	Quantity	Unit
SCRRA Bridge Widening		39+21	1	EA.
SCRRA Bridge Widening		138+05	1	EA.
		Total	**2**	**EA.**

Structural Description	From Station	To Station	Quantity	Unit
Bridge Construction	72+55	73+25	70	T.F.
Bridge Construction	105+08	106+10	102	T.F.
Bridge Construction	118+60	120+25	165	T.F.
Bridge Construction	236+90	238+17	128	T.F.
Bridge Construction	236+90	238+17	128	T.F.
		Total	**420**	**T.F.**

Structural Description	Station	Quantity	Unit
T-Wall Construction	238+17	1,543	Area (ft^2)
T-Wall Construction	238+17	1,543	Area (ft^2)
T-Wall Construction	239+72	5,708	Area (ft^2)
T-Wall Construction	239+72	5,708	Area (ft^2)
T-Wall Construction	253+89	25,347	Area (ft^2)
T-Wall Construction	253+89	25,347	Area (ft^2)
	Total	**65,196**	**Area (ft^2)**

Structural Description	Station	Quantity	Unit
Culvert Extension	153+25	1	EA.
	Total	**1**	**EA.**

Structural Description	Station	Quantity	Unit
Station Platform (Elevated)	275+85	1	EA.
Station Platform (Elevated)	301+65	1	EA.
Station Platform (Elevated)	319+25	1	EA.
Station Platform (Elevated)	351+30	1	EA.
	Total	**4**	**EA.**

Structural Description	Station	Quantity	Unit
Station Platform (At-Grade)	0+00	1	EA.
	Total	**1**	**EA.**

AT-GRADE CROSSING IMPROVEMENTS

Description		Quantity	Unit
Campus Avenue		1	EA.
Grove Avenue		1	EA.
Baker Avenue		1	EA.
Vineyard Avenue		1	EA.
Hellman Avenue		1	EA.
			EA.
	Total	**5**	**EA.**

SIGNALS & COMMUNICATIONS QUANTITIES		
Description	Cost	Unit
Train Control and Signals (Includes Wayside & PTC)	$21,000,000	L.S.
Communications	$9,000,000	L.S.
Central Control (Integrate into Metrolink Operations)	$1,000,000	L.S.
Total	**$31,000,000**	**L.S.**

UTILITY RELOCATION QUANTITIES				
Description	Unit	Unit Cost	Quantity	Cost
Encasement	L.F.	$203	420	$85,260
Minor Fiber Optic	L.S.	$1,000,000	1	$1,000,000
Sewer Line	L.F.	$200	850	$170,000
			Total	**$1,300,000**

BUILDING DEMOLITION			
Description	Station	Cost	Unit
None			EA.
	Total	**$0**	**EA.**

RIGHT-OF-WAY AQCUISITION			
Description	Area	Cost	Unit
Partial Parcel Acquisition - Industrial	117,725	$2,354,500	ft^2
Aerial Easement	426,000	$4,260,000	ft^2
	Total	**$6,614,500**	**L.S.**

GRADE SEPARATION		
Description	Unit	Cost
4th Street Grade Separation	1	$35,000,000
	Total	**$35,000,000**

Alternative A7: LRT option

Governments SANBAG Working Together

PROJECT COST ESTIMATE

Project Name: Ontario Airport Access Study - Alternative A7 - LRT
Design Level: Concept Design (5%)
Last Updated: May-14

DESCRIPTION			UNITS	QUANTITY	UNIT COST	TOTAL COST	NOTES
DEMOLITION			LS	0	$0	$0	Not Applicable
TRACK CONSTRUCTION			T.F.	51,702	$350	$18,100,000	
TRACK CONSTRUCTION, WITHIN ROADWAY			T.F.	0	$575	$0	Not Applicable
TURNOUT INSTALLATION			EACH	4	$175,000	$700,000	
CROSSOVER INSTALLATION			EACH	5	$400,000	$2,000,000	
AT-GRADE CROSSING IMPROVEMENTS			LS	5	$1,000,000	$5,000,000	
TRACTION POWER SUBSTATION			EACH	7	$2,000,000	$14,000,000	
OVERHEAD CATENARY SYSTEM (SINGLE TRACK)			T.F.	18800	$500	$9,400,000	
OVERHEAD CATENARY SYSTEM (DOUBLE TRACK)			T.F.	16820	$600	$10,092,000	
SIGNALS			LS	1	$31,000,000	$31,000,000	
STATION (AT-GRADE)			EACH	1	$4,000,000	$4,000,000	
STATION (ELEVATED)			EACH	4	$30,000,000	$120,000,000	
SCRRA BRIDGE WIDENING			LS	2	$2,500,000	$5,000,000	
BRIDGE CONSTRUCTION			T.F.	420	$10,000	$4,300,000	
CULVERT EXTENSION			LS	1	$100,000	$100,000	
ELEVATED TRACK STRUCTURE (SINGLE TRACK)			T.F.		$8,000	$0	Not Applicable
ELEVATED TRACK STRUCTURE (DOUBLE TRACK)			T.F.	8,552	$14,400	$123,200,000	
T-WALL INSTALLATION			AREA	22,000	$75	$1,700,000	
UTILITY RELOCATION			LS	1	$1,300,000	$1,300,000	
GRADE SEPARATION			LS	1	$35,000,000	$35,000,000	
SUB-TOTAL: CONSTRUCTION COSTS						$384,892,000	
		%					
CONSTRUCTION CONTINGENCY	*DPM	15%				$54,936,178	
CIVIL DESIGN & DESIGN SUPPORT	*DPM	10%				$36,624,119	
S&C DESIGN AND DESIGN SUPPORT	*DPM	3%				$10,987,236	
PROJECT MANAGEMENT	*DPM	4%				$14,649,647	
CONSTRUCTION MANAGEMENT	*DPM	8%				$29,299,295	
FLAGGING	*DPM	6%				$21,974,471	
AGENCY COSTS	*DPM	8%				$29,299,295	
UTILITY//ELECTRICAL/LIGHTING CONTINGENCY				1	10,000,000	$10,000,000	
MATERIAL PROCUREMENT LIST (From DPM -17)						$0	
RIGHT-OF-WAY ACQUISITION				1	$7,000,000	$7,000,000	
OTHERS (PERMITS, FEES, LEGAL)				1	$10,000	$10,000	
SUB-TOTAL: PROJECT RELATED OVERHEAD COSTS						$214,780,241	
		%					
PROJECT RESERVE/CONTINGENCY	DPM	20%				$113,902,286	
						$714,000,000	

*Design Procedures Manual (SCRRA)

Quantity Estimate

DESCRIPTION: Quantities - Alternative A7 - LRT
PROJECT: Ontario Airport Access Study
HDR JOB No: 215728
PREPARED BY: Bob Ryan DATE: 4/29/2014
CHECKED BY: Mike Harrington DATE: 05/02/2014
FILE: TAB:

TRACK WORK QUANTITIES

Track Work Description	From Station	To Station	Quantity	Unit
Alignment A7-1				
Construct Track - 136 lb. Rail, Conc. Ties	0+00	170+40	17,040	T.F.
Construct Crossover	6+67	10+83	1	EA.
Construct Crossover	167+90	172+48	1	EA.
Construct Track - 136 lb. Rail, Conc. Ties	172+48	185+67	1,319	T.F.
Install Turnout	185+67	186+37	1	EA.
Construct Track - 136 lb. Rail, Conc. Ties			350	T.F.
Construct Track - 136 lb. Rail, Conc. Ties	186+37	188+04	167	T.F.
Install Turnout	188+04	189+64	1	EA.
Construct Track - 136 lb. Rail, Conc. Ties	189+64	211+96	2,232	T.F.
Construct Crossover	211+96	213+56	1	EA.
Construct Track - 136 lb. Rail, Conc. Ties	213+56	356+17	14,261	T.F.
Construct Crossover	342+54		1	EA.
Construct Crossover		350+36	1	EA.
Alignment A7-2				
Construct Track - 136 lb. Rail, Conc. Ties	189+64	212+50	2,286	T.F.
Install Turnout	216+55		1	EA.
Install Turnout			1	EA.
Construct Track - 136 lb. Rail, Conc. Ties	214+10	216+55	245	T.F.
Construct Track - 136 lb. Rail, Conc. Ties	218+15	356+17	13,802	T.F.
Description			**Total**	**Unit**
Remove and Salvage Track (Spur)			0	T.F.
Remove and Salvage Turnout - No.11 LH			0	EA.
Construct Track - 136 lb. Rail, Conc. Ties			**51,702**	T.F.
Construct Track - 136 lb. Rail, Conc. Ties, Street			**0**	T.F.
Construct Crossover			**5**	EA.
Install Turnout			**4**	EA.

STRUCTURAL QUANTITIES

Structural Description	From Station	To Station	Quantity	Unit
Elevated Track Structure (Double Track)	245+80	250+84	504	T.F.
Elevated Track Structure (Double Track)	275+69	356+17	8,048	T.F.
		Total	**8,552**	**T.F.**

Structural Description	Spanning	Station	Quantity	Unit
SCRRA Bridge Widening		39+21	1	EA.
SCRRA Bridge Widening		138+05	1	EA.
		Total	**2**	**EA.**

Structural Description	From Station	To Station	Quantity	Unit
Bridge Construction	72+55	73+25	70	T.F.
Bridge Construction	105+08	106+10	102	T.F.
Bridge Construction	118+60	120+25	165	T.F.
Bridge Construction	236+90	238+17	128	T.F.
Bridge Construction	236+90	238+17	128	T.F.
		Total	**420**	**T.F.**

Structural Description	Station	Quantity	Unit
T-Wall Construction	242+37	6,400	Area (ft^2)
T-Wall Construction	250+84	7,200	Area (ft^2)
T-Wall Construction	271+90	8,400	Area (ft^2)
	Total	**22,000**	**Area (ft^2)**

Structural Description	Station	Quantity	Unit
Culvert Extension	153+25	1	EA.
	Total	**1**	**EA.**

Structural Description	Station	Quantity	Unit
Station Platform (Elevated)	275+85	1	EA.
Station Platform (Elevated)	301+65	1	EA.
Station Platform (Elevated)	319+25	1	EA.
Station Platform (Elevated)	351+30	1	EA.
	Total	**4**	**EA.**

Structural Description	Station	Quantity	Unit
Station Platform (At-Grade)	0+00	1	EA.
	Total	**1**	**EA.**

AT-GRADE CROSSING IMPROVEMENTS

Description		Quantity	Unit
Campus Avenue		1	EA.
Grove Avenue		1	EA.
Baker Avenue		1	EA.
Vineyard Avenue		1	EA.
Hellman Avenue		1	EA.
			EA.
	Total	**5**	**EA.**

SIGNALS & COMMUNICATIONS QUANTITIES		
Description	Cost	Unit
Train Control and Signals (Includes Wayside & PTC)	$21,000,000	L.S.
Communications	$9,000,000	L.S.
Central Control (Integrate into Metrolink Operations)	$1,000,000	L.S.
Total	**$31,000,000**	**L.S.**

UTILITY RELOCATION QUANTITIES				
Description	Unit	Unit Cost	Quantity	Cost
Encasement	L.F.	$203	420	$85,260
Minor Fiber Optic	L.S.	$1,000,000	1	$1,000,000
Sewer Line	L.F.	$200	850	$170,000
Major Fiber Optic	L.S.	$2,000,000	1	$2,000,000
			Total	**$3,300,000**

BUILDING DEMOLITION			
Description	Station	Cost	Unit
None			EA.
	Total	**$0**	**EA.**

RIGHT-OF-WAY AQCUISITION			
Description	Area	Cost	Unit
Partial Parcel Acquisition - Industrial	220,000	$4,400,000	ft^2
Aerial Easement	153,500	$1,535,000	ft^2
	Total	**$5,935,000**	**L.S.**

GRADE SEPARATION		
Description	Unit	Cost
4th Street Grade Separation	1	$35,000,000
	Total	**$35,000,000**

Appendix E-4: Alternative C-5

Governments SANBAG Working Together

PROJECT COST ESTIMATE

Project Name: Ontario Airport Access Study - Alternative C5
Design Level: Concept Design (5%)
Last Updated: Jun-14

DESCRIPTION			UNITS	QUANTITY	UNIT COST	TOTAL COST	NOTES
DEMOLITION			LS	1	$150,000	$150,000	
TRACK CONSTRUCTION			T.F.	33,843	$350	$11,900,000	
TRACK CONSTRUCTION, WITHIN ROADWAY			T.F.	1,700	$575	$1,000,000	
TURNOUT INSTALLATION			EACH	2	$175,000	$350,000	
CROSSOVER INSTALLATION			EACH	2	$400,000	$800,000	
AT-GRADE CROSSING IMPROVEMENTS			LS	2	$1,000,000	$2,000,000	
SIGNALS			LS	1	$20,000,000	$20,000,000	
STATION (AT-GRADE)			EACH	0		$0	Not Applicable
STATION (ELEVATED)			EACH	3	$30,000,000	$90,000,000	
SCRRA BRIDGE WIDENING			LS	0		$0	Not Applicable
BRIDGE CONSTRUCTION			T.F.	0		$0	Not Applicable
CULVERT EXTENSION			LS	0	$0	$0	Not Applicable
ELEVATED TRACK STRUCTURE (SINGLE TRACK)			T.F.	0	$8,000	$0	Not Applicable
ELEVATED TRACK STRUCTURE (DOUBLE TRACK)			T.F.	14,180	$14,400	$204,200,000	
T-WALL INSTALLATION			AREA	7,600	$75	$570,000	
UTILITY RELOCATION			LS	1	$2,900,000	$2,900,000	
EXTENSION - SAN BERNARDINO TO RANCHO CUCAMONGA			LS	1	$167,354,706	$0	
SUB-TOTAL: CONSTRUCTION COSTS						$333,870,000	
		%					
CONSTRUCTION CONTINGENCY	*DPM	15%				$50,080,500	
CIVIL DESIGN & DESIGN SUPPORT	*DPM	10%				$33,387,000	
S&C DESIGN AND DESIGN SUPPORT	*DPM	3%				$10,016,100	
PROJECT MANAGEMENT	*DPM	4%				$13,354,800	
CONSTRUCTION MANAGEMENT	*DPM	8%				$26,709,600	
FLAGGING	*DPM	6%				$20,032,200	
AGENCY COSTS	*DPM	8%				$26,709,600	
UTILITY//ELECTRICAL/LIGHTING CONTINGENCY				1	10,000,000	$10,000,000	
MATERIAL PROCUREMENT LIST (From DPM -17)						$0	
RIGHT-OF-WAY ACQUISITION				1	$12,000,000	$12,000,000	
OTHERS (PERMITS, FEES, LEGAL)				1	$10,000	$10,000	
SUB-TOTAL: PROJECT RELATED OVERHEAD COSTS						$202,299,800	
		%					
PROJECT RESERVE/CONTINGENCY	DPM	20%				$107,233,960	
						$644,000,000	
LOW RANGE CALCULATION							
CONSTRUCTION COSTS						*$333,870,000*	
CONSTRUCTION CONTINGENCY		*20%*				*$66,774,000*	
SOFT COSTS (ON CONSTRUCTION PLUS CONSTRUCTION CONTINGENCY)		*30%*				*$120,193,200*	
UTILITY/ELECTRICAL/LIGHTING CONTINGENCY, RIGHT-OF-WAY, AND PERMITS/FEES/LEGAL						*$22,010,000*	
LOW RANGE TOTAL						***$542,847,200***	

*Design Procedures Manual (SCRRA)

Quantity Estimate

DESCRIPTION: Quantities - Alternative C5
PROJECT: Ontario Airport Access Study
HDR JOB No: 215728
PREPARED BY: Bob Ryan DATE: 4/29/2014
CHECKED BY: Mike Harrington DATE: 05/02/2014
FILE: TAB:

TRACK WORK QUANTITIES

Track Work Description	From Station	To Station	Quantity	Unit
Alignment C5-1				
Install Turnout	0+00	1+60	1	EA.
Construct Track - 136 lb. Rail, Conc. Ties	1+60	19+00	1,740	T.F.
Construct Track - 136 lb. Rail, Conc. Ties, Street	19+00	36+00	1,700	T.F.
Construct Track - 136 lb. Rail, Conc. Ties	36+00	38+32	232	T.F.
Install Turnout	38+32	39+92	1	EA.
Construct Track - 136 lb. Rail, Conc. Ties	39+92	199+12	15,920	T.F.
Construct Crossover	187+01		1	EA.
Construct Crossover		194+82	1	EA.
Alignment A7-2				
Construct Track - 136 lb. Rail, Conc. Ties	38+32	197+83	15,951	T.F.

Description	**Total**	**Unit**
Construct Track - 136 lb. Rail, Conc. Ties	**33,843**	T.F.
Construct Track - 136 lb. Rail, Conc. Ties, Street	**1,700**	T.F.
Construct Crossover	**2**	EA.
Install Turnout	**2**	EA.

STRUCTURAL QUANTITIES

Structural Description	From Station	To Station	Quantity	Unit
Elevated Track Structure (Double Track)	57+32	199+12	14,180	T.F.
		Total	**14,180**	**T.F.**

Structural Description	Spanning	Station	Quantity	Unit
SCRRA Bridge Widening				EA.
		Total	**0**	**EA.**

Structural Description	Station	Quantity	Unit
T-Wall Construction	53+00	3,800	Area (ft^2)
T-Wall Construction	53+00	3,800	Area (ft^2)
	Total	**7,600**	**Area (ft^2)**

Structural Description	Station	Quantity	Unit
Culvert Extension			EA.
	Total	**0**	**EA.**

Structural Description	From Station	To Station	Quantity	Unit
Double Track Bridge				T.F.
		Total	**0**	**T.F.**

Structural Description	Station	Quantity	Unit
Station Platform (Elevated)	78+00	1	EA.
Station Platform (Elevated)	163+75	1	EA.
Station Platform (Elevated)	195+80	1	EA.
	Total	**3**	**EA.**

Structural Description	Station	Quantity	Unit
Station Platform (At-Grade)			EA.
	Total	**0**	**EA.**

AT-GRADE CROSSING IMPROVEMENTS

Description		Quantity	Unit
7th Street		1	EA.
6th Street		1	EA.
	Total	**2**	**EA.**

SIGNALS & COMMUNICATIONS QUANTITIES

Description	Cost	Unit
Train Control and Signals (Includes Wayside & PTC)	$12,000,000	L.S.
Communications	$7,000,000	L.S.
Central Control (Integrate into Metrolink Operations)	$1,000,000	L.S.
Total	**$20,000,000**	**L.S.**

UTILITY RELOCATION QUANTITIES

Description	Unit	Unit Cost	Quantity	Cost
Water Line	L.F.	$173	1,370	$237,010
Gas Line	L.S.	$178	600	$106,800
Encasement	L.F.	$203	540	$109,620
Electric Line	L.F.	$178	2,400	$427,200
Major Fiber Optic	L.S.	$2,000,000	1	$2,000,000
			Total	**$2,900,000**

BUILDING DEMOLITION			
Description	Station	Cost	Unit
Commercial Building	139+75	$150,000	EA.
	Total	**$150,000**	**EA.**

RIGHT-OF-WAY AQCUISITION			
Description	Area	Cost	Unit
Partial Parcel Acquisition - Commercial	241,000	$4,820,000	ft^2
Full Parcel Acquisition - Commercial	7,200	$1,440,000	ft^2
Easement	50,000	$1,000,000	ft^2
Aerial Easement	332,000	$3,320,000	ft^2
Business Relocation	1	$500,000	L.S.
	Total	**$12,000,000**	**L.S.**

Governments SANBAG Working Together

PROJECT COST ESTIMATE

Project Name: Ontario Airport Access Study - Rancho to San Bernardino
Design Level: Concept Design (5%)
Last Updated: Jun-14

DESCRIPTION			UNITS	QUANTITY	UNIT COST	TOTAL COST	NOTES
EXTENSION - RANCHO CUCAMONGA TO SAN BERNARDINO			LS	1	$167,354,706	$167,354,706	Per Separate Estimate
SUB-TOTAL: CONSTRUCTION COSTS						$167,354,706	
		%					
CONSTRUCTION CONTINGENCY	*DPM	15%				$25,103,206	
CIVIL DESIGN & DESIGN SUPPORT	*DPM	10%				$16,735,471	
S&C DESIGN AND DESIGN SUPPORT	*DPM	3%				$5,020,641	
PROJECT MANAGEMENT	*DPM	4%				$6,694,188	
CONSTRUCTION MANAGEMENT	*DPM	8%				$13,388,376	
FLAGGING	*DPM	6%				$10,041,282	
AGENCY COSTS	*DPM	8%				$13,388,376	
UTILITY//ELECTRICAL/LIGHTING CONTINGENCY				1	0	$0	
MATERIAL PROCUREMENT LIST (From DPM -17)						$0	
RIGHT-OF-WAY ACQUISITION				1	$0	$0	
OTHERS (PERMITS, FEES, LEGAL)				1	$0	$0	
SUB-TOTAL: PROJECT RELATED OVERHEAD COSTS						$90,371,541	
		%					
PROJECT RESERVE/CONTINGENCY	DPM	20%				$51,545,249	
						$310,000,000	
LOW RANGE CALCULATION							
CONSTRUCTION COSTS						*$167,354,706*	
CONSTRUCTION CONTINGENCY		*20%*				*$33,470,941*	
SOFT COSTS (ON CONSTRUCTION PLUS CONSTRUCTION CONTINGENCY)		*30%*				*$60,247,694*	
UTILITY/ELECTRICAL/LIGHTING CONTINGENCY, RIGHT-OF-WAY, AND PERMITS/FEES/LEGAL						*$0*	
LOW RANGE TOTAL						***$261,073,341***	

*Design Procedures Manual (SCRRA)

Appendix E-5: Alternative D-1

Governments SANBAG Working Together

PROJECT COST ESTIMATE

Project Name: Ontario Airport Access Study - Alternative D1
Design Level: Concept Design (5%)
Last Updated: Jul-14

DESCRIPTION			UNITS	QUANTITY	UNIT COST	TOTAL COST	NOTES
DEMOLITION			LS	0	$0	$0	Not Applicable
TRACK CONSTRUCTION			T.F.	32,703	$350	$11,500,000	
TRACK CONSTRUCTION, WITHIN ROADWAY			T.F.	0	$575	$0	Not Applicable
TURNOUT INSTALLATION			EACH	1	$175,000	$175,000	
CROSSOVER INSTALLATION			EACH	2	$400,000	$800,000	
AT-GRADE CROSSING IMPROVEMENTS			LS	6	$1,000,000	$6,000,000	
SIGNALS			LS	1	$14,000,000	$14,000,000	
STATION (AT-GRADE)			EACH	0	$8,000,000	$0	
STATION (ELEVATED)			EACH	4	$30,000,000	$120,000,000	
SCRRA BRIDGE WIDENING			LS	0		$0	Not Applicable
BRIDGE CONSTRUCTION			T.F.	225	$8,000	$1,798,800	Not Applicable
CULVERT EXTENSION			LS	0	$0	$0	Not Applicable
ELEVATED TRACK STRUCTURE (SINGLE TRACK)			T.F.	3,500	$8,000	$28,000,000	
ELEVATED TRACK STRUCTURE (DOUBLE TRACK)			T.F.	8,473	$14,400	$122,100,000	
T-WALL INSTALLATION			AREA	19,520	$75	$1,500,000	
UTILITY RELOCATION			LS	1	$2,400,000	$2,400,000	
SUB-TOTAL: CONSTRUCTION COSTS						$308,273,800	
		%					
CONSTRUCTION CONTINGENCY	*DPM	15%				$46,241,070	
CIVIL DESIGN & DESIGN SUPPORT	*DPM	10%				$30,827,380	
S&C DESIGN AND DESIGN SUPPORT	*DPM	3%				$9,248,214	
PROJECT MANAGEMENT	*DPM	4%				$12,330,952	
CONSTRUCTION MANAGEMENT	*DPM	8%				$24,661,904	
FLAGGING	*DPM	6%				$18,496,428	
AGENCY COSTS	*DPM	8%				$24,661,904	
UTILITY//ELECTRICAL/LIGHTING CONTINGENCY				1	10,000,000	$10,000,000	
MATERIAL PROCUREMENT LIST (From DPM -17)						$0	
RIGHT-OF-WAY ACQUISITION				1	$10,000,000	$10,000,000	
OTHERS (PERMITS, FEES, LEGAL)				1	$10,000	$10,000	
SUB-TOTAL: PROJECT RELATED OVERHEAD COSTS						$186,477,852	
		%					
PROJECT RESERVE/CONTINGENCY	DPM	20%				$98,950,330	
						$594,000,000	
LOW RANGE CALCULATION							
CONSTRUCTION COSTS						*$308,273,800*	
CONSTRUCTION CONTINGENCY		*20%*				*$61,654,760*	
SOFT COSTS (ON CONSTRUCTION PLUS CONSTRUCTION CONTINGENCY)		*30%*				*$110,978,568*	
UTILITY/ELECTRICAL/LIGHTING CONTINGENCY, RIGHT-OF-WAY, AND PERMITS/FEES/LEGAL						*$20,010,000*	
LOW RANGE TOTAL						***$500,917,128***	

*Design Procedures Manual (SCRRA)

Quantity Estimate

DESCRIPTION: Quantities - Alternative D1
PROJECT: Ontario Airport Access Study
HDR JOB No: 215728
PREPARED BY: Bob Ryan DATE: 4/29/2014
CHECKED BY: Mike Harrington DATE: 05/22/2014
FILE: TAB:

TRACK WORK QUANTITIES

Track Work Description	From Station	To Station	Quantity	Unit
Alignment D1-1				
Construct Track - 136 lb. Rail, Conc. Ties	234+99	238+82	383	T.F.
Install Turnout	238+82	239+74	1	EA.
Construct Track - 136 lb. Rail, Conc. Ties	239+74	373+64	13,390	T.F.
Construct Crossover	373+64		1	EA.
Construct Track - 136 lb. Rail, Conc. Ties	375+27	379+82	456	T.F.
Construct Crossover		381+45	1	EA.
Construct Track - 136 lb. Rail, Conc. Ties	381+45	405+23	2,377	T.F.
Alignment A7-2				
Construct Track - 136 lb. Rail, Conc. Ties	0+92	154+81	15,390	T.F.
Construct Track - 136 lb. Rail, Conc. Ties	156+44	157+44	100	T.F.
Construct Track - 136 lb. Rail, Conc. Ties	159+07	165+15	608	T.F.
Description			**Total**	**Unit**
Construct Track - 136 lb. Rail, Conc. Ties			**32,703**	T.F.
Construct Track - 136 lb. Rail, Conc. Ties, Street			**0**	T.F.
Construct Crossover			**2**	EA.
Install Turnout			**1**	EA.

STRUCTURAL QUANTITIES

Structural Description	From Station	To Station	Quantity	Unit
Elevated Track Structure (Double Track)	319+49	405+23	8,574	T.F.
		Total	**8,574**	**T.F.**

Structural Description	Spanning	Station	Quantity	Unit
SCRRA Bridge Widening				EA.
		Total	**0**	**EA.**

Structural Description	Station	Quantity	Unit
T-Wall Construction	297+27	9,760	Area (ft^2)
T-Wall Construction	57+11	9,760	Area (ft^2)
	Total	**19,520**	**Area (ft^2)**

Structural Description	Station	Quantity	Unit
Culvert Extension			EA.
	Total	**0**	**EA.**

Structural Description	From Station	To Station	Quantity	Unit
Elevated Track Structure (Single Track)	300+99	319+49	1,850	T.F.
Elevated Track Structure (Single Track)	60+78	79+28	1,850	T.F.
		Total	**3,700**	**T.F.**

Structural Description	From Station	To Station	Quantity	Unit
Bridge Construction (Single Track)	242+49	244+74	225	T.F.
Bridge Construction (Single Track)			0	T.F.
		Total	**225**	**T.F.**

Structural Description	Station	Quantity	Unit
Station Platform (Elevated)	322+75	1	EA.
Station Platform (Elevated)	352+46	1	EA.
Station Platform (Elevated)	369+84	1	EA.
Station Platform (Elevated)	401+93	1	EA.
	Total	**4**	**EA.**

Structural Description	Station	Quantity	Unit
Station Platform (At-Grade)		0	EA.
	Total	**0**	**EA.**

AT-GRADE CROSSING IMPROVEMENTS

Description		Quantity	Unit
8th Street		2	EA.
6th Street		2	EA.
Hellman Avenue		2	EA.
	Total	**6**	**EA.**

SIGNALS & COMMUNICATIONS QUANTITIES		
Description	Cost	Unit
Train Control and Signals (Includes Wayside & PTC)	$8,000,000	L.S.
Communications	$5,000,000	L.S.
Central Control (Integrate into Metrolink Operations)	$1,000,000	L.S.
Total	**$14,000,000**	**L.S.**

UTILITY RELOCATION QUANTITIES				
Description	Unit	Unit Cost	Quantity	Cost
Encasement	L.F.	$203	1,370	$278,110
Sewer Line	L.S.	$200	600	$120,000
Major Fiber Optic	L.S.	$2,000,000	1	$2,000,000
			Total	**$2,400,000**

BUILDING DEMOLITION			
Description	Station	Cost	Unit
None			EA.
	Total	**$0**	**EA.**

RIGHT-OF-WAY AQCUISITION			
Description	Area	Cost	Unit
Easement	378,000	$7,560,000	ft^2
Aerial Easement	175,000	$1,750,000	ft^2
	Total	**$10,000,000**	**L.S.**

Governments
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Project Name: Ontario Airport Access Study - Montclair
Design Level: Concept Design (5%)
Last Updated: Jul-14

DESCRIPTION			TOTAL COST	NOTES
EXTENSION - MONTCLAIR TO CUCAMONGA CANYON CREEK				
TRACK			$8,870,500	
STRUCTURES			$4,855,000	
GRADE CROSSINGS			$9,543,000	
STATIONS, FARE COLLECTION AND COMMUNICATIONS			$7,480,000	
SUB-TOTAL: CONSTRUCTION COSTS			$30,748,500	
		%		
CONSTRUCTION CONTINGENCY	*DPM	15%	$4,612,275	
CIVIL DESIGN & DESIGN SUPPORT	*DPM	10%	$3,074,850	
S&C DESIGN AND DESIGN SUPPORT	*DPM	3%	$922,455	
PROJECT MANAGEMENT	*DPM	4%	$1,229,940	
CONSTRUCTION MANAGEMENT	*DPM	8%	$2,459,880	
FLAGGING	*DPM	6%	$1,844,910	
AGENCY COSTS	*DPM	8%	$2,459,880	
UTILITY//ELECTRICAL/LIGHTING CONTINGENCY			$0	
MATERIAL PROCUREMENT LIST (From DPM -17)			$0	
RIGHT-OF-WAY ACQUISITION			$0	
OTHERS (PERMITS, FEES, LEGAL)			$0	
SUB-TOTAL: PROJECT RELATED OVERHEAD COSTS			$16,604,190	
		%		
PROJECT RESERVE/CONTINGENCY	DPM	20%	$9,470,538	
			$57,000,000	
LOW RANGE CALCULATION				
CONSTRUCTION COSTS			*$30,748,500*	
CONSTRUCTION CONTINGENCY		*20%*	*$6,149,700*	
SOFT COSTS (ON CONSTRUCTION PLUS CONSTRUCTION CONTINGENCY)		*30%*	*$11,069,460*	
UTILITY/ELECTRICAL/LIGHTING CONTINGENCY, RIGHT-OF-WAY, AND PERMITS/FEES/LEGAL			*$0*	
LOW RANGE TOTAL			***$47,967,660***	

*Design Procedures Manual (SCRRA)

Alternative D1: LRT option

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PROJECT COST ESTIMATE

Project Name: Ontario Airport Access Study - Alternative D1 - LRT**
Design Level: Concept Design (5%)
Last Updated: Jul-14

DESCRIPTION			UNITS	QUANTITY	UNIT COST	TOTAL COST	NOTES
DEMOLITION			LS	0	$0	$0	Not Applicable
TRACK CONSTRUCTION			T.F.	56,202	$350	$19,700,000	
TRACK CONSTRUCTION, WITHIN ROADWAY			T.F.	0	$575	$0	Not Applicable
TURNOUT INSTALLATION			EACH	1	$175,000	$175,000	
CROSSOVER INSTALLATION			EACH	2	$400,000	$800,000	
AT-GRADE CROSSING IMPROVEMENTS			LS	6	$1,000,000	$6,000,000	
SIGNALS			LS	1	$14,000,000	$14,000,000	
TRACTION POWER SUBSTATION			EACH	8	$2,000,000	$16,000,000	
OVERHEAD CATENARY SYSTEM (SINGLE TRACK)			T.F.	41473	$500	$20,736,500	
OVERHEAD CATENARY SYSTEM (DOUBLE TRACK)			T.F.	8500	$600	$5,100,000	
STATION (AT-GRADE)			EACH	1	$8,000,000	$8,000,000	
STATION (ELEVATED)			EACH	3	$30,000,000	$90,000,000	
SCRRA BRIDGE WIDENING			LS	0		$0	Not Applicable
BRIDGE CONSTRUCTION			T.F.	525	$8,000	$4,198,800	
CULVERT EXTENSION			LS	0	$0	$0	Not Applicable
ELEVATED TRACK STRUCTURE (SINGLE TRACK)			T.F.	1,336	$8,000	$10,700,000	
ELEVATED TRACK STRUCTURE (DOUBLE TRACK)			T.F.	9,311	$14,400	$134,100,000	
T-WALL INSTALLATION			AREA	60,340	$75	$4,600,000	
UTILITY RELOCATION			LS	1	$2,400,000	$2,400,000	
SUB-TOTAL: CONSTRUCTION COSTS						$336,510,300	
		%					
CONSTRUCTION CONTINGENCY	*DPM	15%				$50,476,545	
CIVIL DESIGN & DESIGN SUPPORT	*DPM	10%				$33,651,030	
S&C DESIGN AND DESIGN SUPPORT	*DPM	3%				$10,095,309	
PROJECT MANAGEMENT	*DPM	4%				$13,460,412	
CONSTRUCTION MANAGEMENT	*DPM	8%				$26,920,824	
FLAGGING	*DPM	6%				$20,190,618	
AGENCY COSTS	*DPM	8%				$26,920,824	
UTILITY//ELECTRICAL/LIGHTING CONTINGENCY				1	10,000,000	$10,000,000	
MATERIAL PROCUREMENT LIST (From DPM -17)						$0	
RIGHT-OF-WAY ACQUISITION				1	$10,000,000	$10,000,000	
OTHERS (PERMITS, FEES, LEGAL)				1	$10,000	$10,000	
SUB-TOTAL: PROJECT RELATED OVERHEAD COSTS						$201,725,562	
		%					
PROJECT RESERVE/CONTINGENCY	DPM	20%				$107,647,172.40	
						$646,000,000	

*Design Procedures Manual (SCRRA)

Quantity Estimate

DESCRIPTION: Quantities - Alternative D1 - LRT**
PROJECT: Ontario Airport Access Study
HDR JOB No: 215728
PREPARED BY: Bob Ryan DATE: 4/29/2014
CHECKED BY: Mike Harrington DATE: 05/02/2014
UPDATED BY: Scott Gaastra DATE: 07/15/2014
FILE: TAB:

TRACK WORK QUANTITIES

Track Work Description	From Station	To Station	Quantity	Unit
Alignment D1-1				
Construct Track - 136 lb. Rail, Conc. Ties	0+00	234+99	23,499	T.F.
Construct Track - 136 lb. Rail, Conc. Ties	234+99	238+82	383	T.F.
Install Turnout	238+82	239+74	1	EA.
Construct Track - 136 lb. Rail, Conc. Ties	239+74	373+64	13,390	T.F.
Construct Crossover	373+64		1	EA.
Construct Track - 136 lb. Rail, Conc. Ties	375+27	379+82	456	T.F.
Construct Crossover		381+45	1	EA.
Construct Track - 136 lb. Rail, Conc. Ties	381+45	405+23	2,377	T.F.
Alignment D1-2				
Construct Track - 136 lb. Rail, Conc. Ties	0+92	154+81	15,390	T.F.
Construct Track - 136 lb. Rail, Conc. Ties	156+44	157+44	100	T.F.
Construct Track - 136 lb. Rail, Conc. Ties	159+07	165+15	608	T.F.
Description			**Total**	**Unit**
Construct Track - 136 lb. Rail, Conc. Ties			**56,202**	T.F.
Construct Track - 136 lb. Rail, Conc. Ties, Street			**0**	T.F.
Construct Crossover			**2**	EA.
Install Turnout			**1**	EA.

STRUCTURAL QUANTITIES

Structural Description	From Station	To Station	Quantity	Unit
Elevated Track Structure (Double Track)	0+00	16+20	1,620	T.F.
Elevated Track Structure (Double Track)	328+32	405+23	7,691	T.F.
		Total	**9,311**	**T.F.**

Structural Description	Spanning	Station	Quantity	Unit
SCRRA Bridge Widening				EA.
		Total	**0**	**EA.**

Structural Description	Station	Quantity	Unit
T-Wall Construction	0+00	16,000	Area (ft^2)
T-Wall Construction	20+00	16,000	Area (ft^2)
T-Wall Construction	307+67	19,520	Area (ft^2)
T-Wall Construction	57+11	8,820	Area (ft^2)
	Total	**60,340**	**Area (ft^2)**

Structural Description	Station	Quantity	Unit
Culvert Extension			EA.
	Total	**0**	**EA.**

Structural Description	From Station	To Station	Quantity	Unit
Elevated Track Structure (Single Track)	300+99	307+67	668	T.F.
Elevated Track Structure (Single Track)	60+78	67+46	668	T.F.
		Total	**1,336**	**T.F.**

Structural Description	From Station	To Station	Quantity	Unit
Bridge Construction (Single Track)	242+49	244+74	225	T.F.
Bridge Construction (Single Track)	316+48	319+48	300	T.F.
		Total	**525**	**T.F.**

Structural Description	Station	Quantity	Unit
Station Platform (Elevated)	352+46	1	EA.
Station Platform (Elevated)	369+84	1	EA.
Station Platform (Elevated)	401+93	1	EA.
	Total	**3**	**EA.**

Structural Description	Station	Quantity	Unit
Station Platform (At-Grade)	319+71.49	1	EA.
	Total	**1**	**EA.**

AT-GRADE CROSSING IMPROVEMENTS

Description		Quantity	Unit
8th Street		2	EA.
6th Street		2	EA.
Hellman Avenue		2	EA.
	Total	**6**	**EA.**

SIGNALS & COMMUNICATIONS QUANTITIES		
Description	Cost	Unit
Train Control and Signals (Includes Wayside & PTC)	$8,000,000	L.S.
Communications	$5,000,000	L.S.
Central Control (Integrate into Metrolink Operations)	$1,000,000	L.S.
Total	**$14,000,000**	**L.S.**

UTILITY RELOCATION QUANTITIES				
Description	Unit	Unit Cost	Quantity	Cost
Encasement	L.F.	$203	1,370	$278,110
Sewer Line	L.S.	$200	600	$120,000
Major Fiber Optic	L.S.	$2,000,000	1	$2,000,000
			Total	**$2,400,000**

BUILDING DEMOLITION			
Description	Station	Cost	Unit
None			EA.
	Total	**$0**	**EA.**

RIGHT-OF-WAY AQCUISITION			
Description	Area	Cost	Unit
Easement	378,000	$7,560,000	ft^2
Aerial Easement	175,000	$1,750,000	ft^2
	Total	**$10,000,000**	**L.S.**

**Includes LRT additional items from Montclair to ONT

Appendix F
Operation and Maintenance Cost Estimates

Ontario Airport Rail Access Study

Average Unit Cost Summary

Area Fixed Route Bus Systems - Service Provided and Unit Costs (2012) - Directly Operated Service					
FY 2012 MB Unit Costs		**Bus-Hrs**	**Bus-Miles**	**Garages**	**Peak Buses**
OmniTrans, San Bernardino	Units of Service	585,199	7,549,297	2	145
	Unit Cost	$45.95	$2.18	$1,541,348	$52,252
Riverside Transit Agency	Units of Service	284,824	3,816,100	2	114
	Unit Cost	$43.06	$1.77	$948,382	$51,608
Norwalk Transit System	Units of Service	86,882	1,087,170	1	22
	Unit Cost	$61.54	$3.46	$155,434	$83,327
System Average	**Units of Service**	**318,968**	**4,150,856**	**2**	**94**
	Unit Cost	**$50.19**	**$2.47**	**$881,721**	**$62,395**

Source: 2012 NTD

Regional Light Rail Systems - Service Provided and Unit Costs (2012) - Directly Operated Service						
FY 2012 LR Unit Costs		**Rt-Miles**	**Yards**	**Train-Hrs**	**Car-Miles**	**Peak Cars**
San Diego Trolley	Units of Service	108	1	427,603	7,544,239	95
	Unit Cost	$72,400	$7,822,446	$31.03	$2.57	$157,895
San Jose/VTA Light Rail	Units of Service	81	1	194,696	3,084,075	55
	Unit Cost	$86,303	$8,239,993	$104.58	$6.84	$90,766
Sacramento Regional Transit	Units of Service	76	2	195,769	3,822,585	61
	Unit Cost	$40,816	$1,611,504	$77.13	$4.10	$138,147
System Average	**Units of Service**	**89**	**1**	**272,689**	**4,816,966**	**70**
	Unit Cost	**$66,506**	**$5,891,314**	**$70.91**	**$4.50**	**$128,936**

Source: 2012 NTD

Regional Light Rail Systems - Service Provided and Unit Costs (2012) - Directly Operated Service						
FY 2012 LR Unit Costs		**Rt-Miles**	**Yards**	**Train-Hrs**	**Car-Miles**	**Peak Cars**
LA Metro Light Rail	Units of Service	136	3	518,746	11,143,402	140
	Unit Cost	$116,091	$6,369,717	$172.76	$5.03	$149,017

Source: 2012 NTD

DMU Rail Systems - Service Provided and Unit Costs (2012) - Purchased Transportation						
FY 2012 DMU Unit Costs		**Rt-Miles**	**Yards**	**Train-Hrs**	**Car-Miles**	**Peak Cars**
NCTD Sprinter	Units of Service	44	1	30,305	666,212	8
	Unit Cost	$46,522	$1,252,865	$226.69	$2.66	$232,871
Capital Metro Red Line, Austin	Units of Service	64	2	10,174	237,125	4
	Unit Cost	$25,849	$285,907	$297.30	$7.75	$1,065,959
Tri-Met Westside Express, Portland	Units of Service	29	1	7,528	163,381	4
	Unit Cost	$8,865	$404,460	$344.39	$18.37	$57,268
System Average	**Units of Service**	**46**	**1**	**16,002**	**355,573**	**5**
	Unit Cost	**$27,079**	**$647,744**	**$289.46**	**$9.60**	**$452,033**

Source: 2012 NTD

Ontario Airport Rail Access Study

Annual O&M Cost Summary for Rail Connection Alternatives (A-3, A-4, A-7)

Assuming Average cost from Regional Light Rail Sytem (San Diego Trolley, San Jose/VTA Light Rail, Sacramento Regional Transit)

FY 2012 Unit Rail Costs	Rt-Miles $66,506	Yards $5,891,314	Train-Hrs $70.91	Car-Miles $4.50	Peak Cars $128,936	Total Annual O&M Cost (2012 dollars)	Total Annual O&M Cost (2014 dollars)
Alt A-3 Rancho Cucamonga-ONT Rail (using the Hermosa Avenue/Turner Street alignment)	4.6	0	7,390	109,000	4		
FY 2012 Cost per Variable	$ 305,900	$ -	$ 524,000	$ 490,900	$ 515,700	$ 1,836,500	$ 1,909,960
					Cost per hour	***$ 248.51***	***$ 258.45***
Alt A-4 Rancho Cucamonga-ONT Rail (using the Deer Creek/Cucamonga Creek alignment)	4.8	0	7,200	113,800	4		
FY 2012 Cost per Variable	$ 319,200	$ -	$ 510,600	$ 512,500	$ 515,700	$ 1,858,000	$ 1,932,320
					Cost per hour	***$ 258.06***	***$ 268.38***
Alt A-7 Upland-ONT Rail (using the rail spur/Cucamonga Creek alignment)	6.7	0	9,160	161,100	4		
FY 2012 Cost per Variable	$ 445,600	$ -	$ 649,600	$ 725,500	$ 515,700	$ 2,336,400	$ 2,429,856
					Cost per hour	***$ 255.07***	***$ 265.27***

Source: 2012 NTD

Assuming Average cost as a DMU (NCTD Sprinter, Capital Metro Redline, Austin, Tri-Met Westside Express, Portland)

FY 2012 Unit Rail Costs	Rt-Miles $27,079	Yards $647,744	Train-Hrs $289	Car-Miles $10	Peak Cars $452,033	Total Annual O&M Cost (2012 dollars)	Total Annual O&M Cost (2014 dollars)
Alt A-3 Rancho Cucamonga-ONT Rail (using the Hermosa Avenue/Turner Street alignment)	4.6	0	7,390	109,000	4		
FY 2012 Cost per Variable	$ 124,600	$ -	$ 2,139,100	$ 1,045,900	$ 1,808,100	$ 5,117,700	$ 5,322,408
					Cost per hour	***$ 692.52***	***$ 720.22***
Alt A-4 Rancho Cucamonga-ONT Rail (using the Deer Creek/Cucamonga Creek alignment)	4.8	0	7,200	113,800	4		
FY 2012 Cost per Variable	$ 130,000	$ -	$ 2,084,100	$ 1,091,900	$ 1,808,100	$ 5,114,100	$ 5,318,664
					Cost per hour	***$ 710.29***	***$ 738.70***
Alt A-7 Upland-ONT Rail (using the rail spur/Cucamonga Creek alignment)	6.7	0	9,160	161,100	4		
FY 2012 Cost per Variable	$ 181,400	$ -	$ 2,651,500	$ 1,545,800	$ 1,808,100	$ 6,186,800	$ 6,434,272
					Cost per hour	***$ 675.41***	***$ 702.43***

Source: 2012 NTD
Assumes no additional yard storage required.
CPI based on Bureau of Labor Statistics 1.04
(http://www.bls.gov/data/inflation_calculator.htm)

Ontario Airport Rail Access Study

Annual O&M Cost Summary for Bus Alternative (B-2)

FY 2012 Unit Bus Costs	Bus-Hrs $50.19	Bus-Miles $2.47	Garages $881,721	Peak Buses $62,395	Total Annual O&M Cost (2012 dollars)	Total Annual O&M Cost (2014 dollars)
Alt B-2 Rancho Cucamonga-ONT Bus	8,240	135,100	0	4		
FY 2012 Cost per Variable	$ 413,500	$ 333,800	$ -	$ 249,600	$ 996,900	$ 1,036,776
Variable cost model based on 2012 O&M costs from local bus operators				***Cost per hour***	***$ 120.98***	***$ 125.82***

Source: 2012 NTD

Assumes no additional garage required.

Source: LAWA

1. Unit cost does not assume variable cost model analysis, and should be used with caution in comparing to other alternatives.

CPI based on Bureau of Labor Statistics 1.04
(http://www.bls.gov/data/inflation_calculator.htm)

Ontario Airport Rail Access Study

Annual O&M Cost Summary for Redlands DMU Extension (C-5)

Assuming Average cost as a DMU (NCTD Sprinter, Capital Metro Redline, Austin, Tri-Met Westside Express, Portland)

FY 2012 Unit Rail Costs	Rt-Miles $27,079	Yards $647,744	Train-Hrs $289	Car-Miles $10	Peak Cars $452,033	Total Annual O&M Cost (2012 dollars)	Total Annual O&M Cost (2014 dollars)
Alt C-5 Redlands-ONT Rail (using DMU)	18.4	0	8,070	307,200	6		
FY 2012 Cost per Variable	$ 498,200	$ -	$ 2,335,900	$ 2,947,700	$ 2,712,200	$ 8,494,000	$ 8,833,760
					Cost per hour	***$ 1,052.54***	***$ 1,094.64***

Source: 2012 NTD
Assumes no additional yard storage required.
CPI based on Bureau of Labor Statistics 1.04
(http://www.bls.gov/data/inflation_calculator.htm)

Ontario Airport Rail Access Study

Annual O&M Cost Summary for LA Metro Gold Line Extension (D-1)

(Assuming LA Metro LRT costs)

FY 2012 Unit Rail Costs	Rt-Miles $116,091	Yards[1] $6,369,717	Train-Hrs $173	Car-Miles	Peak Cars $5	Total Annual O&M Cost $149,017 (2012 dollars)	Total Annual O&M Cost (2012 dollars)
Alt D-1 Montclair to Multimodal Center	7.7	0	7,920	780,400	1		
FY 2012 Cost per Variable	$ 893,900	$ -	$ 1,368,300	$ 3,922,000	$ 149,000	$ 6,333,200	$ 6,586,528
					Cost per hour	***$ 799.65***	***$ 831.63***

Source: 2012 NTD

1. Assumes no additional yard storage required.

(Assuming DMU costs)

FY 2012 Unit Rail Costs	Rt-Miles $27,079	Yards[1] $647,744	Train-Hrs $289	Car-Miles $10	Peak Cars $452,033	Total Annual O&M Cost (2012 dollars)	Total Annual O&M Cost (2012 dollars)
Alt D-1 Montclair to Multimodal Center	7.7	0	7,920	780,400	1		
FY 2012 Cost per Variable	$ 208,500	$ -	$ 2,292,500	$ 7,488,200	$ 452,000	$ 10,441,200	$ 10,858,848
					Cost per hour	***$ 1,318.33***	***$ 1,371.07***

Source: 2012 NTD
1. Assumes no additional yard storage required.
CPI based on Bureau of Labor Statistics 1.04
(http://www.bls.gov/data/inflation_calculator.htm)

Appendix G
Environmental Constraints

1. Study Area Description and Delineation

The alternative alignments under consideration are located in the southwestern corner of San Bernardino County, California, and traverse the cities of Ontario, Rancho Cucamonga, and Upland. The project area containing the alternative alignments generally consists of a largely developed, urban center bounded by the Burlington Northern Santa Fe Railway corridor on the north, Milliken Avenue on the east, Ontario International Airport on the south, and Euclid Avenue on the west (see Figure 1). These areas are contained within the northern portions of the U. S. Geological Survey's (USGS) 7.5 minute quadrangles for Ontario (2012) and Guasti (2012). The Metrolink Stations in the Cities of Rancho Cucamonga and Upland were used to delineate the eastern and western limits of the project area.

For the purposes of this constraints analysis, a primary and secondary study area was delineated for each of the alternative alignments (except B-2) within the overall project area to evaluate potential direct and indirect impacts to local environmental resources. The primary study area includes a 200-foot corridor that follows each of the alternative alignments and is based on a 100-foot buffer on each side of the route's centerline. The primary study area was delineated with the intent of identifying resources that could be directly impacted by the construction[1] or operation of the project (e.g. property acquisition, etc.). A secondary study area was also delineated to enable for an evaluation of potential indirect impacts that could occur beyond the immediate limits of construction and with the different vehicle technologies under consideration (e.g. DMU, LRT, etc.). The primary and secondary study areas are illustrated in the environmental resource maps provided in Figures 2 through 9 (see Figure 1 for the Map Index).

The following sections evaluate the alternative alignments for specific categories of potential environmental impacts.

2. Biological Resources

Data Sources/Methods

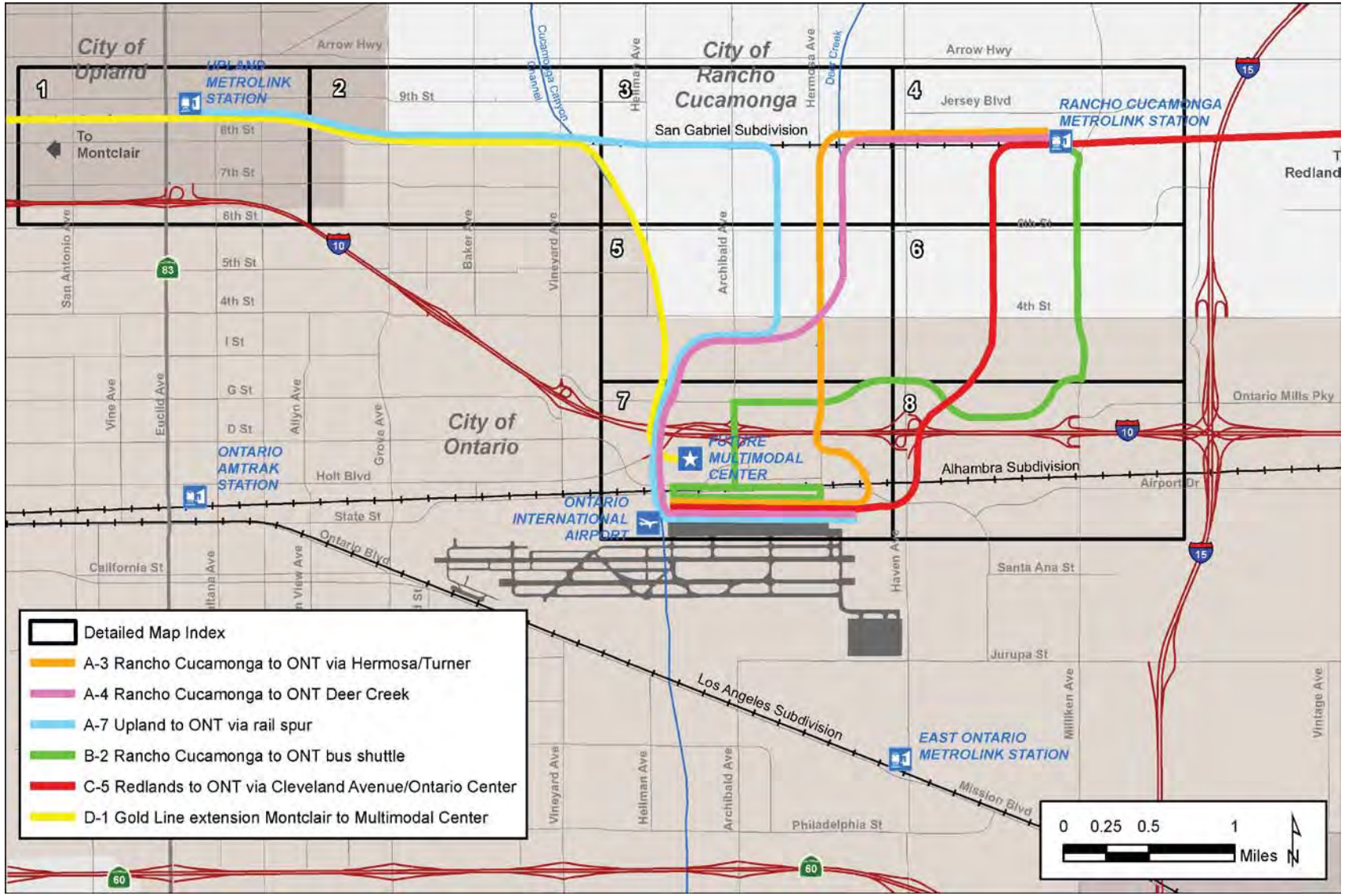
HDR evaluated the primary and secondary study area for the potential to support special-status species based upon publicly available data including a search of the California Natural Diversity Database (CNDDB) and California Native Plant Society's (CNPS) Inventory of Rare and Endangered Vascular Plants for records occurring in the nine quadrangles including and surrounding the study area, U.S. Fish and Wildlife Service (USFWS) critical habitat mapper and National Wetland Inventory mapping, aerial photography, Natural Resource Conservation Service (NRCS) soil mapping and U.S. Geological Survey (USGS) topographic maps. This information was then used to identify potential future survey activities and regulatory approvals that may be required for each of the alternative alignments under consideration.

Alternatives Evaluation

The study areas for each of the alternative alignments traverse an urban center that is largely developed. Undeveloped areas within the study areas are generally limited to parks and recreational areas (e.g. golf courses) or vacant, undeveloped lots that have been subjected to previous grading or agricultural activities. Drainage features traversing the study areas, including Deer Creek and the Cucamonga Channel, are concrete-lined and contain little to no riparian vegetation. As described above, a potential species list was generated for the study area and, based on the habitats visible in aerial photography, a general habitat suitability evaluation was completed (see Appendix G-1 and G-2). Based on this evaluation, the following biological resource constraints were identified:

[1] Note: Temporary direct impacts could expand beyond this buffer depending on the alignment and the various methods proposed for construction access and staging which is beyond this planning level analysis."

Figure 1- Project Area (Map Index)



Threatened/Endangered/Rare Species

- The study area does not fall within federally-designated critical habitat, however, portions of the study area do fall within the Ontario Recovery Unit for Delhi sands flower-loving fly. Alternatives A-3 and C-5 traverse 1.05 and 2.56 miles of area mapped as Delhi sand soil, respectively.

- The study area has the potential to support 9 special-status plant species none of which are federally or state endangered (see Appendix G-1). These species are not anticipated to pose a significant constraint to the project if present and are not further addressed in this report.

- The study area has the potential to support 9 special-status wildlife species including one federally endangered species detailed below (see Appendix G-2).

    - Delhi sands flower-loving fly (*Rhaphiomidas terminatus abdominalis*). The Delhi sands flower-loving fly is a federally endangered species that is associated with fine, sandy soils. This species is restricted to a particular soil type classified as the Delhi series, which occurs throughout the eastern portion of the study area. The primary study area for Alternatives A-3, A-4, C-5, and B-2 traverses soils mapped as Delhi series.

    - California burrowing owl (*Athene cunicularis hypugaea*). The burrowing owl is a State-listed species of special concern. There are multiple vacant properties that border each of the alternative alignments that may contain habitat suitable for burrowing owls. Each of the alternatives (except for B-3) would involve potential improvements along the perimeter of these properties, which could result in direct and/or indirect impacts to burrowing owl.

    - Southwestern pond turtle (Emys marmorata). Southwestern pond turtle is a State-listed species of special concern. The primary study area for Alternatives A-4, A-7, and D-1 include mapped wetland resources that could provide suitable habitat for this species.

Jurisdictional Waters

- Jurisdictional Waters of the U. S. and State. The study area is transected by two major drainage features, Deer Creek and Cucamonga Channel. These drainages are hydrologically connected to the Santa Ana River and, therefore, considered "Waters of the U. S." Alternatives A-3, A-4, A-7, and D-1 would each require the crossing of one or both of these drainages. Temporary construction activities or the placement of fill within these drainages would likely trigger the need to obtain regulatory permits for an approval from the U. S. Army Corps of Engineers (USACE) under Section 404 of the Clean Water Act. Although Alternative C-5 does not cross either of these drainages, there is the potential for this alignment to cross smaller drainage features that may also be regulated by USACE.

Table 1 provides a summary of the biological resource constraints for each of the alternative alignments under consideration. As shown, the level of constraint is qualitatively rated as low, moderate, or high. A "high" rating for an alternative corresponds with a high probability for agency involvement, likelihood for the requirement of one or more permits, and/or increased mitigation costs. A moderate rating indicates a lower probability of species actually occurring within the study area and/or no additional permits required beyond CEQA and NEPA certification. A low rating indicates that no special permits or mitigation requirements are anticipated and/or the resource has a low probability to occur on site.

Table 1. Biological Resource Constraints

Issue/Constraint	ALTERNATIVES					
	A-3	A-4	A-7	B-2	C-5	D-1
T/E Plants	L	L	L	L	L	L
T/E Wildlife	M[1]	M[1]	M[1]	L	H[1]	M[1]
Other Special-Status Wildlife	M[2]	M[2]	M[2]	L	M[2]	M[2]
USACE Jurisdictional Areas	M[3]	M[3]	M[3]	L	M	M[3]

1. Intersects or occurs adjacent to undeveloped habitat that has some potential to support Delhi sands flower-loving fly based on NRCS soil mapping data and will, at a minimum, require a habitat assessment by a permitted biologist.
2. Potential for burrowing owl; however no additional permits required beyond CEQA and NEPA certification
3. Crossings required at or parallel to potential waters of the U. S.

Note: (L) – Low; (M) Moderate); (H) High

Findings and Recommendations

Alternative B-2 would entail the least level of impact to biological resources based on its use of the existing roadway network. As provided in Table 1, each of the rail alternatives would entail the potential for adverse impacts to habitat with potential to support rare plant and wildlife species and the federally endangered Delhi sands flower-loving fly, if present, along with potential impacts to waters of the U.S. Alternatives A-3, A-4, A-7 and C-5 could require formal consultation with USFWS under Section 7 of the endangered Species Act for potential effects to Delhi sands flower-loving fly if surveys identified the species within the impact footprint. Based on the findings of this evaluation, the following is recommended for the alternatives selected for further consideration:

1. Delineation of preliminary construction limits (footprint) for each alternative selected for further consideration (Alternatives A-3, A-4, A-7, B-2, D-1, and C-5);

2. Completion of general biological survey and focused surveys (as appropriate) for special status plant and wildlife species (e.g. Delhi sands flower-loving fly and burrowing owl) (Alternatives A-3, A-4, A-7, B-2, D-1, and C-5);

    - If undeveloped lands mapped as Delhi sands occur within the project footprint, Delhi sands flower-loving fly surveys will likely be required. These surveys must be conducted by a permitted biologist over a two year period during the active season for the species (August 1st through September 20)
    - Rare plants surveys must occur during the blooming period for the target species (Generally February through July)
    - Breeding season surveys for burrowing owl require 4 survey visits: 1) at least one site visit between 15 February and 15 April, and 2) a minimum of three survey visits, at least three weeks apart, between 15 April and 15 July, with at least one visit after 15 June.

3. Completion of a wetland delineation and jurisdictional determination (Alternatives A-3, A-4, A-7, D-1, and C-5); and,

4. Avoidance of undisturbed Delhi fine sands, if present, within the Delhi sands flower-loving fly Recovery Unit (Alternatives A-3, A-4, A-7 and C-5).

Based on the findings of a general biological survey and, if necessary, focused surveys for the alternative alignments carried forward for further consideration, additional species- or resource-specific mitigation measures would be identified.

3. Cultural and Historic Resources

Data Sources/Methods

Historic and cultural (or archaeological) resources are known to occur within the project area. To determine if one or more of these resources occur with the primary study area for each of the alternative alignments, HDR completed a review of the General Plans and supporting environmental impacts reports (EIR) for the Cities of Ontario, Rancho Cucamonga, and Upland. In addition, the National Park Service's, National Register of Historic Places (NRHP) Program Spatial Data was reviewed to determine if any NRHP-listed sites occurred within or in close proximity of the secondary study area for each alternative.

Alternatives Evaluation

Historical Resources. Based on the data sources reviewed, no historical resources listed on the NRHP are located adjacent to or within the primary study area for the alternatives under consideration[2]. The nearest NRHP-listed site is the Hofer Ranch (listed 1993), which is located to the south of the Ontario Airport and outside the project area. Similarly, no California Points of Historical Interest are located within or adjacent to the primary study areas for the alternatives. Below is a summary of the cultural resource sensitivity for each city based on the National Park's database and information contained in the corresponding General Plan.

- *City of Upland*. The City of Upland's General Plan has not been updated since 1992; however, the City adopted a Historic Downtown Upland Specific Plan in 2011. As shown in Figure 2, there are two designated historic districts in the vicinity of the Metrolink Upland Station, which are contained a larger Historic Preservation Overlay Zone. These historic districts include the Euclid Avenue Corridor and the Citrus Transportation Historic District. According to the Specific Plan, the City's Local Register identifies 154 structures with potential National, State, or Local historic significance located within the Historic Preservation Overlay Zone. The western extent of Alternatives A-7 and D-1 (west of Campus Avenue) extends into the eastern portion of the overlay zone.

- *City of Rancho Cucamonga*. Rancho Cucamonga's General Plan (2010) and EIR, Exhibit 4.6-1, illustrates designated historic sites and neighborhood character areas throughout the city. The General Plan identifies the Northtown neighborhood character area to the north and south of the Burlington Northern Santa Fe Railroad (San Gabriel) in the vicinity of Alternatives A-3, A-4, and C-5 (see Figures 4 and 5). According to the General Plan, this neighborhood character area contains one historical landmark (Our Lady of Mount Carmel Church located at 10079 8th Street, Rancho Cucamonga), one California point of historical interest along the railway, and one additional California point of historical interest located in the vicinity of 6th Street and Archibald Avenue.

[2] Note that this determination does not negate the potential for NRHP eligible properties to occur within the primary study area pending the completion of site-specific cultural resources surveys.

Figure 2 – Environmental Resources – Sheet 1

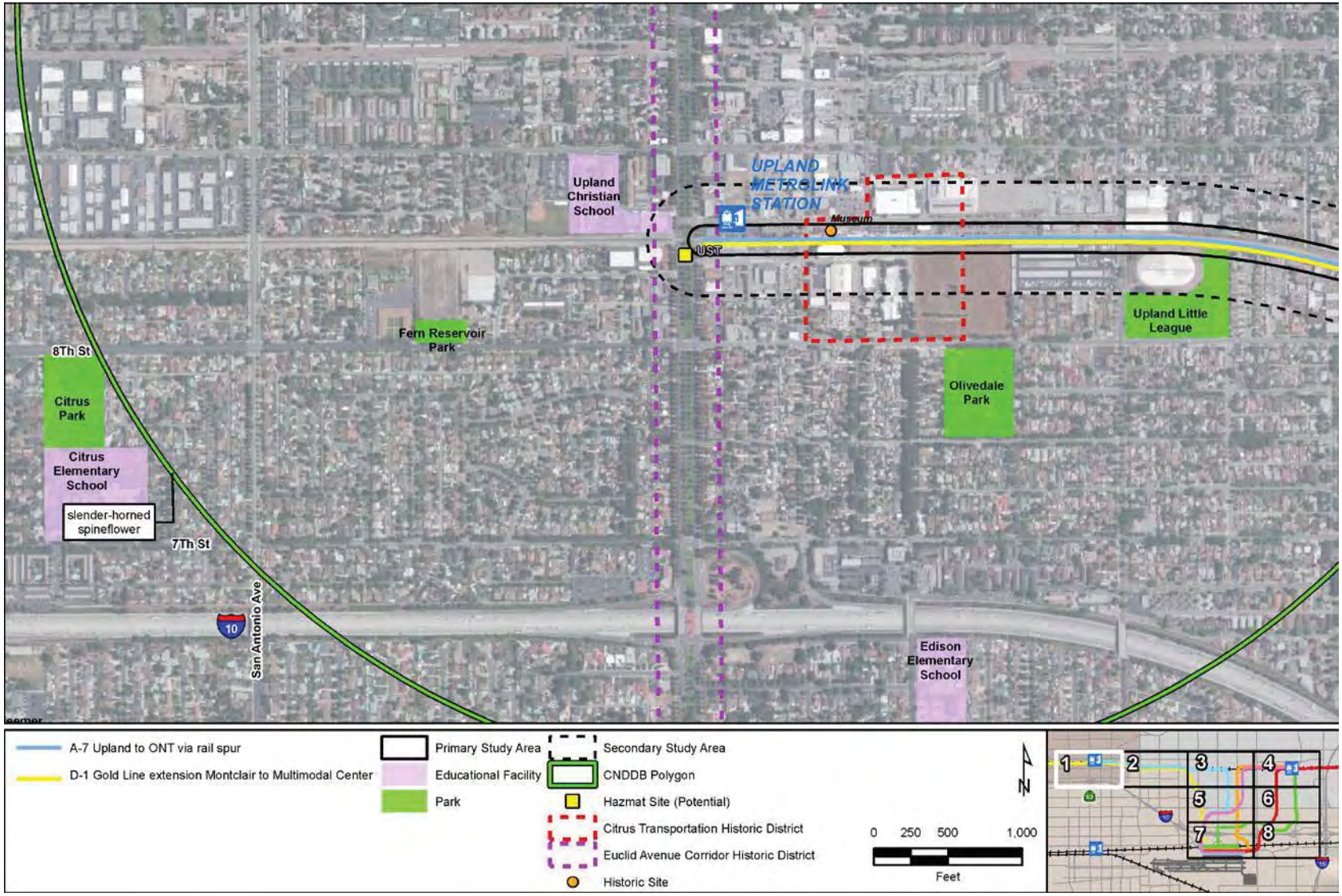


Figure 3 – Environmental Resources – Sheet 2

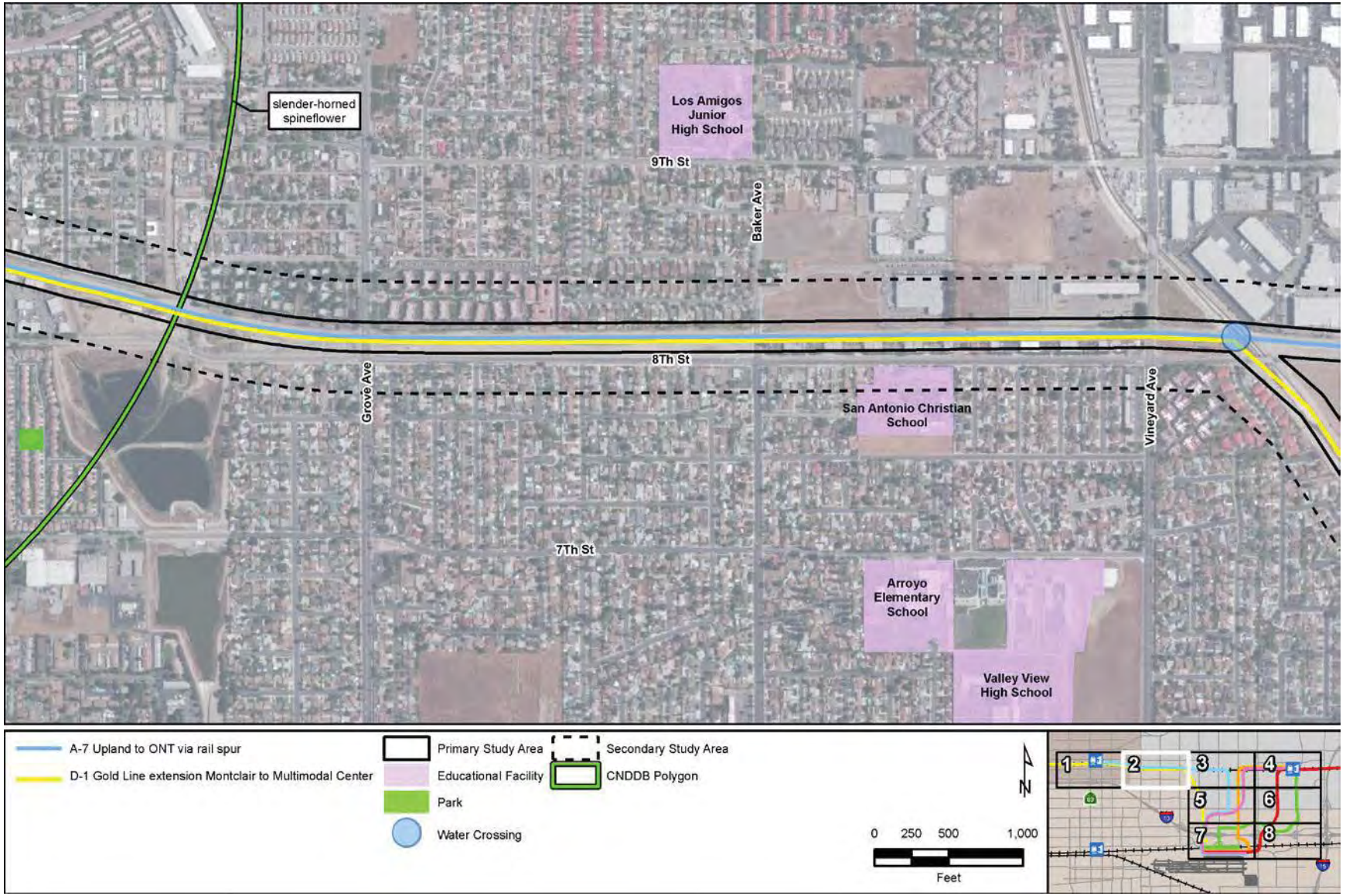


Figure 4 – Environmental Resources – Sheet 3

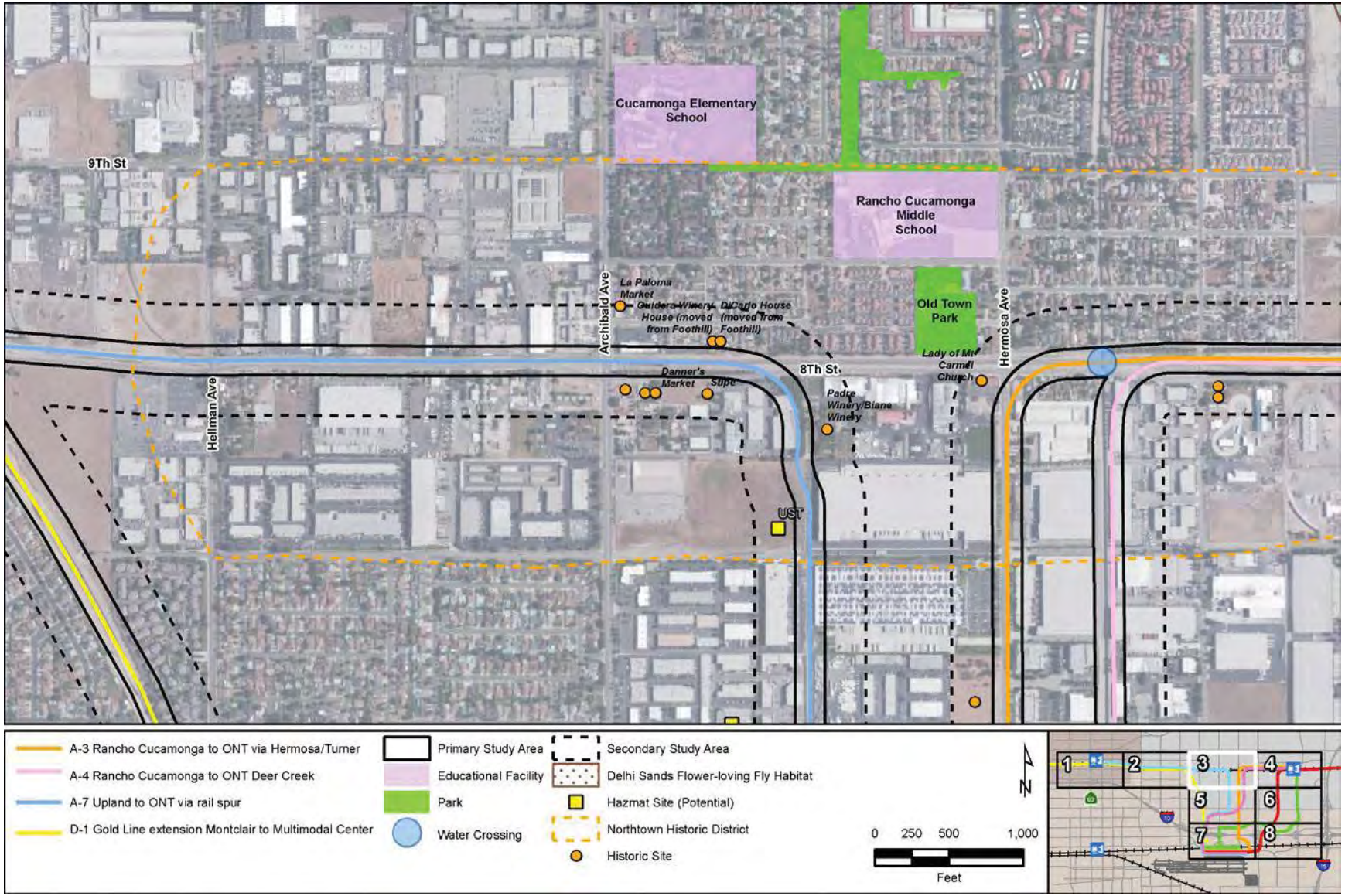


Figure 5 – Environmental Resources – Sheet 4

Figure 6 – Environmental Resources – Sheet 5

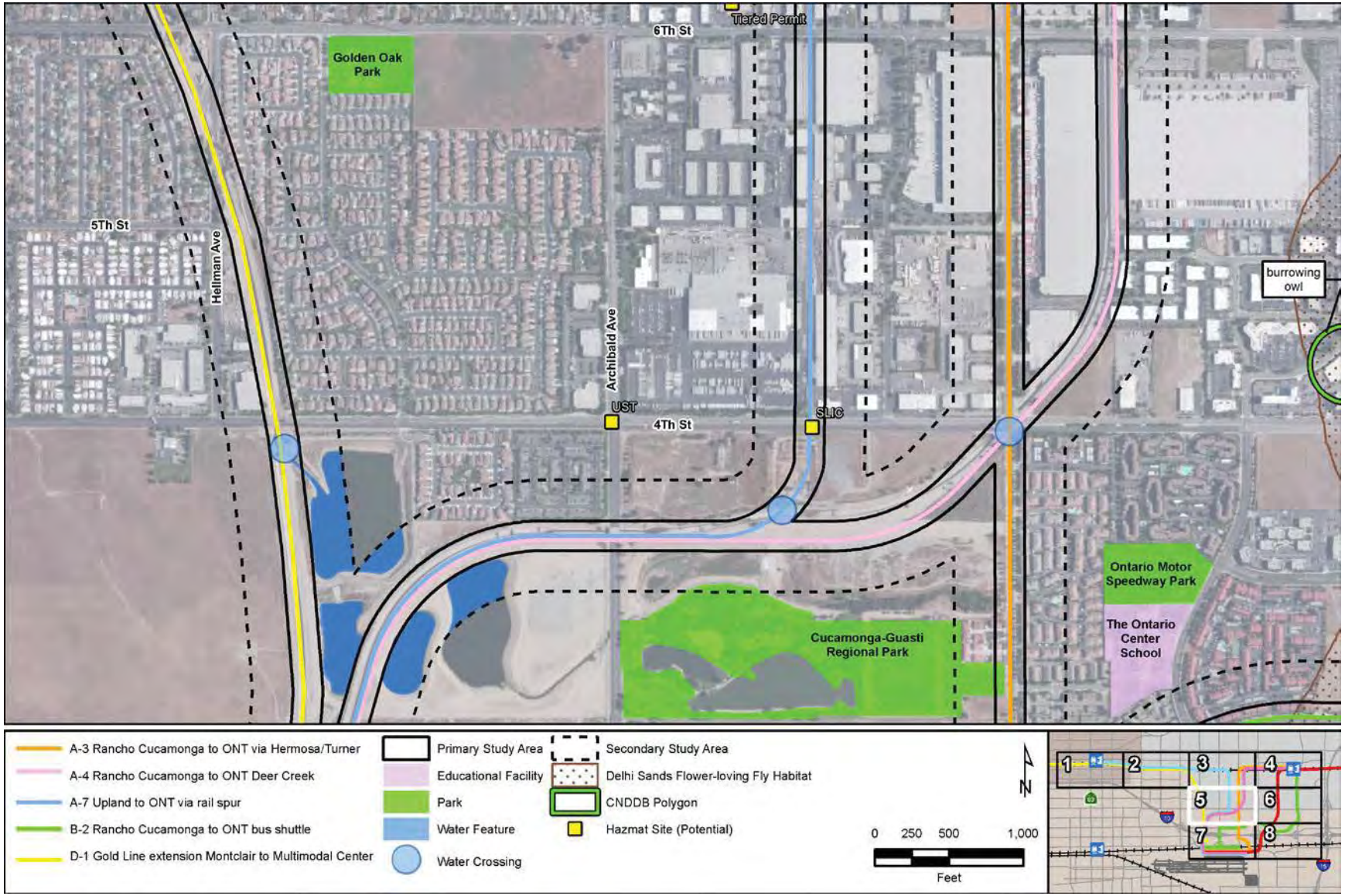


Figure 7 – Environmental Resources – Sheet 6

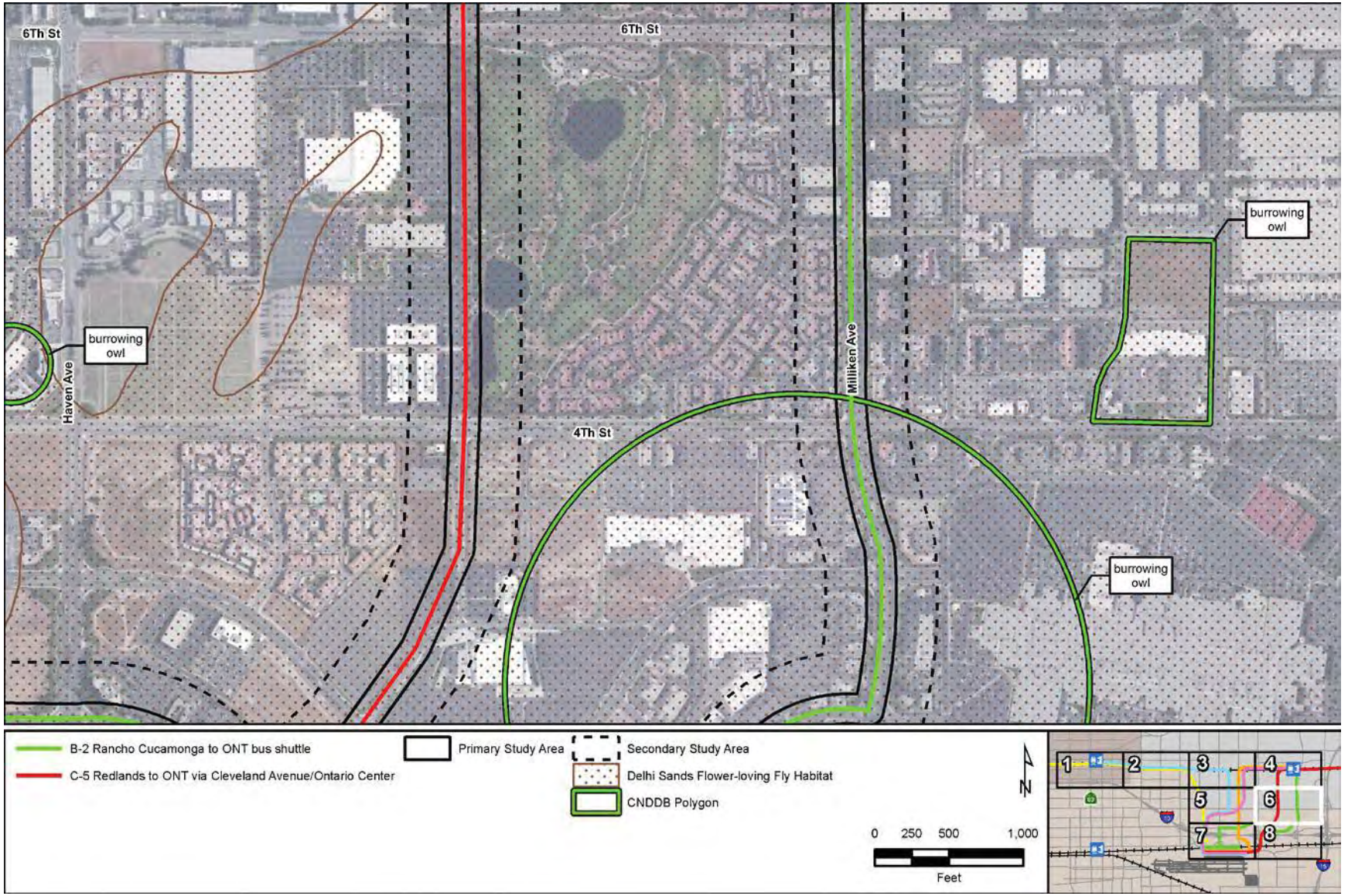


Figure 8 – Environmental Resources – Sheet 7

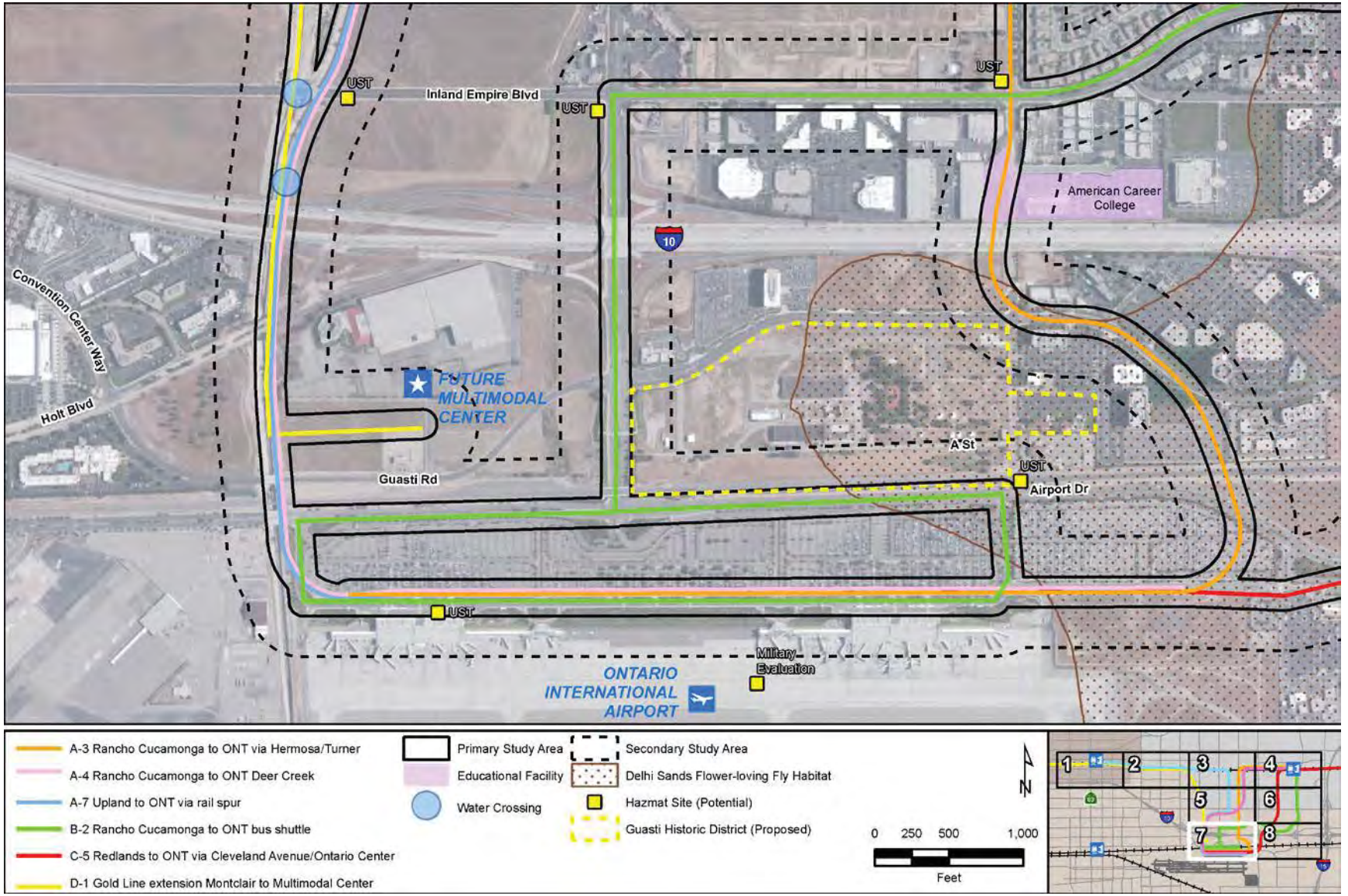


Figure 9 – Environmental Resources – Sheet 8

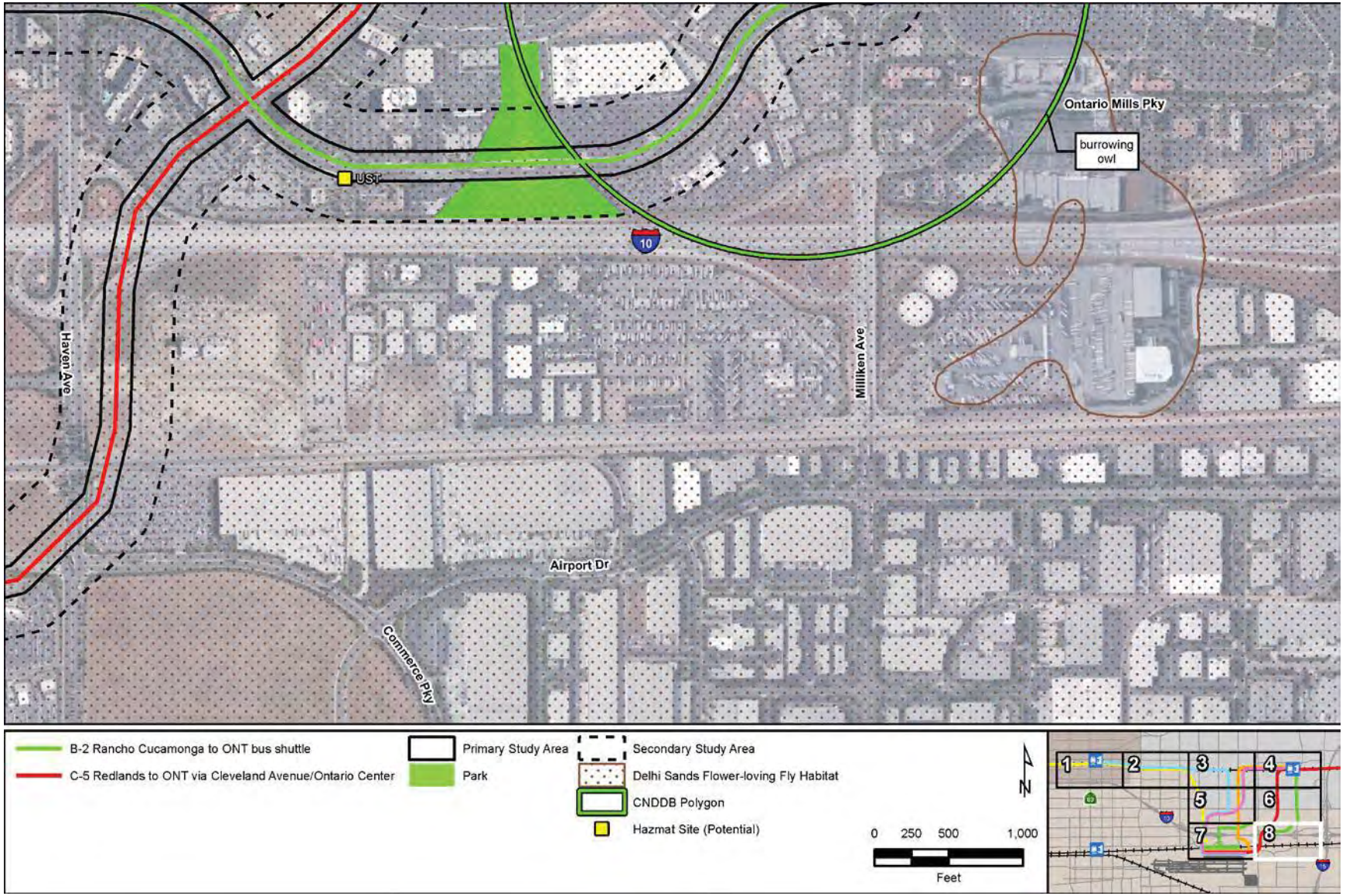
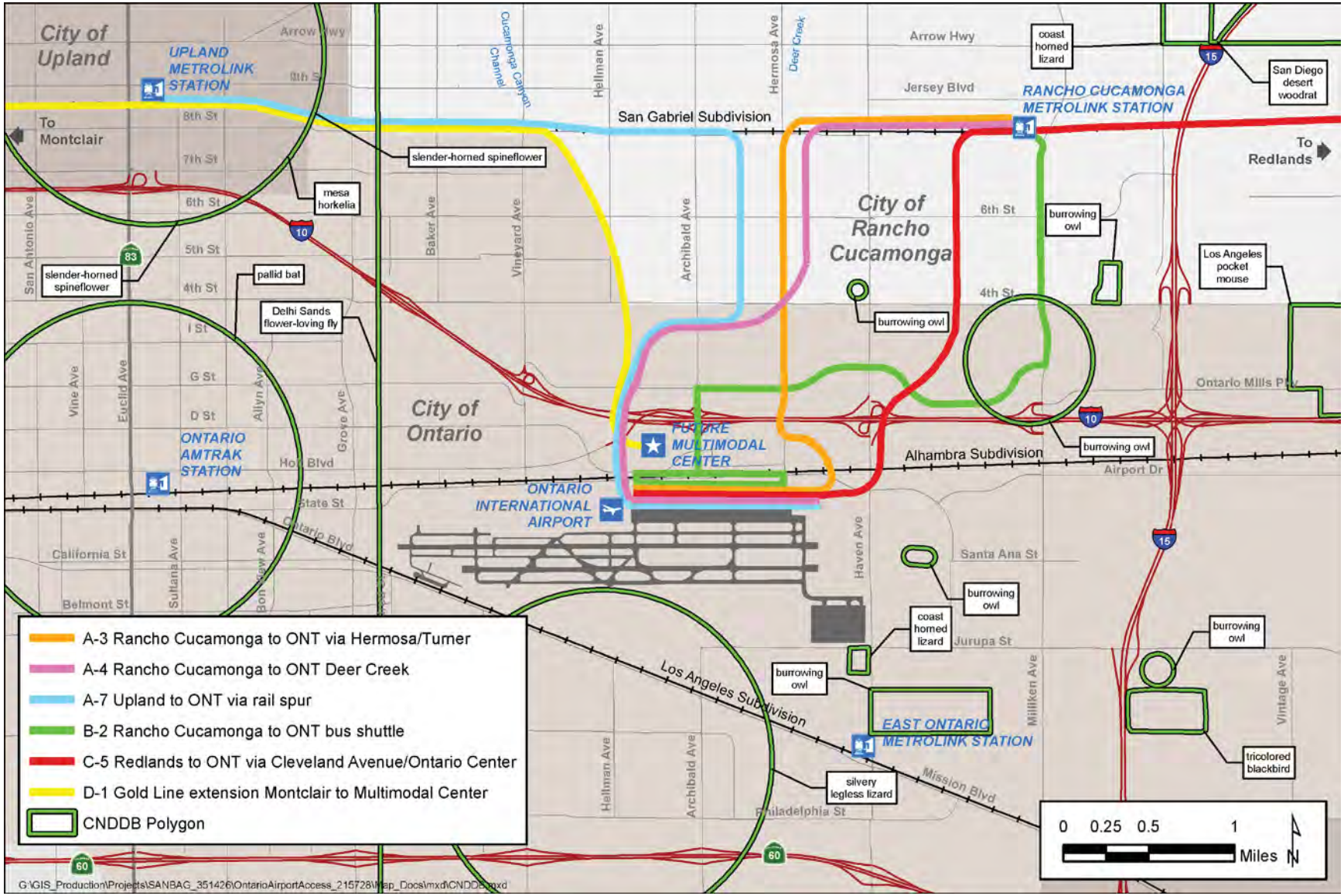


Figure 9 – CNDDB Results



- *City of Ontario*. The City of Ontario's General Plan (1992)[3] includes designated historic districts and historic landmarks. Based on a review of the General Plan, no designated historic districts are located in the project area. The existing designated historic districts are located further west in the vicinity of Euclid Avenue and beyond the limits of the primary study area for each of the alternatives. However, the City is in the process of updating its General Plan (2008), which identifies a proposed historic district (Guasti) just north of Airport Road and east of Archibald Avenue (see Figure 8). This proposed district is bordered by all of the alternatives under consideration near their southerly terminus. Additionally, the San Secondo d'Asti Catholic Church (historical landmark) is located just east of the proposed historic district at 250 N Turner Avenue.

Archaeological Resources. The records review conducted in support of the General Plan EIR (2008) for Ontario indicates that no known prehistoric archaeological resources have been identified in the City of Ontario, but only about 10 percent of the City has been adequately surveyed for prehistoric or historic archaeology. The records search indicated that several villages or native sites spread across Ontario in addition to remnant trails and waterways. Based on these conditions, there is a high potential for discovery of historical archaeology and ethnic sites in un-surveyed portions of the project area.

Table 2 provides a summary of the cultural resource constraints for each of the alternative alignments under consideration. As shown, the level of constraint is qualitatively rated as low, moderate, or high. A "high" rating for an alternative corresponds with a high probability for SHPO involvement, likelihood for directly affecting one or more resources, and/or increased resource evaluation and mitigation costs. A low or moderate rating indicates a lower probability for encountering resources and/or increased resource evaluation costs.

Table 2. Historic and Cultural Resource Constraints

Issue/Constraint	ALTERNATIVES					
	A-3	A-4	A-7	B-2	C-5	D-1
Historical Resources	H[1]	H[1]	H[2]	L[3]	M[2]	H[2]
Archaeological Resources	L[3]	M[4]	M[4]	L[3]	H[4]	L[3]

1. Potential resources located within primary study area.
2. Potential resources located within secondary study area.
3. Use of existing paved surfaces (e.g. roadways and concrete-channels).
4. Traverses undeveloped areas that could contain undiscovered resources.

Note: (L) – Low; (M) Moderate); (H) High

Findings and Recommendations

Due to the sensitive nature of cultural resources, publically available data is generally limited and a formal records search request through the California Information Center is required. A search request will require the development of an area of potential effect (APE) that captures both the direct and indirect affect area for the alternatives selected for further evaluation. If federal funding or approvals are involved, the development of the APE would require consultation with and approval from the California State Historic Preservation Officer (SHPO). Additionally, coordination with local tribes would also be necessary. Once an APE is established, a detailed field archaeological and architectural survey would be required to determine if any undocumented resources exist. Based on the results of this evaluation, each of the alternatives (with the possible exception of B-2) carries a potential to directly or indirectly affect both documented historical resources along with other undocumented

[3] Note: Ontario's Housing Element was adopted in 2001 and the New Model Community (NMC) Sphere of Influence General Plan Amendment was adopted in 1998.

historical and archaeological resources. For this reason, the following recommendations are proposed for each of the alignments selected for further consideration:

- Establish an APE for each of the alternatives alignments selected for further consideration and, if federal agency approvals or funding are contemplated, seek concurrence from SHPO. In parallel, determine if any station planning would require amendments to existing general plan land use designations, which could trigger consultation requirements under Senate Bill (SB) 18.

- Complete archival records search will include the cultural resource databases housed with the South Central Coastal Information Center (SCCIC), the Sacred Lands File (SLF) kept with the Native American Heritage Commission, the BLM's General Land Office (GLO) records, and any available historic aerial imagery and documents for the alternative alignments

- Complete a Phase 1 archaeological survey for the APE following the Secretary of the Interior's (SOI) Standards and Guidelines for Archaeology and Historic Preservation (48FR 44716, September 29, 1983).

- If warranted based on the findings of the Phase 1 survey, complete archaeological testing including an extended Phase I and Phase II significance evaluation.

- Comply with local regulations when completing any required resource evaluations (e.g. Ordinances 2758 and 2789 for the City of Ontario).

Based on the findings of the cultural resources records search and field survey, additional avoidance, minimization, or mitigation measures would be identified.

4. Noise and Vibration

Data Sources/Methods

Noise assessment criteria developed by the Federal Transit Administration (FTA) were utilized to identify land uses that have the potential to be impacted by construction and operational-related noise potentially generated by the alternatives under consideration. Considering that the transit mode has not been determined at this time (except Alternatives B-2 and D-1), the FTA guidelines were used to identify screening distances for bus rapid transit (BRT), Diesel Multiple Unit (DMU) and light rail transit (LRT), and commuter rail modes in this analysis. DMU is not included in the FTA guidance manual, however, based upon available information on the nature of DMU noise, the DMU effects are assumed to be equivalent to that of the LRT. Below are the buffer distances (as defined by FTA) used for each model type to determine the potential sensitive receptors that may be impacted by the construction and operation of the alternatives under consideration:

- BRT: the primary study area (or a 200-foot corridor) was applied as the screening distance (Alterative B-2 only);
- DMU and LRT: a 175-foot buffer (or 350-foot corridor) was applied as the screening distance; and
- Commuter Rail: the secondary study area (or 375-foot buffer) was applied as the screening distance.

It should be noted that the use of the screening distances is a conservative approach because the FTA screening methodology assumes worst-case conditions. Once the project is further refined and a more detailed

analysis of the selected alignment(s) is conducted, the analysis would likely result in fewer receptors being impacted.

Ground borne vibration typically decreases with distance from the source at a greater rate than airborne vibration (i.e., noise), therefore, the analysis for noise is conservatively used as the determinant of potential vibration impacts for purposes of this analysis. The actual impacts associated with vibration impacts would ultimately affect fewer adjacent uses relative to noise.

To identify sensitive land uses along each of the alternative alignments, land use information in GIS was obtained from SANBAG (2011). For the purposes of this evaluation, sensitive land uses include residential development of various types (e.g. low- and high-density single-family, apartments and condominiums, and mobile homes), parks (including golf courses), hotels and motels, educational institutions, churches, and day-care and special care facilities. Figure 11 illustrates the sensitive land uses identified in the project area based on this classification scheme.

Alternatives Evaluation

Table 3 provides the number of sensitive receptors that could be potentially affected by the six alternatives under consideration based on FTA's screening distances. Alternative 2-B would introduce bus transit service on existing roadways and, therefore, is not expected to generate substantial increases in noise beyond ambient conditions. Additionally, a minimal number of sensitive receptors would be exposed to any nominal increase as a result of bus operations. For those alternatives that would introduce new rail service, the extent of potential noise impacts will largely be contingent on the vehicle technology. As shown in Table 3, in all cases the commuter rail locomotive would impact the greatest number of sensitive receptors for each alignment. However, regardless of the vehicle technology, Alternative A-4 had the fewest impact receptors; whereas, Alternative A-7 had the greatest amount of impacts to sensitive receptors. Alternative C-5 has the fewest number of sensitive receptors impacted.

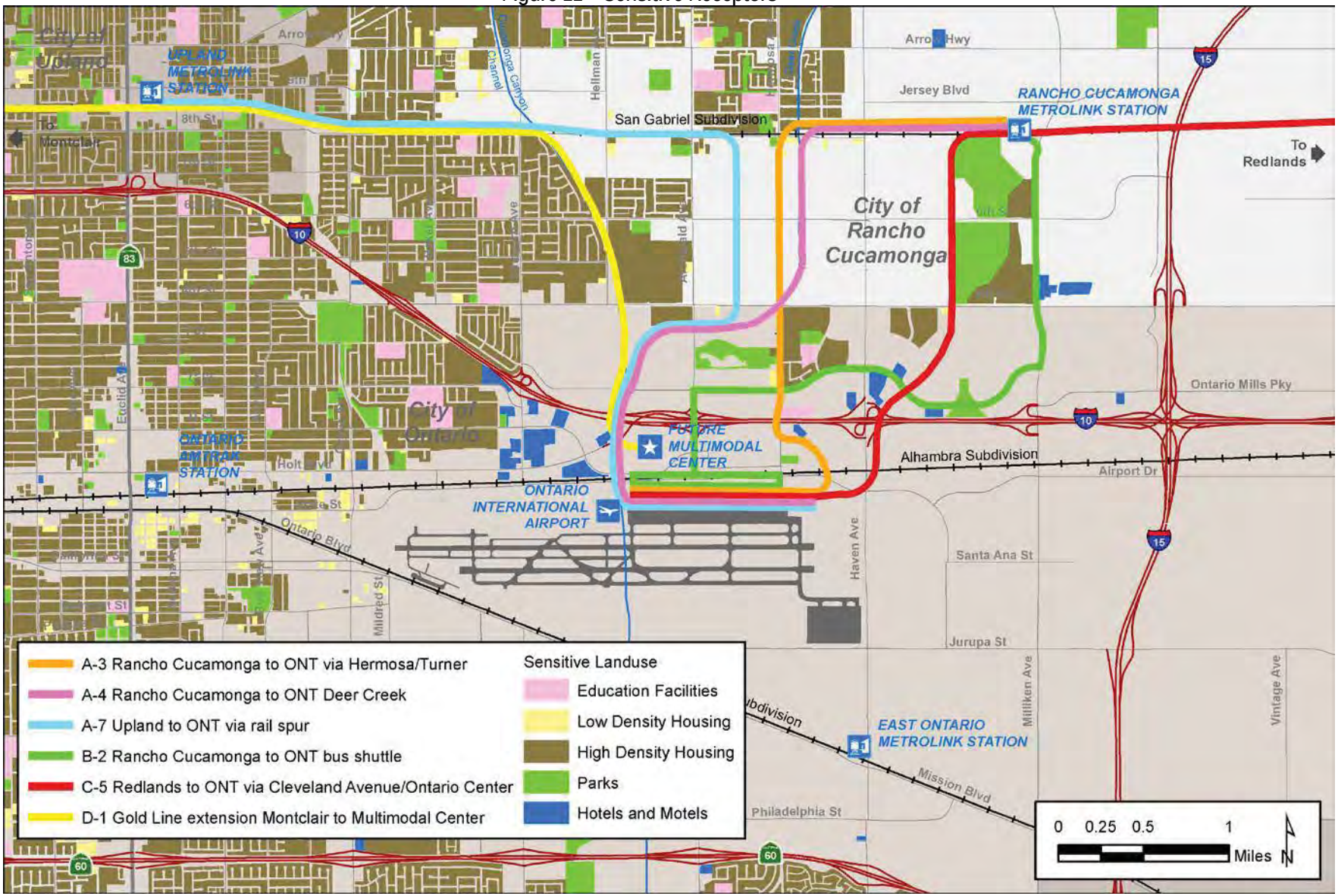
Table 3. Sensitive Land Uses Affected by Modal Types

Vehicle Technology Type	ALTERNATIVES					
	A-3	A-4	A-7	B-2	C-5	D-1
BRT (100-foot Buffer)[1]	N/A	N/A	N/A	16	N/A	N/A
DMU and LRT (175-foot Buffer)[1]	55	19	59	N/A	11	57
Commuter Rail (375-foot Buffer)[1]	87	39	139	N/A	21	N/A

1. Values based on number of parcels within the screening distance and not actual number of dwelling units. Hence, the number of dwelling units could be considerably higher.

Note: Screening distances from FTA's Noise and Vibration Manual (2006)

Figure 11 – Sensitive Receptors



Findings and Recommendations

Based on the screening assessment, the use of LRT or DMU vehicle technologies (except B-3) would generally reduce the number of sensitive receptors affected by approximately one-half when compared to a commuter rail locomotive. Alternatives A-4 and C-5 contain the fewest number of sensitive receptors within each of the specified screening distances. As shown in Figure 11, Alternatives A-7 and D-1 traverse through the greatest concentration of high density residential uses and, therefore, issues related to environmental justice should be investigated further if either of these alternatives are selected for further consideration. Pending the selection of alternatives for further consideration, a project-specific noise and vibration study is recommended for each alternative to quantify potential noise and vibration impacts. This study would include the collection of ambient noise data for multiple receptor locations to better characterize the severity of potential noise impacts. Depending on the vehicle technology selected and the placement of the route, mitigation measures in areas with identified sensitive receptors may include, but are not limited to, establishing quiet zones at grade crossings, constructing noise barriers, installing rail lubricators, or installing other noise-absorptive technologies.

5. Hazards and Hazardous Materials

Data Sources/Methods

The alternative alignments were assessed for their potential to encounter documented hazardous materials sites. A high level assessment was completed by reviewing the California Department of Toxic Substances Control (DTSC) EnviroStor database (2014) to identify sites of concern located in the vicinity of the six alternatives. The secondary study area for each of the alternative was used as the screening area to identify potential sites of concern.

Alternatives Evaluation

The analysis identified seven sites of concern (one active, three inactive, one open, one closed, and one with land use restrictions) located in the vicinity of the project area (see Table 4). The project area, with the exception of areas west of Archibald Avenue, is generally dominated by industrial and light industrial uses and contains a high number of metal manufacturing and/or metal plating businesses. Additionally, the Ontario International Airport was previously used as a military airfield and contains multiple sites within the EnviroStor database. Multiple documented leaking underground storage tank (LUST) sites and Spills, Leaks, Investigation, and Cleanup (SLIC) sites are also documented within the project area (see Figures 2 through 9). Table 4 presents the major sites of concern, the associated clean-up status of the site, site of concern address, and the approximate distance from the corresponding alternative, and a description of the hazardous issue.

Table 4. Identified Potential Hazardous Sites of Concern (Hazards)

Site of Concern	EnvrioStor Identification Number	Clean Up Status	Site of Concern Address	Approximate Distance from Alternative Affected	Hazardous Issue
Hellman Elementary School	36010033	Inactive – Needs Evaluation as of 6/29/2000	6th Street and Hellman Avenue	Located approximately 300 feet east of Alternative D-1.	The site type is identified as a school, however, no school is currently located in this area. The site is listed as containing; historic agricultural chemical use, an abandoned 200-gallon underground storage tank, stained soils, and lead.

San Bernardino Ontario Army Airfield	80000880	Inactive – Needs Evaluation as of 7/1/2005	Covers an area of 875.5 acres west of Archibald Avenue and sections south of Mission Blvd. between Grove Street and Turner Street.	Located south of and adjacent to the six Project Alternatives.	This site has potential lead contamination and previous explosives use.
GE Engine Service, Inc. / Ontario International Airport.	CAD 0089542721	Closed	East Airport Drive	Located south of and adjacent to all of the six Project Alternatives.	This site was a commercial and military jet engine test facility. The area was remediated in 1998 with acceptable levels of volatile organic compounds (VOCs). The latest cleanup activity was dated 8/28/2006, however, the content of the documentation was not available for review, therefore could not be confirmed.
General Electric (GE) Engine Services Test Cell Facility	36370024	Open	East Avion Street	Located over a large area and could affect all six Project Alternatives.	The Department of Toxic Substances Control (DTSC) recommended on 10/24/2013 to the Regional Water Quality Control Board (RWQCB) to hold their decision on the clean-up data status to confirm soil vapor probe data. The data was to assess whether VOCs are migrating from soil to groundwater. At the RWQCB's request, GE is currently preparing a work plan to install additional groundwater wells and soil vapor probes. The work plan approval was expected to be by the end of 2013.
The Hartwell Corporation	71002496	Active	9810 6th Street	Located approximately 300 feet east of Alternative A-7, and 1,600 feet west of Alternative A-3.	This site is listed as open. The site was the location of an aluminum hinge and latch manufacturer. The site has potential for trichloroethylene, cadmium, and VOCs contamination. In addition, groundwater is contaminated.
Robert Manufacturing Company	71002214 80001573	Inactive, needs evaluation as of 11/10/2010	10667 Jersey Blvd.	Site is located approximately 680 feet north of Alternative C-5.	This site previously manufactured plumbing supplies and valves. In 1994, the site was listed to contain an inactive hazardous waste underground storage tank (of unknown origin) and container unit at the facility. No further documentation was available on the EnviroStor website.
Metal Coaters of California	71003778	Certified Operations and Maintenance. Land use restrictions as of 2/14/12.	9133 Center Avenue	Site is located approximately 600 feet east of Alternative A-4.	This site was identified for metals, VOCs, corrosives, petroleum hydrocarbons and SVOCs in the soil. The site was later determined to have low levels of VOCs, however, the site has a land use restriction associated with the parcel.

Source: EnviroStor Database

Findings and Recommendations

According to the EnviroStor database, multiple LUST and SLIC sites are documented in the southern portion of the project area and concentrated along Airport Road and Archibald Avenue (see Figures 6, 7, and 8). Additionally, there are metal manufacturers in close proximity to the alignments for Alternatives A-3, A-4, and C-5 (see Figure 4). These sites are considered active, in need of further evaluation, or have documented land use restrictions. In addition, the Ontario Airport has open and inactive sites that have lead and VOCs contamination in the soil and groundwater. These sources of soil or groundwater contamination could extend beyond the limits of the airport and into the southern portion of the project area pending further investigation.

Following the selection of one or more of the alternative alignments for further consideration, further database research and field investigation would be required to assess the known sites of concern along with identifying other potentially undocumented sources of hazardous materials. A Phase I Environmental Site Assessment following American Society of Testing and Materials (ASTM) procedures should be conducted for the alternatives selected for further consideration to verify the accuracy of the site information provided through EnviroStor (2014) and to document actual conditions on the ground. The results of the Phase I ESA will determine whether a Phase II Preliminary Site Investigation (e.g. drilling and sampling) would be required, as appropriate, for one or more of the alignments.

6. Criteria Air Pollutants and Greenhouse Gases

Data Sources/Methods

The alternative alignments are contained within the South Coast Air Basin (SCAB) in the southwestern corner of San Bernardino County. The South Coast Air Quality Management District (SCAQMD) is the agency responsible for attaining state and federal clean air standards in the SCAB. For the purposes of this constraints level analysis, the area studied for air quality consists of two components: a regional component and a local component. The regional component consists of the SCAB, which is an area covering approximately bounded by the Pacific Ocean to the west and south and the San Gabriel, San Bernardino, and San Jacinto Mountains to the north and east. The local component consists of a ¼ mile corridor for the six alternative alignments under consideration. Source materials reviewed as part of this evaluation included the SCAQMD's Air Quality Handbook, SCAG's regional transportation plan (RTP), and air quality data summaries provided by the California Air Resource Board (CARB).

Alternatives Evaluation

Under the 1990 Clean Air Act (CAA), the U.S. Department of Transportation (DOT) cannot fund, authorize, or approve federal actions to support programs or projects that are not first found to conform to the State Implementation Plan (SIP) for achieving the goals of the CAA requirements. Transportation conformity procedures require more detailed analysis for transportation projects than those required for non-transportation projects receiving Federal funds or approval. In order to have transportation conformity, a project must be included in SCAG's RTP and Transportation Improvement Program (TIP), known as the Federal Transportation Improvement Program (FTIP). The project is not currently identified in SCAG's adopted RTP (2012) or FTIP (2013).

The SCAB region suffers from periods of poor air quality and exceeds National Ambient Air Quality Standards (NAAQS) for multiple criteria air pollutants. More specifically, the SCAB is designated "extreme nonattainment" for ozone, "serious nonattainment" for particulate matter (less than 10 microns; PM10), "nonattainment" for PM2.5, and "serious maintenance" for CO (see Table 5). Based on this attainment status, the air pollutants of greatest concern in San Bernardino County are O3 and PM10 and a conformity determination will be required as operational details become better known.

Table 5. Federal and State Attainment Status for SCAB (San Bernardino County)

Pollutant	Federal Classification	State Classification
O_3 (1-hour standard)	--	Nonattainment
O_3 (8-hour standard)	Extreme Nonattainment	--
PM_{10}	Serious Nonattainment	Nonattainment
$PM_{2.5}$	Nonattainment	Nonattainment
CO	Serious Maintenance	Attainment
NO_2	Unclassified/Attainment	Nonattainment
SO_2	Attainment	Attainment
PB	Attainment*	Attainment

Source: CARB 2014

Construction of any of the Alternatives A-3, A-4, A-7, C-5, and D-1 would have the potential to create air quality impacts through the use of heavy-duty construction equipment, construction worker vehicle trips, material delivery trips, and heavy-duty haul truck trips generated from construction activities. Alternative B-2 would not require the construction of any new infrastructure because the proposed bus shuttle route would utilize existing Omnitrans bus stops. Once constructed, all the alternatives would likely have a net beneficial air quality effect with the quantity of benefit contingent on the vehicle technology selected and ridership. Regional air quality would improve, as the modal shift from passenger vehicles to transit would reduce basin-wide criteria pollutant emissions associated with automobile exhaust.

Findings and Recommendations

Several potential mitigation strategies for the reduction of air quality emissions exist, including (but not limited to) newer, more fuel efficient technologies, emissions capture technologies, and reducing idling time. The implementation of any proposed alternative (regardless of mode) is anticipated to improve regional air quality as commuters chose passenger service instead of individual automobiles as their method of travel. Further quantification of actual emissions would be required during the project environmental review stage to determine whether regional and localized sources of emissions resulting from the project would be compensated by regional reductions in pollutants from decreased vehicle miles traveled (VMT). This would be further analyzed once an alternative is ultimately selected for further study and the associated ridership determined. Additionally, the project should be added to a future version of SCAG's FTIP and RTP to facilitate a future transportation conformity determination.

7. Recreational Resources

Data Sources/Methods

As passed by Congress in 1966, Section 4(f) declares a national policy "to preserve the natural beauty of the countryside and public park and recreation lands, wildlife and waterfowl refuges, and historic sites." Under Section 4(f), the Federal Highway Administration and other USDOT agencies cannot approve a transportation program or project that requires the use of any publicly owned land from a significant public park, recreation area, or wildlife and waterfowl refuge, or any land from a significant historic site, unless a determination is made that:

- There is no prudent and feasible alternative to using that land; and
- The program or project includes all possible planning to minimize harm to the park, recreation area, wildlife and waterfowl refuge, or historic site resulting from the use.

To determine the potential direct and indirect effects to recreational resources, park and recreational resources within a quarter mile buffer of the project area were identified. Resources, such as public parks, trails, and public

golf courses were inventoried within the cities of Ontario, Upland, and Rancho Cucamonga. Recreation areas and trails were identified through a review of each city's General Plan along with a review of local aerial photography and websites for the cities of Ontario, Upland, and Rancho Cucamonga.

Alternatives Evaluation

Parks. Major park facilities within the project area include the 144-acre Empire Lakes Golf Course in Rancho Cucamonga and the 150-acre Cucamonga-Guasti Regional Park in Ontario, which is owned and maintained by the County of San Bernardino (see Figure 5). Table 6 provides parks and recreation facilities in the cities of Rancho Cucamonga, Ontario, and Upland that are within a quarter-mile buffer of the study area. Alternatives A-4 and A-7 traverse Cucamonga-Guasti Regional Park; while Alternative A-3 directly abuts the park on the west. The 144-acre Empire Lakes Golf Course is located directly adjacent to Alternative C-5, which traverses the northwest portion of the golf course (see Figure 4). Alternative A-4 could also impact the golf course because it is directly adjacent to the property.

Table 6. Park and Recreational Facilities within the Study Area

Park/Recreational Facility	Classification	Jurisdiction	Approximate Distance from Alternative(s)
Cucamonga-Guasti Regional park	Regional Park	County of San Bernardino	• Alternatives A-4 and A-7 traverses property • Alternative A-3 directly adjacent to property • 0.13 miles from Alternative B-2
Ontario Motor Speedway Park	Neighborhood Park	City of Ontario	• 0.12 miles from Alternative A-3
Old Town Park	Neighborhood Park	City of Rancho Cucamonga	• 0.08 miles from Alternative A-3
Empire Lakes Golf Course	Recreational Facility	Private	• Alternative C-5 directly adjacent to property and traverses northwest portion of property • Alternative A-4 directly adjacent to property • 0.08 miles from Alternative B-2
8th Street Reservoir Park	Neighborhood Park	City of Upland	• 0.06 miles from Alternative A-7
Olivedale Park	Neighborhood Park	City of Upland	• 0.14 miles from Alternative A-7
Cucamonga Creek Multipurpose Trail	Trail (Public right-of-Way)	Cities of Ontario and Rancho Cucamonga	• Intersects Alternatives A-4, A-7, and D-1.
Deer Creek Trail (Planned)	Class 1 Bike Trail (Future)	City of Rancho Cucamonga	• Intersects Alternatives A-3 and A-4

Trails. Designated bicycle routes and/or trails are located within a quarter-mile buffer of the project routes along Deer Creek and Cucamonga Creek drainage channels. Within the City of Ontario, designated bicycle routes within a quarter-mile buffer of the study area include a Class II bicycle lane along Inland Empire Boulevard and a bicycle corridor along Haven Avenue. Alternative A-4 follows the alignment of Deer Creek and Alternative D-1 follows the alignment of the Cucamonga Channel, which is used as a multipurpose trail.

Findings and Recommendations

Local parks and trails are both sensitive receptors and resources that are afforded protection under Section 4(f) of the USDOT Act. There are four facilities that could potentially be impacted by the alternatives: Cucamonga-Guasti Regional Park, Empire Lakes Golf Course, Cucamonga Creek Multipurpose Trail, and Deer Creek drainage channel. Alternatives A-3, A-4, A-7, C-5, and D-2 would each require further evaluation of potential impacts to 4(f) properties, if NEPA documentation is ultimately required. Potential direct and indirect impacts to

nearby trails would need to be evaluated as well in order to maintain accessibility during and following construction.

8. Traffic/Circulation

Data Sources/Methods

The project alternatives were assessed for the potential to result in transportation and circulation impacts due to the construction and/or operation of the project. To assess the operational effects of the potential rail service, a grade crossing warrant analysis was completed following criteria provided by the California Public Utilities Commission (CPUC). Existing roadway operating conditions were assessed by reviewing SANBAG's Congestion Management Plan for San Bernardino County, the City of Rancho Cucamonga 2010 General Plan Update Draft Program EIR, the City of Upland Downtown Specific Plan (2010), and the Ontario General Plan Draft Environmental Impact Report (EIR) (2008). Roadway operating conditions were limited to the secondary study area for the alternative alignments under consideration.

Alternatives Evaluation

Each of the alternatives under consideration (except B-2) would result in two major affects to traffic and circulation: (1) potential increased traffic congestion; and, (2) interruption or alteration of existing transit service. The affects of the alternatives to local traffic congestion will largely be dictated by which roadway crossings are grade-separated or at-grade. In this context, the locations where project-related impacts to existing traffic congestion would correspond to the locations where at-grade crossings occur, thereby enabling railroad pre-exemption. Table 7 provides the level of service (LOS) for roadway intersections located along the alternative alignments under consideration. Although no specific locations have been chosen yet, Section (or Appendix) XXX [Grade Crossing Analysis Results] provides an indication of which roadways meet CPUC grade separation criteria.

Alternatives A-7 and A-4 are located over 1,000 feet from the intersection of 4th Street and Archibald Avenue, which has an LOS of "D" in the morning and the evening peak commute hours. This intersection operates below current standards and additional traffic analysis would be required to determine if Alternatives A-7 and D-1 could worsen this delay. All the remaining roadways have identified LOS are currently operating at or above operating standards, and would not conflict with adopted plans, policies, or programs. However, more detailed traffic analysis would be required in support of any environmental document to evaluate potential impacts of the alterantive alignments carried forward for additional consideration.

Table 7. Identified Roadways within the Project Study Area and Level of Service

Street Name	Included in the CMP*	LOS Am/Pm	Alternative Affected
4th Street and Milken Avenue	Y	C/D[1]	B-3, C-5
4th Street and Haven Avenue	Y	C/C[3]	C-5
4th and Archibald Avenue	Y	D/D[1]	A-4, A-7
Archibald Avenue and Airport Drive	N	B/B[2]	B-3
Milken Avenue and Airport Drive	N	B/B[2]	B-3
Haven Avenue and Airport Drive	N	B/C[2]	C-5
Euclid Avenue and 8th Street	Y	C/C[3]	A-7, D-1

Sources:
1) Upland General Plan, Rancho Cucamonga 2010 General Plan Update Draft Program EIR,
2) Ontario General Plan Draft EIR (2008)
3) Ontario Gateway Specific Plan Draft. (2003)

Note: In the event there was duplicate information, the most update data was used. Bold indicates an existing impacted roadway.

*Congestion Management Plan

Omnitrans operates three bus routes within the Project area: Routes 61, 81, and 82. Routs 81 and 82 follow portions of Alternative B-2. Route 61 follows Airport Drive. As a result, these bus routes may require adjustment if Alternative B2 is pursued. Similarly, the operation of the passenger rail service would also need to be integrated into the existing transit network.

Findings and Recommendations

Each of the alternatives (except B-2) have the potential to result in spill back effects, otherwise known as "grade crossing queuing." Upon the determination of the preferred alignment(s), a traffic report will be required to identify signalized intersections that are located near grade crossings that may be impacted by the project. Any grade crossings will require approval by the CPUC prior to the start of construction for any re-design and/or closures.

Coordination with Omnitrans would minimize potential impacts to bus patrons for bus service realignment and to maximize transit efficiencies. A transit integration plan would be recommended to establish an approach for coordinating existing transit scheduling with proposed operations in order to maximize route interfaces with the future multimodal center and optimize existing transit routes to minimize the duplication of service.

9. Hydrology/Water Quality

Data Sources/Methods

The analysis for determining potential impacts to hydrology and water quality was conducted by reviewing the Santa Ana River Basin Water Quality Control Plan, the Federal Emergency Management Agency's (FEMA) flood zone maps, GIS data and other mapping. A review of the Strategic Planning Study Report for Metro Gold Line Foothill Extension to LA/Ontario International Airport, dated December 2008, was also conducted to comprehend existing conditions in the general vicinity of Alternative D-1.

The project alternatives are contained within Regional Water Quality Control Board (RWQCB) Region 8, Santa Ana, within the Cucamonga Creek Watershed, which is approximately 92 square miles in area. The watershed includes portions of the cities of Chino, Ontario, Rancho Cucamonga, and Upland and sections of unincorporated Riverside and San Bernardino Counties. The main drainage feature in the study area is Cucamonga Creek, Reach 1. Cucamonga Creek Reach 1 is a concrete-lined flood control channel that extends from the base of the Cucamonga Canyon dam, in the City of Upland, to Hellman Avenue near the border between San Bernardino and Riverside counties. Reach 1 is tributary to the Prado Basin Management Zone and the Middle Santa Ana River. Another prominent drainage feature in the study area is Deer Creek, which confluences with Cucamonga Creek Reach 1 near Hellman Avenue (see Figure 1).

The Santa Ana River Basin Water Quality Control Plan identifies the following designated beneficial uses for Reach 1 of Cucamonga Creek:

- Wildlife Habitat (WILD)
- Limited Warm Freshwater Habitat (LWFH)
- Groundwater Recharge (GWR)
- Municipal and Domestic Supply (MUN+)
- Water Contact Recreation (REC-1)
- Non-Contact Recreation (REC-2)

According to the 2010 Santa Ana Region 303(d) List of Water Quality Limited Segments, Reach 1 of Cucamonga Creek is currently on California's 303(d) list of impaired waters for the following pollutants: cadmium, coliform bacteria, copper, lead, and zinc.

Flood zone maps were reviewed to determine if any of the project alternatives are located within a FEMA Special Flood Hazard Area (SFHA). The SFHA is the area where the National Flood Insurance Program's floodplain management regulations must be enforced and the area where the mandatory purchase of flood insurance applies.

Alternatives Evaluation

Water Quality. The project alternatives (except B-2) would be subject to the requirements of the National Pollutant Discharge Elimination System (NPDES) Construction General Permit, which would require the preparation of a Stormwater Pollution Prevention Plan (SWPPP) and implementation of construction Best Management Practices (BMPs) to minimize effects on surface waters. Post-construction BMPs would likely also be required per the General Construction Permit or the Municipal Stormwater (MS4) Permit (R8-2010-0036), which the cities of Ontario, Rancho Cucamonga, and Upland are co-permittees.

Hydrology/Hydraulics. The existing, concrete-lined sections of the Cucamonga Channel and Deer Creek were originally constructed by the U. S. Army Corps of Engineers (USACE) and currently maintained by the San Bernardino County Flood Control District (SBCFCD). Alternatives A-4, A-7, and D-1 would both cross and parallel one or both of these water features; whereas, Alternative A-3 would be limited to two crossings. Although hydrological conditions within the Cucamonga Channel and Deer Creek would not likely be substantially altered by these alternatives, additional design and hydrological analysis would be required to verify no changes to pre-project conditions. Additionally, if any minor changes to the channel(s) are required to facilitate one or more of the alternatives, such alternatives could be subject to a Section 14 Permit under the Rivers and Harbors Act (33 USC 408).

Flood Hazard. Alternative D-1 and a portion of Alternative A-7 are located along the Cucamonga Channel, which is within Zone A. This area is subject to inundation by the 1% annual chance flood. However, based on FIRM Panel 06071C8628H, the 1% annual chance flood discharge is contained within the channel and the flood plain does not extend beyond the Cucamonga Channel (KOA Corporation 2008). A portion of Alternatives A-7, A-3, and A-4 would also be located along the Deer Creek Channel, which is within Zone A. However, based on Firm Panel 06071C8629H, the 1% annual chance flood discharge is contained within the channel. Alternatives C-5 and B-2 are not located within a FEMA SFHA.

Findings and Recommendations

The project alternatives would be subject to the requirements of the NPDES Construction General Permit, which would require the preparation of a SWPPP. Although SANBAG is not identified as co-permittees of the San Bernardino County MS4 Permit R8-2010-0036, the cities where the project alternatives are located (Ontario,

Upland and Rancho Cucamonga) are subject to the waste discharge requirements of the MS4 Permit. As a result, requirements from both permits could apply for different portions of the project (e.g. stations verses rail).

The alternatives are generally located in Zone X (0.2% annual flood hazard) or in areas located outside of the 0.2% annual chance floodplain. Alternatives A-3, A-4, A-7 and D-1 would be located in areas adjacent to flood control facilities, which could result in conflicts with maintenance or flood fighting activities. Any improvements or minor alterations to the Cucamonga Channel or Deer Creek could require "408" approval from USACE and a corresponding flood control permit from SBCFCD.

10. Visual Resources

Data Sources/Methods

The study area is generally bounded by the Burlington Northern Santa Fe Railway corridor on the north, Milliken Avenue on the east, Ontario International Airport on the south, and Euclid Avenue on the west. The project alternatives are located in a highly developed, urban area. Developed land uses (industrial, commercial, residential, recreational, public, and institutional) are located throughout the study area. Informational sources used for this constraints analysis included the Caltrans - California Scenic Highway Mapping System and the General Plans for the Cities of Ontario, Uplands, and Rancho Cucamonga.

Alternatives Evaluation

Based on a review of the California Scenic Highway Mapping System, the project alternatives are not located near any designated State Scenic Highways. The dominant visual characteristic in the study area is the San Gabriel Mountain range to the north. The project alternatives are not likely to result in a substantial change to the visual character because the study area is highly developed and already contains two major rail corridors. However, areas with residential and recreational uses such as those along Hermosa Avenue and the Cucamonga Channel may be subject to some visual changes as rail infrastructure would be introduced to these areas where it currently does not exist. Additionally, Euclid Avenue is identified in the City's Scenic Highways Element as scenic and historical and any physical changes to the corridor as a result of Alternatives A-7 or D-1 would require careful evaluation. These issues will require further consideration in the NEPA/CEQA process.

Alternative B-2 would not require the construction of any new infrastructure because the proposed bus shuttle route would utilize existing Omnitrans bus stops. Compared to Alternatives A-3, A-4, A-7, C-5 and D-1, this alternative is not anticipated to result in impacts to visual resources.

Findings and Recommendations

Much of the infrastructure associated with the alternatives (except B-2) would be placed at the ground surface and generally would not represent a prominent visual feature in the existing urban landscape. The exception to this would occur in the case of any new station facilities (e.g. canopies, lighting) and new bridge or elevated viaduct structures. These facilities would require further evaluation as engineering details become available and, if necessary, visual simulations from sensitive viewing areas. Changes to existing visual landscapes will be particularly important in downtown Upland, the Northtown Historic District in Rancho Cucamonga, and proposed Guasti Historic District in Ontario.

11. Summary of Environmental Constraints

This environmental constraints analysis provides a high level, desktop assessment of the six alternatives currently under consideration by SANBAG for providing direct transit access to the Ontario International Airport. The main objective of this assessment was to identify environmental "fatal flaws" for each alternative with

particular focus on biological and cultural resources. Table 8 provides a summary of the assessment for each alternative. As shown, Alternative B-2 would result in the least environmental impact of the alternatives currently under consideration. Alternative C-5 would avoid many of the impacts related to the built environment (e.g. sensitive receptors, historic districts, etc.); however, this alternative would result in greater biology impacts as a result of its overlap with the Recovery Unit for the Delhi sands flower loving fly and could require extensive property acquisition for securing a right-of-way. Those alternatives that follow existing drainage facilities (e.g. A-4, A-7, and D-2) may be challenging to implement given their close proximity to existing flood zones and potential for interference with flood response and ongoing maintenance activities.

Based on the findings of this analysis, no environmental fatal flaws were identified for any of the alternatives that would otherwise preclude them from further consideration; however, each alternative possesses unique challenges. This assessment will be need to supplemented at a later date once preliminary engineering becomes available in order to develop a project footprint (or area of potential effect) to allow for the completion of a more detailed environmental analysis of each route in conjunction with the corresponding vehicle technology selected for further consideration.

Table 8. Summary of Environmental Constraints

Issue Area	ALTERNATIVES						PRIMARY CONSTRAINT(S)
	A-3	A-4	A-7	B-2	C-5	D-1	
Biological Resources	M	M	M	L	H[1]	M	Water crossings
Cultural Resources	H	H	H	L	L	H	Overlap with Northtown, Euclid Avenue, Citrus Transportation, and/or Guasti (Proposed) Historic Districts
Noise/Vibration	H	M	H	L	M	H	Proximity to sensitive receptors
Hazards	M	M	M	L	M	M	Proximity to USTs
Criteria Air Pollutants and Greenhouse Gases	M[2]	M[2]	M[2]	L	M[2]	M	Construction-related emissions
Recreational Resources	H	H	H	L	M	H	Potential for use of 4(f) properties
Traffic/Circulation	L	L	M	L	L	M	Proximity to intersection(s) with poor LOS
Hydrology/Water Quality	M	H	H	L	M	H	Potential for alternation(s) at USACE flood control facilities
Visual Resources	H	H	H	L	L	H	Visual changes in historic districts

1. Overlap with Recovery Unit for Delhi sand flower loving fly.
2. Vehicle technology (e.g. locomotive verses LRT) will effect the net air quality benefit that may be attributable to operations.

Note: (L) – Low; (M) Moderate); (H) High

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SWRCB 2010. 2010 Santa Ana Region 303(d) List of Water Quality Limited Segments

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APPENDIX G-1

Potential Sensitive Botanical Species

APPENDIX G-1

Potential Sensitive Botanical Species

Species	Sensitivity Status	Habitat and Distribution	Potential to Occur
Alismataceae			
Sanford's arrowhead *Sagittaria sanfordii*	Federal: None State: None CNPS: 1B.2	Emergent rhizomatous herb. Occurs is freshwater marsh. From 0 to 1,240 feet in elevation.	Yes –has been noted in concrete-lined flood control basins; additional field work is recommended due to the presence of aquatic features within the study area
Apiaceae			
Wooly mountain parsley *Oreonana vestita*	Federal: None State: None CNPS: 1B.3	Perennial herb. Occurs in coniferous forest. From 5,300 to 11,480 feet in elevation.	No - project area does not support suitable habitat
Asteraceae			
singlewhorl burrobrush *Ambrosia monogyra*	Federal: None State: None CNPS: 2.2	Shrub. Occurs in chaparral, Sonoran desert scrub, washes, and dry riverbeds. From 33 to 1,640 feet in elevation	No - project area does not support suitable habitat
San Diego ambrosia *Ambrosia pumila*	Federal: FE State: None CNPS: 1B.1	Perennial rhizomatous herb. Occurs in chaparral, coastal scrub, grasslands, and vernal pools. From 0 to 500 feet in elevation.	No- project area is 10 miles north of nearest recorded occurrence
smooth tarplant *Centromadia pungens* ssp. *laevis*	Federal: None State: None CNPS: 1B.1	Annual herb. Occurs in valley and foothill grasslands, particularly near alkaline locales. Sites with minimal shrub cover. From 0 to 1,600 feet in elevation	Yes – Low Potential - poorly drained alkaline soils not present, however known to occur in disturbed habitat; additional field work is recommended due to the potential presence of non-native grassland within the study area

Coulter's goldfields *Lasthenia glabrata ssp. coulteri*	Federal: None State: None CNPS: 1B.1	Annual herb. Occurs in Salt-marsh, playas and vernal pools in alkaline soils. From 0 to 4,010 feet in elevation	Yes - project area does not appear to support suitable soils; however additional field work is recommended due to the presence of aquatic features within the study area
White rabbit-tobacco *Pseudognaphalium leucophalum*	Federal: None State: None CNPS: 2B.2	Perennial herb. Occurs in chaparral, cismontane woodland, coastal scrub and riparian woodlands with sandy or gravelly soils below 6,890 feet in elevation	No – project area does not support suitable habitat.
chaparral ragwort *Senecio aphanactis*	Federal: None State: None CNPS: 2.2	Annual herb. Occurs generally in alkaline soils in chaparral, cismontane woodland, and coastal scrub. From 40 to 2,630 feet in elevation.	No – project area does not support suitable habitat
San Bernardino aster *Symphyotrichum defoliatum*	Federal: None State: None CNPS: 1B.2	Perennial herb. Occurs in coastal scrub, cismontane woodland, lower montane coniferous forest, meadows and seeps, marshes and swamp and vernally mesic valley and foothill grasslands. up to 6,700 feet in elevation.	Yes – project area does not appear to support suitable habitat; however additional field work is recommended due to the potential presence of non-native grassland within the study area
Greata's aster *Symphyotrichum greatae*	Federal: None State: None CNPS: 1B.3	Rhizomatous herb. Occurs in chaparral, cismontane woodland, lower montane coniferous forest and riparian woodland. From 980 to 6,600 feet in elevation.	No – project area does not support suitable habitat
Berberidaceae			
Nevin's barberry *Berberis nevinii*	Federal: None State: None CNPS: 1B.1	Perennial evergreen shrub. Occurs in chaparral, cismontane woodland, coastal scrub and riparian scrub with gravelly substrates from 900 to 2,705 feet in elevation	No – project area does not support suitable habitat
Boraginaceae			

Brand's star phacelia *Phacelia stellaris*	Federal: None State: None CNPS: 1B.1	Annual herb. Occurs in coastal dunes and coastal scrub below 1,310 feet in elevation	No – project area does not support suitable habitat
Brassicaceae			
Rigid fringepod *Thysanocarpus rigidus*	Federal: None State: None CNPS: 1B.2	Annual herb. Occurs in on dry rocky slopes in pinyon and juniper pine. From 1,960 to 7,220 feet in elevation	No – project area does not support suitable habitat
Cactaceae			
Short-joint beavertail *Opuntia basilaris* var. *brachyclada*	Federal: None State: None CNPS: 1B.2	Succulent perennial. Occurs in chaparral, Joshua Tree woodland, pinyon and juniper woodland and Mojavean desert scrub from 1,395 to 5,905 feet in elevation	No – project area does not support suitable habitat
Caryophyllaceae			
Marsh sandwort *Arenaria paludicola*	Federal: FE State: SE CNPS: 1B.1	Perennial herb. Occurs in sandy openings in boggy marshes below 1,200 feet in elevation	No – project area does not support aquatic habitat in areas mapped with sandy soils
Chenopodiaceae			
Coulter's saltbush *Atriplex coulteri*	Federal: None State: None CNPS: 1B.2	Perennial herb. Occurs in coastal dunes, coastal bluff scrub, coastal sage scrub and foothill valley grassland with alkaline or clay soils up to 1,510 feet in elevation.	Yes – project area does not appear to support suitable habitat; however additional field work is recommended due to the potential presence of non-native grassland within the study area
Convolvulaceae			
Santa Barbara morning glory *Calystegia sepium ssp. binghamiae*	Federal: none State: None CNPS: 1B.1	Rhizomatous herb. Occurs in coastal salt marsh and alluvial riparian scrub up to 720 feet in elevation.	No – project area does not support suitable habitat.
Crassulaceae			

Many-stemmed dudleya *Dudleya multicaulis*	Federal: none State: None CNPS: 1B.2	Perennial herb. Occurs in chaparral, coastal scrub and valley and foothill grasslands and is often associated with clay soils. From 50 to 2,590 feet in elevation	No – project area does not support clay soils
Cyperaceae			
California sawgrass *Cladium californicum*	Federal: None State: None CNPS: 2B.2	Perennial herb. Occurs in meadows and seeps and within freshwater and alkaline marshes and swamps from 200 to 1,968 feet in elevation	Yes– project area may support suitable habitat; however additional field work is recommended due to the presence of aquatic features within the study area
Ericaceae			
San Gabriel Manzanita *Arctostaphylos glandulosa ssp. gabrielensis*	Federal: None State: None CNPS: 1B.2	Evergreen Shrub. Occurs in chaparral. From 1,950 to 5,920 feet in elevation	No – project area does not support suitable habitat.
Lamiaceae			
Jokerst's monardella *Monardella australis* ssp. *jokersti*	Federal: None State: None CNPS: 1B.1	Rhizomatous herb. Occurs in chaparral and coniferous forest. From 4,430 – 5,740 feet in elevation.	No – project area does not support suitable habitat.
Pringle's monardella *Monardella pringlei*	Federal: None State: None CNPS: 1A	Annual herb. Occurs in sandy areas and coastal sage scrub. From 1,100 to 1,600 feet in elevation. Presumed extinct.	No – project area does not support suitable habitat
Hall's monardella *Monardella macrantha ssp. Hallii*	Federal: None State: None CNPS: 1B.3	Perennial herb. Occurs in chaparral, foothill woodlands, yellow pine forest, mixed evergreen forest, and grasslands. From 2,395 to 7,200 feet in elevation	No – Site occurs below known elevation range

Liliaceae			
Slender mariposa-lily *Calochortus clavatus* var. *gracilis*	Federal: None State: None CNPS: 1B.2	Bulbiferous herb. Occurs in chaparral, coastal scrub and valley and foothill grasslands. From 1,050 to 3280 feet in elevation.	No – project area occurs below the known elevation range for the species. Also, there are no known occurrences from San Bernardino County.
Intermediate mariposa-lily *Calochortus weedii* var. *intermedius*	Federal: None State: None CNPS: 1B.2	Bulbiferous herb. Occurs in chaparral, coastal scrub and valley and foothill grasslands with rocky soils. From 340 to 2805 feet in elevation.	No – project area does not support suitable habitat.
Lemon lily *Lilium parryi*	Federal: None State: None CNPS: 1B.2	Perennial herb. Occurs in wetland-riparian areas. From 5,000 to 9,900 feet in elevation.	Yes– project area may support suitable habitat; however additional field work is recommended due to the presence of aquatic features within the study area
Malvaceae			
Salt Spring checkerbloom *Sidalcea neomexicana*	Federal: None State: None CNPS: 2.2	Perennial herb. Occurs in creosote bush scrub, chaparral, sage scrub, yellow pine forest and alkali playas. From below 5,700 feet in elevation.	No – project area does not support suitable habitat.
Montiaceae			
Peirson's spring beauty *Claytonia lanceolata* var *peirsonii*	Federal: None State: None CNPS: 3.1	Perennial herb. Occurs in coniferous forest over 7000 feet in elevation	No – project area does not support suitable habitat.
Nyctaginaceae			

Chaparral sand-verbena *Abronia villosa var. aurita*	Federal: None State: None CNPS: 1B.1	Annual herb. Occurs in sandy soils in chaparral, coastal sage scrub and desert dune. From 250 to 5,250 feet in elevation	No – project area does not support suitable habitat.
Onagraceae			
Lewis' evening primrose *Camissoniopsis lewisii*	Federal: None State: None CNPS: 3	Annual herb. Occurs in sandy or clay soils in coastal sage scrub, cismontane woodland, coastal dunes, coastal bluff scrub and grasslands up to 1000 feet in elevation.	Yes – no recorded occurrences in San Bernardino County; however additional field work is recommended due to the potential presence of non-native grassland and sandy soils within the study area
Orobanchaceae			
Rock creek broomrape *Orobanche valida* ssp. *valida*	Federal: None State: None CNPS: 1B.2	Parasitic perennial herb. Occurs in granitic soils in chaparral and pinyon and juniper woodland. From 4,100 to 6,560 feet in elevation	No – project area does not support suitable habitat.
Polemoniaceae			
Santa Ana River woolly star *Eriastrum densifolium* ssp. *sanctorum*	Federal: Endangered State: Endangered CNPS List: 1B.1	Perennial herb. Occurs in sandy or gravelly chaparral and coastal scrub (alluvial fan). From 300 to 2,000 feet in elevation	No – project area does not support suitable habitat
San Gabriel linanthus *Linanthus concinnus*	Federal: None State: None CNPS:1B.2	Annual herb. Occurs in rocky soils in chaparral and coniferous forest over 5,000 feet in elevation.	No – project area does not support suitable habitat
Prostrate vernal pool navarretia *Navarretia prostrata*	Federal: None State: None CNPS:1B.1	Annual herb. Occurs in coastal sage scrub, grassland, vernal pools and meadows and seeps up to 4,000 feet.	Yes – may be extirpated from San Bernardino County; however additional field work is recommended due to the potential presence of non-native grassland within the study area
Polygonaceae			

Parry's spineflower *Chorizanthe parryi var. parryi*	Federal: None State: None CNPS: 1B.1	Annual herb. Occurs in sandy, dry places, coastal or desert scrub. From 1,100 to 4,600 feet in elevation.	No – project area does not support suitable habitat
White-bracted spineflower *Chorizanthe xanti var. leucotheca*	Federal: None State: None CNPS: 1B.2	Annual herb. Occurs in sandy or gravelly substrate in Mojavean desert scrub and pinyon and juniper woodland. From 980 to 3,950 feet in elevation.	No – project area does not support suitable habitat
Slender-horned spineflower *Dodecahema leptoceras*	Federal: FE State: SE CNPS: 1B.1	Annual herb. Occurs in alluvial sand and coastal scrub. From 700 to 2,700 feet in elevation.	No – project area does not support suitable habitat
Vanishing wild buckwheat *Eriogonum evanidum*	Federal: None State: None CNPS: 1B.1	Annual herb. Occurs in sandy or gravelly substrate in chaparral, cismontane woodland, coniferous forest and pinyon and juniper woodland. From 3,600 to 7,300 feet in elevation.	No – project area does not support suitable habitat
Johnston's buckwheat *Eriogonum microthecum* var. *johnstonii*	Federal: None State: None CNPS: 1B.3	Perennial deciduous shrub. Occurs in rocky soils in coniferous forest over 6,000 feet in elevation.	No – project area does not support suitable habitat
Poaceae			
Prairie wedge grass *Sphenopholis obtusata*	Federal: None State: None CNPS:2B.2	Perennial herb. Occurs in cismontane woodland, meadows and seeps. From 6,500 feet in elevation.	No – project area below the known elevation range for the species
Rosaceae			
Mesa horkelia *Horkelia cuneata ssp. Puberula*	Federal: None State: None CNPS:1B.1	Perennial herb. Occurs in sandy and gravelly soils in cismontane woodland, maritime chaparral and coastal sage scrub. From 230 to 2,660 feet in elevation.	No – project area does not support suitable habitat

Solanaceae			
Parish's desert-thorn *Lycium parishii*	Federal: None State: None CNPS:2B.3	Perennial shrub. Occurs in sage scrub and Sonoran desert scrub. From 1000 to 3,280 feet in elevation	No – project area does not support suitable habitat and occurs below the known elevation range for the species.

FE = Federally Endangered.
FT = Federally Threatened
SE = State Endangered
ST = State Threatened

CNPS = California Native Plant Society listing.
List 1A: Presumed extirpated in California and rare or extirpated elsewhere
List 1 B: Rare, threatened, or endangered in California and elsewhere
List 2A: Presumed extirpated in California but more common elsewhere
List 2B: Rare, threatened, or endangered in California, but more common elsewhere.
List 3: needs review

List A: believed to be extirpated
List B: believe extant

0.1: seriously endangered in California; 0.2: Fairly endangered in California; 0.3: Not very endangered in California.

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APPENDIX G-2

Potential Sensitive Zoological Species

APPENDIX G-2

Potential Sensitive Zoological Species

Species	Sensitivity Status	Preferred Habitat	Potential to Occur
Invertebrates			
Delhi Sands flower-loving fly *Rhaphiomidas terminatus abdominalis*	FE	Fine, sandy soils, often with wholly or partly consolidated dunes. Restricted to a particular soil type classified	Yes – Low Potential in undeveloped portions of the alignments.
Fish			
Arroyo chub *Gila orcuttii*	SSC	Permanent, small to moderate-sized, moderate to high gradient streams with runs and pools.	No- The project site lacks suitable habitat for this species.
Santa Ana Sucker *Catostomus santaanae*	FT, SSC	Slight to swift flowing perennial streams with water depths ranging from a few inches to several feet.	No- The project site lacks suitable habitat for this species. Channels within project area are concrete-lined providing no natural substrate for
Santa Ana speckled dace *Rhinichthys osculus* ssp.	SSC	Permanent, freshwater streams.	No- The project site lacks suitable habitat for this species. Channels within project area are concrete-lined providing no natural substrate for spawning
Amphibians			
Arroyo toad *Anaxyrus californicus*	FE, SSC	found in washes, streams, and arroyos, and adjacent uplands (desert, shrubland). This species also occurs on sandy banks in riparian woodlands (willow, cottonwood, sycamore, and/or coast live oak) in California. Along rivers that have shallow gravelly pools adjacent to sandy terraces	No- The project site lacks suitable habitat for this species. Channels within project area are concrete-lined providing no natural substrate for burrowing

Coast range newt *Taricha torosa*	SSC	chaparral, oak woodland, and grasslands, breed in ponds, reservoirs, and sluggish pools in streams to breed	Project area outside of known range
Northern leopard frog *Lithobates pipiens*	SSC	slow-moving or still water along streams and rivers, wetlands, permanent or temporary pools, beaver ponds, and human-constructed habitats such as earthen stock tanks and borrow pits	Yes – the species is uncommon, however additional field assessment is recommended
Two-striped garter snake *Thamnophis hammondii*	SSC	occurs in several perennial, desert slope streams	No- The project site lacks suitable habitat for this species. Channels within project area are concrete-lined providing no natural vegetation for cover
Southern mountain yellow-legged frog *Rana muscosa*	FE, SE	ponds, dams, lakes, and streams at moderate to high elevations	No – Project area is below known elevation range
Western spadefoot toad *Spea hammondii*	SSC	Open areas with sandy or gravelly soils, often found in woodlands, grasslands, coastal sage scrub, chaparral, sandy washes, floodplains, alluvial fans, playas, alkali flats, foothills and in mountain areas.	Yes – could occur if seasonal ponds are present, additional field evaluation recommended
Reptiles			
Coast horned lizard *Phrynosoma blainvillii*	SSC	Coastal sage scrub, grasslands, chaparral, oak woodland, riparian woodland and coniferous forest.	Yes – could occur based on potential presence of non-native grasslands and sandy soils, additional field evaluation recommended
California mountain kingsnake (San Bernardino population) *Lampropeltis zonata* ssp. *parvirubra*	SSC	montane coniferous forests or mixed coniferous forests, occasionally in riparian woodlands at lower elevations	None – The project site lacks suitable habitat for this species.

Northern red-diamond rattlesnake *Crotalus ruber ruber*	SSC	Rocky areas of desert scrub, thorn scrub, open chaparral, mesquite/cactus, and pine-oak woodland.	None – The project site lacks suitable habitat for this species.
Orangethroat whiptail *Aspidoscelis hyperythra*	SSC	Coastal sage scrub, chaparral, edges of riparian habitats, washes and sandy areas.	None – The project site lacks suitable habitat for this species.
Silvery legless lizard *Anniella pulchra pulchra*	SSC	Semi-stabilized sand dunes, sandy soils in areas vegetated with oak or pine-oak woodland, or chaparral; also wooded stream edges, and occasionally desert-scrub.	None – The project site lacks suitable habitat for this species.
Western pond turtle *Emys marmorata*	SSC	inhabits slow moving permanent or intermittent streams, small ponds, small lakes, reservoirs, abandoned gravel pits, permanent and ephemeral shallow wetlands, stock ponds, and sewage treatment lagoons	Yes - several ponds occur within the study area; additional surveys recommended
Birds			
Black swift *Cypseloides niger*	SSC - Breeding	Breed on cliffs near water	None – The project site lacks suitable habitat for this species.
Coastal cactus wren *Campylorhynchus brunneicapillus sandiegensis*	SSC	Occurs almost exclusively in cactus (cholla and prickly pear) dominated coastal sage scrub.	None – The project site lacks suitable habitat for this species.
Coastal California gnatcatcher *Polioptila californica californica*	FT, SSC	Coastal sage scrub dominated by *Artemesia californica* (California sagebrush).	None – The project site lacks suitable habitat for this species.
Golden eagle *Aquila chrysaetos*	FP	In southern California, occupies grasslands, brushlands, deserts, oak	None – The project site lacks suitable habitat for this species.

Grasshopper sparrow *Ammodramus savannarum*	SSC	Open grasslands	Yes – project area may support suitable habitat based on the potential presence of non-native grasslands, additional field surveys
Least Bell's vireo *Vireo bellii pusillus*	FE, SE	Dense brush and mesquite associated with riparian systems, willow-cottonwood forest, and streamside thickets.	None – The project site lacks suitable habitat for this species.
Loggerhead shrike (*Lanius ludovicianus)*	SSC	Inhabits open brushy areas, meadows, pastures, orchards, thickets along roads, and hedges.	Yes – potential suitable habitat present within the project area; additional field surveys recommended
Southwestern willow flycatcher (Empidonax traillii extimus)	FE, ST	Dense riparian habitat along streams, rivers, lakesides, and other wetland habitats.	None – The project site lacks suitable habitat for this species.
Swainson's Hawk *Buteo swainsoni*	ST	Breeds in stands with few trees in juniper-sage flats, riparian areas, and in oak savannah. It forages in adjacent grasslands or suitable grain or alfalfa fields, or livestock pastures	None – The project site lacks suitable habitat for this species and the species is not known to breed in the area
Ticolored blackbird (nesting colony) *Agelaius tricolor*	SSC	Fresh-water marshes of cattails, tule, bulrushes and sedges.	None – The project site lacks suitable habitat for this species.
Yellow breasted chat (*Icteria virens*)	SSC-Breeding	Breeding habitat includes early successional riparian habitats with well-developed shrub layer and open canopy.	None – The project site lacks suitable habitat for this species.
Yellow warbler (*Dendroica petechia*)	SSC	Inhabits riparian areas, or strips of riparian habitat in foothills.	None – The project site lacks suitable habitat for this species.
Western Burrowing Owl *Athene cunicularis hypugaea*	SSC	Open, dry annual or perennial grasslands, deserts and scrubland characterized by low-growing vegetation.	Yes -breeding habitat occurs throughout the project area ranging in suitability from low to moderate. One transitory/wintering

Western yellow-billed cuckoo *Coccyzus americanus occidentalis*	Federal candidate for listing, SE	Deciduous riparian woodland, especially including dense stands of cottonwood and willow, but also including mesquite and tamarisk in some	None – The project site lacks suitable habitat for this species.
White-tailed kite *Elanus leucurus*	SSC	Low elevation open grasslands, savannah-like habitats, agricultural areas,	None – The project site lacks suitable habitat for this species.
Mammals			
Big free-tailed bat (*Nyctinomops macrotis*)	SSC	Roosts in cliff habitat	None – The project site lacks suitable habitat for this species and is outside of the known range for the species.
Desert bighorn sheep *Ovis canadensis nelsoni*	FP	dry, desert mountains of southeastern California	None – The project site lacks suitable habitat for this species and site occurs outside of the known range for the species
Los Angeles pocket mouse *Perognathus longimembris brevinasus*	SSC	Sandy soil in valleys; firm sandy soil, overlain with pebbles, on slopes with widely spaced shrubs; sagebrush, creosote bush, and cactus communities.	None – The project site lacks suitable habitat for this species.
Northwestern San Diego pocket mouse *Chaetodipus fallax fallax*	SSC	Open, sandy, areas in low desert and foothills.	None – The project site lacks suitable habitat for this species.
Pallid San Diego pocket mouse *Chaetodipus fallax pallidus*	SSC	Open, sandy, areas in chaparral.	None – The project site lacks suitable habitat for this species.
San Bernardino kangaroo rat *Dipodomys merriami parvus*	FE, SSC	Alluvial sage scrub on alluvial fans, flood plains, along washes, and in adjacent upland areas.	None – The project site lacks suitable habitat for this species.

Stephens' kangaroo rat *Dipodomys stephensi*	FE,ST	Primarily annual and perennial grasslands, but also occurs in coastal scrub and sagebrush with sparse canopy cover.	None –Suitable habitat occurs within the project area but the project is not within the range of the species.
San Diego desert woodrat *Neotoma lepida intermedia*	SSC	Sagebrush scrub and chaparral.	None – The project site lacks suitable habitat for this species.
San Diego black-tailed jackrabbit *Lepus californicus bennettii*	SSC	Open areas or semi-open country, typically in grasslands, agricultural fields or sparse coastal scrub.	Yes – could occur based on potential presence of non-native grasslands, additional field work recommended
Western yellow bat *Lasiurus xanthinus*	SSC	Roosts and feeds in, and near, palm oases and riparian habitats. Known to occur in valley foothill riparian, desert riparian, desert wash, and palm oasis	None – lack of appropriate habitat.
Pallid bat *Antrozous pallidus*	SSC	Caves, mines, rock crevices, trees and abandoned buildings for roosting and arid habitat types for	None – lack of appropriate habitat.
Pocketed free-tailed bat *Nyctinomops femorosaccus*	SSC	Prominent on cliffs and cliff faces.	None – lack of appropriate habitat.
American badger *Taxidea taxus*	SSC	Arid, open habitats, grasslands, savannahs, mountain meadows, and desert scrub openings; needs friable soils for digging and open, uncultivated ground.	None - marginal, fragmented habitat exists within the project area. .

FE = Federally Endangered.
FT = Federally Threatened
SE = State Endangered
ST = State Threatened
SSC = State Species of Concern
FP = California Department of Fish and Game Fully Protected

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