Appendix A

Assessor’s Parcel Numbers

Appendix A – Assessor's Parcel Numbers

106 750 020	108 160 040	108 490 100	109 880 010	105 350 150	105 080 130	108 500 020	105 660 120	106 100 060	106 090 090
106 750 030	108 160 050	108 490 110	109 880 020	105 360 010	105 080 160	108 500 050	105 660 130	106 100 080	106 100 040
106 750 040	108 160 060	108 490 120	109 880 030	105 360 020	105 080 180	108 500 080	105 660 140	106 100 090	106 100 070
106 750 050	108 280 010	108 490 130	109 950 010	105 360 040	105 360 030	108 500 090	105 660 150	106 100 100	123 020 010
106 750 060	108 280 020	108 490 140	109 950 020	105 360 050	105 360 070	109 170 010	105 660 160	106 650 010	123 020 020
106 750 070	108 280 030	108 490 150	109 950 030	105 360 060	105 521 020	109 170 020	105 660 170	106 650 030	123 020 030
106 750 080	108 280 040	108 490 160	105 070 010	105 360 080	105 720 030	109 170 030	105 660 180	106 650 050	123 020 040
106 750 090	108 280 050	108 490 170	105 790 050	105 360 090	105 790 020	109 170 040	105 660 190	106 650 070	108 510 100
106 750 100	108 280 060	108 490 180	105 790 100	105 360 100	105 790 030	109 170 050	105 660 200	106 650 090	108 510 110
106 750 110	108 420 020	108 510 010	105 800 010	105 360 110	105 790 040	109 170 060	105 670 010	106 650 100	108 510 120
106 750 120	108 420 030	108 500 030	105 800 040	105 360 120	105 790 060	109 170 070	105 670 020	106 650 120	108 510 130
106 750 130	108 420 040	108 500 040	105 800 170	105 360 130	105 790 070	109 170 080	105 670 030	106 650 140	108 510 140
106 750 140	123 140 070	108 500 060	105 800 200	105 360 140	105 790 080	109 170 090	105 670 040	106 740 020	108 500 010
106 750 150	123 140 080	108 500 070	105 790 010	105 360 150	105 790 090	109 170 100	105 670 050	106 740 030	106 650 110
106 750 160	123 140 090	108 500 100	105 720 010	105 360 160	105 790 110	109 170 110	105 670 060	106 740 040	106 650 130
106 750 170	123 140 100	108 500 110	106 760 010	105 360 170	105 800 020	109 170 120	105 670 070	106 740 050	106 650 020
106 750 180	123 330 010	108 510 090	106 740 010	105 360 180	105 800 030	109 170 130	105 670 080	106 740 060	106 650 080
106 770 020	123 330 020	108 510 020	108 420 010	105 360 190	105 800 050	109 170 140	105 670 090	106 740 070	106 650 040
106 760 020	123 330 030	108 510 030	105 410 010	105 360 200	105 800 060	109 170 150	105 670 100	106 740 080	106 640 010
106 760 030	123 330 040	108 510 040	105 410 030	105 360 220	105 800 070	109 980 020	105 670 110	106 750 010	106 650 060
106 760 040	123 330 050	108 510 050	105 410 040	105 360 230	105 800 080	109 980 030	105 670 120	103 810 010	105 521 010
106 760 050	123 330 060	108 510 060	105 410 050	105 360 240	105 800 090	109 980 040	105 670 130	103 810 020	105 350 010
106 760 060	123 330 070	108 510 070	105 410 070	105 360 250	105 800 100	109 980 050	105 670 140	103 810 030	123 150 010
106 760 070	123 330 080	108 510 080	105 390 010	105 360 260	105 800 110	109 980 060	105 670 150	103 810 040	123 150 020
106 760 080	123 330 090	108 920 010	105 390 020	105 360 270	105 800 120	123 090 010	105 670 160	103 820 010	123 150 030
106 760 090	123 330 100	108 920 020	105 390 030	105 360 280	105 800 130	123 090 020	105 670 170	103 820 020	123 150 040
106 770 010	123 330 120	108 920 030	105 390 040	105 360 290	105 800 140	123 090 030	105 670 180	103 820 030	123 150 050
106 770 030	108 420 050	108 920 040	105 390 050	105 360 300	105 800 150	123 090 040	105 670 190	103 820 040	123 150 060
106 770 040	108 420 060	108 920 050	105 390 060	105 360 310	105 800 160	123 090 050	105 670 200	103 820 050	123 150 070
106 770 050	108 430 010	108 920 060	105 390 070	105 410 020	105 800 180	123 090 060	105 670 210	103 820 060	123 150 080
106 770 060	108 430 020	108 920 070	105 390 080	105 410 060	105 800 190	105 500 010	105 720 020	103 820 070	123 150 090
106 770 070	108 430 030	108 920 080	123 140 010	103 590 010	105 800 210	105 500 020	106 080 010	103 820 080	123 150 100
106 770 080	108 430 040	108 920 090	123 140 020	103 590 020	105 800 220	105 500 030	106 080 020	103 820 090	123 150 110
106 770 090	108 430 050	108 970 010	123 140 030	103 590 030	105 800 230	105 500 040	106 080 030	103 820 100	123 150 120
106 770 100	108 430 060	108 970 020	123 140 040	103 590 040	105 800 240	105 521 030	106 080 040	103 820 110	123 160 010
106 770 110	108 440 010	108 970 030	123 140 050	103 600 010	108 290 010	105 521 040	106 080 050	103 820 120	123 160 020
106 770 120	108 440 020	108 980 010	123 140 060	103 600 020	108 290 020	105 521 050	106 080 090	105 070 030	123 160 030
106 770 130	108 440 030	108 980 020	105 350 020	103 600 030	108 290 030	105 521 060	106 090 010	105 070 040	123 160 040
106 770 140	108 440 040	108 980 030	105 350 030	103 600 040	108 290 040	105 521 070	106 090 020	105 070 050	123 160 050
106 770 150	108 440 050	108 980 040	105 350 040	105 070 020	108 290 050	105 660 010	106 090 030	105 070 070	123 160 060
106 770 160	108 440 060	108 980 050	105 350 050	105 070 060	108 290 060	105 660 020	106 090 040	105 080 010	123 160 070
108 130 010	108 490 010	108 980 060	105 350 060	105 070 080	108 340 010	105 660 030	106 090 050	105 080 030	123 160 080
108 130 020	108 490 020	123 560 010	105 350 070	105 080 020	108 340 020	105 660 040	106 090 060	105 080 070	123 160 090
108 140 010	108 490 030	123 560 020	105 350 080	105 080 040	108 340 030	105 660 050	106 090 070	105 080 090	123 160 100
108 140 020	108 490 040	123 560 030	105 350 090	105 080 050	108 340 040	105 660 060	106 090 080	105 080 140	029 224 130
108 140 030	108 490 050	123 560 040	105 350 100	105 080 060	108 340 050	105 660 070	106 090 100	105 080 150	029 242 170
108 150 010	108 490 060	123 560 050	105 350 110	105 080 080	108 340 060	105 660 080	106 100 010	105 080 170	029 201 040
108 160 010	108 490 070	123 560 060	105 350 120	105 080 100	108 340 070	105 660 090	106 100 020	106 080 060	029 201 330
108 160 020	108 490 080	123 560 070	105 350 130	105 080 110	108 340 080	105 660 100	106 100 030	106 080 070	029 201 370
108 160 030	108 490 090	123 560 080	105 350 140	105 080 120	108 340 090	105 660 110	106 100 050	106 080 080	029 241 050

Appendix A – Assessor's Parcel Numbers (Continued)

029 122 360	029 360 060	029 235 220	029 224 270	029 223 040	029 133 200	029 112 250	029 223 090	029 242 180	029 211 040	029 222 100
029 201 270	029 360 130	029 100 070	029 232 160	029 360 020	029 225 090	029 242 240	029 241 200	029 222 050	029 100 280	029 222 110
029 360 100	029 223 060	029 211 260	029 112 360	029 225 190	029 225 120	029 201 070	029 221 080	029 242 250	029 151 240	
029 360 080	029 360 010	029 100 350	029 100 240	029 214 030	029 244 060	029 224 290	029 225 100	029 201 120	029 112 260	
029 122 140	029 223 080	029 213 020	029 211 060	029 151 130	029 100 360	029 204 040	029 241 180	029 231 200	029 133 150	
029 232 040	029 221 120	029 235 030	029 235 050	029 214 170	029 242 020	029 222 090	029 225 240	029 231 110	029 143 999	
029 224 020	029 241 190	029 213 010	029 241 060	029 100 190	029 203 060	029 152 200	029 241 160	029 243 060	029 214 190	
029 201 080	029 225 220	029 151 160	029 122 120	029 215 050	029 122 280	029 241 020	029 241 170	029 122 020	029 133 020	
029 132 200	029 225 210	029 151 280	029 152 999	029 223 150	029 204 210	029 203 040	029 131 320	029 132 150	029 100 180	
029 131 310	029 225 110	029 112 050	029 122 110	029 360 090	029 122 100	029 231 090	029 215 160	029 132 160	029 151 070	
029 132 190	029 221 020	029 235 020	029 111 120	029 204 030	029 211 010	029 111 180	029 235 130	029 131 290	029 151 120	
029 215 080	029 225 060	029 100 220	029 202 070	029 152 270	029 223 160	029 243 030	029 121 140	029 133 120	029 131 250	
029 221 010	029 225 250	029 152 280	029 111 140	029 121 260	029 243 040	029 224 110	029 132 040	029 215 030	029 131 210	
029 225 050	029 242 150	029 112 350	029 122 350	029 211 180	029 121 430	029 201 140	029 214 080	029 204 220	029 132 050	
029 121 090	029 201 320	029 151 040	029 215 090	029 131 270	029 224 060	029 242 190	029 133 260	029 122 180	029 131 260	
029 211 210	029 222 170	029 235 080	029 213 030	029 242 140	029 201 110	029 122 010	029 221 040	029 203 020	029 153 180	
029 151 220	029 100 040	029 151 140	029 152 110	029 241 070	029 122 250	029 203 080	029 241 140	029 122 330	029 235 060	
029 100 210	029 151 230	029 153 090	029 235 230	029 241 230	029 122 380	029 204 250	029 224 140	029 202 010	029 100 120	
029 225 230	029 121 120	029 100 370	029 100 080	029 222 130	029 204 260	029 204 270	029 241 030	029 122 160	029 151 080	
029 221 060	029 235 140	029 215 120	029 234 020	029 224 160	029 201 060	029 152 190	029 242 160	029 122 410	029 214 200	
029 211 170	029 225 070	029 133 110	029 211 020	029 201 290	029 224 100	029 211 270	029 222 030	029 202 020	029 215 140	
029 111 110	029 221 030	029 215 040	029 112 040	029 241 080	029 242 230	029 224 070	029 201 230	029 243 010	029 153 020	
029 121 440	029 241 130	029 131 110	029 202 030	029 225 150	029 203 090	029 122 260	029 201 030	029 111 220	029 112 330	
029 100 060	029 121 330	029 100 380	029 232 060	029 225 180	029 231 260	029 203 070	029 111 130	029 203 120	029 151 110	
029 152 160	029 231 080	029 215 170	029 111 150	029 360 050	029 211 200	029 242 030	029 211 130	029 231 060	029 100 390	
029 121 150	029 111 200	029 143 010	029 231 040	029 223 050	029 211 280	029 224 300	029 152 210	029 232 050	029 216 010	
029 121 160	029 225 140	029 131 030	029 204 120	029 360 040	029 152 220	029 201 360	029 243 070	029 202 060	029 151 090	
029 222 180	029 360 030	029 222 190	029 122 190	029 242 200	029 231 050	029 151 060	029 231 190	029 232 030	029 133 030	
029 223 140	029 112 120	029 215 190	029 122 050	029 235 210	029 211 030	029 214 180	029 231 120	029 122 090	029 215 130	
029 360 070	029 133 250	029 231 030	029 231 010	029 213 040	029 121 170	029 225 010	029 203 100	029 112 220	029 132 220	
029 360 110	029 111 190	029 232 070	029 121 410	029 152 330	029 360 999	029 132 120	029 122 130	029 214 230	029 214 070	
029 360 120	029 203 030	029 235 110	029 122 230	029 100 270	029 225 200	029 131 230	029 100 330	029 132 060	029 112 400	
029 235 010	029 201 200	029 121 470	029 235 160	029 131 370	029 132 270	029 231 100	029 152 340	029 133 130	029 131 140	
029 100 230	029 241 100	029 244 070	029 100 310	029 131 300	029 121 480	029 242 040	029 111 010	029 131 010	029 132 170	
029 235 270	029 241 090	029 152 230	029 235 180	029 224 090	029 111 060	029 122 240	029 211 190	029 214 040	029 131 400	
029 131 220	029 241 010	029 225 160	029 202 040	029 201 280	029 204 230	029 235 070	029 121 220	029 132 180	029 131 160	
029 223 070	029 222 080	029 360 150	029 122 370	029 122 999	029 212 010	029 214 999	029 204 050	029 215 070	029 132 020	
029 222 040	029 225 130	029 360 160	029 122 150	029 223 130	029 121 040	029 100 130	029 152 320	029 131 170	029 215 210	
029 242 050	029 215 020	029 241 210	029 122 997	029 360 140	029 111 260	029 153 010	029 214 020	029 211 070	029 133 170	
029 224 050	029 152 100	029 222 120	029 211 150	029 241 110	029 215 180	029 151 150	029 131 340	029 121 420	029 215 240	
029 122 270	029 153 120	029 133 280	029 152 120	029 215 010	029 214 240	029 112 060	029 112 320	029 235 190	029 131 150	
029 201 100	029 151 170	029 235 260	029 235 120	029 132 130	029 133 270	029 214 220	029 132 080	029 211 240	029 131 240	
029 243 050	029 132 210	029 131 200	029 201 190	029 132 070	029 122 400	029 100 200	029 132 110	029 112 290	029 133 100	
029 203 050	029 131 380	029 222 060	029 224 150	029 211 230	029 122 170	029 152 300	029 133 290	029 121 190	029 133 140	
029 231 210	029 122 998	029 221 050	029 211 220	029 233 080	029 232 170	029 121 180	029 132 030	029 211 250	029 131 090	
029 211 140	029 231 240	029 241 150	029 235 170	029 121 450	029 122 220	029 132 260	029 131 280	029 211 050	029 132 140	
029 121 050	029 243 020	029 225 080	029 121 230	029 204 060	029 111 160	029 133 160	029 211 080	029 112 270	029 131 060	
029 235 150	029 231 020	029 153 150	029 235 040	029 214 060	029 111 210	029 215 060	029 131 020	029 235 200	029 131 390	
029 152 310	029 111 170	029 214 010	029 153 160	029 215 110	029 204 240	029 215 150	029 224 120	029 100 050	029 131 120	
029 151 180	029 235 250	029 235 240	029 225 170	029 215 200	029 152 050	029 215 100	029 201 380	029 121 130	029 211 160	

Appendix B

Greenhouse Gas Calculations

APPENDIX

URBEMIS model output

Because URBEMIS does not allow for reductions due to project design features or some existing conditions (such as parking fees), these features must be included as "mitigation" in the model in order for their reductions to be counted. Due to this, the title lines of both the Unmitigated and Mitigated reports will indicate "Mitigated Emissions".   The File Name contains the accurate designation as to the unmitigated vs. mitigated reports.

Build Option 1

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Urbemis 2007 Version 9.2.4

Detail Report for Annual Area Source Mitigated Emissions (Tons/Year)

File Name: R:\General Air Quality Info\Projects\0D4136500 - Burlingame Specific Plan\Modeling\Urbemis\Build option 1 - UNmitigated.urb924

Project Name: Burlingame Downtown SP - Build Option 1 - Unmitigated

Project Location: Bay Area Air District

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

AREA SOURCE EMISSION ESTIMATES (Annual Tons Per Year, Mitigated)

Source	CO2
Natural Gas	2,000.85
Hearth	1.70
Landscape	1.01
Consumer Products	
Architectural Coatings	
TOTALS (tons/year, mitigated)	2,003.56

Area Source Mitigation Measures Selected

Mitigation Description	Percent Reduction
Residential Increase Energy Efficiency Beyond Title 24	15.00
Commercial Increase Energy Efficiency Beyond Title 24	15.00
Industrial Increase Energy Efficiency Beyond Title 24	15.00

Area Source Changes to Defaults

Percentage of residences with wood stoves changed from 35% to 0%

Percentage of residences with wood fireplaces changed from 10% to 0%

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Urbemis 2007 Version 9.2.4

Detail Report for Annual Operational Mitigated Emissions (Tons/Year)

File Name: R:\General Air Quality Info\Projects\0D4136500 - Burlingame Specific Plan\Modeling\Urbemis\Build option 1 - UNmitigated.urb924

Project Name: Burlingame Downtown SP - Build Option 1 - Unmitigated

Project Location: Bay Area Air District

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

OPERATIONAL EMISSION ESTIMATES (Annual Tons Per Year, Mitigated)

Source	CO2
Apartments mid rise	5,851.21
Hotel	3,168.80
Strip mall	2,395.07
General office building	2,569.12
TOTALS (tons/year, mitigated)	13,984.20

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2030 Season: Annual

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Operational Mitigation Options Selected

Residential Mitigation Measures

Residential Local-Serving Retail Mitigation

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Operational Mitigation Options Selected

Residential Mitigation Measures

Percent Reduction in Trips is 0% (calculated as a % of 9.57 trips/day)))

Note that the above percent is applied to a baseline of 9.57 and that product is

subtracted from the Unmitigated Trips

Inputs Selected:

The Presence of Local-Serving Retail checkbox was NOT selected.

Residential Pedestrian/Bicycle Friendliness Mitigation

Percent Reduction in Trips is 3.42% (calculated as a % of 9.57 trips/day)

Note that the above percent is applied to a baseline of 9.57 and that product is

subtracted from the Unmitigated Trips

Inputs Selected:

The Number of Intersections per Square Mile is 184

The Percent of Streets with Sidewalks on One Side is 0%

The Percent of Streets with Sidewalks on Both Sides is 50%

The Percent of Arterials/Collectors with Bike Lanes or where Suitable,

Direct Parallel Routes Exist is 50%

Nonresidential Mitigation Measures

Non-Residential Local-Serving Retail Mitigation

Percent Reduction in Trips is 0%

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Nonresidential Mitigation Measures

Inputs Selected:

The Presence of Local-Serving Retail checkbox was NOT selected.

Non-Residential Pedestrian/Bicycle Friendliness Mitigation

Percent Reduction in Trips is 3.42%

Inputs Selected:

The Number of Intersections per Square Mile is 184

The Percent of Streets with Sidewalks on One Side is 0%

The Percent of Streets with Sidewalks on Both Sides is 50%

The Percent of Arterials/Collectors with Bike Lanes or where Suitable,

Direct Parallel Routes Exist is 50%

Non-Residential Parking Pricing/Cash Out Mitigation

Percent Reduction in Trips is 6.25%

Inputs Selected:

The Daily Parking Change was set to 1.5 dollars

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Apartments mid rise	23.03	6.38	dwelling units	875.00	5,584.48	34,249.06
Hotel		25.40	rooms	120.00	3,047.94	18,881.99

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Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Strip mall		12.54	1000 sq ft	183.84	2,304.83	14,285.35
General office building		16.54	1000 sq ft	148.70	2,459.29	15,161.50
					13,396.54	82,577.90

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	54.1	0.0	100.0	0.0
Light Truck < 3750 lbs	12.5	0.0	99.2	0.8
Light Truck 3751-5750 lbs	19.9	0.0	100.0	0.0
Med Truck 5751-8500 lbs	6.6	0.0	100.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	0.9	0.0	77.8	22.2
Lite-Heavy Truck 10,001-14,000 lbs	0.6	0.0	50.0	50.0
Med-Heavy Truck 14,001-33,000 lbs	1.0	0.0	20.0	80.0
Heavy-Heavy Truck 33,001-60,000 lbs	0.3	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	3.2	34.4	65.6	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	0.6	0.0	83.3	16.7

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	6.2	6.1	6.1	6.1	6.2	6.2

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Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Rural Trip Length (miles)	16.8	7.1	7.9	14.7	6.6	6.6
Trip speeds (mph)	35.0	35.0	35.0	35.0	35.0	35.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
Hotel				5.0	2.5	92.5
Strip mall				2.0	1.0	97.0
General office building				35.0	17.5	47.5

Operational Changes to Defaults

Home-based work urban trip length changed from 10.8 miles to 6.2 miles

Home-based shop urban trip length changed from 7.3 miles to 6.1 miles

Home-based other urban trip length changed from 7.5 miles to 6.1 miles

Commercial-based commute urban trip length changed from 9.5 miles to 6.1 miles

Commercial-based non-work urban trip length changed from 7.35 miles to 6.2 miles

Commercial-based customer urban trip length changed from 7.35 miles to 6.2 miles

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Urbemis 2007 Version 9.2.4

Detail Report for Annual Area Source Mitigated Emissions (Tons/Year)

File Name: R:\General Air Quality Info\Projects\0D4136500 - Burlingame Specific Plan\Modeling\Urbemis\Build option 1 - Mitigated.urb924

Project Name: Burlingame Downtown SP - Build Option 1 - Mitigated

Project Location: Bay Area Air District

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

AREA SOURCE EMISSION ESTIMATES (Annual Tons Per Year, Mitigated)

Source	CO2
Natural Gas	2,000.85
Hearth	1.70
Landscape	1.01
Consumer Products	
Architectural Coatings	
TOTALS (tons/year, mitigated)	2,003.56

Area Source Mitigation Measures Selected

Mitigation Description	Percent Reduction
Residential Increase Energy Efficiency Beyond Title 24	15.00
Commercial Increase Energy Efficiency Beyond Title 24	15.00
Industrial Increase Energy Efficiency Beyond Title 24	15.00
Percent of Residential Landscape Equipment that are Electrically Powered and have Electrical Outlets at the the Front and Rear of Residences	20.00
Percent of Commercial and Industrial Landscape Equipment that are Electrically Powered and have Electrical Outlets Available	20.00

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Area Source Changes to Defaults

Percentage of residences with wood stoves changed from 35% to 0%

Percentage of residences with wood fireplaces changed from 10% to 0%

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Urbemis 2007 Version 9.2.4

Detail Report for Annual Operational Mitigated Emissions (Tons/Year)

File Name: R:\General Air Quality Info\Projects\0D4136500 - Burlingame Specific Plan\Modeling\Urbemis\Build option 1 - Mitigated-a-46.urb924

Project Name: Burlingame Downtown SP - Build Option 1 - Mitigated - 1.75

Project Location: Bay Area Air District

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

OPERATIONAL EMISSION ESTIMATES (Annual Tons Per Year, Mitigated)

Source	CO_2
Apartments mid rise	5,851.21
Hotel	3,130.41
Strip mall	2,366.89
General office building	2,529.03
TOTALS (tons/year, mitigated)	13,877.54

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2030 Season: Annual

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Operational Mitigation Options Selected

Residential Mitigation Measures

Residential Local-Serving Retail Mitigation

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Operational Mitigation Options Selected

Residential Mitigation Measures

Percent Reduction in Trips is 0% (calculated as a % of 9.57 trips/day)))

Note that the above percent is applied to a baseline of 9.57 and that product is

subtracted from the Unmitigated Trips

Inputs Selected:

The Presence of Local-Serving Retail checkbox was NOT selected.

Residential Pedestrian/Bicycle Friendliness Mitigation

Percent Reduction in Trips is 3.42% (calculated as a % of 9.57 trips/day)

Note that the above percent is applied to a baseline of 9.57 and that product is

subtracted from the Unmitigated Trips

Inputs Selected:

The Number of Intersections per Square Mile is 184

The Percent of Streets with Sidewalks on One Side is 0%

The Percent of Streets with Sidewalks on Both Sides is 50%

The Percent of Arterials/Collectors with Bike Lanes or where Suitable,

Direct Parallel Routes Exist is 50%

Nonresidential Mitigation Measures

Non-Residential Local-Serving Retail Mitigation

Percent Reduction in Trips is 0%

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Nonresidential Mitigation Measures

Inputs Selected:

The Presence of Local-Serving Retail checkbox was NOT selected.

Non-Residential Pedestrian/Bicycle Friendliness Mitigation

Percent Reduction in Trips is 3.42%

Inputs Selected:

The Number of Intersections per Square Mile is 184

The Percent of Streets with Sidewalks on One Side is 0%

The Percent of Streets with Sidewalks on Both Sides is 50%

The Percent of Arterials/Collectors with Bike Lanes or where Suitable,

Direct Parallel Routes Exist is 50%

Non-Residential Parking Pricing/Cash Out Mitigation

Percent Reduction in Trips is 7.29%

Inputs Selected:

The Daily Parking Change was set to 1.75 dollars

Non-Residential Other Transportation Demand Measures Mitigation

----

Percent Reduction in Trips is 1.17%

Note that the above percent is applied ONLY to worker trips.

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Nonresidential Mitigation Measures

Inputs Selected:

The 'Secure Bike Parking' measure was selected

The 'Information provided on Transportation Alternatives' measure was selected

The 'Preferential Carpool/Vanpool Parking' measure was selected

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Apartments mid rise	23.03	6.38	dwelling units	875.00	5,584.48	34,249.06
Hotel		25.11	rooms	120.00	3,012.79	18,653.47
Strip mall		12.39	1000 sq ft	183.84	2,278.25	14,117.35
General office building		16.35	1000 sq ft	148.70	2,430.92	14,925.87
					13,306.44	81,945.75

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	54.1	0.0	100.0	0.0
Light Truck < 3750 lbs	12.5	0.0	99.2	0.8
Light Truck 3751-5750 lbs	19.9	0.0	100.0	0.0
Med Truck 5751-8500 lbs	6.6	0.0	100.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	0.9	0.0	77.8	22.2
Lite-Heavy Truck 10,001-14,000 lbs	0.6	0.0	50.0	50.0
Med-Heavy Truck 14,001-33,000 lbs	1.0	0.0	20.0	80.0
Heavy-Heavy Truck 33,001-60,000 lbs	0.3	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0

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Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	3.2	34.4	65.6	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	0.6	0.0	83.3	16.7

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	6.2	6.1	6.1	6.1	6.2	6.2
Rural Trip Length (miles)	16.8	7.1	7.9	14.7	6.6	6.6
Trip speeds (mph)	35.0	35.0	35.0	35.0	35.0	35.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
Hotel				5.0	2.5	92.5
Strip mall				2.0	1.0	97.0
General office building				35.0	17.5	47.5

Operational Changes to Defaults

Home-based work urban trip length changed from 10.8 miles to 6.2 miles

Home-based shop urban trip length changed from 7.3 miles to 6.1 miles

Home-based other urban trip length changed from 7.5 miles to 6.1 miles

Commercial-based commute urban trip length changed from 9.5 miles to 6.1 miles

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Operational Changes to Defaults

Commercial-based non-work urban trip length changed from 7.35 miles to 6.2 miles

Commercial-based customer urban trip length changed from 7.35 miles to 6.2 miles

Build Option 2

4/7/2010 4:26:25 PM

Urbemis 2007 Version 9.2.4

Detail Report for Annual Area Source Mitigated Emissions (Tons/Year)

File Name: R:\General Air Quality Info\Projects\0D4136500 - Burlingame Specific Plan\Modeling\Urbemis\Build option 2 - UNmitigated.urb924

Project Name: Burlingame Downtown SP - Build Option 2 - UNmitigated

Project Location: Bay Area Air District

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

AREA SOURCE EMISSION ESTIMATES (Annual Tons Per Year, Mitigated)

Source	CO_2
Natural Gas	2,479.42
Hearth	2.39
Landscape	0.76
Consumer Products	
Architectural Coatings	
TOTALS (tons/year, mitigated)	2,482.57

Area Source Mitigation Measures Selected

Mitigation Description	Percent Reduction
Residential Increase Energy Efficiency Beyond Title 24	15.00
Commercial Increase Energy Efficiency Beyond Title 24	15.00
Industrial Increase Energy Efficiency Beyond Title 24	15.00

Area Source Changes to Defaults

Percentage of residences with wood stoves changed from 35% to 0%

Percentage of residences with wood fireplaces changed from 10% to 0%

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Urbemis 2007 Version 9.2.4

Detail Report for Annual Operational Mitigated Emissions (Tons/Year)

File Name: R:\General Air Quality Info\Projects\0D4136500 - Burlingame Specific Plan\Modeling\Urbemis\Build option 2 - UNmitigated.urb924

Project Name: Burlingame Downtown SP - Build Option 2 - UNmitigated

Project Location: Bay Area Air District

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

OPERATIONAL EMISSION ESTIMATES (Annual Tons Per Year, Mitigated)

Source	CO_2
Apartments mid rise	9,086.73
Strip mall	1,617.72
General office building	5,710.08
TOTALS (tons/year, mitigated)	16,414.53

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2030 Season: Annual

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Operational Mitigation Options Selected

Residential Mitigation Measures

Residential Local-Serving Retail Mitigation

Percent Reduction in Trips is 0% (calculated as a % of 9.57 trips/day)))

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Operational Mitigation Options Selected

Residential Mitigation Measures

Note that the above percent is applied to a baseline of 9.57 and that product is

subtracted from the Unmitigated Trips

Inputs Selected:

The Presence of Local-Serving Retail checkbox was NOT selected.

Residential Pedestrian/Bicycle Friendliness Mitigation

Percent Reduction in Trips is 5.67% (calculated as a % of 9.57 trips/day)

Note that the above percent is applied to a baseline of 9.57 and that product is

subtracted from the Unmitigated Trips

Inputs Selected:

The Number of Intersections per Square Mile is 184

The Percent of Streets with Sidewalks on One Side is 0%

The Percent of Streets with Sidewalks on Both Sides is 100%

The Percent of Arterials/Collectors with Bike Lanes or where Suitable,

Direct Parallel Routes Exist is 75%

Nonresidential Mitigation Measures

Non-Residential Local-Serving Retail Mitigation

Percent Reduction in Trips is 0%

Inputs Selected:

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Nonresidential Mitigation Measures

The Presence of Local-Serving Retail checkbox was NOT selected.

Non-Residential Pedestrian/Bicycle Friendliness Mitigation

Percent Reduction in Trips is 5.67%

Inputs Selected:

The Number of Intersections per Square Mile is 184

The Percent of Streets with Sidewalks on One Side is 0%

The Percent of Streets with Sidewalks on Both Sides is 100%

The Percent of Arterials/Collectors with Bike Lanes or where Suitable,

Direct Parallel Routes Exist is 75%

Non-Residential Parking Pricing/Cash Out Mitigation

Percent Reduction in Trips is 6.25%

Inputs Selected:

The Daily Parking Change was set to 1.5 dollars

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Apartments mid rise	32.42	6.95	dwelling units	1,232.00	8,558.63	53,217.55
Strip mall		8.46	1000 sq ft	183.84	1,556.03	9,648.94

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Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
General office building		21.80	1000 sq ft	248.70	5,421.33	33,707.09
					15,535.99	96,573.58

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	54.1	0.0	100.0	0.0
Light Truck < 3750 lbs	12.5	0.0	99.2	0.8
Light Truck 3751-5750 lbs	19.9	0.0	100.0	0.0
Med Truck 5751-8500 lbs	6.6	0.0	100.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	0.9	0.0	77.8	22.2
Lite-Heavy Truck 10,001-14,000 lbs	0.6	0.0	50.0	50.0
Med-Heavy Truck 14,001-33,000 lbs	1.0	0.0	20.0	80.0
Heavy-Heavy Truck 33,001-60,000 lbs	0.3	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	3.2	34.4	65.6	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	0.6	0.0	83.3	16.7

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	6.2	6.3	6.2	6.2	6.3	6.2
Rural Trip Length (miles)	16.8	7.1	7.9	14.7	6.6	6.6

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Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Trip speeds (mph)	35.0	35.0	35.0	35.0	35.0	35.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
Strip mall				2.0	1.0	97.0
General office building				35.0	17.5	47.5

Operational Changes to Defaults

Home-based work urban trip length changed from 10.8 miles to 6.2 miles

Home-based shop urban trip length changed from 7.3 miles to 6.3 miles

Home-based other urban trip length changed from 7.5 miles to 6.2 miles

Commercial-based commute urban trip length changed from 9.5 miles to 6.2 miles

Commercial-based non-work urban trip length changed from 7.35 miles to 6.3 miles

Commercial-based customer urban trip length changed from 7.35 miles to 6.2 miles

APPENDIX

GHG Modeling Worksheets

Build Option 1

Burlingame Specific Plan - Build Option 1
Greenhouse Gas Emission Worksheet
Project Summary

Project: Burlingame Specific Plan - Build Option 1
Project Number: 0D4136500

Project Totals	Total		Percent of total	
Unmitigated Operation				
Vehicular Use	8,035	metric tons CO_2e	61.6%	
Electricity	3,063	metric tons CO_2e	23.5%	
Natural Gas & other fuels	1,822	metric tons CO_2e	14.0%	
Solid Waste	103	metric tons CO_2e	0.8%	
Water Use	28	metric tons CO_2e	0.2%	
Total	**13,050**	**metric tons CO_2e**	**100.0%**	
Is Mitigation Required?	Yes			
Mitigated Operation				% Reduction
Vehicular Use	7,967	metric tons CO_2e	65.5%	0.84%
Electricity	2,603	metric tons CO_2e	21.4%	15.00%
Natural Gas & other fuels	1,549	metric tons CO_2e	12.7%	14.99%
Solid Waste	26	metric tons CO_2e	0.2%	75.00%
Water Use	25	metric tons CO_2e	0.2%	10.00%
Total	**12,170**	**metric tons CO_2e**	**100.0%**	6.74%

	Unmitigated	***Mitigated***	
Service population	2,618	2,618	
CO2e per service population	5.0	4.6	metric tons CO2e/SP/yr
BAAQMD Thresholds	4.6	4.6	Project Level metric tons CO2e/SP/yr
	6.6	6.6	Plan Level metric tons CO2e/SP/yr
Burlingame Threshold	9.2	9.2	Burlingame CAP CO2e / capita

Burlingame Specific Plan - Build Option 1
Greenhouse Gas Emission Worksheet
Modeling Assumptions

Standard Conversions and Emission Factors

	CO_2	CH_4	N_2O	Not Gas Dependent	
lbs/short ton [1]	-	-	-	2000	C_4
lbs/metric ton [1]	-	-	-	2204.62	C_2
g/metric ton [1]	-	-	-	1,000,000	C_5
metric tons/short ton [1]	-	-	-	0.907185	C_3
kW/MW [1]	-	-	-	1,000	C_1
KWh/Dwelling Unit/year [2]	-	-	-	7,300	D_{ele}
KWh/SF of office/year [3]	-	-	-	15.0	O_{ele}
KWh/SF of hotel/year [3]	-	-	-	14.7	H_{ele}
KWh/SF of Retail/year [3]	-	-	-	14.8	R_{ele}
kWh/Mg Indoor Potable water use NC [4]	-	-	-	3500	F_{IPOT}
kWh/Mg Indoor Wastewater NC [4]	-	-	-	1911	F_{IWW}
kWh/Mg Outdoor water use NC [4]	-	-	-	3,500	
Percent potable water assumed for indoor use [5]	-	-	-	95%	
Percent potable water from renewable sources [5]	-	-	-	85%	
GWP [6]	1	21	310	-	GWP_C, GWP_M, GWP_N
2008+ (lbs/MWh) [7]		0.0302	0.0081	-	EF_{Mele}, EF_{Nele}
2008+ (lbs/MWh) [8]	524	-	-	-	EF_{Cele}
lbs/therm [9]	11.67	0.001	0.00002	-	
Attributable percentage of lbs/therm	99.9913%	0.0086%	0.0002%	-	$\%_{CCO2e}$, $\%_{MCO2e}$, $\%_{NCO2e}$
gr/mile for vehicle fleet [10]	-	varies	varies	-	
gasoline emission factor (lbs/gallon) [11]	19.4	-	-	-	EF_{ClsF}
gasoline emission factor (gr/gallon) [12]	-	0.50	0.22	-	EF_{MlsF}, EF_{NlsF}
landscape gallons per year	-	-	-	104.12	G_F
MT/ton (solid waste) [13]	0	0.07	0	-	
gr/mile [10]	-	0.0051	0.0048	-	EF_{MSWT}, EF_{NSWT}
gr/mile	3464.1638	-	-	-	EF_{CSWT}
kg/gallon [14]	10.15	-	-	-	
miles/gallon [15]	2.93	-	-	-	
Residential (waste tons/cuyd) [16]	-	-	-	0.1125	R_{TCY}
Commercial (waste tons/cuyd) [16]	-	-	-	0.225	C_{TCY}
Truck capacity (cy/truck) [17]	-	-	-	33	T_{CY}
lbs/square foot office/day [18]	-	-	-	0.006	R_{OSW}
lbs/square foot retail/day [18]	-	-	-	0.006	R_{RSW}
lbs/dwelling unit/day [18]	-	-	-	4	R_{DSW}
lbs/hotel room/day [18]	-	-	-	2	R_{HSW}
Miles/trip [19]	-	-	-	38.41	M
Pavley Reduction PC/LDT1 [20]	-	-	-	43.90%	
Pavley Reduction LDT2 [20]	-	-	-	40.20%	

General Assumptions

	CO_2	CH_4	N_2O	Not Gas Dependent	
Annual Water Usage gal/yr (build option 1) [5]	-	-	-	138,000	U_T
Annual Water Usage gal/yr (build option 2) [5]	-	-	-	179,000	
Residential Units [21]	-	-	-	875	DU
Retail square footage [21]	-	-	-	183,843	SF_R
Office Square Footage (build option 1) [21]	-	-	-	148,702	SF_O
Office Square Footage (build option 2) [21]	-	-	-	248,702	
Hotel beds (build option 1) [21]	-	-	-	120	HR
Hotel beds (build option 2) [21]	-	-	-	0	
Hotel Square footage (build option 1) [21]	-	-	-	100,000	SF_H
Hotel Square footage (build option 2) [21]	-	-	-	0	
Residents [21]	-	-	-	1,559	
Employees [21]	-	-	-	1,059	
Office Employees [21]	-	-	-	491	
Retail Employees [21]	-	-	-	460	
Hotel Employees [21]	-	-	-	108	
Service Population	-	-	-	2,618	
Vehicle Miles / year	-	-	-	32,663,850	U_{VMT}

URBEMIS Assumptions

Vehicle Fleet Makeup

	CO_2	CH_4	N_2O	Not Gas Dependent	
Fleet percentages [22]				varies (below)	
Emission Factors [10]				varies (below)	
Vehicle Type					
Light Auto	-	0.0147	0.0079	54.10%	
Light Truck < 3750 lbs	-	0.0157	0.0101	12.50%	
Light Truck 3751-5750 lbs	-	0.0157	0.0101	19.90%	
Med Truck 5751-8500 lbs	-	0.0326	0.0177	6.60%	
Lite-Heavy Truck 8501-10,000 lbs	-	0.0326	0.0177	0.90%	
Lite-Heavy Truck 10,001-14,000 lbs	-	0.0326	0.0177	0.60%	
Med-Heavy Truck 14,001-33,000 lbs	-	0.0326	0.0177	1.00%	
Heavy-Heavy Truck 33,001-60,000 lbs	-	0.0326	0.0177	0.30%	
Other Bus	-	0.0326	0.0177	0.10%	
Urban Bus	-	0.0326	0.0177	0.10%	
Motorcycle	-	0.0147	0.0079	3.20%	
School Bus	-	0.0326	0.0177	0.10%	
Motor Home	-	0.0326	0.0177	0.60%	
Total (Composite based on percentage)	-	*0.01687*	*0.00962*	-	
Pevely Reduced Composite	-	*0.01126*	*0.00638*	-	EF_{MCV}, EM_{NCV}

	CO_2	CH_4	N_2O	Not Gas Dependent
VMT Determination				
Daily County VMT [21]				82,461,040
Daily County + Project [21]				82,550,530
Daily Project				89,490.00
Unmitigated Urbemis Daily VMT [22]				89,516.06
Mitigated Urbemis Daily VMT [22]				80,908.67
Daily Number of trips [21]				14,520.00
Unmitigated Urbemis Daily Trips [22]				14,520.05
Mitigated Urbemis Daily Trips [22]				13,123.25
Average Trip length [21]				6.16
Existing Average cost for daily parking [23]				1.50
Mitigated Average cost for daily parking [23]				1.75
Bicycle lanes and Sidewalks [24]				Various

Emissions determined from URBEMIS	CO_2	CH_4	N_2O		
Tons/year Natural Gas [22]	2,002.55	-	-	-	E_{Cng}
Landscaping emissions [22]	1.01	-	-	-	E_{Cls}
Unmitigated CO_2 emissions from Mobile Sources [22]	13,984.20	-	-	-	E_{CVMT}
Mitigated CO_2 emissions from Mobile Sources [22]	13,877.54	-	-	-	E_{CVMT}

References

1 *Source:* *California Climate Action Registry General Reporting Protocol, Version 3.1 January 2009 (Appendix B)*

2 *Source:* *Greenhouse Gas CEQA Significance Threshold Stakeholder Working Group #12; July 2009.*

3 *Source:* *CBECS: Electricity Consumption and Conditional Energy Intensity by Census Region for All Buildings, 2003. Released December 2006.*

4 *Source:* *CEC: Recommended Revised Water-energy Proxies, Refining Estimates of Water-Related Energy Use in California, CEC-500-2006-118. (Table ES-1).*

5 *Source:* *Water usage provided by the Water supply assessment: City of Burlingame Water Supply Technical Study for the Downtown Specific Plan, PBS&J January 2010.*

http://sfwater.org/mto_main.cfm/MC_ID/12/MSC_ID/145/MTO_ID/344, accessed 4/1/2010.

Note: *Conservative estimates assume water at 100% indoor use with 95% of potable released to sewers.*

6 *Source:* *California Climate Action Registry General Reporting Protocol, Version 3.1 January 2009 (Table C.1)*

7 *Source:* *California Climate Action Registry General Reporting Protocol, Version 3.1 January 2009 (Table C.2)*

8 *Source:* *PG&E: GHG Data Requests, Fact Sheet GHG Data.pdf, Email from John Bohman January 11, 2010*

9 *Source:* *California Climate Action Registry General Reporting Protocol, Version 3.1 January 2009 (Tables C.7 & C.8)*

10 *Source:* *California Climate Action Registry General Reporting Protocol, Version 3.1 January 2009 (Tables C.4)*

11 *Source:* *http://www.epa.gov/oms/climate/420f05001.htm*

12 *Source:* *California Climate Action Registry General Reporting Protocol, Version 3.1 January 2009 (Table C6; Other small utility)*

13 *Source:* *EPA Solid Waste Management and Greenhouse Gases; A life-cycle assessment of emissions and Sinks, 3rd edition, September 2006.*

Ox Mountain Landfill has a methane recovery system with electrical generation.

14 *Source:* *California Climate Action Registry General Reporting Protocol, Version 3.1 January 2009 (Table C.3)*

15 *Source:* *Waste Management's LNG Truck Fleet: Final Results January 2001. (pg 14)*

16 *Source:* *EPA Standard Volume-to-Weight Conversion Factor obtained from http://www.epa.gov/osw/conserve/tools/recmeas/docs/guide_b.pdf, accessed January 18, 2010.*

17 *Source:* *Heil Website (http://www.heil.com/products/python.asp) accessed 1/18/2010 & http://www.tigerdude.com/garbage/frontload/index.html accessed 1/18/2010.*

18 *Source:* *http://www.calrecycle.ca.gov/wastechar/wastegenrates/ last updated December 30, 2009, accessed 3/30/2010.*

19 *Source:* *http://www.mapquest.com, accessed 3/22/2010.*
Miles per trip are determined by average round-trip miles from the downtown specific plan area to the San Carlos Transfer Station and then to the Ox Mountain Landfill.

20 *Source:* *CARB Comparison of Greenhouse Gas Reductions for the United States and Canada Under U.S. CAFÉ Standards and California Air Resources Board Greenhouse Gas Regulations. February 25, 2008.*

21 *Source:* *Wilbur Smith Associates, Burlingame Downtown Specific Plan - VMT Analysis Technical Memorandum, dated March 29, 2010.*

Wilbur Smith Associates, Burlingame Downtown Specific Plan - Traffic Impact Analysis Technical Memorandum, March 27, 2009.

Wilbur Smith Associates, RE: Burlingame Traffic Question. E-mail to Rachel Schuett dated March 31, 2010.

Note: *For a conservative waste generation estimate, assumes only one bed per hotel room.*

22 *Source:* *URBEMIS 2007 Version 9.2.4 runs for Build Option 1 of the Burlingame Downtown Specific Plan dated 04/06/2010 (unmitigated) and 5/18/2010 (Mitigated).*

Note: *Because Urbemis does not allow for reductions due to project design features or some existing conditions (such as parking fees), these features must be included as "mitigation" in the model in order for their reductions to be counted. Due to this, the title lines of both the Unmitigated and Mitigated reports will indicate "Mitigated Emissions". The File Name contains the accurate designation as to the unmitigated vs. mitigated reports.*

URBEMIS VMT and Trips may vary from Project Traffic information values due to rounding in URBEMIS. If difference, VMT from URBEMIS will be higher to show a conservative emissions estimate.

Emissions of Natural Gas are Based on 2005 Title 24 Standard.

23 *Source:* *Burlingame Police Department, phone conversation with Sergeant Don Shepley on 4/5/2010. Mr. Shepley stated that long-term parking was approximately $1.00 to $2.00 per day in the long-term parking lots where employees park. For modeling purposes an average of $1.50 per day was used.*

24 *Note:* *From review of Google Earth, a conservative estimate of 50% coverage for Arterial/Collector bicycle lanes, 184 intersections per square mile, and 50% of streets having sidewalks on both sides were used in the URBEMIS model.*

Burlingame Specific Plan - Build Option 1
Greenhouse Gas Emission Worksheet
Usage and Generation Calculations

Electricity Calcs

Project Area		*Electricity Generation Rate**		*Use*	*Subtotal (kWH/year)*	
875	units	7,300.00	kWH/year/unit	Residential	6,387,500	
	sf		kWH/year/sf	Grocery	-	
	sf		kWH/year/sf	Restaurant	-	
	sf		kWH/year/sf	Hospital	-	
	sf		kWH/year/sf	University	-	
	sf		kWH/year/sf	High School	-	
	sf		kWH/year/sf	Elementary School	-	
148,702	sf	15	kWH/year/sf	Office	2,230,530	
100,000	sf	14.7	kWH/year/sf	Hotel	1,470,000	
	sf		kWH/year/sf	Warehouse	-	
183,843	sf	14.8	kWH/year/sf	Retail	2,720,876	
	sf		kWH/year/sf	Miscellaneous	-	
				Total	12,808,906	kWH/year

[1] Assumes 1 bed per room and 512.82 square feet room. Energy Star Space Use Information - Hotel/Motel retrieved: https://www.energystar.gov/istar/pmpam/help/Hotel_Motel_Space_Use_Information.htm 2/11/2010

Solid Waste Calcs

Project Area		*Solid Waste Generation Rate**		*Use*	*Subtotal (tons/year)*	
148702	sf	0.006	lbs/sf/day	Office	163	
183,843	sf	0.006	lbs/sf/day	Retail	201	
	sf		lbs/sf/day	Department Store	-	
	sf		lbs/sf/day	Manufacturing/warehouse	-	
	sf		lbs/sf/day	School	-	
	beds		lbs/bed/day	Hospital	-	
120	rooms	2	lbs/unit/day	Single-family Residential	44	
875	unit	4	lbs/unit/day	Multi-family Residential	639	
				Total	1,047	tons/year

Water Calcs

Project	*Units*	*Water (gals/day/unit)*	*Water Usage (gals/day)*	*Type Description*	*Annual Water Usage (Million Gallons)*	
	Parcel		0	Single Family Home	0	
	Parcel		0	Duplex	0	
	Parcel		0	Triplex	0	
	Parcel		0	Fourplex	0	
248,702	sf		0	Office	0	
183,843	sf		0	Retail	0	
875	# of Units		0	Five Units or More	0	
	# of Units		0	Mobile Home Park	0	
	Project Total[2]		138,000	Project total	50.37	
			138000	**Total**	**50.37**	MG water (annual)

[2] Water usage provided by the Water supply assessment: *City of Burlingame Water Supply Technical Study for the Downtown Specific Plan* , PBS&J January 2010. Note: WSA maintains 248,702 sf of office instead of 120 rooms of a hotel.

Burlingame Specific Plan - Build Option 1
Greenhouse Gas Emission Worksheet
Operational Emissions

Project:	Burlingame Specific Plan - Build Option 1	**Conversion to CO2e Units based on GWP**	
		CH_4	21
Project Number:	0D4136500	N_2O	310

Indirect Emissions from Electricity Use

Total Project Annual KWh:	**12,808,906**	kWH/year
Project Annual MWh (U_{ele}):	**12,809**	MWH/year

Emission Factors for Electricity Use:

CO_2	524	lbs/MWh/year
CH_4	0.0302	lbs/MWh/year
N_2O	0.0081	lbs/MWh/year

Annual Emissions from Electricity Use:

	Total Emissions		**Total CO_2e Units**	
CO_2 emissions:	3044.4553	metric tons	**3044.5**	metric tons CO_2e
CH_4 emissions:	0.1755	metric tons	**3.7**	metric tons CO_2e
N_2O emissions:	0.0471	metric tons	**14.6**	metric tons CO_2e
		Project Total	***3,063***	***metric tons CO_2e***

Emissions from Natural Gas Use

Emission Factors for Natural Gas Use:

CO_2	11.67	lbs/therm	**99.9913%**
CH_4	0.001	lbs/therm	**0.0086%**
N_2O	0.00002	lbs/therm	**0.0002%**

URBEMIS output[1]

2,002.55 tons (short, US)

Annual Emissions from Natural Gas Use:

	Total Emissions		Total CO_2e Units	
CO_2 emissions:	1,816.6828	metric tons	**1,817**	metric tons CO_2e
CH_4 emissions:	0.1557	metric tons	**3**	metric tons CO_2e
N_2O emissions:	0.0031	metric tons	**1**	metric tons CO_2e
		Project Total	***1,821***	***metric tons CO_2e***

1

The URBEMIS 2007 v 9.2.4 model assumes 2005 Title 24 compliance. In order to account for compliance with the 2008 Title 24 standards, emissions determined by Urbemis were reduced by 15%.

Reduce Natural Gas consumption by 15%		*0.15*	
	Reduced Project total	***1,548***	***metric tons CO_2e***

Emissions from Other Fuel Use

Other onsite fuel use (Landscaping)

CO_2	*19.4*	*lbs/gallon*
CH_4	0.50	*gr/gallon*
N_2O	0.22	*gr/gallon*
Fuel Use	104.12	*gallons/year*

URBEMIS Output

1.01 tons (short, US) CO_2

Annual Emissions from Natural Gas Use:

	Total Emissions		Total CO_2e Units	
CO_2 emissions:	0.9163	metric tons	**0.9163**	metric tons CO_2e
CH_4 emissions:	0.0000521	metric tons	**0.0011**	metric tons CO_2e
N_2O emissions:	0.0000229	metric tons	**0.0005**	metric tons CO_2e
		Project Total	***0.92***	***metric tons CO_2e***

Mitigation

Reduce other fuel consumption by 15%	*0.00*	
Reduced Project total	***0.92***	***metric tons CO_2e***

Indirect Emissions from Solid Waste (Operational)

Total Solid Waste:	1,047	tons/year		
Emission Factors for Natural Gas Use:				
CO_2	0	MT/ton	3,464.16	gr/mile
CH_4	0.07	MT/ton	0.0051	gr/mile
N_2O	0	MT/ton	0.0048	gr/mile

From Fugitive emissions: Fugitive emissions of CO_2 from solid waste operations are not considered anthropogenic and therefore are not considered as part of the emissions inventory. There are no fugitive emissions of N_2O.

	tons/yr	MT/ton	MT CO_2e/yr
CH_4	1,047	0.07	**73.3**

From Exhaust emissions:

	tons/yr	tons/cuyd	cuyd/trip	miles/trip[2]	gr/mile	g/MT	MT/yr
CO_2 - Residential	639	0.1125	33	38.41	3,464.16	1,000,000	22.89
CO_2 - Commercial	364	0.2250	33	38.41	3,464.16	1,000,000	6.53
CH_4 - Residential	639	0.1125	33	38.41	0.0051	1,000,000	0.00003370
CH_4 - Commercial	364	0.2250	33	38.41	0.0051	1,000,000	0.00000961
N_2O - Residential	639	0.1125	33	38.41	0.0048	1,000,000	0.00003172
N_2O - Commercial	364	0.2250	33	38.41	0.0048	1,000,000	0.00000904

Annual Emissions from Solid Waste Generation:

	Total Emissions		Total CO_2e Units	
CO_2 emissions:	29.42000	metric tons	**29.4200**	metric tons CO_2e
CH_4 emissions:	3.48900	metric tons	**73.2690**	metric tons CO_2e
N_2O emissions:	0.00004	metric tons	**0.0126**	metric tons CO_2e
	Project Total		***102.70***	***metric tons CO_2e***

Mitigation

Reduce/Divert waste from landfills by 75%		*0.75*	
	Reduced Project total	***25.68***	***metric tons CO_2e***

[2] Miles per trip are determined by average round-trip miles from the downtown specific plan area to the San Carlos Transfer Station and then to the Ox Mountain Landfill.

Indirect Emissions from Water Use (Includes Potable water and Waste Water)

Indoor Uses Potable	50.37	MG/year	**Emission Factors for Electricity Use:**		
Indoor Uses to Wastewater	47.85	MG/year	CO_2	524	lbs/MWh/year
Outdoor Uses*	0.00	MG/year	CH_4	0.0302	lbs/MWh/year
Total Project Usage/generation:	98.22	MG/year	N_2O	0.0081	lbs/MWh/year
Northern or Southern Ca?	Northern				

Annual Electricity Generation Associated with Water Uses

	Water Consumption (MG)	Energy Factor MWh/MG)		
Indoor Uses Potable	50.37	3.5	176	MWh/year
Indoor Uses to Wastewater	47.85	1.911	91	MWh/year
Outdoor Uses	0.00	3.5	0	MWh/year
Sub Total Project Usage			***268***	**MWh/year**
Usage offset by renewables[3]	-42.81	3.5	*-150*	MWh/year
			118	**MWh/year**

Water-energy proxies (MWh/MG)

	No CA	So CA
Indoor Uses Potable	3.50	13.022
Indoor Use Wastewater	1.91	
Outdoor Uses	3.50	11.111
% from Hetch Hetchy	0.85	

Annual Emissions from Water Use:

	Total Emissions		Total CO_2e Units	
CO_2 emissions:	28.0	metric tons	**28.0**	metric tons CO_2e
CH_4 emissions:	0.0	metric tons	**0.0**	metric tons CO_2e
N_2O emissions:	0.0	metric tons	**0.1**	metric tons CO_2e
	Project Total		***28***	***metric tons CO_2e***

Mitigation

Reduce Water Consumption by 10%		*0.10*	
	Reduced Project total	***25.37***	***metric tons CO_2e***

* * - Input manually

[4] 85% of City Potable water is from the Hetch Hetchy System which offsets electrical generation needed to treat and transport potable water. Therefore 85% of the potable water use from the Specific Plan is assumed to be of a renewable origin and therefore emissions from this 85% are not included in the inventory.

Burlingame Specific Plan - Build Option 2
Greenhouse Gas Emission Worksheet
Mobile Emissions

From URBEMIS 2007 Vehicle Fleet Mix Output:

	Unmitigated	Mitigated
Daily Vehicle Miles Traveled (VMT):	89,490	80,909
Annual VMT:	32,663,850	29,531,665
Unmitigated CO_2 emissions from Urbemis	13,984	13,878

Vehicle Type	Percent Type	Reduction from Energy Efficiency Standard	CO_2 emissions by vehicle type	Reduced CO_2 emissions	CH_4 Emission Factor (g/mile)	New CH_4 Emission Factor (g/mile)	Reduced CH_4 Emission Factor (g/mile)	N_2O Emission Factor (g/mile)	New N_2O Emission Factor (g/mile)	Reduced N_2O Emission Factor (g/mile)
UNMITIGATED										
Light Auto	54.1%	43.90%	7,565	4,244	0.0147	0.007953	0.004461465	0.0079	0.0042739	0.0023977
Light Truck < 3750 lbs	12.5%	43.90%	1,748	981	0.0157	0.001963	0.001100963	0.0101	0.0012625	0.0007083
Light Truck 3751-5750 lbs	19.9%	40.20%	2,783	1,664	0.0157	0.003124	0.001868331	0.0101	0.0020099	0.0012019
Med Truck 5751-8500 lbs	6.6%	0.00%	923	923	0.0326	0.002152	0.0021516	0.0177	0.0011682	0.0011682
Lite-Heavy Truck 8501-10,000 lbs	0.9%	0.00%	126	126	0.0326	0.000293	0.0002934	0.0177	0.0001593	0.0001593
Lite-Heavy Truck 10,001-14,000 lbs	0.6%	0.00%	84	84	0.0326	0.000196	0.0001956	0.0177	0.0001062	0.0001062
Med-Heavy Truck 14,001-33,000 lbs	1.0%	0.00%	140	140	0.0326	0.000326	0.000326	0.0177	0.000177	0.000177
Heavy-Heavy Truck 33,001-60,000 lbs	0.3%	0.00%	42	42	0.0326	9.78E-05	0.0000978	0.0177	0.0000531	0.0000531
Other Bus	0.1%	0.00%	14	14	0.0326	3.26E-05	0.0000326	0.0177	0.0000177	0.0000177
Urban Bus	0.1%	0.00%	14	14	0.0326	3.26E-05	0.0000326	0.0177	0.0000177	0.0000177
Motorcycle	3.2%	0.00%	447	447	0.0147	0.00047	0.0004704	0.0079	0.0002528	0.0002528
School Bus	0.1%	0.00%	14	14	0.0326	3.26E-05	0.0000326	0.0177	0.0000177	0.0000177
Motor Home	0.6%	0.00%	84	84	0.0326	0.000196	0.0001956	0.0177	0.0001062	0.0001062
Total (Composite based on percentage)			13,984	8,777		**0.016868**	**0.011258959**		**0.0096222**	**0.0063837**
Mitigated										
Light Auto	54.1%	43.90%	7,508	4,212	0.0147	0.007953	0.004461465	0.0079	0.0042739	0.0023977
Light Truck < 3750 lbs	12.5%	43.90%	1,735	973	0.0157	0.001963	0.001100963	0.0101	0.0012625	0.0007083
Light Truck 3751-5750 lbs	19.9%	40.20%	2,762	1,651	0.0157	0.003124	0.001868331	0.0101	0.0020099	0.0012019
Med Truck 5751-8500 lbs	6.6%	0.00%	916	916	0.0326	0.002152	0.0021516	0.0177	0.0011682	0.0011682
Lite-Heavy Truck 8501-10,000 lbs	0.9%	0.00%	125	125	0.0326	0.000293	0.0002934	0.0177	0.0001593	0.0001593
Lite-Heavy Truck 10,001-14,000 lbs	0.6%	0.00%	83	83	0.0326	0.000196	0.0001956	0.0177	0.0001062	0.0001062
Med-Heavy Truck 14,001-33,000 lbs	1.0%	0.00%	139	139	0.0326	0.000326	0.000326	0.0177	0.000177	0.000177
Heavy-Heavy Truck 33,001-60,000 lbs	0.3%	0.00%	42	42	0.0326	9.78E-05	0.0000978	0.0177	0.0000531	0.0000531
Other Bus	0.1%	0.00%	14	14	0.0326	3.26E-05	0.0000326	0.0177	0.0000177	0.0000177
Urban Bus	0.1%	0.00%	14	14	0.0326	3.26E-05	0.0000326	0.0177	0.0000177	0.0000177
Motorcycle	3.2%	0.00%	444	444	0.0147	0.00047	0.0004704	0.0079	0.0002528	0.0002528
School Bus	0.1%	0.00%	14	14	0.0326	3.26E-05	0.0000326	0.0177	0.0000177	0.0000177
Motor Home	0.6%	0.00%	83	83	0.0326	0.000196	0.0001956	0.0177	0.0001062	0.0001062
Total (Composite based on percentage)			13,878	8,710		**0.016868**	**0.011258959**		**0.0096222**	**0.0063837**

Annual Mobile Emissions:

	Unmitigated Total Emissions		Total CO_2e units		**Mitigated** Total Emissions		Total CO_2e units	
CO2 Emissions*:	**8,777**	tons CO_2	**7,962**	metric tons CO_2e	8,710	tons CO_2	**7,902**	tons CO_2
CH4 Emissions:	**0.368**	metric tons CH_4	**8**	metric tons CO_2e	**0.332**	metric tons CH_4	**7**	metric tons CH_4
N20 Emissions:	**0.209**	metric tons N_2O	**65**	metric tons CO_2e	**0.189**	metric tons N_2O	**58**	metric tons N_2O
Project Total:			***8,035***	***metric tons CO_2e***			***7,967***	***metric tons CO_2e***

Build Option 2

Burlingame Specific Plan - Build Option 2
Greenhouse Gas Emission Worksheet
Project Summary

Project: Burlingame Specific Plan - Build Option 2
Project Number: 0D4136500

Vehicular Use	9,322	metric tons CO_2e	60.4%
Electricity	3,693	metric tons CO_2e	23.9%
Natural Gas & other fuels	2,257	metric tons CO_2e	14.6%
Solid Waste	137	metric tons CO_2e	0.9%
Water Use	37	metric tons CO_2e	0.2%
Total	**15,445**	**metric tons CO_2e**	**100.0%**

Is Mitigation Required? No

	Unmitigated	
Service population	3,472	
CO2e per service population	4.4	metric tons CO2e/SP/yr
BAAQMD Thresholds	4.6	Project Level metric tons CO2e/SP/yr
	6.6	Plan Level metric tons CO2e/SP/yr
Burlingame CAP threshold	9.2	Burlingame CAP metric tons CO2e/SP/yr

Burlingame Specific Plan - Build Option 2
Greenhouse Gas Emission Worksheet
Modeling Assumptions

Standard Conversions and Emission Factors

	CO_2	CH_4	N_2O	Not Gas Dependent	
lbs/short ton [1]	-	-	-	2000	C_4
lbs/metric ton [1]	-	-	-	2204.62	C_2
g/metric ton [1]	-	-	-	1,000,000	C_5
metric tons/short ton [1]	-	-	-	0.907185	C_3
kW/MW [1]	-	-	-	1,000	C_1
KWh/Dwelling Unit/year [2]	-	-	-	7,300	D_{ele}
KWh/SF of office/year [3]	-	-	-	15.0	O_{ele}
KWh/SF of hotel/year [3]	-	-	-	14.7	H_{ele}
KWh/SF of Retail/year [3]	-	-	-	14.8	R_{ele}
kWh/Mg Indoor Potable water use NC [4]	-	-	-	3500	F_{IPOT}
kWh/Mg Indoor Wastewater NC [4]	-	-	-	1911	F_{IWW}
kWh/Mg Outdoor water use NC [4]	-	-	-	3,500	
Percent potable water assumed for indoor use [5]	-	-	-	95%	
Percent potable water from renewable sources [5]	-	-	-	85%	
GWP [6]	1	21	310	-	GWP_C, GWP_M, GWP_N
2008+ (lbs/MWh) [7]		0.0302	0.0081	-	EF_{Mele}, EF_{Nele}
2008+ (lbs/MWh) [8]	524	-	-	-	EF_{Cele}
lbs/therm [9]	11.67	0.001	0.00002	-	
Attributable percentage of lbs/therm	99.9913%	0.0086%	0.0002%	-	$\%_{CCO2e}$, $\%_{MCO2e}$, $\%_{NCO2e}$
gr/mile for vehicle fleet [10]	-	varies	varies	-	
gasoline emission factor (lbs/gallon) [11]	19.4	-	-	-	EF_{ClsF}
gasoline emission factor (gr/gallon) [12]	-	0.50	0.22	-	EF_{MlsF}, EF_{NlsF}
landscape gallons per year	-	-	-	78.35	G_F
MT/ton (solid waste) [13]	0	0.07	0	-	
gr/mile [10]	-	0.0051	0.0048	-	EF_{MSWT}, EF_{NSWT}
gr/mile	3464.1638	-	-	-	EF_{CSWT}
kg/gallon [14]	10.15	-	-	-	
miles/gallon [15]	2.93	-	-	-	
Residential (waste tons/cuyd) [16]	-	-	-	0.1125	R_{TCY}
Commercial (waste tons/cuyd) [16]	-	-	-	0.225	C_{TCY}
Truck capacity (cy/truck) [17]	-	-	-	33	T_{CY}
lbs/square foot office/day [18]	-	-	-	0.006	R_{OSW}
lbs/square foot retail/day [18]	-	-	-	0.006	R_{RSW}
lbs/dwelling unit/day [18]	-	-	-	4	R_{DSW}
lbs/hotel room/day [18]	-	-	-	2	R_{HSW}
Miles/trip [19]	-	-	-	38.41	M
Pavley reduction PC/LDT1 [20]	-	-	-	43.90%	
Pavley reduction LDT2 [20]	-	-	-	40.20%	

General Assumptions

	CO_2	CH_4	N_2O	Not Gas Dependent	
Annual Water Usage gal/yr (build option 1) [5]	-	-	-	138,000	U_T
Annual Water Usage gal/yr (build option 2) [5]	-	-	-	179,000	U_T
Residential Units [21]	-	-	-	1,232	DU
Retail square footage [21]	-	-	-	183,843	SF_R
Office Square Footage (build option 1) [21]	-	-	-	148,702	SF_O
Office Square Footage (build option 2) [21]	-	-	-	248,702	SF_O
Hotel beds (build option 1) [21]	-	-	-	120	HR
Hotel beds (build option 2) [21]	-	-	-	0	HR
Hotel Square footage (build option 1) [21]	-	-	-	100,000	SF_H
Hotel Square footage (build option 2) [21]	-	-	-	0	SF_H
Residents [21]	-	-	-	2,191	
Employees [21]	-	-	-	1,281	
Office Employees [21]				821	
Retail Employees [21]				460	
Hotel Employees [21]				0	
Service Population	-	-	-	3,472	
Vehicle Miles / year	-	-	-	38,890,750	U_{VMT}

URBEMIS Assumptions

Vehicle Fleet Makeup

	CO_2	CH_4	N_2O	Not Gas Dependent	
Fleet percentages [22]				varies (below)	
Emission Factors [10]				varies (below)	
Vehicle Type					
Light Auto	-	0.0147	0.0079	54.10%	
Light Truck < 3750 lbs	-	0.0157	0.0101	12.50%	
Light Truck 3751-5750 lbs	-	0.0157	0.0101	19.90%	
Med Truck 5751-8500 lbs	-	0.0326	0.0177	6.60%	
Lite-Heavy Truck 8501-10,000 lbs	-	0.0326	0.0177	0.90%	
Lite-Heavy Truck 10,001-14,000 lbs	-	0.0326	0.0177	0.60%	
Med-Heavy Truck 14,001-33,000 lbs	-	0.0326	0.0177	1.00%	
Heavy-Heavy Truck 33,001-60,000 lbs	-	0.0326	0.0177	0.30%	
Other Bus	-	0.0326	0.0177	0.10%	
Urban Bus	-	0.0326	0.0177	0.10%	
Motorcycle	-	0.0147	0.0079	3.20%	
School Bus	-	0.0326	0.0177	0.10%	
Motor Home	-	0.0326	0.0177	0.60%	
Total (Composite based on percentage)	-	0.01687	0.00962	-	
Pavely reduced composite	-	0.01114	0.00631	-	EF_{MCV}, EM_{NCV}

	CO_2	CH_4	N_2O	Not Gas Dependent	
Traffic Inputs & assumptions for URBEMIS					
Daily County VMT [21]				82,461,040	
Daily County + Project [21]				82,567,590	
Daily Project				106,550.00	
Unmitigated URBEMIS Daily VMT [22]				106,603.76	
Mitigated URBEMIS Daily VMT [22]				95,920.63	
Daily Number of trips [21]				17,150.00	
Unmitigated URBEMIS Trips [22]				17,149.70	
Mitigated URBEMIS Trips [22]				15,431.15	
Average Trip length [21]				6.21	
Average cost for daily parking [23]				1.50	
Bicycle lanes and Sidewalks [24]				Various	

Emissions determined from URBEMIS	CO_2	CH_4	N_2O		
Tons/year Natural Gas [22]	2,481.81	-	-	-	E_{Cng}
Landscaping emissions [22]	0.76	-	-	-	E_{Cls}
Unmitigated CO_2 emissions from Mobile Sources [22]	16,414.53	-	-	-	E_{CVMT}

References

1 *Source:* *California Climate Action Registry General Reporting Protocol, Version 3.1 January 2009 (Appendix B)*

2 *Source:* *Greenhouse Gas CEQA Significance Threshold Stakeholder Working Group #12; July 2009.*

3 *Source:* *CBECS: Electricity Consumption and Conditional Energy Intensity by Census Region for All Buildings, 2003. Released December 2006.*

4 *Source:* CEC: Recommended Revised Water-energy Proxies, Refining Estimates of Water-Related Energy Use in California, CEC-500-2006-118. (Table ES-1).

5 *Source:* Water usage provided by the Water supply assessment: *City of Burlingame Water Supply Technical Study for the Downtown Specific Plan*, PBS&J January 2010.

http://sfwater.org/mto_main.cfm/MC_ID/12/MSC_ID/145/MTO_ID/344, accessed 4/1/2010.

Note: Conservative estimates assume water at 100% indoor use with 95% of potable released to sewers.

6 *Source:* *California Climate Action Registry General Reporting Protocol, Version 3.1 January 2009 (Table C.1)*

7 *Source:* *California Climate Action Registry General Reporting Protocol, Version 3.1 January 2009 (Table C.2)*

8 *Source:* *PG&E: GHG Data Requests, Fact Sheet GHG Data.pdf, Email from John Bohman January 11, 2010*

9 *Source:* *California Climate Action Registry General Reporting Protocol, Version 3.1 January 2009 (Tables C.7 & C.8)*

10 *Source:* *California Climate Action Registry General Reporting Protocol, Version 3.1 January 2009 (Tables C.4)*

11 *Source:* *http://www.epa.gov/oms/climate/420f05001.htm*

12 *Source:* *California Climate Action Registry General Reporting Protocol, Version 3.1 January 2009 (Table C6; Other small utility)*

13 *Source:* *EPA Solid Waste Management and Greenhouse Gases; A life-cycle assessment of emissions and Sinks, 3rd edition, September 2006.*

Ox Mountain Landfill has a methane recovery system with electrical generation.

14 *Source:* *California Climate Action Registry General Reporting Protocol, Version 3.1 January 2009 (Table C.3)*

15 *Source:* *Waste Management's LNG Truck Fleet: Final Results January 2001. (pg 14)*

16 *Source:* *EPA Standard Volume-to-Weight Conversion Factor obtained from http://www.epa.gov/osw/conserve/tools/recmeas/docs/guide_b.pdf, accessed January 18, 2010.*

17 *Source:* *Heil Website (http://www.heil.com/products/python.asp) accessed 1/18/2010 & http://www.tigerdude.com/garbage/frontload/index.html accessed 1/18/2010.*

18 *Source:* http://www.calrecycle.ca.gov/wastechar/wastegenrates/ last updated December 30, 2009, accessed 3/30/2010.

19 *Source:* http://www.mapquest.com, accessed 3/22/2010.
Miles per trip are determined by average round-trip miles from the downtown specific plan area to the San Carlos Transfer Station and then to the Ox Mountain Landfill.

20 *Source:* CARB *Comparison of Greenhouse Gas Reductions for the United States and Canada Under U.S. CAFÉ Standards and California Air Resources Board Greenhouse Gas Regulations*. February 25, 2008.

21 *Source:* Wilbur Smith Associates, Burlingame Downtown Specific Plan - VMT Analysis Technical Memorandum, dated March 29, 2010.

Wilbur Smith Associates, Burlingame Downtown Specific Plan - Traffic Impact Analysis Technical Memorandum, March 27, 2009.

Wilbur Smith Associates, RE: Burlingame Traffic Question. E-mail to Rachel Schuett dated March 31, 2010.

Note: For a conservative waste generation estimate, assumes only one bed per hotel room.

22 *Source:* *URBEMIS 2007 Version 9.2.4 runs for Build Option 2 of the Burlingame Downtown Specific Plan dated 04/06/2010. (Unmitigated & Mitigated).*

Note: *Because Urbemis does not allow for reductions due to project design features or some existing conditions (such as parking fees), these features must be included as "mitigation" in the model in order for their reductions to be counted. Due to this, the title lines of both the Unmitigated and Mitigated reports will indicate "Mitigated Emissions". The File Name contains the accurate designation as to the unmitigated vs. mitigated reports.*
URBEMIS VMT and Trips may vary from Project Traffic information values due to rounding in URBEMIS. If difference, VMT from URBEMIS will be higher to show a conservative emissions estimate.

Emissions of Natural Gas are Based on 2005 Title 24 Standard.

23 *Source:* Burlingame Police Department, phone conversation with Sergeant Don Shepley on 4/5/2010. Mr. Shepley stated that long-term parking was approximately $1.00 to $2.00 per day in the long-term parking lots where employees park. For modeling purposes an average of $1.50 per day was used.

24 *Note:* From review of Google Earth, a conservative estimate of 50% coverage for Arterial/Collector bicycle lanes, 184 intersections per square mile, and 50% of streets having sidewalks on both sides were used in the URBEMIS model.

Burlingame Specific Plan - Build Option 2
Greenhouse Gas Emission Worksheet
Usage and Generation Calculations

Electricity Calcs

Project Area		*Electricity Generation Rate**		*Use*	*Subtotal (kWH/year)*	
1,232	units	7,300.00	kWH/year/unit	Residential	8,993,600	
	sf		kWH/year/sf	Grocery	-	
	sf		kWH/year/sf	Restaurant	-	
	sf		kWH/year/sf	Hospital	-	
	sf		kWH/year/sf	University	-	
	sf		kWH/year/sf	High School	-	
	sf		kWH/year/sf	Elementary School	-	
248,702	sf	15	kWH/year/sf	Office	3,730,530	
0	sf	14.7	kWH/year/sf	Hotel	-	
	sf		kWH/year/sf	Warehouse	-	
183,843	sf	14.8	kWH/year/sf	Retail	2,720,876	
	sf		kWH/year/sf	Miscellaneous	-	
				Total	15,445,006	kWH/year

[1] Assumes 1 bed per room and 512.82 square feet room. Energy Star Space Use Information - Hotel/Motel retrieved: https://www.energystar.gov/istar/pmpam/help/Hotel_Motel_Space_Use_Information.htm 2/11/2010

Solid Waste Calcs

Project Area		*Solid Waste Generation Rate**		*Use*	*Subtotal (tons/year)*	
248,702	sf	0.006	lbs/sf/day	Office	272	
183,843	sf	0.006	lbs/sf/day	Retail	201	
	sf		lbs/sf/day	Department Store	-	
	sf		lbs/sf/day	Manufacturing/warehouse	-	
	sf		lbs/sf/day	School	-	
	beds		lbs/bed/day	Hospital	-	
0	rooms	2	lbs/unit/day	Single-family Residential	-	
1,232	unit	4	lbs/unit/day	Multi-family Residential	899	
				Total	1,373	tons/year

Water Calcs

Project	*Units*	*Water (gals/day/unit)*	*Water Usage (gals/day)*	*Type Description*	*Annual Water Usage (Million Gallons)*	
	Parcel		0	Single Family Home	0	
	Parcel		0	Duplex	0	
	Parcel		0	Triplex	0	
	Parcel		0	Fourplex	0	
248,702	sf		0	Office	0	
183,843	sf		0	Retail	0	
1,232	# of Units		0	Five Units or More	0	
	# of Units		0	Mobile Home Park	0	
	Project Total[2]		179,000	Project total	65.335	
			179000	**Total**	**65.34**	MG water (annual)

[2] Water usage provided by the Water supply assessment: *City of Burlingame Water Supply Technical Study for the Downtown Specific Plan* , PBS&J January 2010. Note: WSA maintains 248,702 sf of office instead of 120 rooms of a hotel.

Burlingame Specific Plan - Build Option 2
Greenhouse Gas Emission Worksheet
Operational Emissions

Project:	Burlingame Specific Plan - Build Option 2	**Conversion to CO2e Units based on GWP**	
		CH_4	21
Project Number:	0D4136500	N_2O	310

Indirect Emissions from Electricity Use

Total Project Annual KWh:	**15,445,006**	kWH/year
Project Annual MWh (U_{ele}):	**15,445**	MWH/year

Emission Factors for Electricity Use:

CO_2	524	lbs/MWh/year
CH_4	0.0302	lbs/MWh/year
N_2O	0.0081	lbs/MWh/year

Annual Emissions from Electricity Use:

	Total Emissions		**Total CO_2e Units**	
CO_2 emissions:	3671.0106	metric tons	**3671.0**	metric tons CO_2e
CH_4 emissions:	0.2116	metric tons	**4.4**	metric tons CO_2e
N_2O emissions:	0.0567	metric tons	**17.6**	metric tons CO_2e
		Project Total	***3,693***	***metric tons CO_2e***

Emissions from Natural Gas Use

Emission Factors for Natural Gas Use:

CO_2	11.67	lbs/therm	**99.9913%**
CH_4	0.001	lbs/therm	**0.0086%**
N_2O	0.00002	lbs/therm	**0.0002%**

URBEMIS output[1]

2,481.81	tons (short, US)

Annual Emissions from Natural Gas Use:

	Total Emissions		Total CO_2e Units	
CO_2 emissions:	2,251.4602	metric tons	**2,251**	metric tons CO_2e
CH_4 emissions:	0.1929	metric tons	**4**	metric tons CO_2e
N_2O emissions:	0.0039	metric tons	**1**	metric tons CO_2e
		Project Total	***2,257***	***metric tons CO_2e***

[1] The URBEMIS 2007 v 9.2.4 model assumes 2005 Title 24 compliance. In order to account for compliance with the 2008 Title 24 standards, emissions determined by Urbemis were reduced by 15%.

Emissions from Other Fuel Use

Other onsite fuel use (Landscaping)

CO_2	*19.4*	*lbs/gallon*
CH_4	0.50	*gr/gallon*
N_2O	0.22	*gr/gallon*
Fuel Use	78.35	*gallons/year*

URBEMIS Output

0.76	tons (short, US) CO_2

Annual Emissions from Natural Gas Use:

	Total Emissions		Total CO_2e Units	
CO_2 emissions:	0.6895	metric tons	**0.6895**	metric tons CO_2e
CH_4 emissions:	0.0000392	metric tons	**0.0008**	metric tons CO_2e
N_2O emissions:	0.0000172	metric tons	**0.0004**	metric tons CO_2e
		Project Total	***0.69***	***metric tons CO_2e***

Indirect Emissions from Solid Waste (Operational)

Total Solid Waste: 1,373 tons/year

Emission Factors for Natural Gas Use:

CO_2	0	MT/ton	3,464.16	gr/mile
CH_4	0.07	MT/ton	0.0051	gr/mile
N_2O	0	MT/ton	0.0048	gr/mile

From Fugitive emissions: Fugitive emissions of CO_2 from solid waste operations are not considered anthropogenic and therefore are not considered as part of the emissions inventory. There are no fugitive emissions of N_2O.

	tons/yr	MT/ton	MT CO_2e/yr
CH_4	1,373	0.07	**96.1**

From Exhaust emissions:

	tons/yr	tons/cuyd	cuyd/trip	miles/trip[2]	gr/mile	g/MT	MT/yr
CO_2 - Residential	899	0.1125	33	38.41	3,464.16	1,000,000	32.23
CO_2 - Commercial	474	0.2250	33	38.41	3,464.16	1,000,000	8.49
CH_4 - Residential	899	0.1125	33	38.41	0.0051	1,000,000	0.00004745
CH_4 - Commercial	474	0.2250	33	38.41	0.0051	1,000,000	0.00001250
N_2O - Residential	899	0.1125	33	38.41	0.0048	1,000,000	0.00004466
N_2O - Commercial	474	0.2250	33	38.41	0.0048	1,000,000	0.00001176

Annual Emissions from Solid Waste Generation:

	Total Emissions		Total CO_2e Units	
CO_2 emissions:	40.72000	metric tons	**40.7200**	metric tons CO_2e
CH_4 emissions:	4.57672	metric tons	**96.1110**	metric tons CO_2e
N_2O emissions:	0.00006	metric tons	**0.0175**	metric tons CO_2e
		Project Total	***136.85***	***metric tons CO_2e***

[2] Miles per trip are determined by average round-trip miles from the downtown specific plan area to the San Carlos Transfer Station and then to the Ox Mountain Landfill.

Indirect Emissions from Water Use (Includes Potable water and Waste Water)

Indoor Uses Potable	65.34	MG/year	**Emission Factors for Electricity Use:**		
Indoor Uses to Wastewater	62.07	MG/year	CO_2	524	lbs/MWh/year
Outdoor Uses*	0.00	MG/year	CH_4	0.0302	lbs/MWh/year
Total Project Usage/generation:	127.40	MG/year	N_2O	0.0081	lbs/MWh/year
Northern or Southern Ca?	Northern				

Annual Electricity Generation Associated with Water Uses

	Water Consumption (MG)	Energy Factor MWh/MG)		
Indoor Uses Potable	65.34	3.5	229	MWh/year
Indoor Uses to Wastewater	62.07	1.911	119	MWh/year
Outdoor Uses	0.00	3.5	0	MWh/year
Sub Total Project Usage			***347***	**MWh/year**
Usage offset by renewables[3]	-55.53	3.5	*-194*	MWh/year
			153	**MWh/year**

Water-energy proxies (MWh/MG)

	No CA	So CA
Indoor Uses Potable	3.50	13.022
Indoor Use Wastewater	1.91	
Outdoor Uses	3.50	11.111
% from Hetch Hetchy	0.85	

Annual Emissions from Water Use:

	Total Emissions		Total CO_2e Units	
CO_2 emissions:	36.3	metric tons	**36.3**	metric tons CO_2e
CH_4 emissions:	0.0	metric tons	**0.0**	metric tons CO_2e
N_2O emissions:	0.0	metric tons	**0.2**	metric tons CO_2e
	Project Total		***37***	***metric tons CO_2e***

* * - Input manually

[4] 85% of City Potable water is from the Hetch Hetchy System which offsets electrical generation needed to treat and transport potable water. Therefore 85% of the potable water use from the Specific Plan is assumed to be of a renewable origin and therefore emissions from this 85% are not included in the inventory.

Burlingame Specific Plan - Build Option 2
Greenhouse Gas Emission Worksheet
Mobile Emissions

From URBEMIS 2007 Vehicle Fleet Mix Output:

	Unmitigated
Daily Vehicle Miles Traveled (VMT):	106,604
Annual VMT:	38,910,372
Unmitigated CO_2 emissions from Urbemis	16,415

Vehicle Type	Percent Type	Reduction from Energy Efficiency Standard	CO_2 emissions by vehicle type	Reduced CO_2 emissions	CH_4 Emission Factor (g/mile)	New CH_4 Emission Factor (g/mile)	Reduced CH_4 Emission Factor (g/mile)	N_2O Emission Factor (g/mile)	New N_2O Emission Factor (g/mile)	Reduced N_2O Emission Factor (g/mile)
UNMITIGATED										
Light Auto	54.1%	43.90%	8,880	4,982	0.0147	0.007953	0.004461465	0.0079	0.0042739	0.0023977
Light Truck < 3750 lbs	12.5%	43.90%	2,052	1,151	0.0157	0.001963	0.001100963	0.0101	0.0012625	0.0007083
Light Truck 3751-5750 lbs	19.9%	43.90%	3,266	1,833	0.0157	0.003124	0.001752732	0.0101	0.0020099	0.0011276
Med Truck 5751-8500 lbs	6.6%	0	1,083	1,083	0.0326	0.002152	0.0021516	0.0177	0.0011682	0.0011682
Lite-Heavy Truck 8501-10,000 lbs	0.9%	0	148	148	0.0326	0.000293	0.0002934	0.0177	0.0001593	0.0001593
Lite-Heavy Truck 10,001-14,000 lbs	0.6%	0	98	98	0.0326	0.000196	0.0001956	0.0177	0.0001062	0.0001062
Med-Heavy Truck 14,001-33,000 lbs	1.0%	0	164	164	0.0326	0.000326	0.000326	0.0177	0.000177	0.000177
Heavy-Heavy Truck 33,001-60,000 lbs	0.3%	0	49	49	0.0326	9.78E-05	0.0000978	0.0177	0.0000531	0.0000531
Other Bus	0.1%	0	16	16	0.0326	3.26E-05	0.0000326	0.0177	0.0000177	0.0000177
Urban Bus	0.1%	0	16	16	0.0326	3.26E-05	0.0000326	0.0177	0.0000177	0.0000177
Motorcycle	3.2%	0	525	525	0.0147	0.00047	0.0004704	0.0079	0.0002528	0.0002528
School Bus	0.1%	0	16	16	0.0326	3.26E-05	0.0000326	0.0177	0.0000177	0.0000177
Motor Home	0.6%	0	98	98	0.0326	0.000196	0.0001956	0.0177	0.0001062	0.0001062
Total (Composite based on percentage)			16,415	10,181		**0.016868**	**0.01114336**		**0.0096222**	**0.0063094**
Mitigated										
Light Auto	54.1%	43.90%	8,798	4,936	0.0147	0.007953	0.004461465	0.0079	0.0042739	0.0023977
Light Truck < 3750 lbs	12.5%	43.90%	2,033	1,140	0.0157	0.001963	0.001100963	0.0101	0.0012625	0.0007083
Light Truck 3751-5750 lbs	19.9%	43.90%	3,236	1,815	0.0157	0.003124	0.001752732	0.0101	0.0020099	0.0011276
Med Truck 5751-8500 lbs	6.6%	0.00%	1,073	1,073	0.0326	0.002152	0.0021516	0.0177	0.0011682	0.0011682
Lite-Heavy Truck 8501-10,000 lbs	0.9%	0.00%	146	146	0.0326	0.000293	0.0002934	0.0177	0.0001593	0.0001593
Lite-Heavy Truck 10,001-14,000 lbs	0.6%	0.00%	98	98	0.0326	0.000196	0.0001956	0.0177	0.0001062	0.0001062
Med-Heavy Truck 14,001-33,000 lbs	1.0%	0.00%	163	163	0.0326	0.000326	0.000326	0.0177	0.000177	0.000177
Heavy-Heavy Truck 33,001-60,000 lbs	0.3%	0.00%	49	49	0.0326	9.78E-05	0.0000978	0.0177	0.0000531	0.0000531
Other Bus	0.1%	0.00%	16	16	0.0326	3.26E-05	0.0000326	0.0177	0.0000177	0.0000177
Urban Bus	0.1%	0.00%	16	16	0.0326	3.26E-05	0.0000326	0.0177	0.0000177	0.0000177
Motorcycle	3.2%	0.00%	520	520	0.0147	0.00047	0.0004704	0.0079	0.0002528	0.0002528
School Bus	0.1%	0.00%	16	16	0.0326	3.26E-05	0.0000326	0.0177	0.0000177	0.0000177
Motor Home	0.6%	0.00%	98	98	0.0326	0.000196	0.0001956	0.0177	0.0001062	0.0001062
Total (Composite based on percentage)			16,262	10,087		**0.016868**	**0.01114336**		**0.0096222**	**0.0063094**

Annual Mobile Emissions:

	Unmitigated Total Emissions		**Total CO_2e units**	
CO2 Emissions*:	**10,181**	tons CO_2	**9,236**	metric tons CO_2e
CH4 Emissions:	**0.434**	metric tons CH_4	**9**	metric tons CO_2e
N20 Emissions:	**0.246**	metric tons N_2O	**76**	metric tons CO_2e
	Project Total:		***9,322***	***metric tons CO_2e***

APPENDIX

Explanation of Calculations

Burlingame Specific Plan - Build Option 1
Greenhouse Gas Emission Worksheet
Explanation of Calculations

Electricity Usage:

Total emissions from electricity is the sum of the emissions from CO_2, CH_4, and N_2O with respect to annual electricity consumption. The equations used to determine GHG emissions from electricity for CO_2, CH_4, and N_2O are as follows:

$$E_{ele} = [((EF_{Cele} * U_{ele}) * C_1) * GWP_C] + [((EF_{Mele} * U_{ele}) * C_1) * GWP_M] + [((EF_{Nele} * U_{ele}) * C_1) * GWP_N]$$

Where:

$$U_{ele} = [(D_{ele} * DU) + (O_{ele} * SF_O) + (H_{ele} * SF_H) + (R_{ele} * SF_R)] / C_2$$

And:

E_{ele} = Total Emissions (metric tons/year) per GHG (for carbon dioxide, methane and nitrous oxide)
EF_{Xele} = Emission Factor for CO_2, CH_4, and N_2O respectively
U_{ele} = Annual Usage in MWh/yr
C_1 = Conversion from lbs to metric tons (1 metric ton = 2204.62 lbs)
GWP_X = Global Warming Potential for the respective gas
X_{ele} = Electrical usage rate for land use type (D= residential dwellings, O = office, H = Hotel, R = Retail)
DU = Number of residential units
SF_X = Square footage of land use (O = office, H = Hotel, R = Retail)
C_2 = Conversion from kWh to MWh (1000 kW = 1 MW)

Natural Gas Usage:

Total emissions from natural gas usage is the sum of the emissions from CO_2, CH_4, and N_2O with respect to annual natural gas consumption. CO_2 emissions are determined from the URBEMIS 2007 model. The equation used to determine GHG emissions from natural gas usage for CH_4, and N_2O is as follows:

$$E_{ng} = [(E_{Cng} * GWP_C) + (E_{Cng} * \%_{MCO2e} * GWP_M) + (E_{Cng} * \%_{NCO2e} * GWP_N)]$$

Where:

E_{ng} = Total natural gas Emissions (metric tons/year) per GHG (for methane and nitrous oxide).
E_{cng} = Emissions of CO_2 in metric tons per year (short tons from URBEMIS * C_3)
$\%_{XCO2e}$ = Percentage of total CO_2e that is attributed to methane/nitrous oxide emissions. Determined by dividing the emission factors for natural gas use for CH_4 and N_2O by the sum of the emission factors for CO_2, CH_4 and N_2O.
GWP_X = Global Warming Potential for the respective gas CH_4 = 21; N_2O = 310.
C_3 = Conversion from short tons to metric tons (1 short ton = 0.90718474 metric tons)

Landscape Emissions:

Emissions of CO_2 from landscaping equipment is determined directly from URBEMIS. The methane and nitrous oxide emissions from landscaping equipment is determined separately using the following equation.

$$E_{ls} = [((G_F * EF_{MlsF}) / C_5) * GWP_M] + [((GF * EF_{NlsF}) / C_5) * GW_{PN}] + E_{Cls}$$

Where:

E_{ls} = Annual emissions from landscape equipment (metric tons/year).
G_F = Gallons of fuel per year = $(E_{Cls} * C_4) / EF_{ClsF}$
E_{Cls} = Annual emissions of CO_2 from landscaping (from URBEMIS).
C_4 = Conversion factor from lbs to tons; (2000 lbs = 1 ton)
EF_{ClsF} = Conversion of CO_2 from lbs to gallons
EF_{XlsF} = Emission factor for methane/nitrous oxide for landscape fuel (typically gasoline)
C_5 = Conversion from grams to metric tons (1,000,000 g/MT).
GWP_X = Global Warming Potential for the respective gas

Solid Waste from Operations:
Total emissions from solid waste is the sum of the fugitive emissions, exhaust emissions, and landfill equipment emissions generated from the transportation and disposal of the annual waste generated. CO_2 fugitive emissions are considered non-anthropogenic and are not included in the inventory. N_2O emissions are not generated from the decomposition of waste. Landfill equipment emissions are only counted if the project has jurisdiction over the landfill used. Since Burlingame does not have jurisdiction over the local landfill onsite equipment emissions are not included in this inventory.

$$E_{SW} = E_{SWF} + E_{SWT} + E_{SWE}$$

Where:

E_{SW} = Total emissions (metric tons/year) of GHG emissions from solid waste generation.
E_{SWF} = Total emissions (metric tons/year) of GHG emissions from fugitive solid waste emissions.
E_{SWT} = Total emissions (metric tons/year) of GHG emissions from transportation of solid waste.
E_{SWE} = Total emissions (metric tons/year) of GHG emissions from landfill equipment usage.

Fugitive Emissions:

$$E_{SWF} = U_{SW} * EF_{MF}$$

Where:

U_{SW} = Total annual generation of waste in tons.
EF_{MF} = Emission factor for methane from solid waste generation

Transportation Emissions:

$$E_{SWT} = [(((U_{RSW} / R_{TCY}) / T_{CY}) * M * EF_{CSWT}) / C_5] + [(((U_{CSW} / C_{TCY}) / T_{CY}) * M * EF_{CSWT}) / C_5] + [(((U_{RSW} / R_{TCY}) / T_{CY}) * M * EF_{MSWT}) / C_5] + [(((U_{CSW} / C_{TCY}) / T_{CY}) * M * EF_{MSWT}) / C_5] + [(((U_{RSW} / R_{TCY}) / T_{CY}) * M * EF_{NSWT}) / C_5] + [(((U_{CSW} / C_{TCY}) / T_{CY}) * M * EF_{NSWT}) / C_5]$$

Where:

U_{RSW} = Total annual generation of waste from resedential land uses in tons.
= $(DU * R_{DSW} * 365) / C_4$
DU = Number of residential units
R_{XSW} = Waste generation rate by landuse type in lbs/unit/day. (DU = residntial dwelling units, O = sqft office, R = sqft retail, H = hotel rooms)
C_4 = Conversion factor from lbs to tons;
R_{TCY} = Weight (tons) per cubic yard of residnetial waste.
T_{CY} = Tons per cubic yard of waste collection trucks.
M = Roundtrip miles from center of the project to the landfill.
EF_{XSWT} = Emission Factor for waste collection trucks (usually heavy duty truck) for CO_2, CH_4, and N_2O respectively.
C_5 = Conversion from grams to metric tons (1,000,000 g/MT).
U_{CSW} = Total amount of waste generation from non-residential land uses in tons.
= $[(HR * R_{HSW} * 365) / C_4] + [(SF_O * R_{OSW} * 365) / C_4] + [(SF_R * R_{RSW} * 365) / C_4]$
HR = Number of hotel rooms
SF_X = Square footage of land use (O = office, H = Hotel, R = Retail)
C_{TCY} = Weight (tons) per cubic yard of non-residential waste.

Landfill Equipment Emissiosn:

Are not calculated for this inventory.

Water Usage:

Total emissions from water usage is the sum of the emissions of $CO_{2,}$ and $CH_{4,}$ and N_2O with respect electricity used to treat and transport water. The equations used to determine GHG emissions from water usage are as follows:

$$E_W = [(U_T * EF_{Cele} * GWP_C) + (U_T * EF_{Mele} * GWP_M) + (U_T * EF_{Nele} * GWP_N)] / C_1$$

Where:

$$U_T = (U_I * F_{IPOT}) + (U_I * \%_{WW} * F_{IWW}) - (U_I * \%_{RR} * F_{IPOT})$$

And:

E_W = Total annual emissions from potable water usage (metric tons/year) .

U_T = Total annual water usage (MG)

EF_{Xele} = Emission Factor for CO_2, CH_4, and N_2O respectively

C_1 = Conversion from lbs to metric tons (1 metric ton = 2204.62 lbs)

GWP_X = Global Warming Potential for the respective gas

U_I = Total annual indoor water usage (MG/day)

F_{IPOT} = Energy factor for indoor potable water usage in kWh/MG.

$\%_{WW}$ = Percentage of potable water not consumed (goes to sewer as waste water)

F_{IWW} = Energy factor for indoor waste water generation in kWH/MG.

$\%_{RR}$ = Percent of potable water obtained from a renewable resource

Traffic:

Total emissions from vehicle miles traveled (VMT) is the sum of the emissions of $CO_{2,}$ CH_4, and N_2O with respect to annual travel. CO_2 emissions are determined from the URBEMIS model. The equations used to determine GHG emissions from vehicle miles traveled for N_2O and CH_4 are as follows:

$$E_{VMT} = [((U_{VMT} * EF_{MCV}) / C_5) * GWP_M] + [((U_{VMT} * EF_{NCV}) / C_5) * GWP_N] + E_{CVMT}$$

Where:

E_{VMT} = Annual emissions from vehicle miles traveled (metric tons/year) per GHG (for methane and nitrous oxide).

U_{VMT} = Total annual VMT

EF_{XCV} = Composit Emission Factor for CH_4, and N_2O, respectively

Composit emission factors are determined by summing the products of the emission factor from each vehicle class by the % of traffic from that vehicle class.

C_5 = Conversion from grams to metric tons (1,000,000 g/MT).

GWP_X = Global Warming Potential for the respective gas

E_{CVMT} = Annual emissions of CO_2 from vehicle miles traveled (From URBEMIS)

Determination of CO_2e per service population:

$$AE_{SP} = E_{tot} / SP$$

Where:

AE_{SP} = Annual Emissions per service population (metric tons CO_2e)

E_{tot} = Total Annual emissions (metric tons CO_2e)

SP = Where service population is the sum of residents and employees resulting from a project

Appendix C

VMT Analysis Memorandum

Wilbur Smith Associates
ENGINEERS
PLANNERS
ECONOMISTS

DRAFT

March 29, 2010

To: Maureen Brooks
Planning Manager
City of Burlingame
501 Primrose Road
Burlingame, California 94010

From: Shruti Malik, PE
Peter Costa

Subject: Burlingame Downtown Specific Plan - VMT Analysis Technical Memorandum

This technical memorandum serves as an addendum to the Draft Burlingame Downtown Specific Plan: Traffic Impact Analysis Technical Memorandum (Wilbur Smith Associates, January 2009) and provides a comprehensive vehicle miles traveled (VMT) analysis for the Burlingame Downtown Specific Plan (herein referred to as the Proposed Project). The purpose of conducting this analysis was to be consistent with the recently updated plan-level thresholds of significance by the Bay Area Air Quality Management District (BAAQMD). This analysis examined the future year (Year 2030) VMT per capita (vehicle miles traveled per person) in the City of Burlingame and San Mateo County Limits with and without the implementation of the Proposed Project. The following sections include an understanding of the VMT analysis and the methodology used in order to conduct the analysis as well as a brief overview of the project purpose. Analysis findings and results are also provided in the memorandum.

This transportation study was conducted using the methodology and requirements set forth by the Bay Area Air Quality Management District (BAAQMD) and documented in their *California Environmental Quality Act (CEQA) Guidelines Update – Proposed Thresholds of Significance* (December 2009).

1.0 VMT Analysis

VMT is a measure used to describe automobile use on a daily or annual basis. General components of VMT include the number of vehicle trips and the length of those trips. Turning movement counts, which are typically used in traffic studies, measure the number of vehicles passing a fixed point during a specific time; whereas, VMT represents the trip distance along with the traffic volumes. VMT is the product of the total number of vehicles traveling and the average number of miles traveled per vehicle. This can be calculated either per day or per year. Importantly, VMT is a useful measurement to determine changes in travel demand within a given environment. Since VMT captures vehicle trip demand and trip lengths, it constitutes several factors, including distance to places of employment, residence, and retail centers as well as other socioeconomic factors such as income, population, workers per household, and age.[1]

1.1 Methodology

Under the direction of the City of Burlingame and through direct coordination with the City and County of Governments (C/CAG), the VMT analysis was conducted using the latest version of the C/CAG Regional Travel Demand Model (C/CAG Model). This regional model, developed using EMME/2 software, includes multiple links (roadways), nodal regions (major/minor intersecting link locations), and traffic analysis zones (TAZs) throughout the San Francisco Bay Area. For study purposes, only the model parameters within San Mateo County Limits, City of Burlingame Limits, and Downtown Burlingame (as defined by the Proposed Project study area) were considered. A combination of two methodologies, network-based and trip-based approaches, was applied in this analysis. The network-based approach was used to determine the travel demand and the lengths of roadway segments within the County and City limits; this approach was used to identify regional-level VMT. The trip-based approach was applied to determine the intra-zonal trips and determine sub-regional VMT within the study area.

The C/CAG Model, like most regional models, is a four-step model that includes four major components - trip generation, trip distribution, mode choice, and traffic assignment. San Mateo County is divided into various TAZs, each with different socioeconomic characteristics and travel pattern information. A regional model is often used to predict single-occupancy vehicles (SOVs), high-occupancy vehicles (HOVs), and transit riders. For each mode of travel, a trip table is generated which shows the number of trips that are expected.[2]

The C/CAG Model has travel demand forecasts for two specific years, Year 2005 (base year) and Year 2030 (future year). Since the Proposed Project would likely be fully developed by Year 2030, this analysis only evaluated the VMT for future year scenario. VMT were analyzed for morning (AM) and evening (PM) peak periods; the C/CAG model does not generate daily VMT or traffic volumes. The C/CAG Model generates only the AM and the PM peak hour VMT values, but not the daily VMT. Therefore, for study purposes, the daily VMT was developed by assuming the estimated PM peak hour VMT to be 10 percent of the projected daily VMT. As an industry standard in determining the relationship between the PM peak hour and daily travel demand, this procedure is to be applied when daily volume demand is unavailable.[3] The analysis includes estimating the daily and the peak hour VMT per capita rates. To estimate the VMT per capita under Year 2030 Conditions for with and without project scenarios, the following modifications were performed:

- Baseline Scenario - no modifications were applied to the model.
- Plus Project Scenario – applied land use and socioeconomic data associated with the Proposed Project to the TAZs located within the Proposed Project boundaries (land use information and socioeconomic data is presented in Section 2.0).

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[1] These are general components of how VMT is calculated; however, it should be noted that travel demand models typically consider a multitude of socioeconomic and transportation-related data that is otherwise not mentioned in the memorandum.

[2] It should be noted that the C/CAG model under existing (Year 2005) and future (Year 2030) conditions includes travel demand and trip reduction factors based on existing and future transit ridership projections and forecasted mode split data.

[3] In addition, this assumption is documented in the Institute of Transportation Engineers:Traffic Engineering Handbook, 4th Edition (1992); Figure 2-16, pgs. 50-51

Therefore, to represent the Year 2030 plus Project scenario, the Year 2030 C/CAG Model was updated to include the land use and socioeconomic data associated with Proposed Project. VMT projections were developed for both with and without project scenarios under Year 2030 Conditions. A detailed discussion of the methodology and the VMT modeling process is included in **Appendix A**.

2.0 Project Overview

The Proposed Project incorporates several area-wide projects, such as new developments in key areas located in the Downtown Burlingame, generally bounded by Burlingame Avenue to the north, Peninsula Avenue to the south, California Drive to the east, and Primrose Road to the west. According to the *Burlingame Downtown Specific Plan Development Program Summary* (November 2008) designated focus areas will be modified from current development standards to enhanced design standards and maximize development capacity. These improvements include planning mixed-use development according to modified zoning regulations, creating additional open space, and improving streetscapes. Several blocks in the Downtown area have been selected for these improvements. According to the Specific Plan, an additional 183,843 gross square feet (GSF) of retail use; 248,702 GSF of office use; and a range of 875 to 1,232 residential units have been planned throughout these focus areas. In addition, a 120-bed hotel has also been considered, as part of the allocated office space.[4] The potential development capacity for the focus areas is shown in **Table 1**.

Table 1: Development Capacity

	Retail Use	Office Use	Residential Use	Hotel Use (optional)
Total Development	183,843 GSF	248,702 GSF	875 – 1,232 units	120 beds

Source: Burlingame Downtown Specific Plan Development Summary (November 3, 2008).

There are two build options associated with the Proposed Project as outlined below:

- Build Option 1 – includes 183,843 GSF of retail use; 148,702 GSF of office use; a 120-bed hotel; and 875 residential units.
- Build Option 2 – includes 183,843 GSF of retail use; 248,702 GSF of office use; and 1,232 residential units.

For modeling purposes, the travel demand and socioeconomic data associated with the proposed developments were incorporated into the Year 2030 plus Project scenario for both the build alternatives. Since the planned land uses are concentrated in the Downtown area, the C/CAG Model applied the additional employment and residential variables to the specified area.[5] The socioeconomic data per build option is shown in **Table 2**.

[4] The hotel development is estimated to be 100,000 GSF, therefore reducing the total square footage of office use from 248,702 GSF to 148,702 GSF dedicated for office development only.
[5] Refer to Appendix A for detailed information on socioeconomic variable data.

Table 2: Socioeconomic Data Inputs – Future Year 2030 Estimates		
	Proposed Developments	
Variables[1]	**Build Option 1**	**Build Option 2**
Employed Residents	1,341	1,884
Total Households	875	1,232
Total Population	1,559	2,191
Employees[2]		
Office	*491*	*821*
Retail	*460*	*460*
Service (hotel)	*108*	*0*
Total	1,059	1,281

Source: Wilbur Smith Associates (March, 2010)
Notes:
1. Please refer to **Appendix A** for detailed methodology on employed residents, total household and total population projections.
2. Since the type of office and retail uses are unknown, the *Institute of Transportation Engineers* (ITE) *Handbook 2009* rates were used to generate employment density estimates. The average number of employees relative to the average size (in gross square feet) of office and retail use was applied to determine employment density estimates.

3.0 Results

VMT analysis results from the C/CAG Model and Year 2030 population projections were calculated to determine the daily, the morning (AM) peak hour, and the evening (PM) peak hour VMT per capita for the two Build Options discussed in Section 2. Future year population projections for San Mateo County and the City of Burlingame were derived from the Association of Bay Area Governments (ABAG). Under Year 2030 Conditions, daily VMT, peak hour VMT, population, and VMT per capita estimates by jurisdiction for various scenarios are shown in **Table 3**.

Table 3: Year 2030 VMT, Population, and VMT per Capita Estimates by Jurisdiction

Scenario	San Mateo County							City of Burlingame						
	Population	VMT			VMT per Capita[1]			Population	VMT			VMT per Capita[1]		
		Daily	AM	PM	Daily	AM	PM		Daily	AM	PM	Daily	AM	PM
Year 2030 Baseline	702,519	82,461,040	7,022,657	8,246,104	117.4	10.0	11.7	48,038	5,581,060	533,582	558,106	116.2	11.1	11.6
Year 2030 plus Project (Build Option 1)	704,078	82,550,530	7,028,874	8,255,053	117.2	10.0	11.7	49,597	5,606,160	534,606	560,616	113.0	10.8	11.3
Year 2030 plus Project (Build Option 2)	704,710	82,567,590	7,032,895	8,256,759	117.2	10.0	11.7	50,229	5,614,170	535,366	561,417	111.8	10.7	11.2

Source: Wilbur Smith Associates (March, 2010)

Notes:

1. VMT per capita is provided in vehicle-miles traveled per person.

Under Year 2030 plus Project Conditions, for the Build Option 1, VMT would increase compared to the Baseline scenario. With Build Option 1, VMT would increase during the daily, the AM peak hour, and the PM peak hour conditions both in the San Mateo County and the City of Burlingame. However, the daily VMT per capita would decrease from 117.4 vehicle-miles traveled per person to 117.2 vehicle-miles traveled per person in the San Mateo County and from 116.2 vehicle-miles traveled per person to 113 vehicle-miles traveled per person in the City of Burlingame. The peak hour VMT would remain same in the San Mateo County as under Baseline Scenario (10.0 vehicle-miles traveled per person in the AM peak hour and 11.7 vehicle-miles traveled per person in the PM peak hour), but would reduce in the City of Burlingame (from 11.1 to 10.8 vehicle-miles traveled per person in the AM peak hour and from 11.6 to 11.3 vehicle-miles traveled per person in the PM peak hour).

Build Option 2 shows a similar pattern for VMT values as Build Option 1 under 2030 plus Project Conditions. Compared to the Baseline scenario, the daily, the AM peak hour, and the PM peak hour VMT values would increase in the San Mateo County and the City of Burlingame under the Build Option 2 scenario. However, the daily VMT per capita would decrease from 117.4 vehicle-miles traveled per person to 117.2 vehicle-miles traveled per person in the San Mateo County and from 116.2 vehicle-miles traveled per person to 111.8 vehicle-miles traveled per person in the City of Burlingame. The VMT per capita would remain same in the San Mateo County as under the Baseline Scenario (10.0 vehicle-miles traveled per person in the AM peak hour and 11.7 vehicle-miles traveled per person in the PM peak hour), but would reduce in the City of Burlingame (from 11.1 to 10.7 vehicle-miles traveled per person in the AM peak hour and from 11.6 to 11.2 vehicle-miles traveled per person in the PM peak hour).

The outputs from the C/CAG model for Build Options 1 and 2 indicate that for both the alternatives, the VMT per capita will not increase. This is because the rate of increase in VMT would be less than the rate of increase in population for the City of Burlingame. Additionally, for the San Mateo County, model outputs indicate that the rate of increase in VMT will be similar to the rate of increase in the population.

4.0 Conclusions

A comparison of the rate of increase in the population and the rate of increase in the VMT due to the Proposed Project under Year 2030 Conditions in provided in **Table 4**.

Table 4: Rate of Change in VMT Vs Rate of Change in Population by Jurisdiction – Year 2030 Conditions

	San Mateo County				City of Burlingame			
		VMT				VMT		
Scenario	Population	Daily	AM	PM	Population	Daily	AM	PM
Year 2030 plus Project (Build Option 1)	0.22%	0.11%	0.09%	0.11%	3.25%	0.45%	0.19%	0.45%
Year 2030 plus Project (Build Option 2)	0.31%	0.13%	0.15%	0.13%	4.56%	0.59%	0.33%	0.59%

Source: Wilbur Smith Associates (March, 2010)

As shown in Table 4, this VMT analysis indicates that:

- The Proposed Project would result in a marginal (less than one percent) increase in VMT in San Mateo County and the City of Burlingame. The relatively low increase in VMT could be attributed to the study area environment and future transportation network. The Proposed Project would be focused in Downtown Burlingame, which is surrounded by a robust transit, bicycle, and pedestrian network. This could contribute to the minimal increase in VMT.[6]

- Under Year 2030 Conditions, the projected rate of increase in the VMT due to the Proposed Project (for both the build options) will be less than the projected rate of increase in the population during the daily, the AM peak hour, and the PM peak hour conditions.

- The Proposed Project meets the new plan-level threshold of significance proposed by the BAAQMD (projected VMT or vehicle trip increase is less than or equal to project population increase).

[6] It should be noted that ABAG and C/CAG have identified the El Camino Real arterial as a Priority Development Area (PDA) which traverses through the Proposed Project's study area. The PDA area includes infill development opportunity areas within existing communities that are established to promote higher density housing and mixed-use development, which are characteristics closely associated with the Proposed Project. As such, the planned development in the Downtown Burlingame is likely to create a very low increase in VMT throughout the City and County due to the projected increase in alternative modes of transportation and efficient development.

APPENDIX

APPENDIX A

VMT ANALYSIS METHODOLOGY

This appendix describes in detail, the methodology used for conducting the VMT analysis for the Burlingame Downtown Specific Plan (herein referred to as the "Proposed Project"). The model assumptions, data information, and a complete breakdown of the methodology adopted to determine VMT and VMT per capita for the San Mateo County and the City of Burlingame under with and without the Proposed Project scenarios are included in this section.

WSA performed the study using the most recent version of the C/CAG Model. This model includes travel demand data for two years - Year 2005 and Year 2030. The Proposed Project is planned for the Downtown Burlingame and the C/CAG model (which is specific to the San Mateo County and the City of Burlingame) was used to determine the VMT throughout the County and City under with and without the Proposed Project scenarios.

Model Testing

Base year (2005) and future year (2030) EMME/2 models were tested by the WSA team before proceeding with the analysis. Model parameters (i.e. link attributes, assignment variables, model scenarios, and macro files) were tested and confirmed. No modifications were applied to the 2030 Model under Year 2030 Baseline Scenario. A screenshot of the C/CAG Model is provided in **Exhibit A-1**.

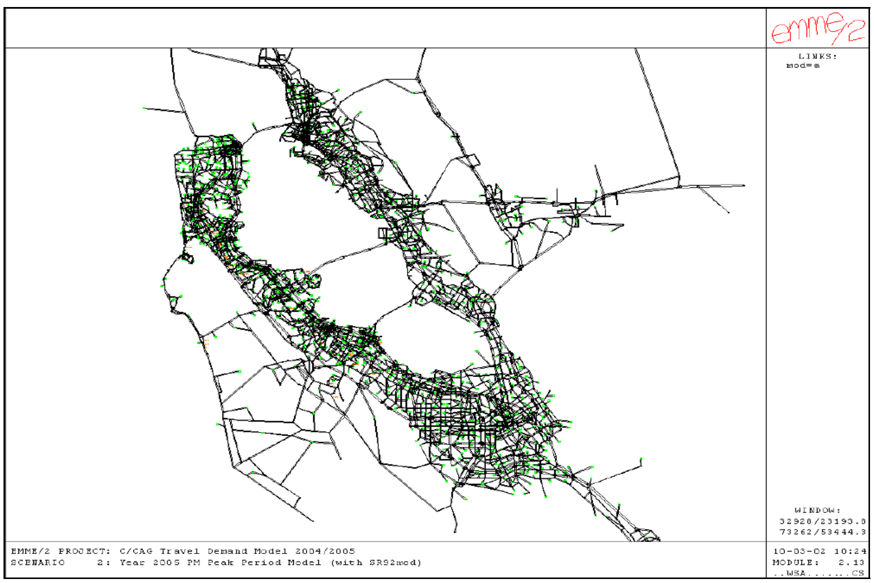


Exhibit A-1: C/CAG Regional Model Plot

Model Adjustments – Applying "Proposed Project" to Regional Model

The land use data associated with the Proposed Project were applied to Downtown Burlingame. TAZs specifically located in the Downtown were plotted and isolated for future analysis. Screenshots of C/CAG Model representing the City of Burlingame and the Downtown Burlingame are provided in **Exhibits A-2 and A-3**.

Exhibit A-2: Citywide Model TAZs

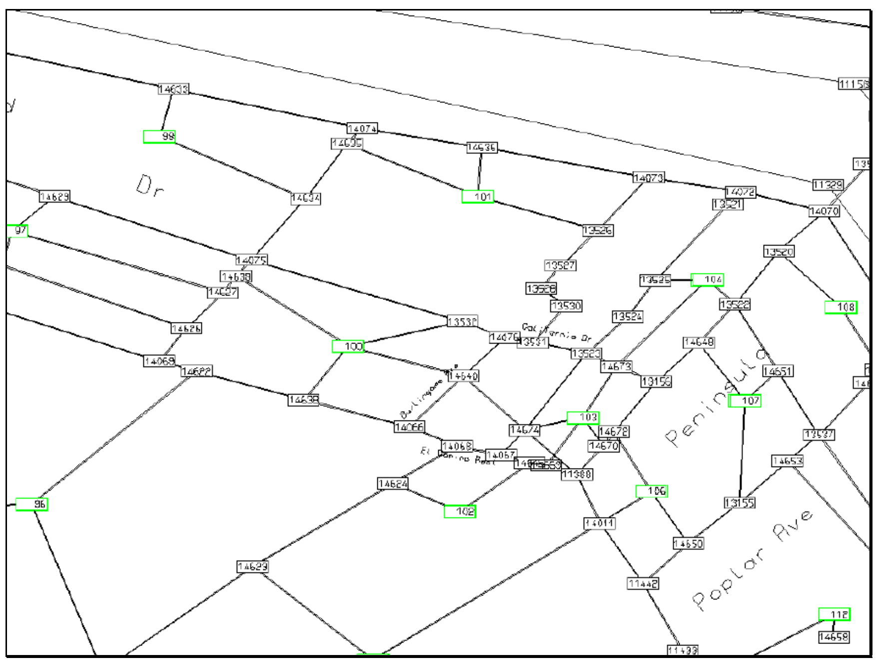


Exhibit A-3: Downtown Burlingame Model Network (Link/Nodal Areas)

Model batch files were used to run the model. The model includes a series of four steps - trip generation, trip distribution, mode split, and traffic assignment. The following model adjustments were performed:

1. The proposed land use updates were applied to the trip generation and trip distribution steps to comprehensively study the future year impacts. This process was essential to understand and analyze the No Build scenario.
2. The next step included isolating City of Burlingame and San Mateo County. The EMME/2 model was exported to ArcGIS compatible files to define the City and County boundaries. The

node/link information was extracted from GIS files and used to determine the appropriate links and nodes specifically within the Downtown Burlingame, the City of Burlingame, and the San Mateo County. An EMME/2 macro was developed to export link attributes that connect to those nodes.

3. The link attributes (node number, links connected to each node, volumes on the link, and link length) were exported and calculated in a Microsoft Excel-based format. Final Baseline Scenario VMT values, including County/City-level, and the AM peak hour and the PM peak hour VMT were identified.

Developing Year 2030 plus Project Conditions

The Proposed Project is located in TAZ #103 of the C/CAG Model. Future year land use information, population variation, manufacture/retail/service employment change, residential units increase, and hotel developments were incorporated into the model. The increase in either number of persons or residential/commercial acreage was directly applied to the trip generation. The land use data input format and the land use changes associated with the Proposed Project are outlined in **Table A-1**.

Table A-1: Proposed Project Model Inputs

Field ID	Contents	Year 2030 plus Project (Option 1)	Year 2030 plus Project (Option 2)
1	MTC TAZ	n.a-ID field, no change	ID field, no change
2	CAG TAZ	n.a-ID field, no change	ID field, no change
3	Employed Residents	1341	1884
4	Tot HH	875	1232
5	Tot POP	1559	2191
6	Manu Employ	n.a	n.a
7	Other Employ-office	491	821
8	Retail Emp	460	460
9	Service Employ-Hotel	108	0
10	Tot Emp	1,059	1,281
11	Mean HH Income	$96,098	$96,098
12	Zonal Acreage	n.a - redevelopment	n.a - redevelopment
13	Net Residential Acre	42	59
14	Net Commercial Acre	7.6	9.9

Source: Wilbur Smith Associates (March 2010).

For employed residents and total population, ABAG Year 2030 projections for the MTC TAZ #251 (downtown area) were used. To estimate the number of employed residents, the ratio of year 2030 employed residents to the total population for the TAZ was multiplied by the net total population (1,559 and 2,191, depending on the build option). Total households were estimated based on the number of households proposed per build option. For total population, the proportion of year 2030 Total Population based on ABAG data (5,662 persons) to the total number of households units based on ABAG data (3,186 units); produced a rate of 1.78 persons per household. This rate was multiplied by the total number of proposed households (876 or 1,231 based on each build option), which produced the net total increase in population.

Since the type of office and retail uses are unknown, the *Institute of Transportation Engineers* (ITE) *Handbook 2009* rates were used to generate employment density estimates. The average number of employees relative to the average size (in gross square feet) of office and retail use was applied to determine employment estimates. For hotel use, an ITE rate of 0.9 employees per room was applied. As such, the following metrics and assumptions were applied per employee type:

- Retail - employment density was based on 1 employee per 400 GSF of development
- Office – employment density was based on 3.3 employees per 1,000 GSF of development
- Hotel – employment density was based on 0.9 employees per room

After the land use data and socioeconomic inputs were incorporated into the model, a batch file was developed and applied to perform the 4-step process (trip generation, trip distribution, mode-split, and traffic assignment). A macro file was then developed to export VMT numbers for the County and the City.[1] The VMT numbers generated from the updated model were calculated relative to the forecasted population projections under each scenario. The baseline Year 2030 total population forecast was provided by ABAG data. In adding the total net increase in population associated with Proposed Project (as shown in Table A-1) to the total baseline Year 2030 population per jurisdiction; the analysis identified the appropriate VMT per capita for each jurisdiction and for each study scenario.

[1] VMT estimate includes an approximate City/County boundary and was not compared to any pervious studies, if there are any. Secondly, the way to calculate VMT may vary, e.g. the centroid links may or may not have distances in other VMT analysis; therefore results may vary depending on project location and/or project attributes. Finally, the model used to calculate VMT for City of Burlingame and San Mateo County has not been validated, due to the time land budget restrictions.

Appendix A

PROPOSED DEVELOPMENT & TRIP GENERATION ESTIMATES

Proposed Development (Future Year 2030 Option 1)

Proposed Development (Land Use) per Block

Block	Retail	Office	Hotel*	Residential Units
15B	16.008	13.661		84
16B	6.348	-0.749		50
17B	-4.219	21.216		112
18	-8.081	14.292		57
21B	13.301	2.392		19
22A	12.572	-8.237		37
23A	16.718	-9.908		34
24A	3.334	2.881		34
25A	5.141	4.002		16
25B	17.572	23.016		91
26	44.735	27.510		109
32B	22.383	30.443		121
33	38.032	28.182		112
Total	**183.844**	**148.702**	**120.00**	**876**
	GSF	**GSF**	**Rooms**	**Units**

*use 100,000GSF of hotel; 120 rooms

Trip Generation per Block - PM Peak Hour

Block	Retail	Office	Hotel	Residential Units
15B	61	20	71	44
16B	24	-1		26
17B	-16	32		58
18	-31	21		30
21B	51	4		10
22A	48	-12		19
23A	64	-15		18
24A	13	4		18
25A	20	6		8
25B	67	34		47
26	171	41		57
32B	86	45		63
33	146	42		58
Total	**704**	**222**	**71**	**456**

Total trips **1,452**

Source: Block development information provided by Burlingame Downtown Specific Plan Development Program Summary (November 2008)

Note:
ITE Land Use Codes: Retail (876); Office (710); Hotel (310); Residential (230)

Proposed Development (Future Year 2030 Option 2)

Proposed Development (Land Use) per Block

Block	Retail	Office	Residential Units
15B	16.008	22.848	118
16B	6.348	-1.253	71
17B	-4.219	35.483	158
18	-8.081	23.903	80
21B	13.301	4.001	26
22A	12.572	-13.776	52
23A	16.718	-16.571	48
24A	3.334	4.819	48
25A	5.141	6.694	22
25B	17.572	38.494	128
26	44.735	46.01	153
32B	22.383	50.916	170
33	38.032	47.134	157
Total	**183.844**	**248.702**	**1,232**
	GSF	**GSF**	**Units**

Trip Generation per Block - PM Peak Hour

Block	Retail	Office	Residential Units
15B	61	34	61
16B	24	-2	37
17B	-16	53	82
18	-31	36	42
21B	51	6	14
22A	48	-21	27
23A	64	-25	25
24A	13	7	25
25A	20	10	11
25B	67	57	67
26	171	69	80
32B	86	76	88
33	146	70	82
Total	**704**	**371**	**640**

Total trips **1,715**

Source: Block development information provided by Burlingame Downtown Specific Plan Development Program Summary (November 2008)

Note:
ITE Land Use Codes: Retail (876); Office (710); Hotel (310); Residential (230)

Appendix B
LOS CALCULATION SHEETS

EXISTING CONDITIONS – PM PEAK HOUR

HCM Signalized Intersection Capacity Analysis
1: Howard Ave & El Camino Real

Existing PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	16	77	14	102	106	199	9	975	36	152	1044	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0	4.0		4.0			4.0	
Lane Util. Factor		1.00		1.00	1.00	1.00		0.95			0.95	
Frt		0.98		1.00	1.00	0.85		0.99			1.00	
Flt Protected		0.99		0.95	1.00	1.00		1.00			0.99	
Satd. Flow (prot)		1817		1770	1863	1583		3519			3511	
Flt Permitted		0.94		0.95	1.00	1.00		0.94			0.58	
Satd. Flow (perm)		1727		1770	1863	1583		3307			2035	
Peak-hour factor, PHF	0.92	0.92	0.92	0.95	0.95	0.95	0.82	0.82	0.82	0.89	0.89	0.89
Adj. Flow (vph)	17	84	15	107	112	209	11	1189	44	171	1173	15
RTOR Reduction (vph)	0	5	0	0	0	82	0	2	0	0	1	0
Lane Group Flow (vph)	0	111	0	107	112	127	0	1242	0	0	1358	0
Turn Type	Perm			Prot		Perm	Perm			Perm		
Protected Phases		8		7	4			6			2	
Permitted Phases	8					4	6			2		
Actuated Green, G (s)		11.3		5.0	20.3	20.3		67.1			67.1	
Effective Green, g (s)		11.3		5.0	20.3	20.3		67.1			67.1	
Actuated g/C Ratio		0.12		0.05	0.21	0.21		0.70			0.70	
Clearance Time (s)		4.0		4.0	4.0	4.0		4.0			4.0	
Vehicle Extension (s)		3.0		3.0	3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)		205		93	396	337		2326			1431	
v/s Ratio Prot				c0.06	0.06							
v/s Ratio Perm		c0.06				0.08		0.38			c0.67	
v/c Ratio		0.54		1.15	0.28	0.38		0.53			0.95	
Uniform Delay, d1		39.6		45.2	31.5	32.1		6.7			12.6	
Progression Factor		1.00		1.00	1.00	1.00		1.00			1.00	
Incremental Delay, d2		2.9		139.5	0.4	0.7		0.2			13.4	
Delay (s)		42.5		184.7	31.8	32.8		7.0			26.0	
Level of Service		D		F	C	C		A			C	
Approach Delay (s)		42.5			70.6			7.0			26.0	
Approach LOS		D			E			A			C	

Intersection Summary			
HCM Average Control Delay	25.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	95.4	Sum of lost time (s)	12.0
Intersection Capacity Utilization	84.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
2: Park Rd & Burlingame Ave

Existing PM

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	59	79	185	68	67	206
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.86	0.86	0.92	0.92	0.77	0.77
Hourly flow rate (vph)	69	92	201	74	87	268
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	680	238			275	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	680	238			275	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	82	89			93	
cM capacity (veh/h)	389	801			1288	

Direction, Lane #	NW 1	NE 1	SW 1
Volume Total	160	275	355
Volume Left	69	0	87
Volume Right	92	74	0
cSH	551	1700	1288
Volume to Capacity	0.29	0.16	0.07
Queue Length 95th (ft)	30	0	5
Control Delay (s)	14.2	0.0	2.4
Lane LOS	B		A
Approach Delay (s)	14.2	0.0	2.4
Approach LOS	B		

Intersection Summary			
Average Delay	4.0		
Intersection Capacity Utilization	46.5%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
3: Primrose Rd & Chapin Ln

Existing PM

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Volume (veh/h)	122	118	134	108	113	189
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.83	0.83	0.88	0.88	0.84	0.84
Hourly flow rate (vph)	147	142	152	123	135	225
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			289		645	218
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			289		645	218
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			88		65	73
cM capacity (veh/h)			1273		384	822

Direction, Lane #	SE 1	NW 1	NE 1	NE 2
Volume Total	289	275	135	225
Volume Left	0	152	135	0
Volume Right	142	0	0	225
cSH	1700	1273	384	822
Volume to Capacity	0.17	0.12	0.35	0.27
Queue Length 95th (ft)	0	10	39	28
Control Delay (s)	0.0	5.0	19.3	11.0
Lane LOS		A	C	B
Approach Delay (s)	0.0	5.0	14.1	
Approach LOS			B	

Intersection Summary			
Average Delay	7.0		
Intersection Capacity Utilization	43.0%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
4: Primrose Rd & Bellevue Ave

Existing PM

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	19	92	38	16	140	60	41	38	39	105	41	28
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	21	100	41	17	152	65	45	41	42	114	45	30
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	217			141			434	414	121	445	402	185
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	217			141			434	414	121	445	402	185
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			99			91	92	95	75	91	96
cM capacity (veh/h)	1352			1442			470	514	931	460	522	857

Direction, Lane #	SE 1	NW 1	NE 1	SW 1
Volume Total	162	235	128	189
Volume Left	21	17	45	114
Volume Right	41	65	42	30
cSH	1352	1442	581	512
Volume to Capacity	0.02	0.01	0.22	0.37
Queue Length 95th (ft)	1	1	21	42
Control Delay (s)	1.1	0.7	12.9	16.1
Lane LOS	A	A	B	C
Approach Delay (s)	1.1	0.7	12.9	16.1
Approach LOS			B	C

Intersection Summary			
Average Delay	7.0		
Intersection Capacity Utilization	37.0%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
5: Primrose Rd & Douglas Ave

Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Volume (veh/h)	4	87	59	150	62	7
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	95	64	163	67	8
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	227				249	146
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	227				249	146
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				91	99
cM capacity (veh/h)	1341				737	901

Direction, Lane #	SE 1	NW 1	SW 1
Volume Total	99	227	75
Volume Left	4	0	67
Volume Right	0	163	8
cSH	1341	1700	751
Volume to Capacity	0.00	0.13	0.10
Queue Length 95th (ft)	0	0	8
Control Delay (s)	0.4	0.0	10.3
Lane LOS	A		B
Approach Delay (s)	0.4	0.0	10.3
Approach LOS			B

Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	22.9%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
6: Lorton Ave & California Dr

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	72	92	98	781	732	189
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.97	0.97	0.95	0.95	0.89	0.89
Hourly flow rate (vph)	74	95	103	822	822	212
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1440	411	1035			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1440	411	1035			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	29	84	85			
cM capacity (veh/h)	105	590	667			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	74	95	103	411	411	411	411	212
Volume Left	74	0	103	0	0	0	0	0
Volume Right	0	95	0	0	0	0	0	212
cSH	105	590	667	1700	1700	1700	1700	1700
Volume to Capacity	0.71	0.16	0.15	0.24	0.24	0.24	0.24	0.12
Queue Length 95th (ft)	93	14	14	0	0	0	0	0
Control Delay (s)	97.8	12.3	11.4	0.0	0.0	0.0	0.0	0.0
Lane LOS	F	B	B					
Approach Delay (s)	49.8		1.3			0.0		
Approach LOS	E							

Intersection Summary			
Average Delay	4.5		
Intersection Capacity Utilization	39.7%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
7: Peninsula Ave & El Camino Real

Existing PM

Movement	WBL	WBR	WBR2	NBT	NBR	NBR2	SBL	SBT	SWL2	SWL	SWR
Lane Configurations											
Volume (vph)	85	0	70	1003	0	284	37	1088	91	1	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0		4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00			1.00		1.00	1.00	1.00		1.00	1.00
Frt	0.94			1.00		0.85	1.00	1.00		1.00	0.85
Flt Protected	0.97			1.00		1.00	0.95	1.00		0.95	1.00
Satd. Flow (prot)	1702			1863		1583	1770	1863		1770	1583
Flt Permitted	0.97			1.00		1.00	0.18	1.00		0.95	1.00
Satd. Flow (perm)	1702			1863		1583	340	1863		1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	92	0	76	1090	0	309	40	1183	99	1	16
RTOR Reduction (vph)	31	0	0	0	0	62	0	0	0	0	3
Lane Group Flow (vph)	137	0	0	1090	0	247	40	1183	0	100	13
Turn Type						Perm	Perm		Prot		Perm
Protected Phases	8!			2!				6!	4!	6!	
Permitted Phases						2	6!				6
Actuated Green, G (s)	12.8			82.1		82.1	82.1	82.1		94.9	82.1
Effective Green, g (s)	12.8			82.1		82.1	82.1	82.1		94.9	82.1
Actuated g/C Ratio	0.12			0.80		0.80	0.80	0.80		0.92	0.80
Clearance Time (s)	4.0			4.0		4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0			3.0		3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	212			1486		1263	271	1486		1770	1263
v/s Ratio Prot	c0.08			0.59				c0.64		0.01	
v/s Ratio Perm						0.16	0.12			0.05	0.01
v/c Ratio	0.65			0.73		0.20	0.15	0.80		0.06	0.01
Uniform Delay, d1	42.9			5.1		2.5	2.4	5.8		0.3	2.1
Progression Factor	1.00			1.00		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	6.7			3.2		0.3	1.1	4.5		0.0	0.0
Delay (s)	49.6			8.3		2.8	3.5	10.3		0.3	2.1
Level of Service	D			A		A	A	B		A	A
Approach Delay (s)	49.6			7.1				10.0		0.6	
Approach LOS	D			A				B		A	

Intersection Summary			
HCM Average Control Delay	10.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	102.9	Sum of lost time (s)	8.0
Intersection Capacity Utilization	81.4%	ICU Level of Service	D
Analysis Period (min)	15		
! Phase conflict between lane groups.			
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
8: Peninsula Ave & California Drive

Existing PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	15	183	19	61	181	230	8	440	120	233	575	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00		0.95	1.00		0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85		1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		1.00	1.00		0.99	
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583		3536	1583		3477	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.94	1.00		0.68	
Satd. Flow (perm)	1770	1863	1583	1770	1863	1583		3324	1583		2405	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	16	199	21	66	197	250	9	478	130	253	625	22
RTOR Reduction (vph)	0	0	17	0	0	195	0	0	47	0	1	0
Lane Group Flow (vph)	16	199	4	66	197	55	0	487	83	0	899	0
Turn Type	Prot		Perm	Prot		Perm	Perm		Perm	Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases			4			8	2		2	6		
Actuated Green, G (s)	1.5	16.4	16.4	6.0	20.9	20.9		60.5	60.5		60.5	
Effective Green, g (s)	1.5	16.4	16.4	6.0	20.9	20.9		60.5	60.5		60.5	
Actuated g/C Ratio	0.02	0.17	0.17	0.06	0.22	0.22		0.64	0.64		0.64	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	
Lane Grp Cap (vph)	28	322	274	112	410	349		2119	1009		1533	
v/s Ratio Prot	0.01	c0.11		c0.04	0.11							
v/s Ratio Perm			0.00			0.03		0.15	0.05		c0.37	
v/c Ratio	0.57	0.62	0.01	0.59	0.48	0.16		0.23	0.08		0.59	
Uniform Delay, d1	46.4	36.3	32.5	43.3	32.3	29.9		7.3	6.6		10.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	
Incremental Delay, d2	25.2	3.5	0.0	7.7	0.9	0.2		0.3	0.2		1.6	
Delay (s)	71.6	39.9	32.6	51.0	33.2	30.1		7.6	6.7		11.6	
Level of Service	E	D	C	D	C	C		A	A		B	
Approach Delay (s)		41.4			34.0			7.4			11.6	
Approach LOS		D			C			A			B	

Intersection Summary			
HCM Average Control Delay	18.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	94.9	Sum of lost time (s)	12.0
Intersection Capacity Utilization	62.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	114	142	144	58	129	58	115	634	19	16	570	168
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0			4.0	
Lane Util. Factor	1.00	1.00			1.00	1.00		0.95			0.95	
Frt	1.00	0.92			1.00	0.85		1.00			0.97	
Flt Protected	0.95	1.00			0.98	1.00		0.99			1.00	
Satd. Flow (prot)	1770	1722			1834	1583		3500			3417	
Flt Permitted	0.95	1.00			0.82	1.00		0.62			0.93	
Satd. Flow (perm)	1770	1722			1529	1583		2188			3185	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	124	154	157	63	140	63	125	689	21	17	620	183
RTOR Reduction (vph)	0	33	0	0	0	43	0	2	0	0	30	0
Lane Group Flow (vph)	124	278	0	0	203	20	0	833	0	0	790	0
Turn Type	Prot			Perm		Perm	Perm			Perm		
Protected Phases	5	2			6			8			4	
Permitted Phases				6		6	8			4		
Actuated Green, G (s)	10.3	42.4			28.1	28.1		37.6			37.6	
Effective Green, g (s)	10.3	42.4			28.1	28.1		37.6			37.6	
Actuated g/C Ratio	0.12	0.48			0.32	0.32		0.43			0.43	
Clearance Time (s)	4.0	4.0			4.0	4.0		4.0			4.0	
Vehicle Extension (s)	3.0	3.0			3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)	207	830			488	505		935			1361	
v/s Ratio Prot	c0.07	0.16										
v/s Ratio Perm					c0.13	0.01		c0.38			0.25	
v/c Ratio	0.60	0.34			0.42	0.04		0.89			0.58	
Uniform Delay, d1	36.9	14.1			23.5	20.6		23.3			19.2	
Progression Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Incremental Delay, d2	4.6	1.1			2.6	0.1		10.6			0.6	
Delay (s)	41.5	15.2			26.1	20.8		33.9			19.8	
Level of Service	D	B			C	C		C			B	
Approach Delay (s)		22.7			24.9			33.9			19.8	
Approach LOS		C			C			C			B	

Intersection Summary			
HCM Average Control Delay	25.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	88.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	82.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

FUTURE YEAR 2030 NO PROJECT BUILD CONDITIONS – PM PEAK HOUR

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	24	84	22	97	130	181	17	1410	37	144	1455	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0	4.0		4.0			4.0	
Lane Util. Factor		1.00		1.00	1.00	1.00		0.95			0.95	
Frt		0.98		1.00	1.00	0.85		1.00			1.00	
Flt Protected		0.99		0.95	1.00	1.00		1.00			1.00	
Satd. Flow (prot)		1803		1770	1863	1583		3524			3516	
Flt Permitted		0.92		0.95	1.00	1.00		0.91			0.51	
Satd. Flow (perm)		1674		1770	1863	1583		3194			1810	
Peak-hour factor, PHF	0.92	0.92	0.92	0.95	0.95	0.95	0.82	0.82	0.82	0.89	0.89	0.89
Adj. Flow (vph)	26	91	24	102	137	191	21	1720	45	162	1635	26
RTOR Reduction (vph)	0	8	0	0	0	26	0	2	0	0	1	0
Lane Group Flow (vph)	0	133	0	102	137	165	0	1784	0	0	1822	0
Turn Type	Perm			Prot		Perm	Perm			Perm		
Protected Phases		8		7	4			6			2	
Permitted Phases	8					4	6			2		
Actuated Green, G (s)		12.4		5.0	21.4	21.4		67.1			67.1	
Effective Green, g (s)		12.4		5.0	21.4	21.4		67.1			67.1	
Actuated g/C Ratio		0.13		0.05	0.22	0.22		0.70			0.70	
Clearance Time (s)		4.0		4.0	4.0	4.0		4.0			4.0	
Vehicle Extension (s)		3.0		3.0	3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)		215		92	413	351		2221			1259	
v/s Ratio Prot				c0.06	0.07							
v/s Ratio Perm		c0.08				0.10		0.56			c1.01	
v/c Ratio		0.62		1.11	0.33	0.47		0.80			1.65dl	
Uniform Delay, d1		39.8		45.8	31.5	32.6		10.1			14.7	
Progression Factor		1.00		1.00	1.00	1.00		1.00			1.00	
Incremental Delay, d2		5.2		126.2	0.5	1.0		2.2			205.8	
Delay (s)		45.0		172.0	32.0	33.6		12.3			220.5	
Level of Service		D		F	C	C		B			F	
Approach Delay (s)		45.0			65.9			12.3			220.5	
Approach LOS		D			E			B			F	

Intersection Summary			
HCM Average Control Delay	109.7	HCM Level of Service	F
HCM Volume to Capacity ratio	1.31		
Actuated Cycle Length (s)	96.5	Sum of lost time (s)	12.0
Intersection Capacity Utilization	113.0%	ICU Level of Service	H
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.
c Critical Lane Group

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	105	89	175	83	58	216
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.86	0.86	0.92	0.92	0.77	0.77
Hourly flow rate (vph)	122	103	190	90	75	281
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	666	235			280	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	666	235			280	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	69	87			94	
cM capacity (veh/h)	399	804			1282	

Direction, Lane #	NW 1	NE 1	SW 1
Volume Total	226	280	356
Volume Left	122	0	75
Volume Right	103	90	0
cSH	519	1700	1282
Volume to Capacity	0.43	0.16	0.06
Queue Length 95th (ft)	54	0	5
Control Delay (s)	17.2	0.0	2.1
Lane LOS	C		A
Approach Delay (s)	17.2	0.0	2.1
Approach LOS	C		

Intersection Summary			
Average Delay	5.4		
Intersection Capacity Utilization	50.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Volume (veh/h)	202	121	130	163	110	192
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.83	0.83	0.88	0.88	0.84	0.84
Hourly flow rate (vph)	243	146	148	185	131	229
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			389		797	316
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			389		797	316
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			87		58	68
cM capacity (veh/h)			1169		311	724

Direction, Lane #	SE 1	NW 1	NE 1	NE 2
Volume Total	389	333	131	229
Volume Left	0	148	131	0
Volume Right	146	0	0	229
cSH	1700	1169	311	724
Volume to Capacity	0.23	0.13	0.42	0.32
Queue Length 95th (ft)	0	11	50	34
Control Delay (s)	0.0	4.5	24.8	12.2
Lane LOS		A	C	B
Approach Delay (s)	0.0	4.5	16.8	
Approach LOS			C	

Intersection Summary			
Average Delay	7.0		
Intersection Capacity Utilization	49.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	30	154	43	15	169	82	36	38	42	122	32	26
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	33	167	47	16	184	89	39	41	46	133	35	28
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	273			214			562	561	191	583	540	228
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	273			214			562	561	191	583	540	228
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			99			90	90	95	63	92	97
cM capacity (veh/h)	1290			1356			385	420	851	360	432	811

Direction, Lane #	SE 1	NW 1	NE 1	SW 1
Volume Total	247	289	126	196
Volume Left	33	16	39	133
Volume Right	47	89	46	28
cSH	1290	1356	497	405
Volume to Capacity	0.03	0.01	0.25	0.48
Queue Length 95th (ft)	2	1	25	64
Control Delay (s)	1.2	0.5	14.7	21.9
Lane LOS	A	A	B	C
Approach Delay (s)	1.2	0.5	14.7	21.9
Approach LOS			B	C

Intersection Summary			
Average Delay	7.7		
Intersection Capacity Utilization	44.5%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
5: Primrose Rd & Douglas Ave

2030 No Project PM

Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Volume (veh/h)	6	164	82	149	63	7
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	178	89	162	68	8
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	251				361	170
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	251				361	170
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				89	99
cM capacity (veh/h)	1314				634	874

Direction, Lane #	SE 1	NW 1	SW 1
Volume Total	185	251	76
Volume Left	7	0	68
Volume Right	0	162	8
cSH	1314	1700	652
Volume to Capacity	0.00	0.15	0.12
Queue Length 95th (ft)	0	0	10
Control Delay (s)	0.3	0.0	11.2
Lane LOS	A		B
Approach Delay (s)	0.3	0.0	11.2
Approach LOS			B

Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	24.1%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
6: Lorton Ave & California Dr

2030 No Project PM

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	93	166	116	772	804	180
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.97	0.97	0.95	0.95	0.89	0.89
Hourly flow rate (vph)	96	171	122	813	903	202
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1554	452	1106			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1554	452	1106			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	69	81			
cM capacity (veh/h)	84	555	627			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	96	171	122	406	406	452	452	202
Volume Left	96	0	122	0	0	0	0	0
Volume Right	0	171	0	0	0	0	0	202
cSH	84	555	627	1700	1700	1700	1700	1700
Volume to Capacity	1.15	0.31	0.19	0.24	0.24	0.27	0.27	0.12
Queue Length 95th (ft)	170	33	18	0	0	0	0	0
Control Delay (s)	233.5	14.4	12.1	0.0	0.0	0.0	0.0	0.0
Lane LOS	F	B	B					
Approach Delay (s)	93.0		1.6			0.0		
Approach LOS	F							

Intersection Summary			
Average Delay	11.4		
Intersection Capacity Utilization	43.8%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
7: Peninsula Ave & El Camino Real

2030 No Project PM

Movement	WBL	WBR	WBR2	NBT	NBR	NBR2	SBL	SBT	SWL2	SWL	SWR
Lane Configurations											
Volume (vph)	94	0	123	1423	0	242	189	1288	116	0	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0		4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00			1.00		1.00	1.00	1.00		1.00	1.00
Frt	0.92			1.00		0.85	1.00	1.00		1.00	0.85
Flt Protected	0.98			1.00		1.00	0.95	1.00		0.95	1.00
Satd. Flow (prot)	1684			1863		1583	1770	1863		1770	1583
Flt Permitted	0.98			1.00		1.00	0.05	1.00		0.95	1.00
Satd. Flow (perm)	1684			1863		1583	95	1863		1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	102	0	134	1547	0	263	205	1400	126	0	35
RTOR Reduction (vph)	48	0	0	0	0	58	0	0	0	0	8
Lane Group Flow (vph)	188	0	0	1547	0	205	205	1400	0	126	27
Turn Type						Perm	Perm		Prot		Perm
Protected Phases	8!			2!				6!	4!	6!	
Permitted Phases						2	6!				6
Actuated Green, G (s)	14.4			78.8		78.8	78.8	78.8		93.2	78.8
Effective Green, g (s)	14.4			78.8		78.8	78.8	78.8		93.2	78.8
Actuated g/C Ratio	0.14			0.78		0.78	0.78	0.78		0.92	0.78
Clearance Time (s)	4.0			4.0		4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0			3.0		3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	240			1451		1233	74	1451		1770	1233
v/s Ratio Prot	c0.11			0.83				0.75		0.01	
v/s Ratio Perm						0.13	c2.17			0.06	0.02
v/c Ratio	0.78			1.07		0.17	2.77	0.96		0.07	0.02
Uniform Delay, d1	41.9			11.2		2.8	11.2	10.0		0.3	2.5
Progression Factor	1.00			1.00		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	15.3			43.5		0.3	833.0	16.6		0.0	0.0
Delay (s)	57.2			54.7		3.1	844.2	26.6		0.4	2.6
Level of Service	E			D		A	F	C		A	A
Approach Delay (s)	57.2			47.2				131.0		0.8	
Approach LOS	E			D				F		A	

Intersection Summary			
HCM Average Control Delay	81.1	HCM Level of Service	F
HCM Volume to Capacity ratio	2.46		
Actuated Cycle Length (s)	101.2	Sum of lost time (s)	8.0
Intersection Capacity Utilization	117.9%	ICU Level of Service	H
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
8: Peninsula Ave & California Drive

2030 No Project PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	21	296	36	73	234	204	13	491	150	236	700	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00		0.95	1.00		0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85		1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		1.00	1.00		0.99	
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583		3535	1583		3482	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.92	1.00		0.67	
Satd. Flow (perm)	1770	1863	1583	1770	1863	1583		3262	1583		2371	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	23	322	39	79	254	222	14	534	163	257	761	28
RTOR Reduction (vph)	0	0	31	0	0	166	0	0	64	0	2	0
Lane Group Flow (vph)	23	322	8	79	254	56	0	548	99	0	1044	0
Turn Type	Prot		Perm	Prot		Perm	Perm		Perm	Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases			4			8	2		2	6		
Actuated Green, G (s)	1.5	20.4	20.4	6.2	25.1	25.1		60.3	60.3		60.3	
Effective Green, g (s)	1.5	20.4	20.4	6.2	25.1	25.1		60.3	60.3		60.3	
Actuated g/C Ratio	0.02	0.21	0.21	0.06	0.25	0.25		0.61	0.61		0.61	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	
Lane Grp Cap (vph)	27	384	327	111	473	402		1989	965		1446	
v/s Ratio Prot	0.01	c0.17		c0.04	0.14							
v/s Ratio Perm			0.01			0.04		0.17	0.06		c0.44	
v/c Ratio	0.85	0.84	0.02	0.71	0.54	0.14		0.28	0.10		0.72	
Uniform Delay, d1	48.6	37.7	31.3	45.5	31.9	28.6		9.1	8.0		13.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	
Incremental Delay, d2	110.0	14.7	0.0	19.3	1.2	0.2		0.3	0.2		3.2	
Delay (s)	158.6	52.4	31.3	64.8	33.1	28.7		9.4	8.3		16.6	
Level of Service	F	D	C	E	C	C		A	A		B	
Approach Delay (s)		56.6			35.8			9.1			16.6	
Approach LOS		E			D			A			B	

Intersection Summary			
HCM Average Control Delay	24.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	98.9	Sum of lost time (s)	12.0
Intersection Capacity Utilization	73.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	113	162	118	54	138	66	111	657	23	27	674	226
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0			4.0	
Lane Util. Factor	1.00	1.00			1.00	1.00		0.95			0.95	
Frt	1.00	0.94			1.00	0.85		1.00			0.96	
Flt Protected	0.95	1.00			0.99	1.00		0.99			1.00	
Satd. Flow (prot)	1770	1745			1837	1583		3499			3405	
Flt Permitted	0.95	1.00			0.84	1.00		0.58			0.91	
Satd. Flow (perm)	1770	1745			1558	1583		2047			3105	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	123	176	128	59	150	72	121	714	25	29	733	246
RTOR Reduction (vph)	0	24	0	0	0	50	0	2	0	0	34	0
Lane Group Flow (vph)	123	280	0	0	209	22	0	858	0	0	974	0
Turn Type	Prot			Perm		Perm	Perm			Perm		
Protected Phases	5	2			6			8			4	
Permitted Phases				6		6	8			4		
Actuated Green, G (s)	10.4	42.3			27.9	27.9		42.0			42.0	
Effective Green, g (s)	10.4	42.3			27.9	27.9		42.0			42.0	
Actuated g/C Ratio	0.11	0.46			0.30	0.30		0.46			0.46	
Clearance Time (s)	4.0	4.0			4.0	4.0		4.0			4.0	
Vehicle Extension (s)	3.0	3.0			3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)	199	800			471	479		931			1413	
v/s Ratio Prot	c0.07	0.16										
v/s Ratio Perm					c0.13	0.01		c0.42			0.31	
v/c Ratio	0.62	0.35			0.44	0.05		0.92			0.69	
Uniform Delay, d1	39.1	16.1			25.9	22.8		23.6			20.0	
Progression Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Incremental Delay, d2	5.6	1.2			3.0	0.2		14.1			1.4	
Delay (s)	44.7	17.3			29.0	23.0		37.7			21.4	
Level of Service	D	B			C	C		D			C	
Approach Delay (s)		25.2			27.4			37.7			21.4	
Approach LOS		C			C			D			C	

Intersection Summary			
HCM Average Control Delay	28.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	92.3	Sum of lost time (s)	12.0
Intersection Capacity Utilization	88.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

FUTURE YEAR 2030 PROJECT BUILD (Option 1) CONDITIONS – PM PEAK HOUR

HCM Signalized Intersection Capacity Analysis
1: Howard Ave & El Camino Real

2030 Project OPT 1 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	24	105	22	121	154	227	17	1410	47	186	1455	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0	4.0		4.0			4.0	
Lane Util. Factor		1.00		1.00	1.00	1.00		0.95			0.95	
Frt		0.98		1.00	1.00	0.85		1.00			1.00	
Flt Protected		0.99		0.95	1.00	1.00		1.00			0.99	
Satd. Flow (prot)		1812		1770	1863	1583		3520			3512	
Flt Permitted		0.93		0.95	1.00	1.00		0.90			0.49	
Satd. Flow (perm)		1693		1770	1863	1583		3183			1722	
Peak-hour factor, PHF	0.92	0.92	0.92	0.95	0.95	0.95	0.82	0.82	0.82	0.89	0.89	0.89
Adj. Flow (vph)	26	114	24	127	162	239	21	1720	57	209	1635	26
RTOR Reduction (vph)	0	6	0	0	0	26	0	2	0	0	1	0
Lane Group Flow (vph)	0	158	0	127	162	213	0	1796	0	0	1869	0
Turn Type	Perm			Prot		Perm	Perm			Perm		
Protected Phases		8		7	4			6			2	
Permitted Phases	8					4	6			2		
Actuated Green, G (s)		13.3		5.0	22.3	22.3		67.1			67.1	
Effective Green, g (s)		13.3		5.0	22.3	22.3		67.1			67.1	
Actuated g/C Ratio		0.14		0.05	0.23	0.23		0.69			0.69	
Clearance Time (s)		4.0		4.0	4.0	4.0		4.0			4.0	
Vehicle Extension (s)		3.0		3.0	3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)		231		91	427	362		2193			1186	
v/s Ratio Prot				c0.07	0.09							
v/s Ratio Perm		0.09				c0.13		0.56			c1.09	
v/c Ratio		0.68		1.40	0.38	0.59		0.82			2.27dl	
Uniform Delay, d1		40.0		46.2	31.7	33.5		10.8			15.2	
Progression Factor		1.00		1.00	1.00	1.00		1.00			1.00	
Incremental Delay, d2		8.1		231.6	0.6	2.4		2.5			263.3	
Delay (s)		48.1		277.8	32.3	35.9		13.3			278.4	
Level of Service		D		F	C	D		B			F	
Approach Delay (s)		48.1			93.0			13.3			278.4	
Approach LOS		D			F			B			F	

Intersection Summary			
HCM Average Control Delay	138.0	HCM Level of Service	F
HCM Volume to Capacity ratio	1.36		
Actuated Cycle Length (s)	97.4	Sum of lost time (s)	8.0
Intersection Capacity Utilization	116.9%	ICU Level of Service	H
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.
c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
2: Park Rd & Burlingame Ave

2030 Project OPT 1 PM

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	109	93	196	113	76	240
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.86	0.86	0.92	0.92	0.77	0.77
Hourly flow rate (vph)	127	108	213	123	99	312
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	784	274			336	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	784	274			336	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	62	86			92	
cM capacity (veh/h)	333	764			1223	

Direction, Lane #	NW 1	NE 1	SW 1
Volume Total	235	336	410
Volume Left	127	0	99
Volume Right	108	123	0
cSH	450	1700	1223
Volume to Capacity	0.52	0.20	0.08
Queue Length 95th (ft)	74	0	7
Control Delay (s)	21.4	0.0	2.6
Lane LOS	C		A
Approach Delay (s)	21.4	0.0	2.6
Approach LOS	C		

Intersection Summary			
Average Delay	6.2		
Intersection Capacity Utilization	55.8%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Volume (veh/h)	237	121	130	179	126	245
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.83	0.83	0.88	0.88	0.84	0.84
Hourly flow rate (vph)	286	146	148	203	150	292
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			431		857	358
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			431		857	358
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			87		47	57
cM capacity (veh/h)			1128		285	686

Direction, Lane #	SE 1	NW 1	NE 1	NE 2
Volume Total	431	351	150	292
Volume Left	0	148	150	0
Volume Right	146	0	0	292
cSH	1700	1128	285	686
Volume to Capacity	0.25	0.13	0.53	0.43
Queue Length 95th (ft)	0	11	71	53
Control Delay (s)	0.0	4.4	30.9	14.1
Lane LOS		A	D	B
Approach Delay (s)	0.0	4.4	19.8	
Approach LOS			C	

Intersection Summary			
Average Delay	8.4		
Intersection Capacity Utilization	53.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	30	167	43	19	201	96	36	38	47	139	32	26
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	33	182	47	21	218	104	39	41	51	151	35	28
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	323			228			628	634	205	654	605	271
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	323			228			628	634	205	654	605	271
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			98			89	89	94	52	91	96
cM capacity (veh/h)	1237			1340			344	380	836	317	395	768

Direction, Lane #	SE 1	NW 1	NE 1	SW 1
Volume Total	261	343	132	214
Volume Left	33	21	39	151
Volume Right	47	104	51	28
cSH	1237	1340	464	356
Volume to Capacity	0.03	0.02	0.28	0.60
Queue Length 95th (ft)	2	1	29	94
Control Delay (s)	1.2	0.6	15.8	29.3
Lane LOS	A	A	C	D
Approach Delay (s)	1.2	0.6	15.8	29.3
Approach LOS			C	D

Intersection Summary			
Average Delay	9.3		
Intersection Capacity Utilization	45.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Volume (veh/h)	6	171	90	179	69	7
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	186	98	195	75	8
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	292				394	195
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	292				394	195
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				88	99
cM capacity (veh/h)	1269				607	846

Direction, Lane #	SE 1	NW 1	SW 1
Volume Total	192	292	83
Volume Left	7	0	75
Volume Right	0	195	8
cSH	1269	1700	624
Volume to Capacity	0.01	0.17	0.13
Queue Length 95th (ft)	0	0	11
Control Delay (s)	0.3	0.0	11.7
Lane LOS	A		B
Approach Delay (s)	0.3	0.0	11.7
Approach LOS			B

Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	26.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	93	194	153	944	1010	180
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.97	0.97	0.95	0.95	0.89	0.89
Hourly flow rate (vph)	96	200	161	994	1135	202
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1954	567	1337			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1954	567	1337			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	57	69			
cM capacity (veh/h)	38	466	512			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	96	200	161	497	497	567	567	202
Volume Left	96	0	161	0	0	0	0	0
Volume Right	0	200	0	0	0	0	0	202
cSH	38	466	512	1700	1700	1700	1700	1700
Volume to Capacity	2.50	0.43	0.31	0.29	0.29	0.33	0.33	0.12
Queue Length 95th (ft)	265	53	33	0	0	0	0	0
Control Delay (s)	903.9	18.4	15.2	0.0	0.0	0.0	0.0	0.0
Lane LOS	F	C	C					
Approach Delay (s)	305.3		2.1			0.0		
Approach LOS	F							

Intersection Summary			
Average Delay	33.3		
Intersection Capacity Utilization	51.5%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
7: Peninsula Ave & El Camino Real

2030 Project OPT 1 PM

Movement	WBL	WBR	WBR2	NBT	NBR	NBR2	SBL	SBT	SWL2	SWL	SWR
Lane Configurations											
Volume (vph)	135	0	140	1423	0	314	198	1288	116	0	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0		4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00			1.00		1.00	1.00	1.00		1.00	1.00
Frt	0.93			1.00		0.85	1.00	1.00		1.00	0.85
Flt Protected	0.98			1.00		1.00	0.95	1.00		0.95	1.00
Satd. Flow (prot)	1693			1863		1583	1770	1863		1770	1583
Flt Permitted	0.98			1.00		1.00	0.05	1.00		0.95	1.00
Satd. Flow (perm)	1693			1863		1583	97	1863		1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	147	0	152	1547	0	341	215	1400	126	0	35
RTOR Reduction (vph)	37	0	0	0	0	81	0	0	0	0	8
Lane Group Flow (vph)	262	0	0	1547	0	260	215	1400	0	126	27
Turn Type						Perm	Perm		Prot		Perm
Protected Phases	8!			2!				6!	4!	6!	
Permitted Phases						2	6!				6
Actuated Green, G (s)	16.0			77.0		77.0	77.0	77.0		93.0	77.0
Effective Green, g (s)	16.0			77.0		77.0	77.0	77.0		93.0	77.0
Actuated g/C Ratio	0.16			0.76		0.76	0.76	0.76		0.92	0.76
Clearance Time (s)	4.0			4.0		4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0			3.0		3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	268			1420		1207	74	1420		1770	1207
v/s Ratio Prot	c0.15			0.83				0.75		0.01	
v/s Ratio Perm						0.16	c2.22			0.06	0.02
v/c Ratio	0.98			1.09		0.22	2.91	0.99		0.07	0.02
Uniform Delay, d1	42.3			12.0		3.4	12.0	11.5		0.3	2.9
Progression Factor	1.00			1.00		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	48.2			52.2		0.4	893.0	20.8		0.0	0.0
Delay (s)	90.5			64.2		3.8	905.0	32.2		0.4	2.9
Level of Service	F			E		A	F	C		A	A
Approach Delay (s)	90.5			53.3				148.4		0.9	
Approach LOS	F			D				F		A	

Intersection Summary			
HCM Average Control Delay	92.7	HCM Level of Service	F
HCM Volume to Capacity ratio	2.58		
Actuated Cycle Length (s)	101.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	121.7%	ICU Level of Service	H
Analysis Period (min)	15		
! Phase conflict between lane groups.			
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
8: Peninsula Ave & California Drive

2030 Project OPT 1 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	25	296	36	73	234	263	13	604	150	293	840	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00		0.95	1.00		0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85		1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		1.00	1.00		0.99	
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583		3536	1583		3481	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.92	1.00		0.63	
Satd. Flow (perm)	1770	1863	1583	1770	1863	1583		3253	1583		2220	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	27	322	39	79	254	286	14	657	163	318	913	34
RTOR Reduction (vph)	0	0	31	0	0	208	0	0	63	0	2	0
Lane Group Flow (vph)	27	322	8	79	254	78	0	671	100	0	1263	0
Turn Type	Prot		Perm	Prot		Perm	Perm		Perm	Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases			4			8	2		2	6		
Actuated Green, G (s)	2.3	19.7	19.7	6.2	23.6	23.6		60.3	60.3		60.3	
Effective Green, g (s)	2.3	19.7	19.7	6.2	23.6	23.6		60.3	60.3		60.3	
Actuated g/C Ratio	0.02	0.20	0.20	0.06	0.24	0.24		0.61	0.61		0.61	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	
Lane Grp Cap (vph)	41	374	318	112	448	380		1998	972		1363	
v/s Ratio Prot	0.02	c0.17		c0.04	c0.14							
v/s Ratio Perm			0.00			0.05		0.21	0.06		c0.57	
v/c Ratio	0.66	0.86	0.02	0.71	0.57	0.20		0.34	0.10		0.93	
Uniform Delay, d1	47.6	37.9	31.5	45.1	32.8	29.8		9.2	7.8		17.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	
Incremental Delay, d2	32.2	18.0	0.0	18.3	1.6	0.3		0.5	0.2		12.2	
Delay (s)	79.8	55.9	31.6	63.4	34.5	30.1		9.7	8.0		29.2	
Level of Service	E	E	C	E	C	C		A	A		C	
Approach Delay (s)		55.1			36.1			9.3			29.2	
Approach LOS		E			D			A			C	

Intersection Summary			
HCM Average Control Delay	28.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	98.2	Sum of lost time (s)	16.0
Intersection Capacity Utilization	82.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	130	213	156	69	138	66	134	787	28	31	823	253
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0			4.0	
Lane Util. Factor	1.00	1.00			1.00	1.00		0.95			0.95	
Frt	1.00	0.94			1.00	0.85		1.00			0.97	
Flt Protected	0.95	1.00			0.98	1.00		0.99			1.00	
Satd. Flow (prot)	1770	1745			1832	1583		3499			3413	
Flt Permitted	0.95	1.00			0.76	1.00		0.52			0.89	
Satd. Flow (perm)	1770	1745			1420	1583		1849			3052	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	141	232	170	75	150	72	146	855	30	34	895	275
RTOR Reduction (vph)	0	26	0	0	0	53	0	2	0	0	28	0
Lane Group Flow (vph)	141	376	0	0	225	19	0	1029	0	0	1177	0
Turn Type	Prot			Perm		Perm	Perm			Perm		
Protected Phases	5	2			6			8			4	
Permitted Phases				6		6	8			4		
Actuated Green, G (s)	11.2	42.0			26.8	26.8		50.0			50.0	
Effective Green, g (s)	11.2	42.0			26.8	26.8		50.0			50.0	
Actuated g/C Ratio	0.11	0.42			0.27	0.27		0.50			0.50	
Clearance Time (s)	4.0	4.0			4.0	4.0		4.0			4.0	
Vehicle Extension (s)	3.0	3.0			3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)	198	733			381	424		925			1526	
v/s Ratio Prot	c0.08	0.22										
v/s Ratio Perm					c0.16	0.01		c0.56			0.39	
v/c Ratio	0.71	0.51			0.59	0.05		1.23dl			0.77	
Uniform Delay, d1	42.8	21.4			31.8	27.1		25.0			20.3	
Progression Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Incremental Delay, d2	11.4	2.6			6.6	0.2		65.5			2.5	
Delay (s)	54.3	24.0			38.4	27.3		90.5			22.8	
Level of Service	D	C			D	C		F			C	
Approach Delay (s)		31.9			35.7			90.5			22.8	
Approach LOS		C			D			F			C	

Intersection Summary			
HCM Average Control Delay	48.3	HCM Level of Service	D
HCM Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	103.4%	ICU Level of Service	G
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.
c Critical Lane Group

FUTURE YEAR 2030 PROJECT BUILD (Option 2) CONDITIONS – PM PEAK HOUR

HCM Signalized Intersection Capacity Analysis
1: Howard Ave & El Camino Real

2030 Project OPT 2 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	24	109	22	126	159	236	17	1410	48	192	1455	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0	4.0		4.0			4.0	
Lane Util. Factor		1.00		1.00	1.00	1.00		0.95			0.95	
Frt		0.98		1.00	1.00	0.85		1.00			1.00	
Flt Protected		0.99		0.95	1.00	1.00		1.00			0.99	
Satd. Flow (prot)		1813		1770	1863	1583		3520			3512	
Flt Permitted		0.93		0.95	1.00	1.00		0.90			0.49	
Satd. Flow (perm)		1695		1770	1863	1583		3181			1718	
Peak-hour factor, PHF	0.92	0.92	0.92	0.95	0.95	0.95	0.82	0.82	0.82	0.89	0.89	0.89
Adj. Flow (vph)	26	118	24	133	167	248	21	1720	59	216	1635	26
RTOR Reduction (vph)	0	6	0	0	0	26	0	2	0	0	1	0
Lane Group Flow (vph)	0	162	0	133	167	222	0	1798	0	0	1876	0
Turn Type	Perm			Prot		Perm	Perm			Perm		
Protected Phases		8		7	4			6			2	
Permitted Phases	8					4	6			2		
Actuated Green, G (s)		13.4		5.0	22.4	22.4		67.1			67.1	
Effective Green, g (s)		13.4		5.0	22.4	22.4		67.1			67.1	
Actuated g/C Ratio		0.14		0.05	0.23	0.23		0.69			0.69	
Clearance Time (s)		4.0		4.0	4.0	4.0		4.0			4.0	
Vehicle Extension (s)		3.0		3.0	3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)		233		91	428	364		2189			1182	
v/s Ratio Prot				c0.08	0.09							
v/s Ratio Perm		0.10				c0.14		0.57			c1.09	
v/c Ratio		0.70		1.46	0.39	0.61		0.82			2.35dl	
Uniform Delay, d1		40.1		46.2	31.8	33.6		10.9			15.2	
Progression Factor		1.00		1.00	1.00	1.00		1.00			1.00	
Incremental Delay, d2		8.7		258.1	0.6	2.9		2.6			268.3	
Delay (s)		48.8		304.3	32.4	36.5		13.5			283.5	
Level of Service		D		F	C	D		B			F	
Approach Delay (s)		48.8			100.3			13.5			283.5	
Approach LOS		D			F			B			F	

Intersection Summary			
HCM Average Control Delay	141.0	HCM Level of Service	F
HCM Volume to Capacity ratio	1.38		
Actuated Cycle Length (s)	97.5	Sum of lost time (s)	8.0
Intersection Capacity Utilization	117.6%	ICU Level of Service	H
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
2: Park Rd & Burlingame Ave

2030 Project OPT 2 PM

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	112	99	199	114	79	243
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.86	0.86	0.92	0.92	0.77	0.77
Hourly flow rate (vph)	130	115	216	124	103	316
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	799	278			340	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	799	278			340	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	60	85			92	
cM capacity (veh/h)	325	761			1219	

Direction, Lane #	NW 1	NE 1	SW 1
Volume Total	245	340	418
Volume Left	130	0	103
Volume Right	115	124	0
cSH	444	1700	1219
Volume to Capacity	0.55	0.20	0.08
Queue Length 95th (ft)	82	0	7
Control Delay (s)	22.7	0.0	2.7
Lane LOS	C		A
Approach Delay (s)	22.7	0.0	2.7
Approach LOS	C		

Intersection Summary			
Average Delay	6.6		
Intersection Capacity Utilization	56.9%	ICU Level of Service	B
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
3: Primrose Rd & Chapin Ln

2030 Project OPT 2 PM

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Volume (veh/h)	242	121	130	182	130	253
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.83	0.83	0.88	0.88	0.84	0.84
Hourly flow rate (vph)	292	146	148	207	155	301
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			437		867	364
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			437		867	364
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			87		45	56
cM capacity (veh/h)			1122		281	681

Direction, Lane #	SE 1	NW 1	NE 1	NE 2
Volume Total	437	355	155	301
Volume Left	0	148	155	0
Volume Right	146	0	0	301
cSH	1700	1122	281	681
Volume to Capacity	0.26	0.13	0.55	0.44
Queue Length 95th (ft)	0	11	77	57
Control Delay (s)	0.0	4.4	32.5	14.4
Lane LOS		A	D	B
Approach Delay (s)	0.0	4.4	20.6	
Approach LOS			C	

Intersection Summary			
Average Delay	8.8		
Intersection Capacity Utilization	54.1%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
4: Primrose Rd & Bellevue Ave

2030 Project OPT 2 PM

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	30	168	43	19	208	100	36	38	49	141	32	26
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	33	183	47	21	226	109	39	41	53	153	35	28
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	335			229			639	647	206	667	616	280
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	335			229			639	647	206	667	616	280
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			98			88	89	94	50	91	96
cM capacity (veh/h)	1225			1339			338	373	835	309	389	758

Direction, Lane #	SE 1	NW 1	NE 1	SW 1
Volume Total	262	355	134	216
Volume Left	33	21	39	153
Volume Right	47	109	53	28
cSH	1225	1339	461	348
Volume to Capacity	0.03	0.02	0.29	0.62
Queue Length 95th (ft)	2	1	30	99
Control Delay (s)	1.2	0.6	16.0	31.0
Lane LOS	A	A	C	D
Approach Delay (s)	1.2	0.6	16.0	31.0
Approach LOS			C	D

Intersection Summary			
Average Delay	9.7		
Intersection Capacity Utilization	46.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Volume (veh/h)	6	172	92	178	69	7
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	187	100	193	75	8
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	293				397	197
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	293				397	197
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				88	99
cM capacity (veh/h)	1268				605	844

Direction, Lane #	SE 1	NW 1	SW 1
Volume Total	193	293	83
Volume Left	7	0	75
Volume Right	0	193	8
cSH	1268	1700	622
Volume to Capacity	0.01	0.17	0.13
Queue Length 95th (ft)	0	0	11
Control Delay (s)	0.3	0.0	11.7
Lane LOS	A		B
Approach Delay (s)	0.3	0.0	11.7
Approach LOS			B

Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	26.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	93	196	144	997	1044	180
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.97	0.97	0.95	0.95	0.89	0.89
Hourly flow rate (vph)	96	202	152	1049	1173	202
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2001	587	1375			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2001	587	1375			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	55	69			
cM capacity (veh/h)	36	453	495			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	96	202	152	525	525	587	587	202
Volume Left	96	0	152	0	0	0	0	0
Volume Right	0	202	0	0	0	0	0	202
cSH	36	453	495	1700	1700	1700	1700	1700
Volume to Capacity	2.66	0.45	0.31	0.31	0.31	0.35	0.35	0.12
Queue Length 95th (ft)	270	56	32	0	0	0	0	0
Control Delay (s)	985.5	19.2	15.5	0.0	0.0	0.0	0.0	0.0
Lane LOS	F	C	C					
Approach Delay (s)	330.1		2.0			0.0		
Approach LOS	F							

Intersection Summary			
Average Delay	35.0		
Intersection Capacity Utilization	52.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	WBR2	NBT	NBR	NBR2	SBL	SBT	SWL2	SWL	SWR
Lane Configurations											
Volume (vph)	145	0	150	1423	0	396	209	1288	166	0	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0		4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00			1.00		1.00	1.00	1.00		1.00	1.00
Frt	0.93			1.00		0.85	1.00	1.00		1.00	0.85
Flt Protected	0.98			1.00		1.00	0.95	1.00		0.95	1.00
Satd. Flow (prot)	1693			1863		1583	1770	1863		1770	1583
Flt Permitted	0.98			1.00		1.00	0.05	1.00		0.95	1.00
Satd. Flow (perm)	1693			1863		1583	97	1863		1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	158	0	163	1547	0	430	227	1400	180	0	35
RTOR Reduction (vph)	37	0	0	0	0	60	0	0	0	0	8
Lane Group Flow (vph)	284	0	0	1547	0	370	227	1400	0	180	27
Turn Type						Perm	Perm		Prot		Perm
Protected Phases	8!			2!				6!	4!	6!	
Permitted Phases						2	6!				6
Actuated Green, G (s)	16.0			76.7		76.7	76.7	76.7		92.7	76.7
Effective Green, g (s)	16.0			76.7		76.7	76.7	76.7		92.7	76.7
Actuated g/C Ratio	0.16			0.76		0.76	0.76	0.76		0.92	0.76
Clearance Time (s)	4.0			4.0		4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0			3.0		3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	269			1419		1206	74	1419		1770	1206
v/s Ratio Prot	c0.17			0.83				0.75		0.02	
v/s Ratio Perm						0.23	c2.34			0.09	0.02
v/c Ratio	1.06			1.09		0.31	3.07	0.99		0.10	0.02
Uniform Delay, d1	42.4			12.0		3.7	12.0	11.5		0.4	2.9
Progression Factor	1.00			1.00		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	70.3			52.5		0.7	965.2	20.9		0.0	0.0
Delay (s)	112.6			64.5		4.4	977.2	32.4		0.4	2.9
Level of Service	F			E		A	F	C		A	A
Approach Delay (s)	112.6			51.4				164.2		0.8	
Approach LOS	F			D				F		A	

Intersection Summary			
HCM Average Control Delay	97.9	HCM Level of Service	F
HCM Volume to Capacity ratio	2.72		
Actuated Cycle Length (s)	100.7	Sum of lost time (s)	8.0
Intersection Capacity Utilization	126.2%	ICU Level of Service	H
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	24	296	36	73	234	264	13	604	150	303	865	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00		0.95	1.00		0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85		0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		1.00	1.00		0.99	
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583		3536	1583		3477	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.92	1.00		0.63	
Satd. Flow (perm)	1770	1863	1583	1770	1863	1583		3246	1583		2219	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	26	322	39	79	254	287	14	657	163	329	940	45
RTOR Reduction (vph)	0	0	31	0	0	209	0	0	63	0	2	0
Lane Group Flow (vph)	26	322	8	79	254	78	0	671	100	0	1312	0
Turn Type	Prot		Perm	Prot		Perm	Perm		Perm	Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases			4			8	2		2	6		
Actuated Green, G (s)	2.3	19.7	19.7	6.2	23.6	23.6		60.3	60.3		60.3	
Effective Green, g (s)	2.3	19.7	19.7	6.2	23.6	23.6		60.3	60.3		60.3	
Actuated g/C Ratio	0.02	0.20	0.20	0.06	0.24	0.24		0.61	0.61		0.61	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	
Lane Grp Cap (vph)	41	374	318	112	448	380		1993	972		1363	
v/s Ratio Prot	0.01	c0.17		c0.04	c0.14							
v/s Ratio Perm			0.00			0.05		0.21	0.06		c0.59	
v/c Ratio	0.63	0.86	0.02	0.71	0.57	0.21		0.34	0.10		0.96	
Uniform Delay, d1	47.5	37.9	31.5	45.1	32.8	29.8		9.2	7.8		17.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	
Incremental Delay, d2	27.9	18.0	0.0	18.3	1.6	0.3		0.5	0.2		16.9	
Delay (s)	75.4	55.9	31.6	63.4	34.5	30.1		9.7	8.0		34.8	
Level of Service	E	E	C	E	C	C		A	A		C	
Approach Delay (s)		54.8			36.1			9.4			34.8	
Approach LOS		D			D			A			C	

Intersection Summary			
HCM Average Control Delay	30.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	98.2	Sum of lost time (s)	16.0
Intersection Capacity Utilization	84.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	123	190	122	76	138	66	138	806	23	33	890	255
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0			4.0	
Lane Util. Factor	1.00	1.00			1.00	1.00		0.95			0.95	
Frt	1.00	0.94			1.00	0.85		1.00			0.97	
Flt Protected	0.95	1.00			0.98	1.00		0.99			1.00	
Satd. Flow (prot)	1770	1753			1830	1583		3502			3420	
Flt Permitted	0.95	1.00			0.77	1.00		0.51			0.88	
Satd. Flow (perm)	1770	1753			1429	1583		1790			3007	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	134	207	133	83	150	72	150	876	25	36	967	277
RTOR Reduction (vph)	0	23	0	0	0	53	0	2	0	0	25	0
Lane Group Flow (vph)	134	317	0	0	233	19	0	1050	0	0	1255	0
Turn Type	Prot			Perm		Perm	Perm			Perm		
Protected Phases	5	2			6			8			4	
Permitted Phases				6		6	8			4		
Actuated Green, G (s)	11.0	42.0			27.0	27.0		50.0			50.0	
Effective Green, g (s)	11.0	42.0			27.0	27.0		50.0			50.0	
Actuated g/C Ratio	0.11	0.42			0.27	0.27		0.50			0.50	
Clearance Time (s)	4.0	4.0			4.0	4.0		4.0			4.0	
Vehicle Extension (s)	3.0	3.0			3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)	195	736			386	427		895			1504	
v/s Ratio Prot	c0.08	0.18										
v/s Ratio Perm					c0.16	0.01		c0.59			0.42	
v/c Ratio	0.69	0.43			0.60	0.05		1.52dl			0.83	
Uniform Delay, d1	42.8	20.5			31.8	27.0		25.0			21.4	
Progression Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Incremental Delay, d2	9.6	1.8			6.8	0.2		89.5			4.2	
Delay (s)	52.5	22.4			38.7	27.2		114.5			25.6	
Level of Service	D	C			D	C		F			C	
Approach Delay (s)		30.9			36.0			114.5			25.6	
Approach LOS		C			D			F			C	

Intersection Summary			
HCM Average Control Delay	57.5	HCM Level of Service	E
HCM Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	103.0%	ICU Level of Service	G
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.
c Critical Lane Group

Appendix C

TRAFFIC MITIGATION OUTPUTS

FUTURE YEAR 2030 PROJECT BUILD (Option 1) CONDITIONS – PM PEAK HOUR

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	93	194	153	944	1010	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	1770	3539	3539	1583
Flt Permitted	0.95	1.00	0.21	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	400	3539	3539	1583
Peak-hour factor, PHF	0.97	0.97	0.95	0.95	0.89	0.89
Adj. Flow (vph)	96	200	161	994	1135	202
RTOR Reduction (vph)	0	121	0	0	0	72
Lane Group Flow (vph)	96	79	161	994	1135	130
Turn Type		Perm	Perm			Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6
Actuated Green, G (s)	8.7	8.7	30.1	30.1	30.1	30.1
Effective Green, g (s)	8.7	8.7	30.1	30.1	30.1	30.1
Actuated g/C Ratio	0.19	0.19	0.64	0.64	0.64	0.64
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	329	294	257	2276	2276	1018
v/s Ratio Prot	c0.05			0.28	0.32	
v/s Ratio Perm		0.05	c0.40			0.08
v/c Ratio	0.29	0.27	0.63	0.44	0.50	0.13
Uniform Delay, d1	16.4	16.3	5.0	4.1	4.4	3.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.5	0.5	4.7	0.1	0.2	0.1
Delay (s)	16.9	16.8	9.7	4.3	4.6	3.3
Level of Service	B	B	A	A	A	A
Approach Delay (s)	16.8			5.0	4.4	
Approach LOS	B			A	A	

Intersection Summary			
HCM Average Control Delay	6.0	HCM Level of Service	A
HCM Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	46.8	Sum of lost time (s)	8.0
Intersection Capacity Utilization	51.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

#6 California Drive / Lorton Avenue (YEAR 2030 PM OPTION 1)
Signal Warrant Analysis

Figure 4C-101 (CA). Traffic Signal Warrants Worksheet (Sheet 2 of 4)

WARRANT 2 - Four Hour Vehicular Volume — **SATISFIED* YES ☐ NO ☐**

Record hourly vehicular volumes for any four hours of an average day.

APPROACH LANES	One	2 or More	Hour			
Both Approaches - Major Street						
Higher Approach - Minor Street						

*All plotted points fall above the curves in Figure 4C-1. (URBAN AREAS)	Yes ☐	No ☐
OR, All plotted points fall above the curves in Figure 4C-2. (RURAL AREAS)	Yes ☐	No ☐

WARRANT 3 - Peak Hour
(Part A or Part B must be satisfied) — **SATISFIED YES ☒ NO ☐**

PART A — **SATISFIED YES ☐ NO ☒**

(All parts 1, 2, and 3 below must be satisfied for the same one hour, for any four consecutive 15-minute periods)

1. The total delay experienced for traffic on one minor street approach (one direction only) controlled by a STOP sign equals or exceeds four vehicle-hours for a one-lane approach, or five vehicle-hours for a two-lane approach; AND	Yes ☐	No ☒
2. The volume on the same minor street approach (one direction only) equals or exceeds 100 vph for one moving lane of traffic or 150 vph for two moving lanes; AND	Yes ☒	No ☐
3. The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with four or more approaches or 650 vph for intersections with three approaches.	Yes ☒	No ☐

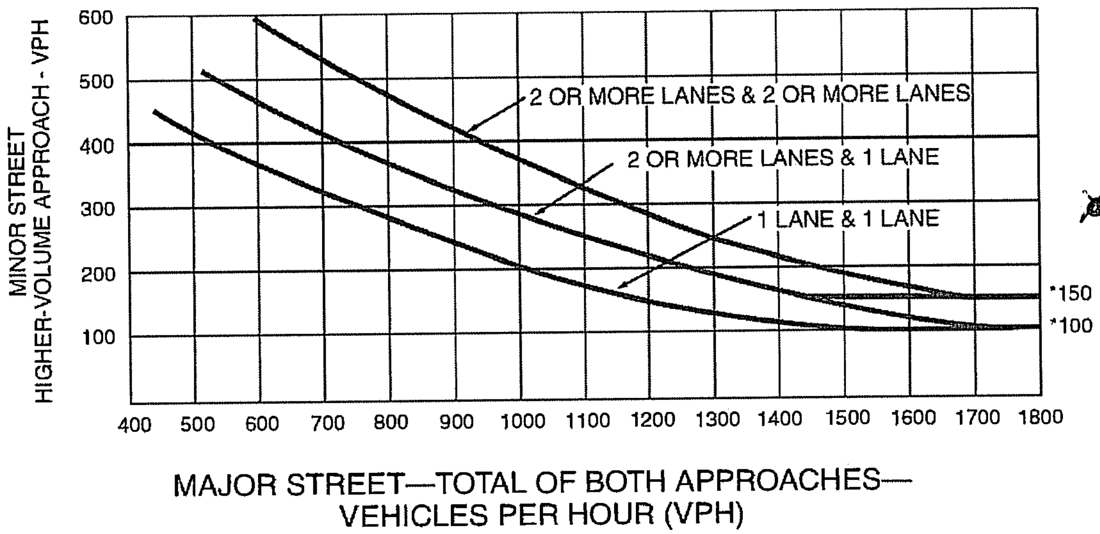
PART B — **SATISFIED YES ☒ NO ☐**

APPROACH LANES	One	2 or More	Hour
Both Approaches - Major Street		X	2287
Higher Approach - Minor Street		X	287

The plotted point falls above the curve in Figure 4C-3.	Yes ☒	No ☐
OR, The plotted point falls above the curve in Figure 4C-4.	Yes ☐	No ☐

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

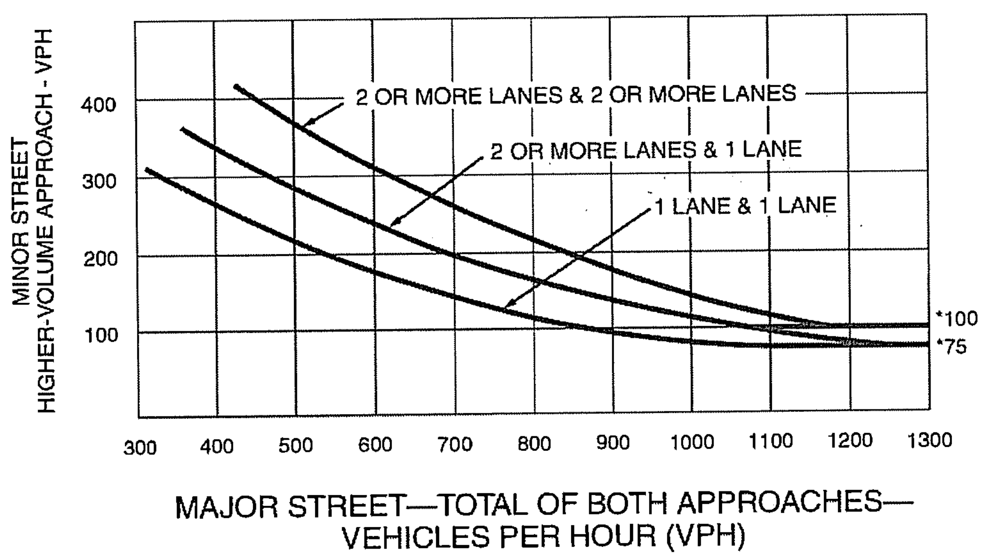
Figure 4C-3. Warrant 3, Peak Hour



*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE ~~70~~ 64 km/h OR ABOVE 40 mph ON MAJOR STREET)



*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

FUTURE YEAR 2030 PROJECT BUILD (Option 2) CONDITIONS – PM PEAK HOUR

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	93	196	144	997	1044	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	1770	3539	3539	1583
Flt Permitted	0.95	1.00	0.20	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	380	3539	3539	1583
Peak-hour factor, PHF	0.97	0.97	0.95	0.95	0.89	0.89
Adj. Flow (vph)	96	202	152	1049	1173	202
RTOR Reduction (vph)	0	117	0	0	0	72
Lane Group Flow (vph)	96	85	152	1049	1173	130
Turn Type		Perm	Perm			Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6
Actuated Green, G (s)	8.6	8.6	30.1	30.1	30.1	30.1
Effective Green, g (s)	8.6	8.6	30.1	30.1	30.1	30.1
Actuated g/C Ratio	0.18	0.18	0.64	0.64	0.64	0.64
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	326	292	245	2281	2281	1020
v/s Ratio Prot	c0.05			0.30	0.33	
v/s Ratio Perm		0.05	c0.40			0.08
v/c Ratio	0.29	0.29	0.62	0.46	0.51	0.13
Uniform Delay, d1	16.4	16.4	4.9	4.2	4.4	3.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.5	0.6	4.8	0.1	0.2	0.1
Delay (s)	16.9	17.0	9.7	4.3	4.6	3.3
Level of Service	B	B	A	A	A	A
Approach Delay (s)	17.0			5.0	4.4	
Approach LOS	B			A	A	

Intersection Summary			
HCM Average Control Delay	6.0	HCM Level of Service	A
HCM Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	46.7	Sum of lost time (s)	8.0
Intersection Capacity Utilization	52.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

#6 California Drive / Larton Avenue (YEAR 2030 PM OPTION 2)
Signal Warrant Analysis

Figure 4C-101 (CA). Traffic Signal Warrants Worksheet (Sheet 2 of 4)

WARRANT 2 - Four Hour Vehicular Volume

SATISFIED* YES ☐ NO ☐

Record hourly vehicular volumes for any four hours of an average day.

APPROACH LANES	One	2 or More	Hour	Hour	Hour	Hour
Both Approaches - Major Street						
Higher Approach - Minor Street						

*All plotted points fall above the curves in Figure 4C-1. (URBAN AREAS)	Yes ☐ No ☐
OR, All plotted points fall above the curves in Figure 4C-2. (RURAL AREAS)	Yes ☐ No ☐

WARRANT 3 - Peak Hour
(Part A or Part B must be satisfied)

SATISFIED YES ☒ NO ☐

PART A

SATISFIED YES ☐ NO ☒

(All parts 1, 2, and 3 below must be satisfied for the same one hour, for any four consecutive 15-minute periods)

1. The total delay experienced for traffic on one minor street approach (one direction only) controlled by a STOP sign equals or exceeds four vehicle-hours for a one-lane approach, or five vehicle-hours for a two-lane approach; AND	Yes ☐ No ☒
2. The volume on the same minor street approach (one direction only) equals or exceeds 100 vph for one moving lane of traffic or 150 vph for two moving lanes; AND	Yes ☒ No ☐
3. The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with four or more approaches or 650 vph for intersections with three approaches.	Yes ☒ No ☐

PART B

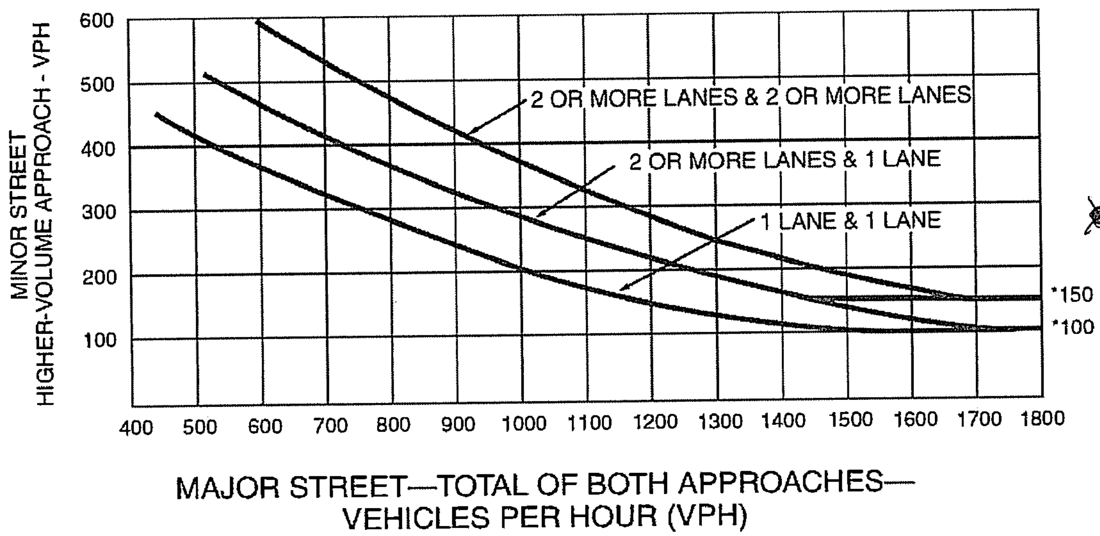
SATISFIED YES ☒ NO ☐

APPROACH LANES	One	2 or More	PM Hour
Both Approaches - Major Street		X	2365
Higher Approach - Minor Street		X	289

The plotted point falls above the curve in Figure 4C-3.	Yes ☒ No ☐
OR, The plotted point falls above the curve in Figure 4C-4.	Yes ☐ No ☐

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

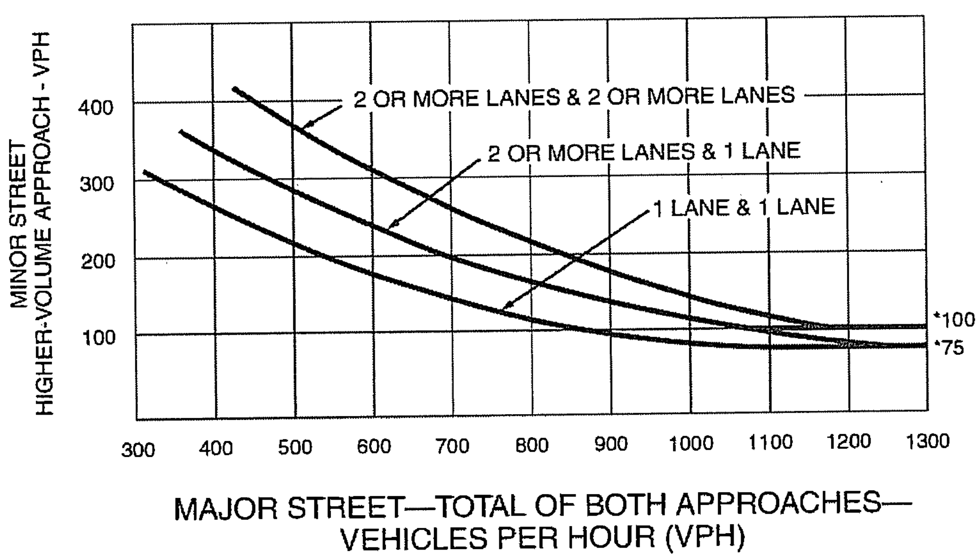
Figure 4C-3. Warrant 3, Peak Hour



*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE ~~70~~ 64 km/h OR ABOVE 40 mph ON MAJOR STREET)



*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

Movement	WBL	WBR	WBR2	NBT	NBR	NBR2	SBL	SBT	SWL2	SWL	SWR
Lane Configurations											
Volume (vph)	145	0	150	1423	0	396	209	1288	166	0	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0		4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00			1.00		1.00	1.00	1.00		1.00	1.00
Frt	0.93			1.00		0.85	1.00	1.00		1.00	0.85
Flt Protected	0.98			1.00		1.00	0.95	1.00		0.95	1.00
Satd. Flow (prot)	1693			1863		1583	1770	1863		1770	1583
Flt Permitted	0.98			1.00		1.00	0.06	1.00		0.95	1.00
Satd. Flow (perm)	1693			1863		1583	112	1863		1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	158	0	163	1547	0	430	227	1400	180	0	35
RTOR Reduction (vph)	39	0	0	0	0	96	0	0	0	0	10
Lane Group Flow (vph)	282	0	0	1547	0	334	227	1400	0	180	25
Turn Type						Perm	Perm		Prot		Perm
Protected Phases	8!			2!				6!	4!	6!	
Permitted Phases						2	6!				6
Actuated Green, G (s)	20.0			66.8		66.8	66.8	66.8		86.8	66.8
Effective Green, g (s)	20.0			66.8		66.8	66.8	66.8		86.8	66.8
Actuated g/C Ratio	0.21			0.70		0.70	0.70	0.70		0.92	0.70
Clearance Time (s)	4.0			4.0		4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0			3.0		3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	357			1313		1115	79	1313		1770	1115
v/s Ratio Prot	c0.17			0.83				0.75		0.02	
v/s Ratio Perm						0.21	c2.04			0.08	0.02
v/c Ratio	0.79			1.18		0.30	2.87	1.07		0.10	0.02
Uniform Delay, d1	35.4			14.0		5.2	14.0	14.0		0.4	4.2
Progression Factor	1.00			1.00		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	11.0			88.4		0.7	876.6	44.6		0.0	0.0
Delay (s)	46.4			102.4		5.9	890.6	58.6		0.4	4.2
Level of Service	D			F		A	F	E		A	A
Approach Delay (s)	46.4			81.4				174.7		1.0	
Approach LOS	D			F				F		A	

Intersection Summary			
HCM Average Control Delay	111.2	HCM Level of Service	F
HCM Volume to Capacity ratio	2.40		
Actuated Cycle Length (s)	94.8	Sum of lost time (s)	8.0
Intersection Capacity Utilization	126.2%	ICU Level of Service	H
Analysis Period (min)	15		
! Phase conflict between lane groups.			
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	123	190	122	76	138	66	138	806	23	33	890	255
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0			4.0	
Lane Util. Factor	1.00	1.00			1.00	1.00		0.95			0.95	
Frt	1.00	0.94			1.00	0.85		1.00			0.97	
Flt Protected	0.95	1.00			0.98	1.00		0.99			1.00	
Satd. Flow (prot)	1770	1753			1830	1583		3502			3420	
Flt Permitted	0.95	1.00			0.76	1.00		0.53			0.89	
Satd. Flow (perm)	1770	1753			1413	1583		1854			3052	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	134	207	133	83	150	72	150	876	25	36	967	277
RTOR Reduction (vph)	0	23	0	0	0	56	0	2	0	0	25	0
Lane Group Flow (vph)	134	317	0	0	233	16	0	1049	0	0	1255	0
Turn Type	Prot			Perm		Perm	Perm			Perm		
Protected Phases	5	2			6			8			4	
Permitted Phases				6		6	8			4		
Actuated Green, G (s)	11.0	37.0			22.0	22.0		55.0			55.0	
Effective Green, g (s)	11.0	37.0			22.0	22.0		55.0			55.0	
Actuated g/C Ratio	0.11	0.37			0.22	0.22		0.55			0.55	
Clearance Time (s)	4.0	4.0			4.0	4.0		4.0			4.0	
Vehicle Extension (s)	3.0	3.0			3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)	195	649			311	348		1020			1679	
v/s Ratio Prot	c0.08	0.18										
v/s Ratio Perm					c0.16	0.01		c0.57			0.41	
v/c Ratio	0.69	0.49			0.75	0.05		1.15dl			0.75	
Uniform Delay, d1	42.8	24.2			36.4	30.7		22.5			17.2	
Progression Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Incremental Delay, d2	9.6	2.6			15.2	0.2		35.7			1.9	
Delay (s)	52.5	26.8			51.7	31.0		58.2			19.1	
Level of Service	D	C			D	C		E			B	
Approach Delay (s)		34.1			46.8			58.2			19.1	
Approach LOS		C			D			E			B	

Intersection Summary			
HCM Average Control Delay	37.3	HCM Level of Service	D
HCM Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	103.0%	ICU Level of Service	G
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

c Critical Lane Group

Appendix D

Traffic Impact Analysis Memorandum

ENGINEERS
PLANNERS
ECONOMISTS
Wilbur Smith Associates

DRAFT

March 27, 2009

To: Kevin Gardiner
Kevin Gardiner & Associates
2809 Market Street
San Francisco, California 94114

From: Terri O'Connor, AICP;
Peter Costa

Subject: **Burlingame Downtown Specific Plan: Traffic Impact Analysis Technical Memorandum**

This memorandum comprises a three-part evaluation of transportation for the prospective development in downtown Burlingame, California. The first part includes a trip generation analysis for the project. Evening peak hour trips related to the project are discussed within this section. Following the trip generation analysis, a complete traffic impact analysis is presented, which considers the potential traffic impacts associated with the proposed project under existing and future conditions. The last portion of the memorandum includes mitigation measures specific to the project area. The objective of this analysis is to document how the planned developments in downtown Burlingame would impact the traffic conditions within the surrounding environs.

Project Overview

The Burlingame Downtown Specific Plan incorporates several area-wide projects, such as new development in key areas located in the downtown region. According to the *Burlingame Downtown Specific Plan Development Program Summary* (November 2008), designated "focus areas" will be modified from current develop standards in order to enhance design standards and maximize development capacity. These improvements include planning mixed-use development according to modified zoning regulations, creating additional open space, and improving streetscapes. Several blocks in the downtown area have been selected for these improvements. According to the Specific Plan, an additional 183,843 gross square feet (GSF) of retail use, 248,702 GSF of office use, and a range of 875 to 1,232 residential units have been planned throughout these "focus areas". In addition, a 120-bed hotel has also been considered, as a part of the allocated office space.[1] Table 1 summarizes the potential development capacity for the focus areas.[2]

Table 1: Development Capacity

	Retail Use	Office Use	Residential Use	Hotel Use (optional)
Total Development	183,843 GSF	248,702 GSF	875 – 1,232 units	120 beds

Source: Burlingame Downtown Specific Plan Development Summary (November 3, 2008).

As stated, the increased traffic demand associated with the prospective development and potential traffic impacts are evaluated. For purposes of this study, nine intersections throughout the downtown area were examined. The following section includes a traffic impact analysis of each study intersection under existing and future (project build) conditions. Figure 1 illustrates the study area, "focus area" locations, and study intersections.

[1] The hotel use is estimated to be 100,000 GSF of development, therefore reducing the total GSF of office development from 248,702 GSF to 148,702 GSF dedicated for office use.

[2] Refer to Appendix A for complete list of proposed developments, and size of each proposed development per block within each "focus area".

Traffic Impact Analysis

A traffic impact analysis (TIA) focuses on how project-related vehicle trips influence the existing and future transportation network near the project site. This study includes an in depth analysis of the existing study area and evaluates traffic impacts during typical weekday evening hours. The study also includes a sensitivity analysis, in which each key intersection and associated traffic volumes are observed under various conditions (existing, future no project, and future plus project scenarios). Traffic counts, turning movement data, vehicle delay, and a level of service (LOS) evaluation for each intersection is included in the study.

Street Network

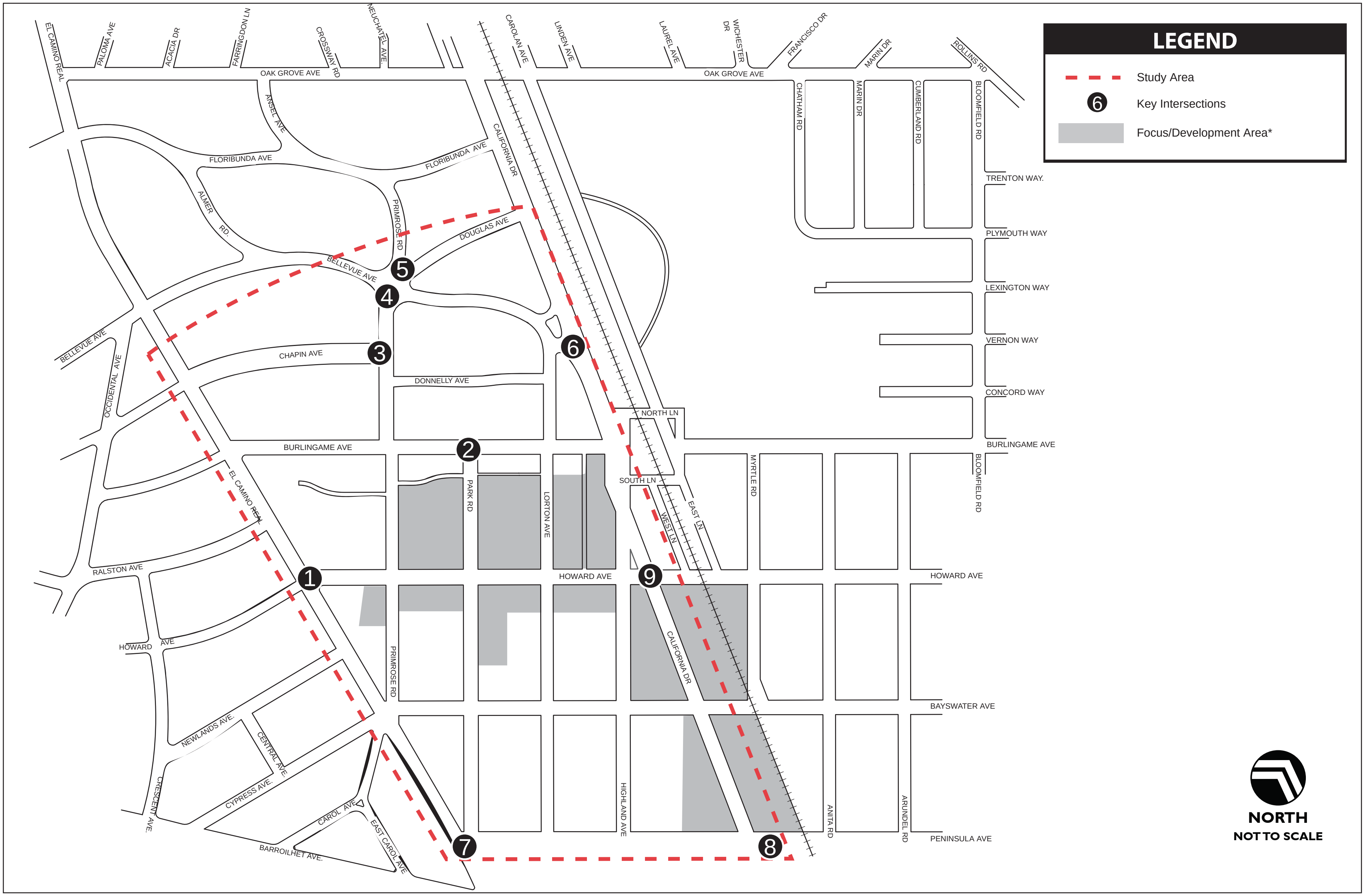
The initial study area is bounded by Burlingame Avenue (to the north), Peninsula Avenue (to the south), El Camino Real (to the west), and California Avenue (to the east). Regional access to the study area is provided via Highway 101 freeway. The closest interchanges with the freeway are located at Peninsula Avenue (southern edge of the study area) and at Broadway (north of the study area). The Peninsula interchange provides access in the northbound direction only, while the Broadway interchange provides access for both northbound and southbound traffic. A system of major arterials accommodates the longer distance local trips and connects Burlingame with adjacent communities. These include El Camino Real (State Highway 82) and California Drive providing north-south access. Other major arterials include Peninsula Avenue and Oak Grove Avenue. These arterials carry the major volume of east-west trips and connect with state highways and freeways. The other elements of the street system are secondary arterials, such as Howard Avenue, that connect collector and local access streets to the major arterials. Collector streets feed traffic to the arterials and major centers of activity in Burlingame. As such, Primrose Road, Burlingame Avenue, Chapin Avenue, Lorton Avenue, and Park Road are classified as collector streets in the downtown area.

Intersection Operating Conditions

Nine intersections near the project site were evaluated and observed for this analysis.[3] Due to the location and size of the project area, the traffic generated by the project will primarily affect the intersections listed below:

- #1 – El Camino Real/Howard Avenue
- #2 – Burlingame Avenue/Park Road
- #3 – Primrose Road/Chapin Avenue
- #4 – Primrose Road/Bellevue Avenue
- #5 – Primrose Road/Douglas Avenue
- #6 – California Drive/Lorton Avenue
- #7 – El Camino Real/Peninsula Avenue/Park Road
- #8 – California Drive/Peninsula Avenue
- #9 – California Drive/Howard Avenue/Highland Avenue

[3] The Primrose Road/Bellevue Avenue/Douglas Avenue intersection was analyzed as two separate intersections, due to the lane configuration and turning movement operations.



* Focused development area provided by Burlingame Downtown Specific Plan (November 2008)

WilburSmith ASSOCIATES

STUDY AREA AND KEY INTERSECTIONS
FIGURE 1

Methodology for Intersection Analysis

Operation of the study intersections was evaluated using Level of Service (LOS) calculations. LOS is a qualitative description of the performance of an intersection based on the average delay per vehicle. Intersection levels of service range from LOS A, which indicates free flow or excellent conditions with short delays, to LOS F, which indicates congested or overloaded conditions with extremely long delays.

Signalized Intersections

Levels of Service for signalized intersections were calculated using the *Highway Capacity Manual 2000* (HCM 2000) methodology. The LOS is based on the average delay (in seconds per vehicle) for the various movements within the intersection. A combined weighted average delay and LOS are presented for each of the signalized intersections. The average delay for signalized intersections was calculated using the *Synchro* analysis software and is correlated to the level of service designation as shown in Table 2.

Table 2
Level of Service Criteria – Signalized Intersections

Level of Service	Description of Operations	Average Delay
A	Operations with very low delay occurring with favorable progression and/or short cycle length.	≤ 10.0
B	Operations with low delay occurring with good progression and/or short cycle lengths.	10.1 – 20.0
C	Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.	20.1 – 35.0
D	Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, or high V/C ratios. Many vehicles stop and individual cycle failures are noticeable.	35.1 – 55.0
E	Operations with high delay values indicating poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences. This is considered to be the limit of acceptable delay.	55.1 – 80.0
F	Operation with delays unacceptable to most drivers occurring due to over saturation, poor progression, or very long cycle lengths.	≥ 80.1

Source: Highway Capacity Manual, Transportation Research Board, 2000
NOTES:
Delay presented in seconds per vehicle.

Unsignalized Intersections

Unsignalized intersections were evaluated using the *Highway Capacity Manual 2000* methodology. The LOS rating is based on the weighted average control delay expressed in seconds per vehicle as illustrated in Table 3. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration. At two-way controlled intersections, LOS is calculated for each controlled movement, as opposed to the intersection as a whole. For all-way stop controlled locations, LOS is computed for the intersection as a whole.

Table 3
Level of Service Criteria – Unsignalized Intersections

Level of Service	Description of Operations	Average Delay
A	No Delay for stop-controlled approaches.	≤ 10.0
B	Operations with minor delays.	10.1 – 15.0
C	Operations with moderate delays.	15.1 – 25.0
D	Operations with some delays.	25.1 – 35.0
E	Operations with high delays, and long queues.	35.1 – 50.0
F	Operations with extreme congestion, with very high delays and long queues unacceptable to most drivers.	≥ 50.1

Source: Highway Capacity Manual, Transportation Research Board, 2000
NOTES:
Delay presented in seconds per vehicle.

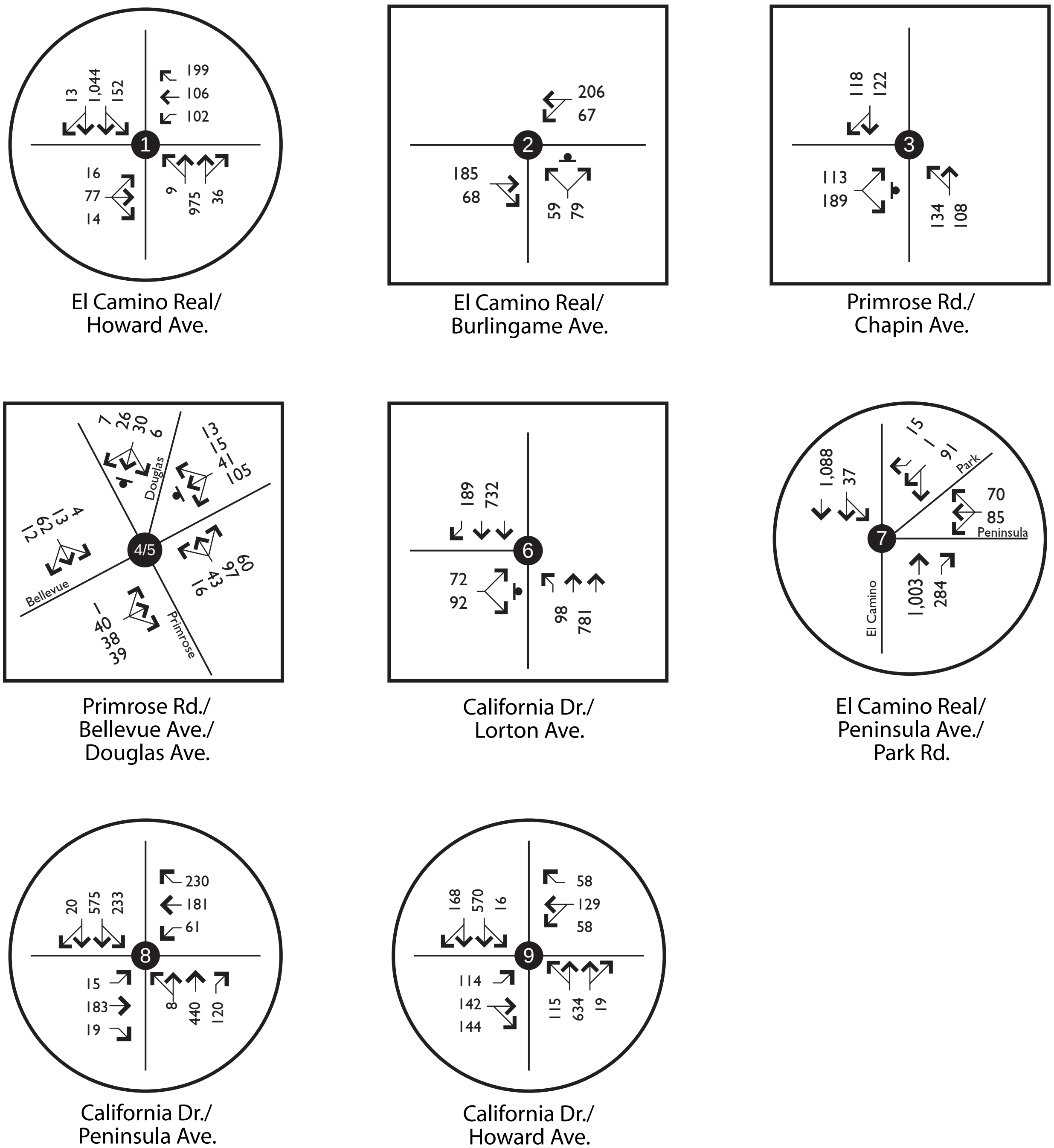
Existing Conditions Analysis

Existing intersection operating conditions were evaluated for the evening peak hour (4:00 PM to 6:00 PM) using *Synchro* software. Existing commute peak hour traffic volumes at six intersections were developed from intersection turning movement counts conducted by Wilbur Smith Associates (WSA) on Wednesday, July 25, 2007. Peak hour traffic volumes at three intersections (El Camino Real/Peninsula Avenue/Park Road; California Drive/Peninsula Avenue; and California Drive/Howard Avenue/Highland Avenue) were developed from intersection turning movement counts conducted by WSA on Wednesday, November 19, 2008. The traffic movements were counted and recorded by traffic surveyors in 15-minute intervals during the peak commute periods. These counts were then analyzed to determine the peak one-hour traffic volumes at each intersection.

As stated, the total of nine (9) intersections were analyzed under existing conditions of which four (4) are signalized, one (1) is a Two-Way Stop Controlled intersection (TWSC), and four (4) are Side-Street Stop-Controlled (SSSC) intersections.

A field visit was conducted to collect the existing intersection lane configurations, and intersection control devices. Figure 2 shows the existing geometric configurations and the PM peak hour turning movement volumes at the nine (9) study intersections under existing conditions.

The existing lane configurations and peak hour turning movement volumes were used to calculate the levels of service for the nine (9) study intersections under existing peak hour conditions. The results of the existing LOS analysis are presented in Table 4, and the LOS calculation worksheets are included in Appendix B.



LANE CONFIGURATIONS AND EXISTING PM PEAK HOUR TURNING MOVEMENTS

FIGURE 2

Under existing PM peak hour conditions, eight (8) of the nine (9) study intersections operate acceptably at LOS B or LOS C. The California Drive/Lorton Avenue intersection operates at a LOS E with a delay of 49.8 seconds/vehicle. This is primarily because of delay (97.8 seconds/vehicle) for the eastbound Lorton Avenue left turning movement, which is currently operating at LOS F conditions.

Table 4: Peak Hour Intersection Operations –Existing Conditions

#	Intersection	Control	PM Peak Hour		
			V/C Ratio	Delay	LOS
1	El Camino Real/Howard Avenue	Signal	0.91	25.2	C
2	Burlingame Avenue/Park Road	SSSC	0.29 (NB)	14.2 (NB)	B
3	Primrose Road/Chapin Avenue	SSSC	0.62 (EB)	14.1 (EB)	B
4	Primrose Road/Bellevue Avenue	TWSC	0.37 (WB)	16.1 (WB)	C
5	Primrose Road/Douglas Avenue	SSSC	0.10 (WB)	10.3 (WB)	B
6	California Drive/Lorton Avenue	SSSC	**0.71 (EB)**	**49.8 (EB)**	**E**
7	El Camino Real/Peninsula Avenue/Park Road	Signal	0.78	10.5	B
8	California Drive/Peninsula Avenue	Signal	0.64	21.8	C
9	California Drive/Howard Avenue	Signal	0.68	25.9	C

Notes:
SSSC – Side-Street Stop Controlled
TWSC – Two-Way Stop Controlled
Signal – Traffic Signal
Delay presented in seconds per vehicle.
Delay and LOS presented for worst approach for two-way and side-street stop controlled intersections.
Bold type indicates unacceptable values.

Source: Wilbur Smith Associates, January 2009

Year 2030 (Future) Conditions Analysis

Future Year 2030 intersection operating conditions were evaluated for the evening (PM) peak hour using *Synchro* software. In order to determine future peak hour traffic volumes, an average growth factor based on the City and County Association of Governments (C/CAG) travel demand model was applied to each study intersection. In addition, three future scenarios were evaluated.

Future Year 2030 No Project scenario includes future PM peak hour traffic conditions without the developments proposed in the Downtown Burlingame Specific Plan. The additional traffic associated with the planned projects does not apply to this scenario.

Future Year 2030 plus Project (Option 1) scenario includes future PM peak hour traffic and the additional traffic associated with the planned projects in downtown Burlingame, in accordance to the *Specific Plan*. The developments included in Option 1 are 183,843 GSF of retail use, 148,702 GSF of office use, a 120-bed hotel, and 875 residential units. As such, trip generation, trip distribution, and trip assignment procedures were applied to the scenario.

Future Year 2030 plus Project (Option 2) scenario includes future PM peak hour traffic and the additional traffic associated with the planned projects in downtown Burlingame, in accordance to the *Specific Plan*. The developments included in Option 2 are 183,843 GSF of retail use, 248,702 GSF of office use, and 1,232 residential units. As such, trip generation, trip distribution, and trip assignment procedures were applied to the scenario.

The following sections include the future volume development methodology, trip generation estimates based on each planned development per future scenario, trip distribution patterns, and trip assignment assumptions.

Volume Development - C/CAG Methodology

The Year 2030 peak hour volumes traffic volume forecasts was developed using the City/County Association of Governments (C/CAG) travel demand model. C/CAG travel demand model is one of the most common methods of forecasting future travel demand in a given area. The model is based on inputs such as projections of population, employment, observed travel behavior, and anticipated changes to the roadway network. The C/CAG model has Year 2005 as the base Year and the Year 2030 as the future forecast year and provided 4 hour AM and PM peak period traffic volumes. For purposes of this analysis, PM peak hour volumes were developed and the analysis does not include morning peak hour volumes.

The C/CAG travel demand model showed an average annual growth rate of 1.5 percent during the PM peak period conditions along the study area. The average annual growth rate was used to develop both the Year 2030 PM peak hour volumes at the study intersections. As such, the average annual growth rate obtained between the C/CAG Year 2005 and Year 2030 model runs during the PM peak period conditions were applied to the existing PM peak hour traffic counts to develop the Year 2030 PM peak hour traffic volumes.

Trip Generation Estimates

Trip generation analysis includes the evening (PM) peak hour trip generation rates and estimates the number of vehicle trips generated by the prospective developments in downtown Burlingame.

In order to determine trip rates for each planned project discussed in the *Specific Plan*, the *ITE Trip Generation Handbook*, 8th Edition (2008) was used. Given the description of the each planned project, several ITE land use codes were applied.

According to the *Specific Plan*, the planned mixed-use developments will include retail, office, hotel, and residential uses. For each planned development, general land use codes and PM peak hour trip generation rates were applied. For retail and office uses, the size of each retail and office development (in gross square feet) and trip generation rates determined the number of vehicle-trips associated with each use. For the proposed hotel, the total number of beds and the trip generation rate were used to determine the number of vehicle trips. Lastly, for the planned residential uses, the total number of residential units and the trip generation rate were calculated to determine the number of vehicle trips.[4] Since there are two build options under future conditions, trip generation rates will differ. Table 5 presents the estimated trips under the Future Year 2030 Project Build (Option 1) scenario and Table 6 presents the estimated trips under the Future Year 2030 Project Build (Option 2) scenario.[5]

Under Option 1, the planned developments are estimated to generate 1,452 trips during the PM peak hour. The majority of auto trips are associated with the planned retail uses (48 percent), and residential uses would generate 31 percent of the total trips. The office uses would generate 15 percent of the total trips and the proposed hotel would generate nearly 5 percent, respectively. Table 5 summarizes these findings.

Table 5: Trip Generation Estimate – Future Year 2030 Scenario (Option 1)

Planned Land Use	Development Capacity	Trip Estimate	% Trips
Retail	183,843 GSF	704	48%
Office	148,702 GSF	222	15%
Hotel	120 Beds	71	5%
Residential	875 Units	456	31%
Total		**1,452**	**100%**

Under Option 2, the planned developments are estimated to generate 1,715 trips during the PM peak hour. The majority of auto trips are associated with the planned retail uses (41 percent), and residential uses would generate 37 percent of the total trips; and the office uses would generate 22 percent of the total trip, respectively. Due to the intensification in retail and office use, and increase in residential units, the analysis estimated 263 more auto trips under Option 2, than under Option 1. Table 6 summarizes these findings.

Table 6: Trip Generation Estimate – Future Year 2030 Scenario (Option 2)

Planned Land Use	Development Capacity	Trip Estimate	% Trips
Retail	183,843 GSF	704	41%
Office	248,702 GSF	371	22%
Residential	1,232 Units	640	37%
Total		**1,715**	**100%**

[4] Land Use Code 876: Apparel Store was applied to "retail use"; Land Use Code 710: General Office was applied to "office use"; Land Use Code 310: Hotel was applied to "hotel use"; and Land Use Code 230: Condominium/Townhome was applied to "residential use". Source: ITE Trip Generation, 8th Edition (2008). Note: standard trip generation rates were applied; therefore the analysis represents a conservative trip estimate per land use category.

[5] Refer to Appendix A for detailed trip generation tables per scenario.

Trip Distribution

The directions of approach and departure for project trips were estimated based on existing travel patterns near the project area. Since travel patterns alter throughout a typical weekday, evening (PM) trip distribution percentages were applied.

Based on existing travel patterns throughout the study area, approximately 26 percent of traffic is distributed along California Drive (south of Burlingame Avenue) and 31 percent of traffic is distributed along the California Drive (north of Burlingame Avenue); 33 percent of traffic is distributed along El Camino Real and would be dispersed along collector roadways within the area. As such, 15 percent is distributed along Howard Avenue; 8 percent is distributed along Burlingame Avenue; 10 percent is distributed along Peninsula Avenue. Ten percent of project-traffic is distributed along Primrose Road. Figure 3 illustrates the PM peak hour trip distribution

According to *ITE Trip Generation, 8th Edition* (2008), each land use experiences an inbound and outbound trip distribution percentage. These inbound and outbound trips are distributed along each roadway (as previously defined) throughout the study area. Table 7 and Table 8 summarize the number of inbound and outbound trips per land use under each future scenario.

Table 7: Trip Distribution – Future Year 2030 Scenario (Option 1)

Planned Land Use	Trips	Trip Estimate	
		Inbound	Outbound
Retail	704	352	352
Office	222	38	184
Hotel	71	38	33
Residential	456	305	150
Total	**1,452**	**732 (51%)**	**720 (49%)**

Table 8: Trip Distribution – Future Year 2030 Scenario (Option 2)

Planned Land Use	Trips	Trip Estimate	
		Inbound	Outbound
Retail	704	352	352
Office	371	63	308
Residential	640	429	211
Total	**1,715**	**844 (49%)**	**871 (51%)**

Trip Assignment

Trips were assigned accordingly, with the majority of project trips entering and exiting the project area via California Drive from north of Burlingame Avenue and south of Peninsula Avenue. Due to the location and access points of the Proposed Project, it was assumed that patrons destined to the downtown area would exit from El Camino Real at the first opportunity and utilize the east-west collector roadways. As such, non-downtown bound traffic would likely bypass the Proposed Project and continue traveling along El Camino Real while the majority of project-related traffic would likely access the Proposed Project site via California Drive or exit along El Camino Real and access the project via Howard Avenue, Burlingame Avenue, and Bayswater Avenue. In addition, on-street parking supply and off-street parking facilities are primarily located along these downtown, local roadways and would attract patrons to exit El Camino Real to easily park and visit the downtown. Figure 4 illustrates the typical vehicular access to the project site.

PM PEAK TRIP DISTRIBUTION

FIGURE 3

WilburSmith ASSOCIATES

* *Focused development area provided by Burlingame Downtown Specific Plan (November 2008)*

TYPICAL VEHICALE ACCESS TO PROJECT AREA
FIGURE 4

Future Conditions – Intersection Operations

Year 2030 forecasted PM peak hour turning movement volumes were used to calculate the levels of service for the nine (9) study intersections under Future No Project and Future plus Project conditions. The results of the future LOS analysis are presented in Table 9 and Table 10. The calculation worksheets are included in Appendix B.

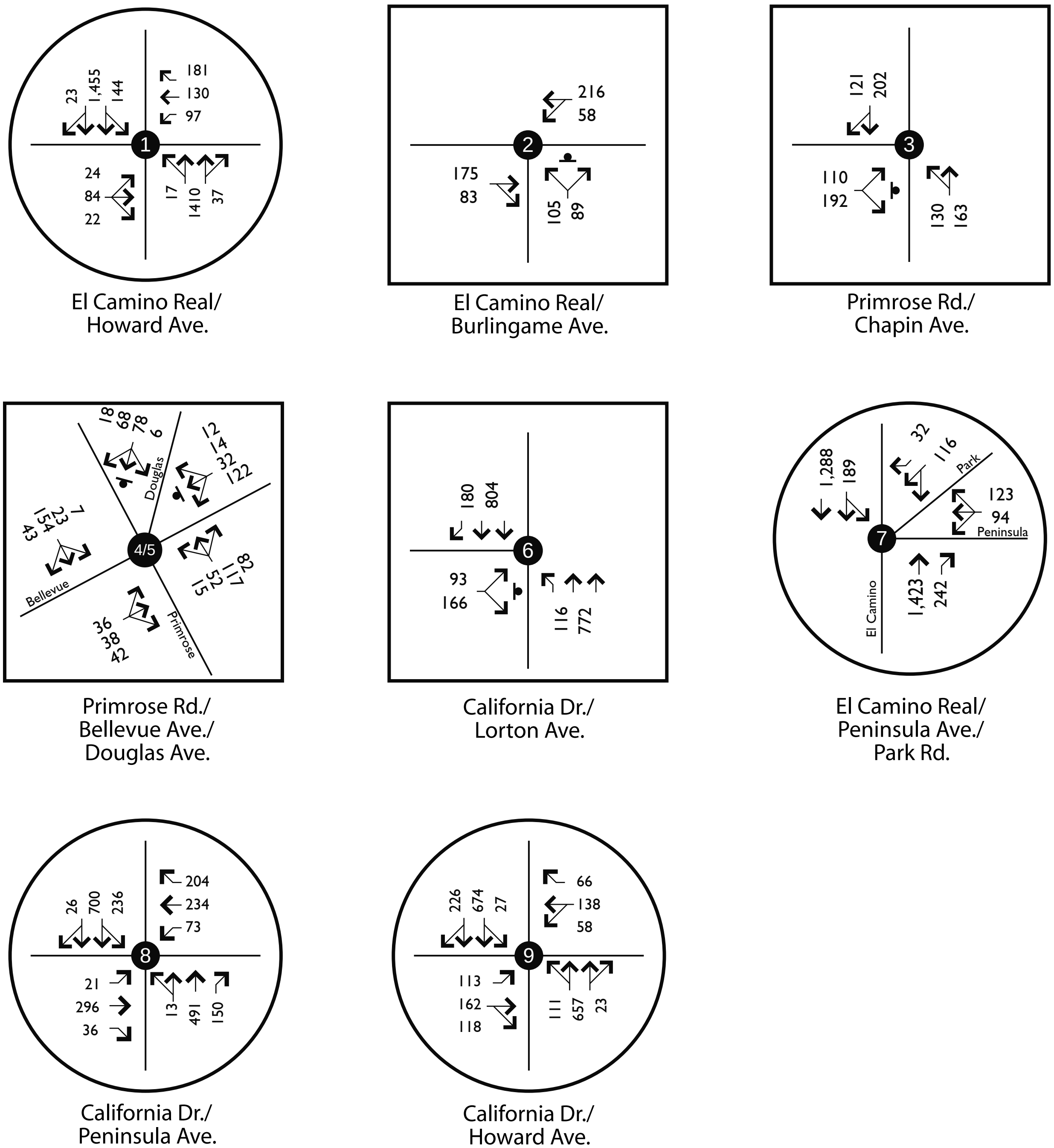
Under Year 2030 No Project PM peak hour conditions, six (6) of the nine (9) study intersections operate acceptably at LOS B or LOS C. The El Camino Real/Howard Avenue intersection would operate at LOS F with a delay of more than 80 seconds/vehicle. The El Camino Real southbound critical movement would experience a significant delay. The California Drive/Lorton Avenue intersection would operate at LOS F with a delay of more than 50 seconds/vehicle. This is primarily because of delay for the eastbound Lorton Avenue left turning movement, which would operate at LOS F conditions. The El Camino Real/Peninsula Avenue/Park Road intersection would operate at LOS F with a delay of more than 80 seconds/vehicle; primarily due to the El Camino Real southbound critical movement. Table 9 summarizes these results.

Table 9: Year 2030 No Project PM Peak Hour Intersection Operations

#	Intersection	Control	Year 2030 No Project PM Peak Hour Conditions		
			V/C Ratio	Delay	LOS
1	El Camino Real/Howard Avenue	Signal	**1.31**	**>80**	**F**
2	Burlingame Avenue/Park Road	SSSC	0.43 (NB)	17.2 (NB)	C
3	Primrose Road/Chapin Avenue	SSSC	0.42 (NB)	16.8 (NB)	C
4	Primrose Road/Bellevue Avenue	TWSC	0.48 (SB)	21.9 (SB)	C
5	Primrose Road/Douglas Avenue	SSSC	0.12 (SB)	11.2 (SB)	B
6	California Drive/Lorton Avenue	SSSC	**1.15 (EB)**	**>50 (EB)**	**F**
7	El Camino Real/Peninsula Avenue/Park Road	Signal	**2.46**	**>80**	**F**
8	California Drive/Peninsula Avenue	Signal	0.75	24.3	C
9	California Drive/Howard Avenue	Signal	0.72	28.1	C

Notes:
Source: Wilbur Smith Associates, January 2009
SSSC – Side-Street Stop Controlled
TWSC – Two-Way Stop Controlled
Signal – Traffic Signal
Delay presented in seconds per vehicle.
Delay and LOS presented for worst approach for two-way and side-street stop controlled intersections.
Bold type indicates unacceptable values.

Figure 5 on the following page illustrates the Year 2030 No Project turning movement volumes and geometries.



LANE CONFIGURATIONS AND
YEAR 2030 NO PROJECT PM PEAK HOUR TURNING MOVEMENTS
FIGURE 5

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ASSOCIATES

Year 2030 Project (Option 1) Conditions

Under PM peak hour conditions, six (6) of the nine (9) study intersections operate acceptably at LOS D or better.

The El Camino Real/Howard Avenue intersection would operate at LOS F with a delay of more than 80 seconds/vehicle. However, in comparison to Year 2030 No Project Conditions, there is no change in LOS and the volume-to-capacity ratio (V/C) increases by 3.8 percent. Therefore, the Proposed Project would not worsen the LOS at this intersection and a significant impact would not occur as a result of the Proposed Project.

The California Drive/Lorton Avenue intersection would operate at LOS F with a delay of more than 50 seconds/vehicle. This is primarily because of delay for the eastbound Lorton Avenue left turning movement, which would operate at LOS F conditions. In comparison to Year 2030 No Project Conditions, there is no change in LOS; however the V/C ratio increases nearly 67 percent (from 1.5 to 2.5), therefore a significant impact would occur as a result of the Proposed Project.

The El Camino Real/Peninsula Avenue/Park Road intersection would operate at LOS F with a delay of more than 80 seconds/vehicle; primarily due to the El Camino Real southbound critical movement. However, in comparison to Year 2030 No Project Conditions, there is no change in LOS and the volume-to-capacity ratio (V/C) increases by 4.8 percent. Therefore, the Proposed Project would not worsen the LOS at this intersection and a significant impact would not occur as a result of the Proposed Project. Table 10 summarizes these results.

Year 2030 Project (Option 2) Conditions

Under Year 2030 Project (Option 2) PM peak hour conditions, five (5) of the nine (9) study intersections operate acceptably at LOS D or better.

The El Camino Real/Howard Avenue intersection would operate at LOS F with a delay of more than 80 seconds/vehicle. However, in comparison to Year 2030 No Project Conditions, there is no change in LOS and the volume-to-capacity ratio (V/C) increases by 5.3 percent. Therefore, the Proposed Project would not worsen the LOS at this intersection and a significant impact would not occur as a result of the Proposed Project.

The California Drive/Lorton Avenue intersection would operate at LOS F with a delay of more than 50 seconds/vehicle. This is primarily because of delay for the eastbound Lorton Avenue left turning movement, which would operate at LOS F conditions. In comparison to Year 2030 No Project Conditions, there is no change in LOS, however the V/C ratio increases nearly 73 percent (from 1.5 to 2.6); therefore a significant impact would occur as a result of the Proposed Project.

The El Camino Real/Peninsula Avenue/Park Road intersection would operate at LOS F with a delay of more than 80 seconds/vehicle; primarily due to the El Camino Real southbound critical movement. In comparison to Year 2030 No Project Conditions, there is no change in LOS, however the V/C ratio increases nearly 12 percent (from 2.42 to 2.72); therefore a significant impact would occur as a result of the Proposed Project.

The California Drive/Howard Avenue intersection would operate at LOS E, with a delay of 57.5 seconds/vehicle; primarily due to the California Drive northbound critical movement. In comparison to Year 2030 No Project Conditions, the LOS would deteriorate from LOS C to LOS E; therefore a significant impact would occur as a result of the Proposed Project. Table 10 summarizes these results.

Table 10: Year 2030 plus Project PM Peak Hour Intersection Operations

#	Intersection	Year 2030 plus Project PM Peak Hour Conditions					
		Option 1			Option 2		
		V/C Ratio	Delay	LOS	V/C Ratio	Delay	LOS
1	El Camino Real/Howard Avenue	**1.36**	**>80**	**F**	**1.38**	**>80**	**F**
2	Burlingame Avenue/Park Road	0.52 (NB)	21.4 (NB)	C	0.55 (NB)	22.7 (NB)	C
3	Primrose Road/Chapin Avenue	0.53 (NB)	30.9 (NB)	C	0.55 (NB)	20.6 (NB)	C
4	Primrose Road/Bellevue Avenue	0.60 (SB)	29.3 (SB)	D	0.62 (SB)	31 (SB)	D
5	Primrose Road/Douglas Avenue	0.13 (SB)	11.7 (SB)	B	0.13 (SB)	11.7 (SB)	B
6	California Drive/Lorton Avenue	**2.50 (EB)**	**>50 (EB)**	**F**	**2.66 (EB)**	**>50 (EB)**	**F**
7	El Camino Real/Peninsula Avenue/Park Road	**2.58**	**>80**	**F**	**2.72**	**>80**	**F**
8	California Drive/Peninsula Avenue	0.93	28.5	C	0.95	30.8	C
9	California Drive/Howard Avenue	0.90	48.3	D	**0.94**	**57.5**	**E**

Notes:
Delay presented in seconds per vehicle.
Delay and LOS presented for worst approach for two-way and side-street stop controlled intersections.
Bold type indicates unacceptable values.

Source: Wilbur Smith Associates, January 2009

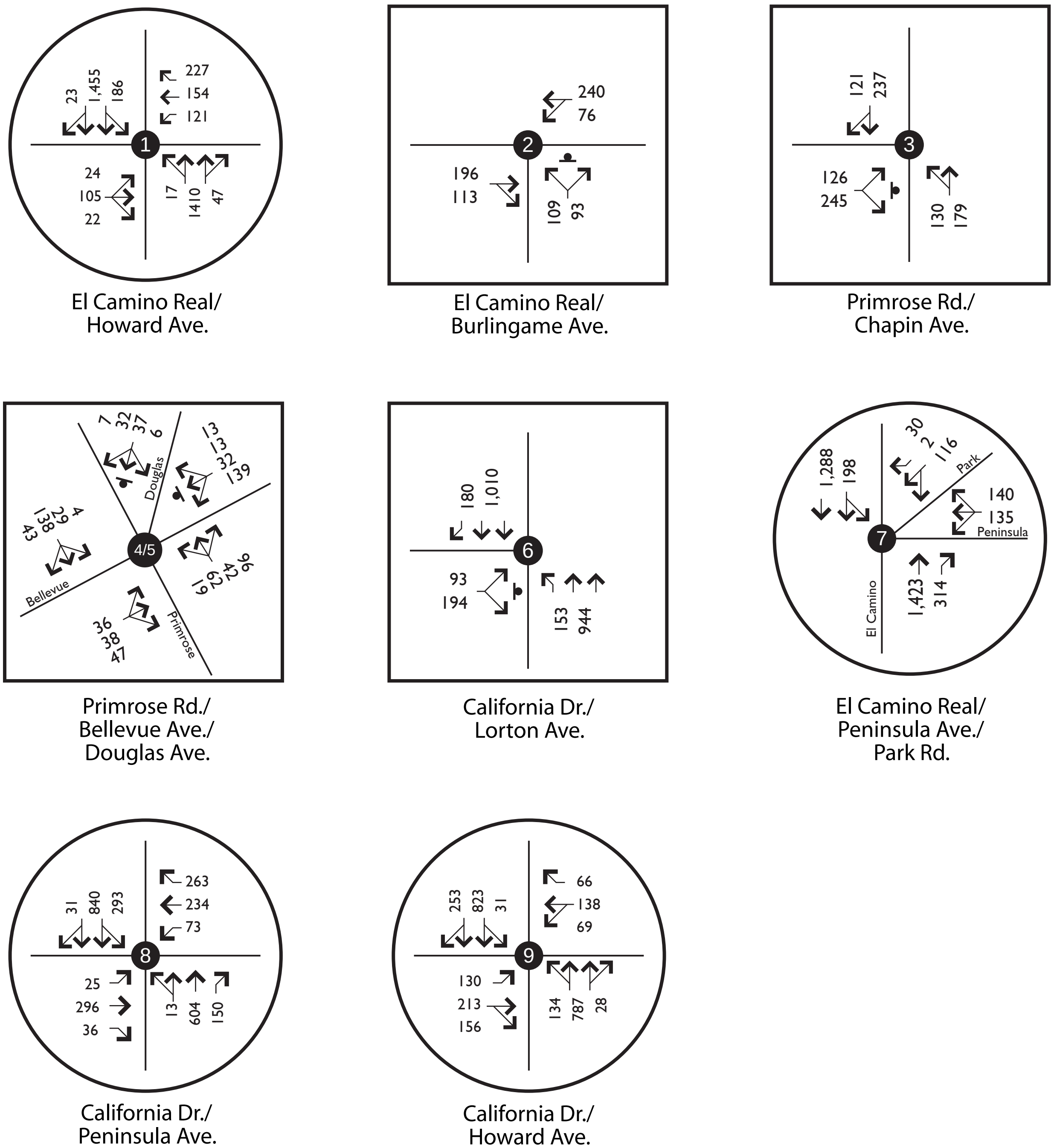
Significant Impact 1: The California Drive/Lorton Avenue intersection would operate at LOS F with a delay of more than 50 seconds/vehicle under Year 2030 Project (Option 1) Conditions.

Significant Impact 2: The California Drive/Lorton Avenue intersection would operate at LOS F with a delay of more than 50 seconds/vehicle under Year 2030 Project (Option 2) Conditions.

Significant Impact 3: The El Camino Real/Peninsula Avenue/Park Road intersection would operate at LOS F with a delay of more than 80 seconds/vehicle under Year 2030 Project (Option 2) Conditions.

Significant Impact 4: The California Drive/Howard Avenue intersection would operate at LOS E, with a delay of 57.5 seconds/vehicle under Year 2030 Project (Option 2) Conditions.

Figure 6 and Figure 7 illustrate the Year 2030 Project (Option 1) and Year 2030 Project (Option 2) turning movement volumes and geometries.



LANE CONFIGURATIONS AND
YEAR 2030 PROJECT (OPTION 1) PM PEAK HOUR TURNING MOVEMENTS
FIGURE 6

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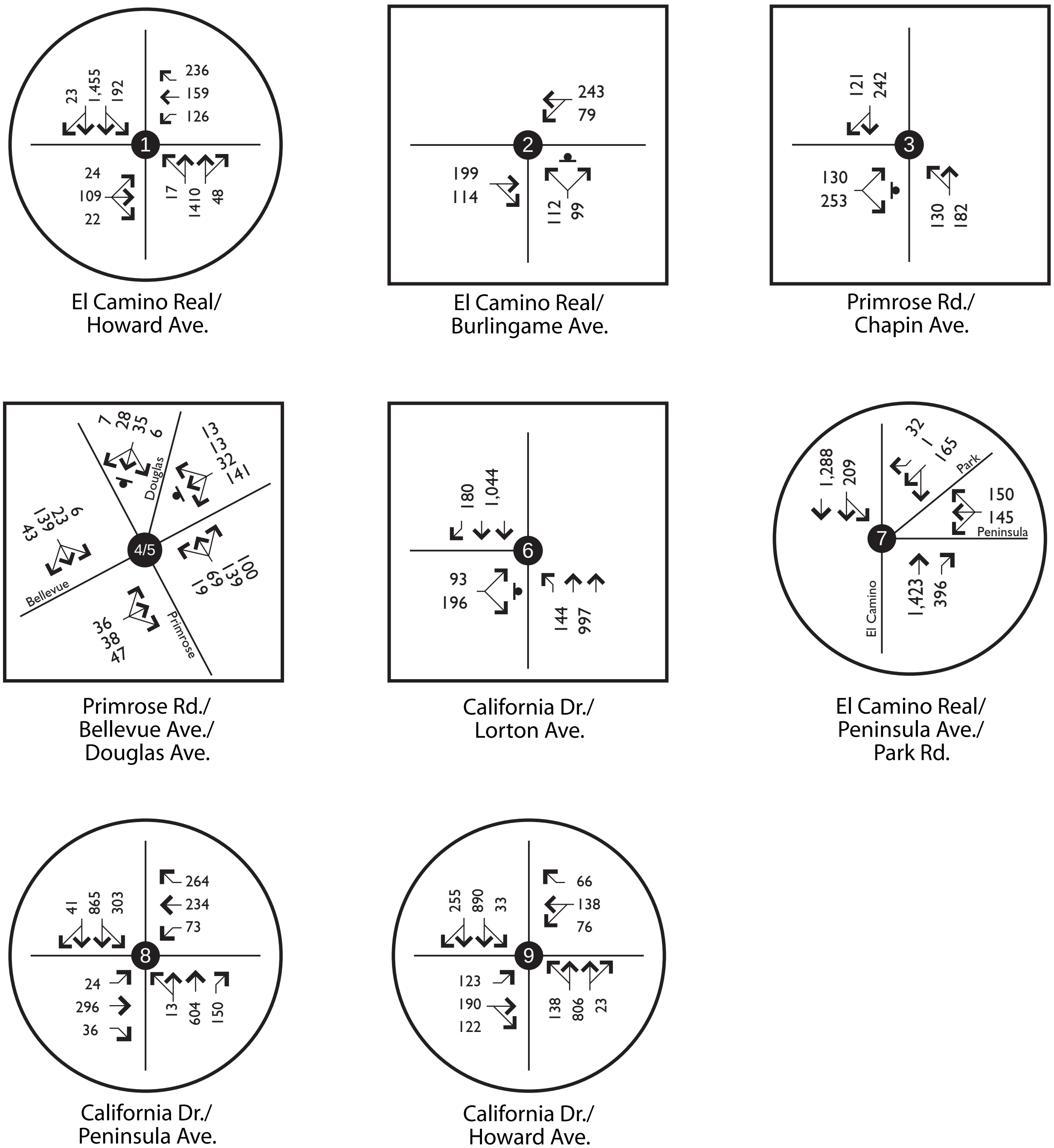

LANE CONFIGURATIONS AND
YEAR 2030 PROJECT (OPTION 2) PM PEAK HOUR TURNING MOVEMENTS
FIGURE 7

Mitigation Measures

This section identifies and summarizes the potential transportation impacts on the roadway network due to travel demand generated by the Proposed Project. Recommended improvements to the surrounding transportation system are proposed at the locations where significant impacts are identified.

- ***Significant Impact 1:*** The California Drive/Lorton Avenue intersection would operate at LOS F with a delay of more than 50 seconds/vehicle under Year 2030 Project (Option 1) Conditions.

- ***Mitigation:*** Per the California Manual on Uniform Traffic Control Devices (MUTCD), a signal warrant analysis was conducted to determine the feasibility of signalization of the California Drive/Lorton Avenue intersection. As shown in Appendix C, the criteria for signal warrants were satisfied. Therefore, signalization was proposed as the mitigation measure for this intersection.

  It is proposed that the intersection be converted from a Side-Street Stop Controlled (SSSC) intersection to a signalized intersection (with the application of 100 seconds of cycle length). With this improvement, the intersection would operate at LOS A, with 6 seconds of average delay. Signalization of the intersection would improve the intersection operations from LOS F to LOS A, and reduce delay significantly for Year 2030 Project (Option 1) Conditions. Hence, this mitigation measure would reduce impacts of the Proposed Project to a less than significant level.

- ***Significant Impact 2:*** The California Drive/Lorton Avenue intersection would operate at LOS F with a delay of more than 50 seconds/vehicle under Year 2030 Project (Option 2) Conditions.

- ***Mitigation:*** Per the California Manual on Uniform Traffic Control Devices (MUTCD), a signal warrant analysis was conducted to determine the feasibility of signalization of the California Drive/Lorton Avenue intersection. As shown in Appendix C, the criteria for signal warrants were satisfied. Therefore, signalization was proposed as the mitigation measure for this intersection.

  It is proposed that the intersection be converted from a Side-Street Stop Controlled (SSSC) intersection to a signalized intersection (with the application of 100 seconds of cycle length). With this improvement, the intersection would operate at LOS A, with 6 seconds of average delay. Signalization of the intersection would improve the intersection operations from LOS F to LOS A, and reduce delay significantly for Year 2030 Project (Option 2) Conditions. Hence, this mitigation measure would reduce impacts of the Proposed Project to a less than significant level.

- ***Significant Impact 3:*** The El Camino Real/Peninsula Avenue/Park Road intersection would operate at LOS F with a delay of more than 80 seconds/vehicle under Year 2030 Project (Option 2) Conditions.

- ***Mitigation:*** It is proposed to increase the amount of signal green time by ten seconds in the Peninsula Avenue westbound approach and Park Road southwest approach and ten seconds of green time is removed in the northbound and southbound El Camino Real approaches. This signal timing adjustment would improve the V/C ratio from 2.72 to 2.4 (an 11 percent decrease), which is comparable to Year 2030 No Project Conditions; In addition, it will improve delay in the northbound El Camino Real approach, westbound Peninsula Avenue left-turn movement, and improve delay in the southbound El Camino Real movement. Therefore, this mitigation measure would reduce impacts of the Proposed Project to a less than significant level under Year 2030 Project (Option 2) Conditions. Appendix C summarizes these findings.

- ***Significant Impact 4:*** The California Drive/Howard Avenue intersection would operate at LOS E, with a delay of 57.5 seconds/vehicle under Year 2030 Project (Option 2) Conditions.

- ***Mitigation:*** It is proposed to increase the amount of signal green time by five seconds in the California Drive northbound and southbound approaches and five seconds of green time is removed in the Howard Avenue eastbound and westbound approaches. This signal timing adjustment would improve the intersection from LOS E to D, with a delay of 37.3 seconds/vehicle (an improvement of 20.2 seconds); therefore this mitigation measure would reduce impacts of the Proposed Project to a less than significant level under Year 2030 Project (Option 2) Conditions. Appendix C summarizes these findings.

We hope you find this information helpful. Please feel free to contact me, or Peter Costa regarding this analysis.

Best regards,

WILBUR SMITH ASSOCIATES

Terri O'Connor, AICP
Transportation Planning Manager

Peter Costa
Transportation Planner

Appendix E

Parking and Circulation Analysis Memorandum

ENGINEERS
PLANNERS
ECONOMISTS
Wilbur Smith Associates

DRAFT

June 2, 2009

To: Kevin Gardiner
Kevin Gardiner & Associates
2809 Market Street
San Francisco, California 94114

From: Terri O'Connor, AICP;
Peter Costa

Subject: **Burlingame Downtown Specific Plan: Parking & Circulation Analysis Technical Memorandum**

A parking and circulation analysis was conducted to determine potential parking and circulation impacts associated with the Proposed Project. Furthermore, this analysis serves as a supplement to two prior studies: *Burlingame Downtown Specific Plan: Existing Conditions Workbook* (October 2007) and *Burlingame Downtown Specific Plan: Options and Alternatives Workbook* (March 2008). These studies identified potential parking and circulation impacts based on proposed developments throughout Downtown Burlingame. For purposes of this study, the analysis focuses on the land use developments planned in the *Burlingame Downtown Specific Plan Development Program Summary* (November 2008). As such, a parking generation analysis was conducted to estimate the weekday and weekend peak parking demand of each land use proposed the *Specific Plan*. Transportation circulation conditions, relative to the traffic associated with the Proposed Project was also examined.[1] Lastly, the parking and circulation findings from previous reports will serve as the basis against which impacts related to the Proposed Project would be identified in this analysis.

Project Overview

The Burlingame Downtown Specific Plan incorporates several area-wide projects, such as new development in key areas located in the downtown region. According to the *Burlingame Downtown Specific Plan Development Program Summary* (November 2008), designated "focus areas" will be modified from current development standards in order to enhance design standards and maximize development capacity. These improvements include planning mixed-use development according to modified zoning regulations, creating additional open space, and improving streetscapes. Several blocks in the downtown area have been selected for these improvements. According to the *Specific Plan*, an additional 183,843 gross square feet (GSF) of retail use, 248,702 GSF of office use, and a range of 875 to 1,232 residential units have been planned throughout these "focus areas". In addition, a 120-bed hotel has also been considered, as a part of the allocated office space.[2] Table 1 summarizes the potential development capacity for the focus areas.[3] Figure 1 illustrates the Proposed Project Area.

Table 1: Development Capacity

	Retail Use	Office Use	Residential Use	Hotel Use (optional)
Total Development	183,843 GSF	248,702 GSF	875 – 1,232 units	120 beds

Source: Burlingame Downtown Specific Plan Development Summary (November 3, 2008).

[1] For purposes of this analysis, a traffic study is not included; however the traffic associated with the Proposed Project has been identified and is referenced in the *Draft Burlingame Downtown Specific Plan: Traffic Impact Analysis Technical Memorandum* (Wilbur Smith Associates, January 2009).

[2] The hotel use is estimated to be 100,000 GSF of development, therefore reducing the total GSF of office development from 248,702 GSF to 148,702 GSF dedicated for office use.

[3] Refer to Appendix A for complete list of proposed developments, and size of each proposed development per block within each "focus area".

* *Focused development area provided by Burlingame Downtown Specific Plan (November 2008)*

PROPOSED PROJECT AREA
FIGURE 1

WilburSmith ASSOCIATES

Existing Parking Conditions

The Proposed Project Area within the downtown region, consists of 20 City-owned off-street parking facilities as well as metered on-street parking located on most local roadways.[4] As stated in the *Burlingame Downtown Specific Plan: Existing Conditions Workbook* (October 2007), the total parking supply of the downtown region is 2,244 parking spaces. Of this total, 1,273 spaces are located in off-street facilities and the remaining 971 spaces are on-street stalls.[5]

With regard to parking occupancy, the parking evaluation presented in the *Burlingame Downtown Specific Plan: Existing Conditions Workbook* (October 2007) determined that the current parking utilization in the downtown area does not exceed practical capacity (85 to 90 percent occupancy). Furthermore, the downtown area experienced an average on-street parking occupancy of 87 percent, respectively.[6] Off-street parking facilities experienced a parking demand of 79 percent occupancy, on average. Based on the existing demand, there is a parking surplus (availability) of 393 parking spaces. Table 2 below summarizes the weekday peak period parking conditions throughout Downtown Burlingame.

Table 2: Parking Utilization

Parking Facility Type	Parking Supply	Parking Demand	% Occupancy	Parking Availability
On-Street[1]	971	845	87 %	126
Off-Street[2]	1,273	1,006	79 %	267
Total	**2,244**	**1,851**	**83 %**	**393**

Notes: Table summarizes parking survey data presented in *Burlingame Downtown Specific Plan: Existing Conditions Workbook* (October 2007); Tables 3-4 and 3-5.
(1) On-street parking utilization based on weekday peak parking occupancy in Core Area (October 2004); survey conducted by Wilbur Smith Associates.
(2) Off-street parking utilization based on weekday peak parking occupancy in Core Area (July 2007); survey conducted by Wilbur Smith Associates.

In order to determine potential parking impacts associated with the proposed land use developments presented in the *Burlingame Downtown Specific Plan Development Program Summary* (November 2008), a parking generation analysis was conducted to estimate parking demand. The following discussion includes an examination of parking demand based on two development conditions.

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[4] Refer to Figure 3-4: Off-Street Parking Facilities and Tables 3-4, 3-5, and 3-6 in the *Burlingame Downtown Specific Plan: Existing Conditions Workbook* (October 2007) for illustrations and detailed descriptions of parking supply.
[5] The on-street parking supply is only in reference to the Core Area; as defined in the *Burlingame Downtown Specific Plan: Existing Conditions Workbook* (October 2007)
[6] As stated in the prior study, the Core Area is bounded by Bellevue and Chapin Avenues to the north, California Drive to the east, Howard Avenue to the south, and El Camino Real to the west (pp.3-9).

Parking Generation Analysis

Parking generation analysis includes the weekday and weekend parking rates and estimates the number of parked vehicle (demand) generated by the prospective developments in downtown Burlingame. Parking rates determine the average peak period parking demand. Typically, parking rates estimate the number of parked vehicles per 1,000 GFA (gross floor area) of land use, total number of rooms, or total number of employees per land use. In order to determine parking rates for each planned project discussed in the *Burlingame Downtown Specific Plan Development Program Summary* (November 2008), the *ITE Parking Generation Handbook*, 3rd Edition (2004) was used. Given the description of the each planned project, several ITE land use codes were applied.[7]

According to the *Specific Plan*, the planned mixed-use developments will include retail, office, hotel, and residential uses. For each planned development, general land use codes and parking generation rates were applied. For retail and office uses, the size of each retail and office development (in gross square feet) and parking generation rates determined the number of parked vehicles associated with each use. For the proposed hotel, the total number of beds and the parking generation rate were used to determine parking demand. Lastly, for the planned residential uses, the total number of residential units and the parking generation rate were calculated to determine the number of vehicle trips.[8]

Since there are two build options under future conditions, parking demand estimates will differ based on type and intensity of use. The build options are described below:

Project Build (Option 1) scenario includes the planned projects in downtown Burlingame, in accordance to the *Specific Plan*. The developments included in Option 1 are 183,843 GSF of retail use, 148,702 GSF of office use, a 120-bed hotel, and 875 residential units.

Project Build (Option 2) scenario includes additional office and residential use and does not include a proposed hotel. The developments included in Option 2 are 183,843 GSF of retail use, 248,702 GSF of office use, and 1,232 residential units.

Table 3 presents the estimated parking demand under the Project Build (Option 1) scenario and Table 4 presents the estimated parking demand under the Project Build (Option 2) scenario. Detailed parking generation estimate tables are located in Appendix A.

[7] For purposes of this analysis, parking generation estimates were based on the weekday and weekend peak hour period per land use.

[8] Land Use Code 870: Apparel Store was applied to "retail use"; Land Use Code 701: General Office was applied to "office use"; Land Use Code 310: Hotel was applied to "hotel use"; and Land Use Code 230: Condominium/Townhome was applied to "residential use". Source: ITE Parking Generation, 3rd Edition (2004).

Under Project Build Option 1, the planned developments are estimated to generate a total of 2,065 parked vehicles during the weekday peak hour period. In addition, the planned developments are estimated to generate a total of 1,480 parked vehicles during the weekend peak hour period. These estimates are based on the total gross square footage (GSF) of retail and office use, the total number of hotel rooms, and the total number of residential dwelling units proposed. The parking requirement for each land use, based on the City of Burlingame Municipal Code, is 2,389 parking spaces. In comparison to the parking generation estimate, the analysis indicates that the planned developments would generate 324 fewer parked vehicles during the weekday peak period than the amount of parking required by the Municipal Code. During the weekend peak period, the planned developments would generate 909 fewer parked vehicles than the amount of parking required by the Municipal Code. The analysis has also indicated that the weekend peak period parking demand is 585 fewer vehicles than the weekday peak period. This is primarily due to the low parking demand for office and residential uses; whereas retail and hotel parking demand tends to be slightly higher during the weekend peak period than the weekday peak period. Since the majority of the planned development capacity is oriented toward office and residential, the overall parking demand during the weekend peak period is significantly less. Table 3 summarizes these findings.

Table 3: Parking Generation Analysis Metrics and Assumptions Summary – Project Build Option 1

Land Use	Total Size of Project[1]	Peak Hour Demand	
		Weekday	Weekend
Retail	183,844 GSF	208	392
Office	148,702 GSF	422	128
Hotel	120 rooms	156	216
Residential	875 dwelling units	1,279	745
Total Required Parking[2]		**2,065 parking spaces**	**1,480 parking spaces**
City of Burlingame Parking Requirements per land use			
Retail Use			1 space per 400 GSF
Office Use			1 space per 300 GSF
Hotel Use			1 space per room
Residential Use			1.5 space per dwelling unit
Total project parking space requirement[3]			**2,389 parking spaces**

(1) Project size provided by *Burlingame Downtown Specific Plan Development Program Summary* (November 2008).
(2) Parking Demand Estimate based on ITE Parking Generation 3rd Edition (2004) Land Use Codes: Retail (870); Office (701); Hotel (310); Residential (230). This estimate represents maximum parking demand for all land uses during each respective observed peak hour.
(3) Total parking space requirements based on City of Burlingame Municipal Code for Off-Street Parking. Retail (Code 25.70.040); Office (Code 25.70.040); Hotel (Code 25.70.034); Residential (Code 25.70.032). Source: City of Burlingame Municipal Code (2008).

Under Project Build Option 2, the planned developments are estimated to generate a total of 2,711 parked vehicles during the weekday peak period. In addition, the planned developments are estimated to generate a total of 1,652 parked vehicles during the weekend peak hour period. The parking requirement for each land use, based on the City of Burlingame Municipal Code, is 3,135 parking spaces. In comparison to the parking generation estimate, the analysis indicates that the planned developments would generate 424 fewer parked vehicles during the weekday peak period than the amount of parking required by the Municipal Code. During the weekend peak period, the planned developments would generate 1,483 fewer parked vehicles than the amount of parking required by the Municipal Code. The analysis has also indicated that the weekend peak period parking demand is 1,059 fewer vehicles than the weekday peak period. As stated, this parking demand differential is primarily due to the low parking demand of office and residential uses during the weekend peak period. Table 4 summarizes these findings.

Table 4: Parking Generation Analysis Metrics and Assumptions Summary – Project Build Option 2

Land Use	Total Size of Project[1]	Peak Hour Demand	
		Weekday	Weekend
Retail	183,844 GSF	208	392
Office	148,702 GSF	706	214
Residential	1,231 dwelling units	1,797	1,046
Total Required Parking[2]		**2,711 parking spaces**	**1,652 parking spaces**
City of Burlingame Parking Requirements per land use			
Retail Use			1 space per 400 GSF
Office Use			1 space per 300 GSF
Residential Use			1.5 space per dwelling unit
Total project parking space requirement[3]			**3,135 parking spaces**

(1) Project size provided by *Burlingame Downtown Specific Plan Development Program Summary* (November 2008).
(2) Parking Demand Estimate based on ITE Parking Generation 3rd Edition (2004) Land Use Codes: Retail (870); Office (701); Residential (230). This estimate represents maximum parking demand for all land uses during each respective observed peak hour.
(3) Total parking space requirements based on City of Burlingame Municipal Code for Off-Street Parking. Retail (Code 25.70.040); Office (Code 25.70.040); Residential (Code 25.70.032). Source: City of Burlingame Municipal Code (2008).

Parking Evaluation

The analysis has determined the parking demand associated with the Proposed Project is a projected range of 1,480 spaces to 2,711 spaces, depending on the build option and peak hour period. Based on existing parking demand, there is an estimated surplus of 393 overall spaces that may be considered available.

Under Project Build (Option 1), the parking demand estimate is 2,065 spaces during the weekday peak period. Since there is an available supply of 393 spaces based on the existing parking demand, an estimated 1,672 spaces would need to be provided due Project Build (Option 1) impacts. In addition, the parking demand estimate during the weekend peak period is 1,480 spaces; which would result in a shortfall of 1,067 parking spaces.

Under Project Build (Option 2), the parking demand estimate is 2,711 spaces during the weekday peak period; whereas the available parking supply is 393 spaces. As a result, there would be a shortfall of 2,318 spaces and significant parking impacts would likely occur under Project Build (Option 2) conditions. During the weekend peak period, the parking demand is 1,652 spaces, which results in a parking shortfall of 1,257 spaces.

Table 5: Parking Evaluation – Available Supply v. Estimated Demand

Scenario	Estimated Parking Demand(1)	Available Parking Supply(2)	Surplus/(Deficit)
Project Build – Option 1			
Weekday Peak	2,065	393	(1,672)
Weekend Peak	1,480	393	(1,067)
Project Build – Option 2			
Weekday Peak	2,711	393	(2,318)
Weekend Peak	1,652	393	(1,257)

Notes:
(1) Estimated parking demand represents maximum parking demand for all land uses during each respective observed peak hour.
(2) Available parking spaces provided by *Burlingame Downtown Specific Plan: Existing Conditions Workbook* (October 2007).

The analysis has indicated that parking impacts are likely to occur as a result of the Proposed Project, most significantly caused by a parking deficit during the weekday peak period for both Build Options. Under Project Build (Option 1) Conditions, there is a shortfall of 1,672 spaces. In addition, a parking shortfall of 2,318 spaces would result during the weekday peak period under Project Build (Option 2) Conditions.

It must be mentioned that the estimated parking demand (1,480 spaces to 2,711 spaces, depending on the Build Option) represents the maximum peak hour parking demand; however, these proposed land uses will experience a different parking demand throughout the duration of the day. For example, retail land uses tend to experience peak hour parking demand between 3:00 PM and 4:00 PM during the weekday and between 1:00 PM and 2:00 PM during the weekend. Office land uses experience 100 percent parking occupancy between 10:00 AM and 11:00 AM during the weekday and during the weekend, the estimated parking demand is nearly 10 percent of total capacity (or 10 percent of weekday peak demand); primarily due to limited weekend operating hours for employees. Hotel uses experience peak parking demand between 5:00 AM and 6:00 AM during the weekday and weekend. Residential uses experience peak hour parking demand between 5:00 AM and 6:00 AM during the weekday and weekend.[9] As stated, the proposed residential development in Downtown Burlingame includes mixed use residential, primarily condominiums. Therefore the majority of these prospective residents will be parking within the confines of the residential building. As such, an off-street parking facility will only be patronized by these residents. It can be assumed that these residents will "self park" and will not utilize on-street parking or any additional off-street facilities. Under Project Build (Option 1), implementing "self park" for future residential use would reduce the overall parking demand by 62 percent during the weekday peak, and reduce the parking demand by 50 percent during the weekend peak period, respectively. Under Project Build (Option 2), the overall parking demand would decrease by 66 percent during the weekday peak, and the parking demand would decrease 63 percent during the weekend peak period.

Furthermore, the analysis assumes that since the Proposed Project includes mixed use development, shared parking facilities could be implemented to accommodate more than one land use type. Retail, hotel, and office uses could utilize shared parking (in that an off-street facility will primarily accommodate to office employees during the majority of the day, and during the late midday and evening hours, retail/hotel patrons would transition to majority use the off-street facility). As a result of the different times of peak parking demand by these complementary uses, demand is overlapping rather than additive, thus less parking is required. Additionally, the parking demand for retail uses could be further reduced simply because the majority of retail patrons work within close proximity of these shops; therefore they "park once" and would tend to walk rather than drive, and re-park their vehicle in order to patronize the shops. Under Project Build (Option 1), during the morning peak, parking demand would decrease 36 percent; during the midday peak, the parking demand would decrease seven percent, and the demand would decrease 63 percent if retail, hotel, and office land uses utilize shared parking. Under Project Build (Option 2), the need for parking would be reduced 34 percent during the morning peak; during the midday peak, the parking demand would decrease 6 percent; and during the evening peak, the parking demand would decrease 75 percent if these land uses utilize shared parking. Overall, if shared parking is supported through municipal policy and programs, the analysis can assume an average parking demand reduction of 35 percent under Project Build (Option 1), and an average parking demand reduction of 38 percent under Project Build (Option 2). Table 6 on the following page summarizes the parking demand based on the application of shared parking reductions.

As stated, parking demand adjustments can be applied based on the parking demand differential between proposed land uses. Given the amount of available parking (393 spaces), there would be a constant parking surplus of 105 to 138 additional spaces during the evening peak hours, depending on the build option. Under Project Build (Option 1), there would be a parking shortfall of 112 spaces during the morning peak hour and a parking shortfall of 341 spaces during the midday peak hour. Under Project Build (Option 2), there would

[9] Observed peak hour parking demand per land use based on *ITE Parking Generation Handbook,* 3rd Edition (2004) case studies.

be a parking deficit of 214 spaces during the morning peak hour and a parking shortfall of 469 spaces during the midday peak hour. The estimated parking deficit during the morning and midday peak hours can attributed to the office and hotel uses (which experience high parking demand during the morning peak hour) as well as retail uses, which typically experience high parking demand during midday (or "lunch hour" for employees) peak hour and evening peak hour.[10] As a result, current parking demand, in combination with project-related demand would exceed current parking supply. Table 6 summarizes these findings.

Table 6: Adjusted Parking Demand Estimate

Peak Hour	Available Parking Supply	Parking Demand	Surplus/(Deficit)
Project Build – Option 1			
Morning (AM)	393	505	(112)
Midday (MID)	393	734	(341)
Evening (PM)	393	288	105
Project Build – Option 2			
Morning (AM)	393	607	(214)
Midday (MID)	393	862	(469)
Evening (PM)	393	225	138

Notes:
(1) The assumptions below are based on the application of shared parking:
(2) Morning peak hour – represents minimal retail demand (<5%), and high hotel and office parking demand (100%).
(3) Midday peak hour – represents minimal hotel demand (<10%), and high retail and office demand (100%).
(4) Evening peak hour – represents minimal office demand (<10%), and high retail and hotel parking demand (100%).
(5) Residential parking demand not included; analysis assumes prospective residents will utilize facilities built specifically for residential uses.

Shared parking measures would reduce the overall parking demand associated with the Proposed Project, however parking deficiencies would occur, primarily due to existing and future demand and current parking supply availability. The following discussion includes several parking mitigation strategies that would reduce potential parking impacts as well as increase parking supply throughout the Downtown Area. Planned parking developments, improvements strategies, and construction phasing for off-street facilities are examined.

Parking Mitigation Strategies

In order to mitigate these potential impacts, several strategies are recommended to address these needs. As stated in the *Burlingame Downtown Specific Plan: Existing Conditions Workbook* (October 2007), proposed parking improvements throughout Downtown Burlingame included parking pricing strategies, adjustments to parking time restrictions, implement valet/attended parking operations, modifications to parking enforcement strategies, implementing parking permits for residents/employees, and promoting alternative modes of transport (i.e. shuttle bus, promoting transit incentives to employees). In fact, many parking improvement measures were enacted, according to the *Burlingame Downtown Specific Plan: Existing Conditions Workbook* (October 2007), in that short-term on-street meter rates were increased and off-street parking facilities extended parking hours in order to create additional long-term parking spaces. The outcome of these strategies have indicated that parking demand in the downtown area has decreased to at or below practical

[10] It must be mentioned that even though many retail patrons working nearby these shops, the high retail parking demand during the midday and evening peak hours are primarily due to patrons driving into the area from nearby communities and places of employment.

capacity and more constituents are utilizing long-term parking in facilities in the periphery of the downtown area; therefore allowing additional short-term use.[11]

Additional parking considerations were imposed in the *Burlingame Downtown Specific Plan: Options and Alternatives Workbook* (March 2008). Key parking strategies included reconstruction of existing off-street facilities, consolidation of parking lots, encourage subterranean or elevated parking structures, reexamination of current parking requirements, consideration of shared parking practices, improve wayfinding and signage for parking facilities, and improve parking management. Furthermore, several developmental alternatives were discussed, which included detailed parking strategies for specific areas in the downtown region. For example, construction of off-street parking structures could be located on Lot J (Primrose Road and City Hall Lane) as well as Lot A (Primrose Road and Donnelly Avenue). Expansion of Lot A to include Lot A-3 (adjacent to Lot A) would produce 123 new parking spaces; developing a new parking structure to link Lot C (across from Lot A), Lot A-3, and Lot A would produce 224 new spaces; the construction of a parking facility on Lot J would gain 256 new spaces, and the construction of parking structure on Lot H (El Camino Real and Ralston Avenue) would gain 97 new spaces. This analysis assumed that Lot E would be closed per community preference and developed as an open space, thus removed from the available parking supply.[12]

Overall, if these off-street facilities were developed, modified, or constructed, an estimated 700 new spaces would be available; therefore increasing the available parking supply from 393 to 1,093 spaces in Downtown Burlingame, an increase in supply by 178 percent, respectively. Under these conditions, the parking demand associated with the developments in Project Build (Option 1) and Project Build (Option 2) would be significantly less than the proposed parking supply. In sum, if the aforementioned modifications to existing off-street parking facilities are enacted, on-street parking management strategies are implemented, and shared parking measures are utilized, the parking impacts associated with the proposed developments in Downtown Burlingame would be less than significant.

Parking Phasing

As Table 6 suggests, the current parking supply throughout the downtown area would not be able to accommodate the projected parking demand associated with the Proposed Project, therefore parking deficiencies would result. Shared parking policies would assist in the reduction of parking demand during each observed peak parking period; however under each Build Option, the morning and midday peak hours would experience significant parking shortfalls. As stated in the previous discussion, if the City of Burlingame were to implement each proposed improvement to increase its parking supply, parking impacts associated with the Proposed Project would ultimately be reduced or eliminated. As such, the City has several options available in order to increase parking supply, including the expansion of Lot A, implementing structured parking on Lot J, permanent closure of Lot E and expansion of Lot H. However, during the (re)construction period of each off-street facility, parking supply would shift throughout the downtown area, creating parking displacement for current and future residents, employees, and visitors to the downtown area. In order to identify which locations should absorb potential parking displacement during the construction phase, and recommend appropriate strategies, a sensitivity analysis was conducted. The analysis examines several "what if" conditions that represent the change in parking operations relative to the location and supply of parking spaces near the Proposed Project Area.

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[11] These parking strategies were implemented as a result of the *Burlingame Avenue Commercial District Parking Study Final Report* prepared by Wilbur Smith Associates (February 2000). The results of these parking strategies were observed by WSA during parking survey analysis and later documented in the *Burlingame Downtown Specific Plan: Existing Conditions Workbook* (October 2007).

[12] In Fall 2007, two community workshops were held to develop ideas for future development in Downtown Burlingame. These parking strategies were reflective of propositions from constituents and residents and WSA evaluated these suggestions and quantified these proposed parking supply adjustments. Source: *Burlingame Downtown Specific Plan: Options and Alternatives Workbook* (March 2008).

The aforementioned mitigation strategies present an overall growth of available parking supply, which in turn would be to accommodate existing and project-related parking demand. However, the restructuring and reconfiguration of existing parking facilities would need to be conducted incrementally, as to not impact current parking operations and disrupt the public welfare. The closure of parking Lot E for the development of the city designated open space would displace 73 public spaces, permanently reducing the supply from 1,273 to 1,200 spaces. In constructing a new parking structure on Lot J, the off-street parking supply would reduce from 1,200 spaces to 1,131 spaces, displacing 69 public spaces. The construction of a parking structure on Lot H would displace 85 public spaces, reducing the off-street parking supply from 1,200 spaces to 1,115 spaces. Lastly, the plan to link Lots C, A, and A-3 would result in the subsequent closure of these lots, therefore reducing the off-street parking supply by 274 spaces (from 1,200 spaces to 926 spaces). Overall, if Lot E would be permanently closed and Lots J, H, C, A, and A-3 were to be closed due to construction for a significant duration of time, the total off-street parking supply would reduce from 1,273 spaces to 772 spaces, a displacement of 501 public parking spaces (a 39 percent reduction).[13]

Since it would be impractical to close several off-street facilities for construction purposes at the same time, the analysis has identified several mitigation measures to shift parking supply during each phase of construction without impeding parking conditions. Parking phasing assumptions were incorporated into the analysis; these assumptions are listed below:

- Existing parking demand for each off-street facility was considered in order to determine parking availability.[14]
- Shifting additional parking along most on-street facilities would not be feasible, primarily due to the high occupancy rates observed during the peak period.
- Phasing strategies apply only to lots within a comfortable pedestrian walk-shed of the parking lot being constructed. For example, if Lot H were to be closed for construction, recommending parking utilization at Lot O would not be feasible, primarily due to distance and increased travel time.
- The closure and reconstruction of an off-street parking facility should be done incrementally, in that no more than one facility should be undergoing construction at any given time. Closure of more than one facility could result in a significant parking impact.

For the closure and reconstruction of Lot J, utilizing Lots L, W, and C would absorb the reduced supply. Based on existing demand of these three lots, there would be potentially 74 spaces available, which would accommodate to the loss of 69 spaces in Lot J during construction phasing. Lot E's permanent closure would result in the loss of 73 spaces, as such; it should be staged to start after the completion of the Lot J garage to mitigate parking impacts. The permanent loss of Lot E's 73 spaces would be absorbed by the supply in the Lot J garage and Lots W and C as well . For the construction of a parking structure on Lot H, several parking lots would offer available parking, including Lots K, K-1, L, and J. In addition, temporarily reduce the metering fare for on-street parking along Howard Avenue (similar to pricing in the periphery of downtown) would encourage parking utilization and absorb additional demand associated with the closure of Lot H. For the expansion and consolidation of Lots A and A-3, encouraging parking in Lots C, O, V, M, J, and L would mitigate the potential loss of 189 off-street spaces. Furthermore, reconstruction of Lots A and A-3 should be proportional, in which no more than 50 percent of the existing parking supply of Lot A should be closed during construction phasing, thus retaining at least 83 parking spaces for public use. For the expansion of Lot C, encouraging parking usage in Lots O, V, M, J, A, and A-3 would create 85 available spaces, which would accommodate the potential loss 82 spaces in Lot C. Table 7 summarizes these recommendations.

[13] The reduced parking supply during construction phasing includes the removal of Lot E, which would ultimately eliminate 73 parking spaces from the downtown area. The future land use for the Lot E area would be designated for open space (public park).

[14] Parking demand derived from Table 3-5 in the *Burlingame Downtown Specific Plan: Existing Conditions Workbook* (October 2007).

Table 7: Parking Phasing Summary

Lot	Improvement	Reduced Parking[1]	New Parking[2]	Net Gain[3]	Phasing Strategy
J	Construct parking structure	69 spaces	256 spaces	325 spaces	Utilize Lots L, W, C
E	Remove Lot/Build Park	73 Spaces	--	(73) spaces	Utilize Garage on Lot J; and Lots W, C
H	Construct parking structure	85 spaces	97 spaces	182 spaces	Utilize Lots, K, K-1, L, J; Encourage Howard Ave. on-street parking (reduce fare/increase limits)
A/A-3	Expansion/consolidate lots	189 spaces	123 spaces	312 spaces	Utilize Lots C, O, V, M, J, L; incremental/proportional expansion of Lot A
C	Expansion/link to Lots A/A-3	82 spaces	224 spaces	306 spaces	Utilize Lots O, V, M, J, A/A-3

Notes:
(1) indicates number of spaces temporarily removed during (re)construction of facility.
(2) indicates number of new parking spaces planned per facility.
(3) indicates total number of parking spaces per facility (inclusive of existing and proposed spaces).

Howard Avenue

The *Specific Plan* will provide incentives to encourage new development along the Howard Avenue Mixed Use District. This district would extend along Howard Avenue, from El Camino Real to California Drive. This "focused development area" would include new mixed use development regulations, new streetscape improvements, and enhanced downtown design standards and guidelines. Specific improvements include mixed use housing, increased building height regulations (from 35' permitted height to a 55' conditional height), and implement bulbouts to improve pedestrian conditions. Similar to the requirements along Burlingame Avenue, the *Specific Plan* would intend on eliminating the on-site parking requirements along Howard Avenue; therefore allowing developers to replace an existing single-story office or retail building with a 2- to 3-story mixed use building, and no parking would be required for the first floor use.[15]

As presented in Table 1, the total development capacity includes 183,843 gross square feet (GSF) of retail use, 248,702 GSF of office use, a 120-room hotel, and a range of 875 to 1,232 residential units throughout the downtown area. The development capacity of proposed land uses along Howard Avenue include 105,857 GSF of retail use (58 percent of total development capacity); 112,158 GSF of office use (45 percent of total development capacity); a 120-bed hotel (optional), and between 552 to 776 residential units (63 percent of total development capacity), depending on the build option. Assuming shared parking would be utilized by proposed office, hotel, and retail land uses and planned residential uses would provide self-park facilities for residents; the adjusted parking demand along Howard Avenue is estimated to range from 70 to 218 parked vehicles during the weekday and 11 to 117 parked vehicles during the weekend, respectively.[16]

Due to the location of the proposed developments along Howard Avenue, there is on-street parking and four off-street parking facilities that would be optimal for future patrons. Currently, there are approximately 47 on-street, metered parking spaces and City lots F, G, N, and W containing 326 off-street parking spaces,

[15] See City of Burlingame Municipal Code 25.36.040: Burlingame Avenue Commercial Area (2008).
[16] Adjusted parking demand incorporates typical demand per land use during morning (8:00 AM), midday (11:00 AM), and evening (6:00 PM) peak hours based on ITE Parking rates.

totaling 373 available public parking spaces along Howard Avenue that service several downtown commercial land uses.[17] Recent parking utilization analyses indicate Lots F and N currently experience high parking demand during the weekday peak (99 and 97 percent), whereas Lots G and W experience moderate demand during the weekday peak (68 and 52 percent). During the weekend peak, all four lots are underutilized, experiencing less than 20 percent occupancy.[18]

If the parking requirements along Howard Avenue are to emulate the regulations set forth in the Burlingame Avenue Commercial Area, on-site parking would be exempt; thus parking would need to be accommodated off-site in a municipal parking lot or garage, perhaps through an in-lieu fee arrangement. Under such an agreement, the City collects funds from developers which are set aside to build centralized public parking at a future date or are used to pay down a bond for an existing parking facility that the developer's project will have access to. Based on existing parking demand at each off-street facility along Howard Avenue, Lot F and Lot N are near maximum capacity during the weekday peak period; therefore 169 spaces would not be available, thus reducing the parking supply from 373 to 204 available spaces. Since Lots G and W are relatively underutilized during the weekday peak period, these lots could absorb the additional parking demand associated with the Proposed Project. During the weekend peak period, these lots experience low demand, therefore the additional weekend project-related parking demand would not exceed current supply along Howard Avenue, therefore parking spillover would not occur. It must be noted that the parking demand along Howard Avenue incorporates shared parking policies amongst each planned use and if the proposed residential uses do not include self-park facilities, the parking impacts could become significant, in which current supply would not be able accommodate demand, resulting in parking spillover throughout the downtown area.

Transportation Circulation

The following discussion includes existing transportation conditions in the vicinity of the Proposed Project Area and an examination of potential impacts to existing transportation facilities is discussed.

Roadway Network

The Proposed Project Area is bounded by Burlingame Avenue (to the north), Peninsula Avenue (to the south), El Camino Real (to the west), and California Avenue (to the east). Regional access to Downtown Burlingame is provided via Highway 101 freeway. The closest interchanges with the freeway are located at Peninsula Avenue (southern edge of the study area) and at Broadway (north of the study area). The Peninsula interchange provides access in the northbound direction only, while the Broadway interchange provides access for both northbound and southbound traffic. A system of major arterials accommodates the longer distance local trips and connects Burlingame with adjacent communities. These include El Camino Real (State Highway 82) and California Drive providing north-south access. Other major arterials include Peninsula Avenue and Oak Grove Avenue. These arterials carry the major volume of east-west trips and connect with State highways and freeways. The other elements of the street system are secondary arterials, such as Howard Avenue, that connect collector and local access streets to the major arterials. Collector streets feed traffic to the arterials and major centers of activity in Burlingame.

[17] Refer to Table 3-4 in the *Burlingame Downtown Specific Plan: Existing Conditions Workbook* (October 2007).
[18] Refer to Table 3-6 in the *Burlingame Downtown Specific Plan: Existing Conditions Workbook* (October 2007).

Traffic Conditions

Due to the location and size of the project area, the traffic generated by the project will primarily affect the intersections listed below:

- El Camino Real/Howard Avenue
- Burlingame Avenue/Park Road
- Primrose Road/Chapin Avenue
- Primrose Road/Bellevue Avenue
- Primrose Road/Douglas Avenue
- California Drive/Lorton Avenue
- El Camino Real/Peninsula Avenue/Park Road
- California Drive/Peninsula Avenue
- California Drive/Howard Avenue/Highland Avenue

Based on existing travel patterns throughout the Proposed Project Area, the majority of project-traffic would occur along California Drive (south of Burlingame Avenue) and along the California Drive (north of Burlingame Avenue). Additional project-traffic would occur along Howard, Burlingame, and Peninsula avenues; and traffic along Primrose Road as well.

Due to the location and access points of the Proposed Project, patrons destined to the downtown area would exit from El Camino Real at first opportunity and utilize the east-west collector roadways. As such, non-downtown bound traffic will likely bypass the Proposed Project and continue traveling along El Camino Real while the majority of project-related traffic will likely access the Proposed Project site via California Drive or exit along El Camino Real and access the project via Howard Avenue, Burlingame Avenue, and Bayswater Avenue. In addition, on- and off-street parking facilities are primarily located along these downtown, local roadways, which would attract patrons to exit El Camino Real in order to access these parking facilities.

The traffic associated with Proposed Project is expected to impact high volume intersections within the Proposed Project Area, specifically intersections at California Drive/Lorton Avenue, El Camino Real/Peninsula Avenue/Park Road, and California Drive/Howard Avenue. However, traffic mitigation measures, such as signalization and signal timing adjustments have been proposed in order to reduce potential impacts to these intersections.[19] The following section discusses how the proposed roundabout at the intersections of California Drive/Bellevue Avenue and Bellevue Avenue/Lorton Avenue would impact existing and future traffic conditions. In addition, a brief discussion of the potential closure of Highland Avenue is presented.

Roundabout Operations

In order to improve traffic operations and safety conditions at the California Drive/Bellevue Avenue intersection and the Bellevue Avenue/Lorton Avenue intersection, the City of Burlingame proposed installing a traffic roundabout; a road junction in which traffic would enter one-way around a center island (traffic circle), typically in a counterclockwise direction. Currently, both intersections are stop controlled, with free flowing traffic along California Avenue. As stated in the *Draft Burlingame Downtown Specific Plan: Traffic Impact Analysis Technical Memorandum* (Wilbur Smith Associates, January 2009), the current traffic flow at these two intersections was observed to be satisfactory; however, traffic conditions at California Drive/Lorton Avenue were operating unsatisfactory during the evening peak hour, primarily because of delay and queuing for the eastbound Lorton Avenue left turning movement onto California Drive. Furthermore, under both Build

[19] A detailed traffic assessment of the traffic impacts associated with Downtown Burlingame Specific Plan is provided in the *Draft Burlingame Downtown Specific Plan: Traffic Impact Analysis Technical Memorandum* (Wilbur Smith Associates, January 2009).

Options, this intersection would continue to perform unsatisfactorily, due to the significant amount of delay for vehicles attempting to turn left onto California Drive from Lorton Avenue.[20]

Previous documentation has analyzed the feasibility of installing a roundabout and merging the California/Bellevue Avenue and California Drive/Lorton Avenue intersections. According to the *Traffic Engineering Technical Assistance Program (TETAP): California Drive/Bellevue Avenue Traffic Signal and Intersection Evaluation Final Report* (December 2007), the installation of a roundabout would require the elimination of 10 on-street parking spaces, relocation of bus stops, and relocation of an existing fire hydrant on the east corner of the California Drive/Lorton Avenue intersection. Additional requirements include installing appropriate signage for automobiles, transit vehicles as well as pedestrians; relocate bus shelter, install new curb ramp and high visibility crosswalk; and install new "Yield" signs in all approaches. Major improvements would include reducing the number of travel lanes on California Drive from two lanes to one lane at the roundabout entrance. Furthermore, the analysis concluded that installing a roundabout would reduce travel delay, and increase pedestrian safety.[21]

Sidra Intersection, a micro-analytical tool traffic evaluation program was used to model the lane geometries and travel demand of a planned roundabout at California Drive/Lorton Avenue/Bellevue Avenue. As such, the existing intersection was reconfigured to provide a four-legged roundabout intersection, with one travel lane in each direction; with each movement "yielding" at the entry curb of the roundabout.[22] Roundabout operations were conducted under Year 2030 No Project, Year 2030 plus Project (Option 1), and Year 2030 (Option 2) conditions. No project and project-related trips per turning movement were incorporated into each scenario (similar to intersection operation analyses).[23] Measures of effectiveness (MOEs) in analyzing roundabout operations are similar to typical intersection operation analyses, which consider average vehicle delay per approach, travel speed and time, and queuing. It must be noted that LOS values for the roundabout analysis are based on the *Highway Capacity Manual* (HCM 2000) methodology, and roundabout LOS performance is a function of capacity and volume-to-capacity ratio.[24]

Under Year 2030 No Project conditions, the roundabout would operate satisfactorily at LOS B, with 10.4 seconds of average. Under Year 2030 plus Project (Option 1) conditions, the roundabout would operate satisfactorily at LOS C, with 21.5 seconds of delay. Lastly, the roundabout would operate satisfactorily at LOS C, with 23.4 seconds of delay under Year 2030 plus Project (Option 2) conditions. Overall, the intersection would perform at an acceptable LOS (LOS D or better) under each Future Year condition. Table 8 summarizes these results; detailed roundabout outputs are located in Appendix B.

[20] Refer to *Draft Burlingame Downtown Specific Plan: Traffic Impact Analysis Technical Memorandum* (Wilbur Smith Associates, January 2009) for a detailed traffic analysis.

[21] Refer to *Traffic Engineering Technical Assistance Program (TETAP): California Drive/Bellevue Avenue Traffic Signal and Intersection Evaluation Final Report* (December 2007) for detailed description and illustration of the proposed roundabout at the California Drive/Lorton Avenue/Bellevue Avenue intersection.

[22] Roundabout assumptions and geometrics were based on the roundabout schematic provided in the *Traffic Engineering Technical Assistance Program (TETAP): California Drive/Bellevue Avenue Traffic Signal and Intersection Evaluation Final Report* (December 2007).

[23] Project trip estimates for roundabout analysis under Future Year scenarios were derived from *Draft Burlingame Downtown Specific Plan: Traffic Impact Analysis Technical Memorandum* (Wilbur Smith Associates, January 2009).

[24] Refer to Highway Capacity Manual (HCM 2000); Chapter 17 for roundabout methodology.

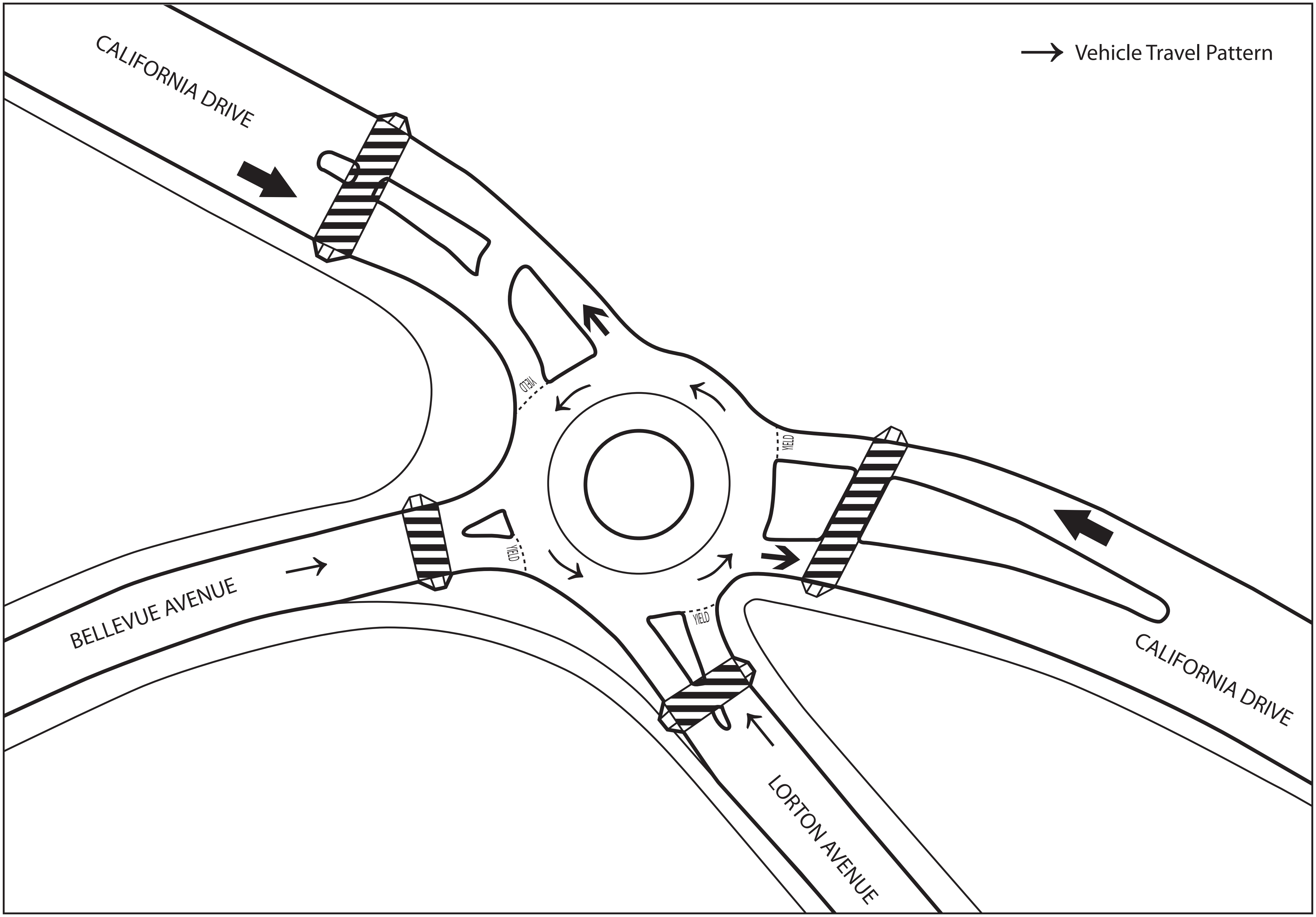
Table 8: Roundabout Operations Analysis

Scenario	PM Peak Hour		
	V/C Ratio	Delay	LOS
Year 2030 No Project	0.78	10.4	B
Year 2030 No Project (Option 1)	1.0	21.5	C
Year 2030 No Project (Option 2)	1.02	23.4	C

The Proposed Project would increase the amount of traffic at the California Drive/Lorton Avenue/Bellevue Avenue intersection, primarily due to project location and travel patterns within the Proposed Project Area. Projected traffic along Lorton Avenue and Bellevue Avenue would be minimal; however the project-trips relative to future traffic volumes would increase along California Drive. A roundabout would minimize intersection delay, primarily for vehicles attempting to access California Drive from Lorton and Bellevue avenues. Furthermore, the roundabout would increase traffic capacity, and improve traffic flow under Year 2030 plus Project conditions, as presented in the analysis.[25]

Figure 2 illustrates the roundabout schematic and vehicle travel pattern.

[25] Future traffic conditions are based on Year 2030 projections, based on the C\CAG regional travel demand model. As discussed, the travel demand associated with the Proposed Project would not exceed travel capacity if a roundabout were to be installed. Refer to *Traffic Engineering Technical Assistance Program (TETAP): California Drive/Bellevue Avenue Traffic Signal and Intersection Evaluation Final Report* (December 2007) for typical roundabout features, and installation requirements, specifically at the California Drive/Lorton Avenue/Bellevue Avenue intersection.



** Note: Schematic based on TETAP Final Report. DKS Associates (December 28, 2007)*

FIGURE 2: PROPOSAL ROUNDABOUT VEHICLE TRAVEL PATTERN

WilburSmith
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Highland Avenue Closure

In order to maximize developmental space, the lane closure along Highland Avenue, from California Avenue (north) to Howard Avenue (south) has been proposed. This roadway is nearly 260 feet (78 meters) in distance, with two, one-way travel lanes in the southbound direction. In addition, there are approximately 22 on-street parking spaces along both sides of the street, with furnishing, retail, and café/restaurant uses located along the roadway. Existing travel patterns and field observations have noted that the majority of through traffic along this roadway originate in the southbound Howard Avenue approach, and travel onto Highland Avenue in order to perform right-turns (westbound) onto Howard Avenue (stop controlled), instead of continuing along California Drive and turn right onto Howard Avenue at the California Drive/Howard Avenue intersection (signal controlled). Furthermore, field observations have indicated that there are minimal traffic volumes along Highland Avenue during the peak hours. Since the majority of traffic associated with the Proposed Project would travel through California Drive and would not turn onto Highland Avenue, the closer of this roadway would not impact the traffic operations at the California Drive/Howard Avenue intersection.[26] According to the *Draft Burlingame Downtown Specific Plan: Traffic Impact Analysis Technical Memorandum* (Wilbur Smith Associates, January 2009), signal timing adjustments under future conditions would mitigate potential traffic impacts along California Drive and these improvements would not affect traffic conditions along Howard Avenue or Highland Avenue.[27]

Transit Conditions

In order to understand how the Proposed Project would potentially impact the existing transit system, an assessment of weekday and weekend mode split data and transit usage was reviewed.

Based on the *San Francisco Bay Area Travel Survey 2000 Regional Travel Characteristics Report* (August 2004), of the total weekday trips from other counties to San Mateo County, the majority of commuters were single-occupancy drivers (SOVs), 61 percent. Weekday trips from San Mateo County to other counties were mostly SOVs, 60 percent. For transit-related trips, the percentage is much lower; in which 3.1 percent of total weekday trips were on transit from other counties to San Mateo County, and 4.63 percent of the total weekday trips from San Mateo County to other counties used transit in order to get to their destination. Intraregional mode split within San Mateo County indicates of the total weekday trips within the county, 58 percent are SOVs, 25 percent are passengers in a vehicle, and 2.8 percent are transit riders. During the weekend, the mode split trend is similar to weekday travel behavior. Of the total weekend trips from other counties to San Mateo County, 0.82 percent use transit and of the total trips from San Mateo County to other counties, 1.5 percent use transit. For weekend trips within San Mateo County during the weekend, 0.66 percent use transit. Overall, the majority of commuters travel to and from San Mateo County, and within San Mateo County during the weekday and weekend travel by automobile, and a low proportion of commuters use transit.[28]

On a local level, Burlingame has a relatively low percentage of commuters who use public transportation and a relatively high percentage that drive alone to work. Two percent of the total workforce commute via bus in order to get to work and five percent use heavy rail in order to commute to work; whereas 77 percent drive alone to work. Travel modes to work for Burlingame are presented in Table 9.

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[26] It must be noted that an agreement between city officials, local business owners, and residents would be necessary in order to ensure that the closer of Highland Avenue would deem practical and feasible.

[27] The potential closer of Highland Avenue was not evaluated in the *Draft Burlingame Downtown Specific Plan: Traffic Impact Analysis Technical Memorandum* (Wilbur Smith Associates, January 2009); however, the analysis determined no significant impacts associated with the Proposed Project along Highland Avenue.

[28] Refer to Table 5.3.6D and Table 5.3.8E in the *San Francisco Bay Area Travel Survey 2000 Regional Travel Characteristics Report* (August 2004). Metropolitan Transportation Commission.

Table 9: Commute to Work Mode Split

Mode	Total Commuters	Percent of Total Commuters (%)
Drove Alone	11,733	77%
Carpooled	1,053	7%
Bus	257	2%
Subway or elevated	126	<1%
Railroad	751	5%
Ferry	0	0%
Bicycle	108	<1%
Walked	360	2%
Other	99	<1%
Worked at Home	715	5%
Total	15,202	100%

Source: 2000 US Census

The following discussion includes detailed descriptions of each transit service provider that operates throughout the Proposed Project Area. System-level ridership, performance measures, and planned transit improvements specific to transit stations and stops in Burlingame are further reviewed.

There are several public transit services throughout the Proposed Project Area. Caltrain (commuter rail), SamTrans (bus transit operations) and the local Burlingame Trolley (shuttle services) routes are located throughout the network.[29]

Caltrain. Due to the location of planned developments in the *Specific Plan*, the downtown Burlingame Caltrain station (located at California Drive and Burlingame Avenue) would be the optimal commuter rail station for patrons of the Proposed Project. During commute hours, limited-stop trains provide faster service to/from Burlingame. During off-peak weekday hours, the limited-stop trains alternate with local service trains which stop at all stations. The weekday frequency service is nearly 30 minutes during evenings; and weekends and holidays run at 1-hour intervals.

The main objectives of the *Caltrain Short Range Transportation Plan* (2008) include addressing station needs while coordinating service with connecting transit operators throughout the Bay Area, improve station access for all passengers, and enhance system performance. In regards to patronage, average weekday ridership has increased 22 percent (between Year 2004 and Year 2006), with a projected 58 percent growth by Year 2017. As of March 2008, two trains were added to the existing 96-train weekday fleet schedule and in Year 2009, Caltrain will acquire eight additional passenger rail cars to accommodate increasing passenger demand. Through Year 2013, Caltrain is expected to operate a 98-train weekday schedule, with current service pattern of five trains per hour per direction in the peak. By Year 2014, a sixth train will be added per hour; therefore operating a 110-weekday schedule through Year 2017. Proposed station improvements have been planned at the current Burlingame station, which will allow trains traveling in opposing directions to serve the same station simultaneously without incurring delay and appropriate fencing has also been planned at the station.[30]

According to the *2009 Annual Passenger Counts*, passenger boardings at Burlingame Caltrain Station are 1.86 percent of the weekday total passenger boardings, while operating at 24 percent capacity during the weekday northbound commute hours, and 17 to 25 percent during the weekday southbound commute.[31] These

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[29] Refer to *Burlingame Downtown Specific Plan: Existing Conditions Workbook* (October 2007) for additional information on public transit services for the Downtown Burlingame Specific Plan Area.

[30] Refer to Caltrain Short Range Transit Plan Fiscal Years 2008 to 2017 (February 2008). Caltrain.

[31] 2009 Caltrain Annual Passenger Counts (February 2009). Caltrain.

passenger boardings and capacity utilization rates are relatively moderate-to-low in comparison to other commuter rail stations.

Given the current service operations, frequencies, moderate-to-low passenger capacity rates at the Burlingame Caltrain Station, and proposed station improvements, it is evident that future capacity would be able to accommodate future demand associated with the Proposed Project; therefore no identifiable impacts would affect the transit operations as a result of the Proposed Project.

Burlingame Trolley. This local service would provide access to Proposed Project Area; operating every day at 45 minute intervals. In addition, this service provides access to shopping areas along Burlingame Avenue. The service operates between 11:30 AM and 9:30 PM, seven days a week. Scheduled stops within the Project Area include El Camino Real/Burlingame Avenue, and California Drive/Highland Avenue/Burlingame Avenue (Burlingame Caltrain Station).

Based on the recent operating levels, the seating capacity of the Burlingame Trolley is 32 seats, and in comparison to Year 2008 performance measures, current ridership has decreased 16.5 percent, respectively. More so, the system rarely experiences demand greater than 75 percent, with the highest recorded demand to be 68.8 percent.[32]

Visitors and residents that live near downtown would likely patronize the trolley system throughout the Proposed Project Area; however, recent operating performance levels indicate that the trolley experiences low ridership, and is often underutilized. Based on these performance trends, the Burlingame Trolley would not experience any significant transit impacts as a result of the Proposed Project. However, the Burlingame Trolley would serve as transportation alternative and serve to increase access to the Proposed Project Area.

SamTrans. There are several transit routes that operate throughout the Proposed Project Area. The majority of transit routes near the Proposed Project Area operate along the El Camino Real (western boundary), as well as provide direct access to Burlingame Avenue (northern boundary) and California Drive (eastern boundary). The SamTrans routes that operate throughout the Proposed Project Area are summarized below:

- **Route 46 (Arundel & Howard/Quesada & Trousdale) -** The 'Community Service' Route 46 bus circulates within Proposed Project Area primarily operating along Burlingame Avenue, El Camino Real, and along California Drive. The route seeks primarily to serve local students, as it functions only during school days and circulates once in the morning at approximately 8:00 am, and at early afternoon times that are tailored to local school schedules.

- **Route 292 Caltrain Connection -** The SamTrans Route 292 bus stops within the Proposed Project Area at the intersection of California Drive and Howard Avenue, and at California Drive and Bellevue Avenue, and stops at frequencies of between 30 and 60 minutes during the week and on weekends.

- **Route 390 BART/Caltrain Connection -** The SamTrans 390 bus runs along El Camino Real on the western edge of the Proposed Project Area at frequencies of between 30 and 60 minutes during both the weekday and weekend service hours. The 390 bus provides direct access to the Proposed Project Area at the El Camino Real/Burlingame Avenue stop.

- **Route 391 BART/Caltrain Connection -** The SamTrans 391 bus operates intermittent municipal stops along Mission Street in San Francisco and shopping areas along El Camino Real. Route 391

[32] Peninsula Traffic Congestion Relief Alliance Shuttle Summary (Fiscal Year 2008 – 2009 3rd Quarter Results). Michael Stevenson, Shuttle Program Manager for Peninsula Traffic Congestion Relief Alliance.

runs on El Camino Real along the western edge of the Proposed Project Area. The 391 bus provides direct access to the Proposed Project Area at the El Camino Real/Burlingame Avenue stop.

- **Route 397 All Nighter -** The 397 All Nighter bus operates along El Camino Real along the western edge of the Proposed Project Area. The 397 operates at 60 minute intervals every night. The 397 bus provides direct access to the Proposed Project Area at the El Camino Real/Burlingame Avenue stop.

According to the *MTC Transit Passenger Demographic Survey* (June 2007), the majority of SamTrans patrons used transit in order to get to their place of residence (42.9 percent), place of employment (22.8 percent), and school (13.4 percent). Of the total surveyed, 5.7 percent used transit for retail purposes, 1.2 percent used transit for recreational purposes, and few used transit for other purposes. In addition, the majority of respondents indicated that their total travel time on SamTrans was between 20 and 29 minutes (27.5 percent); 10 to 19 minutes (16.4 percent); and 30 to 39 minutes (15.4 percent).[33] This may indicate that the majority of transit riders are traveling a significant distance to their destination, from their place of origin.

Based on *SamTrans Short Range Transportation Plan* (SRTP), there are several planned improvements to enhance system performance, increase ridership, and improve accessibility. Key improvements relative to the Proposed Project Area include prioritization of service improvements in areas of where high density and mixed-use developments are provided. In addition, the SRTP states that transit service along El Camino Real experiences significant demand and SamTrans has considered adding an express bus service along the corridor. However, the analysis concluded this express service to be infeasible until land use density increase with additional housing and employment centers along El Camino Real. In order to increase intercity transit use, and to accommodate to the growing aging population, community-based shuttles are planned to increase throughout the transit network. Ridership projections for fixed-route service is expected to grow at a rate of two percent per year, beginning in Year 2009, and with the exception of increases in peak headways along El Camino Real, there are no significant service changes currently planned for the next 10 years.[34]

As stated, SamTrans has continued to investigate the potential for increasing transit service as developments continue to be planned and built. Due to current transit operations for each route, an increase in ridership and accessibility would likely occur as a result of the Proposed Project; however, current ridership levels and projected ridership, with the addition of transit demand based on the Proposed Project would not impact schedule adherence or productivity; therefore there are no identifiable transit impacts as a result of the Proposed Project.

Bicycle Conditions

There are several bicycle routes and bicycle lanes in the vicinity of the Proposed Project Area. Currently, there are bicycle routes at the following locations:[35]

- **Primrose Road** – from Oak Grove Avenue (north) to Howard Avenue (south). In reference to the Proposed Project Area, this route intersects with Burlingame and Howard avenues.

- **Highland Avenue –** from Howard Avenue (north) to Peninsula Avenue (south) and continues south of Peninsula Avenue. In reference to the Proposed Project Area, this route intersects with Howard, Baywater, and Peninsula avenues.

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[33] Refer to MTC Transit Passenger Demographic Survey Phase One Draft 1. Presented to MTC and prepared by Godbe Research (April 2007).

[34] Refer to *SamTrans Short Range Transportation Plan* Fiscal Years 2008 through 2017 (June 2007). San Mateo County Transit District.

[35] Bicycle route and lane locations were provided by City of Burlingame (2009).

- **California Drive –** from Burlingame City Limits (north) to Howard Avenue (south). In reference to the Proposed Project Area, this route intersects with Burlingame Avenue.

- **Howard Avenue –** from Humboldt Road (east) to Occidental Avenue (west). In reference to the Proposed Project Area, this route intersects with El Camino Real, Primrose Road, Park Road, Lorton Avenue, and Highland Avenue. A bicycle lane is also present along Howard Avenue, which operates from Humboldt Road (east) to Highland Avenue (west). In reference to the Proposed Project Area, this bicycle lane intersects with Highland Avenue and California Drive.

According to the *Draft Burlingame Downtown Specific Plan: Traffic Impact Analysis Technical Memorandum* (Wilbur Smith Associates, January 2009), a significant impact at the intersection of California Drive and Howard Avenue would occur as a result of the Proposed Project. However, signal timing adjustments at this intersection were proposed, which would reduce traffic impacts to a less than significant level. Furthermore, the preliminary traffic assessment indicates that the impact will most likely occur in the northbound California Drive approach, and would not affect the east-west Howard Avenue approaches; therefore the increased volumes along this roadway would not impact the bicycle lane.

Pedestrian Conditions

The Proposed Project Area is pedestrian oriented and has a high amount of pedestrian traffic. According to the *Burlingame Downtown Specific Plan: Existing Conditions Workbook* (October 2007), field observations indicated that the greatest volume of pedestrian crossings were across Bellevue Avenue, near the library, and across Burlingame Avenue at Park Road. These findings can be primarily caused by the amount of retail, office, and restaurant land uses along Bellevue and Burlingame avenues. These corridors often experience high amounts of pedestrian volume and adequate sidewalks and pedestrian crossings are located along these local streets. According to the *Draft Burlingame Downtown Specific Plan: Traffic Impact Analysis Technical Memorandum* (Wilbur Smith Associates, January 2009), there are no identifiable traffic impacts along Burlingame or Bellevue avenues, therefore the increased traffic associated with the Proposed Project would not affect the pedestrian conditions along these local streets.

Public consideration for increasing pedestrian safety has been an issue, specifically in the downtown region. As stated in the *Burlingame Downtown Specific Plan: Options and Alternatives Workbook* (March 2008), several mitigation measures were presented in order to improve pedestrian conditions. These improvements included implementing traffic-calming measures (speed bumps, mid-block crossings, and proposing additional one-way streets), increase sidewalk “linkage” to improve connectivity downtown, and widening sidewalks. Overall, these mitigation measures would improve pedestrian safety and encourage residents and visitors to patronize Downtown Burlingame.

We hope you find this information helpful. Please feel free to contact me or Peter Costa regarding this analysis.

Best regards,

WILBUR SMITH ASSOCIATES

Terri O'Connor, AICP
Transportation Planning Manager

Peter Costa
Transportation Planner

Appendix A

PROPOSED DEVELOPMENT & TRIP GENERATION ESTIMATES

Proposed Development (Future Year 2030 Option 1)

Proposed Developmetn (Land Use) per Block

				Residential
Block	**Retail**	**Office**	**Hotel***	**units**
15B	16.008	13.661		84
16B	6.348	-0.749		50
17B	-4.219	21.216		112
18	-8.081	14.292		57
21B	13.301	2.392		19
22A	12.572	-8.237		37
23A	16.718	-9.908		34
24A	3.334	2.881		34
25A	5.141	4.002		16
25B	17.572	23.016		91
26	44.735	27.510		109
32B	22.383	30.443		121
33	38.032	28.182		112
Total	**183.844**	**148.702**	**120.00**	**876**
			rooms	**units**
*use 100,000gsf of hotel; 120 rooms				

Maximum Peak Hour Demand

Weekday

	Spaces
Retail	208
Office	422
Hotel	156
Low Res	1279
Total	**2,065**

Weekend

	Spaces
Retail	392
Office	128
Hotel	216
Low Res	745
Total	**1,480**

Adjusted Peak Hour Demand (shared parking redux)
(does not consider residential demand)

	AM	**MID**	**PM**
Retail	0	156	98
Office	363	422	76
Hotel	142	156	114
Total	505	734	288
% Reduction	36%	7%	63%

Parking Requirements

Municipal Code		Spaces	Type	Total
25.70.032	Condomini	1.5	per dwelling	1,314
25.70.040	Commercial Use			
	Retail	1	per 400 GSF	460
	Office	1	per 300 GSF	496
25.70.034	Hotel Use	1	per dwelling	120
Total				**2,389**

Proposed Development (Future Year 2030 Option 2)

			Residential
Block	**Retail**	**Office**	**units**
15B	16.008	22.848	118
16B	6.348	-1.253	71
17B	-4.219	35.483	158
18	-8.081	23.903	80
21B	13.301	4.001	26
22A	12.572	-13.776	52
23A	16.718	-16.571	48
24A	3.334	4.819	48
25A	5.141	6.694	22
25B	17.572	38.494	128
26	44.735	46.01	153
32B	22.383	50.916	170
33	38.032	47.134	157
Total	**183.844**	**248.702**	**1,231**
			units

Maximum Peak Hour Demand

Weekday

Retail	208
Office	706
High Res	1797
Total	**2,711**

Weekend

Retail	392
Office	214
High Res	1046
Total	**1,652**

Adjusted Peak Hour Demand (shared parking redux)
(does not consider residential demand)

	AM	**MID**	**PM**
Retail	0	156	98
Office	607	706	127
Total	607	862	225
% Reduction	34%	6%	75%

Parking Requirements

Municipal Code		Spaces	Type	Total
25.70.032	Condomi	1.5	per dwelling	1,847
25.70.040	Commercial Use			
	Retail	1	per 400 GSF	460
	Office	1	per 300 GSF	829
Total				**3,135**

Appendix B

ROUNDABOUT ANALYSIS OUTPUTS

SIDRA INTERSECTION

Movement Summary

Bellevue Roundabout

No Build Scenario PM Peak Hour

Roundabout

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (ft)	Prop. Queued	Eff. Stop Rate	Aver Speed (mph)
Lorton Avenue										
11L	L	1	50.0	0.400	21.0	LOS C	88	0.91	0.99	25.5
16T	T	64	1.6	0.390	14.0	LOS B	88	0.91	0.97	28.5
16R	R	115	1.7	0.390	15.7	LOS B	88	0.91	0.86	27.4
Approach		**181**	**2.2**	**0.390**	**15.2**	**LOS B**	**88**	**0.91**	**0.90**	**27.7**
California Drive WB										
1L	L	116	1.7	0.652	13.8	LOS B	233	0.55	0.62	28.3
6R	R	722	1.9	0.653	6.2	LOS A	233	0.55	0.49	31.9
Approach		**838**	**1.9**	**0.653**	**7.3**	**LOS A**	**233**	**0.55**	**0.51**	**31.3**
California Drive EB										
15L	L	804	2.0	0.783	12.7	LOS B	325	0.73	0.62	28.5
12T	T	126	2.4	0.783	6.9	LOS A	325	0.73	0.55	31.0
12R	R	54	1.9	0.783	7.9	LOS A	325	0.73	0.55	30.6
Approach		**984**	**2.0**	**0.783**	**11.7**	**LOS B**	**325**	**0.73**	**0.60**	**28.9**
Bellevue Avenue										
13L	L	28	3.6	0.204	21.8	LOS C	43	0.91	0.94	25.2
18R	R	51	2.0	0.204	14.7	LOS B	43	0.91	0.92	28.0
Approach		**79**	**2.5**	**0.204**	**17.2**	**LOS B**	**43**	**0.91**	**0.92**	**26.9**
All Vehicles		**2082**	**2.0**	**0.783**	**10.4**	**LOS B**	**325**	**0.68**	**0.60**	**29.6**

Symbols which may appear in this table:

Following Degree of Saturation
x = 1.00 for Short Lane with resulting Excess Flow
* x = 1.00 due to minimum capacity

Following LOS
- Based on density for continuous movements

Following Queue
- Density for continuous movement

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SIDRA INTERSECTION

Movement Summary

Bellevue Roundabout

Option 1 PM Peak Hour

Roundabout

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (ft)	Prop. Queued	Eff. Stop Rate	Aver Speed (mph)
Lorton Avenue										
11L	L	1	50.0	0.667	41.4	LOS D	208	1.00	1.16	18.9
16T	T	70	1.4	0.693	34.4	LOS C	208	1.00	1.19	20.0
16R	R	127	2.4	0.694	35.4	LOS D	208	1.00	1.09	19.6
Approach		**199**	**2.5**	**0.692**	**35.1**	**LOS D**	**208**	**1.00**	**1.13**	**19.8**
California Drive WB										
17L	L	107	1.9	0.849	14.1	LOS B	438	0.86	0.58	27.7
14T	T	46	2.2	0.852	7.0	LOS A	438	0.86	0.55	30.4
14R	R	944	2.0	0.850	8.0	LOS A	438	0.86	0.54	30.1
Approach		**1097**	**2.0**	**0.849**	**8.6**	**LOS A**	**438**	**0.86**	**0.54**	**29.8**
California Drive EB										
15L	L	1010	2.0	0.999	31.6	LOS C	1183	1.00	0.99	21.6
12T	T	126	2.4	1.000	24.5	LOS C	1183	1.00	0.99	23.3
12R	R	54	1.9	1.000	25.5	LOS C	1183	1.00	0.96	22.9
Approach		**1190**	**2.0**	**0.999**	**30.6**	**LOS C**	**1183**	**1.00**	**0.99**	**21.8**
Bellevue Avenue										
13L	L	32	3.1	0.416	33.8	LOS C	100	1.00	1.05	20.9
18T	T	55	1.8	0.414	26.7	LOS C	100	1.00	1.05	22.5
18R	R	2	33.3	0.429	27.7	LOS C	100	1.00	0.97	22.1
Approach		**90**	**3.3**	**0.415**	**29.3**	**LOS C**	**100**	**1.00**	**1.05**	**21.9**
All Vehicles		**2576**	**2.1**	**1.000**	**21.5**	**LOS C**	**1183**	**0.94**	**0.81**	**24.3**

Symbols which may appear in this table:

Following Degree of Saturation
x = 1.00 for Short Lane with resulting Excess Flow
* x = 1.00 due to minimum capacity

Following LOS
- Based on density for continuous movements

Following Queue
- Density for continuous movement

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SIDRA INTERSECTION

Movement Summary

Bellevue Roundabout

Option 2 PM Peak Hour

Roundabout

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (ft)	Prop. Queued	Eff. Stop Rate	Aver Speed (mph)
Lorton Avenue										
11L	L	1	50.0	0.667	45.2	LOS D	223	1.00	1.18	18.0
16T	T	70	1.4	0.722	38.2	LOS D	223	1.00	1.21	18.9
16R	R	128	2.3	0.719	39.2	LOS D	223	1.00	1.12	18.6
Approach		**200**	**2.5**	**0.721**	**38.9**	**LOS D**	**223**	**1.00**	**1.15**	**18.7**
California Drive WB										
17L	L	101	2.0	0.878	14.3	LOS B	503	0.95	0.57	27.5
14T	T	43	2.3	0.878	7.3	LOS A	503	0.95	0.56	30.0
14R	R	997	2.0	0.881	8.3	LOS A	503	0.95	0.54	29.7
Approach		**1141**	**2.0**	**0.881**	**8.8**	**LOS A**	**503**	**0.95**	**0.54**	**29.5**
California Drive EB										
15L	L	1044	2.0	1.016	34.9	LOS C	1310	1.00	1.03	20.6
12T	T	126	2.4	1.016	27.9	LOS C	1310	1.00	1.03	22.1
12R	R	54	1.9	1.019	28.9	LOS C	1310	1.00	1.00	21.7
Approach		**1224**	**2.0**	**1.015**	**33.9**	**LOS C**	**1310**	**1.00**	**1.03**	**20.7**
Bellevue Avenue										
13L	L	32	3.1	0.432	35.4	LOS D	105	1.00	1.06	20.4
18T	T	56	1.8	0.431	28.3	LOS C	105	1.00	1.06	21.9
18R	R	2	33.3	0.429	29.2	LOS C	105	1.00	0.97	21.5
Approach		**91**	**3.3**	**0.430**	**30.8**	**LOS C**	**105**	**1.00**	**1.05**	**21.4**
All Vehicles		**2656**	**2.1**	**1.019**	**23.4**	**LOS C**	**1310**	**0.98**	**0.83**	**23.5**

Symbols which may appear in this table:

Following Degree of Saturation
x = 1.00 for Short Lane with resulting Excess Flow
* x = 1.00 due to minimum capacity

Following LOS
- Based on density for continuous movements

Following Queue
- Density for continuous movement

SIDRA SOLUTIONS

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Appendix F

CNDDB Search

California Department of Fish and Game
Natural Diversity Database
Selected Elements by Common Name - Portrait
D41365.00 Burlingame SPCA - Sam Mateo Quad only

	Common Name/Scientific Name	Element Code	Federal Status	State Status	GRank	SRank	CDFG or CNPS
1	Alameda song sparrow *Melospiza melodia pusillula*	ABPBXA301S			G5T2?	S2?	SC
2	American peregrine falcon *Falco peregrinus anatum*	ABNKD06071	Delisted	Endangered	G4T3	S2	
3	Bay checkerspot butterfly *Euphydryas editha bayensis*	IILEPK4055	Threatened		G5T1	S1	
4	California black rail *Laterallus jamaicensis coturniculus*	ABNME03041		Threatened	G4T1	S1	
5	California clapper rail *Rallus longirostris obsoletus*	ABNME05016	Endangered	Endangered	G5T1	S1	
6	California red-legged frog *Rana aurora draytonii*	AAABH01022	Threatened		G4T2T3	S2S3	SC
7	Crystal Springs lessingia *Lessingia arachnoidea*	PDAST5S0C0			G1	S1.2	1B.2
8	Davidson's bush mallow *Malacothamnus davidsonii*	PDMAL0Q040			G1	S1.1	1B.2
9	Edgewood blind harvestman *Calicina minor*	ILARA13020			G1	S1	
10	Franciscan onion *Allium peninsulare var. franciscanum*	PMLIL021R1			G5T2	S2.2	1B.2
11	Hall's bush mallow *Malacothamnus hallii*	PDMAL0Q0F0			G1Q	S1.2	1B.2
12	Hillsborough chocolate lily *Fritillaria biflora var. ineziana*	PMLIL0V031			G1QT1Q	S1.1	1B.1
13	Marin western flax *Hesperolinon congestum*	PDLIN01060	Threatened	Threatened	G2	S2.1	1B.1
14	Myrtle's silverspot *Speyeria zerene myrtleae*	IILEPJ6089	Endangered		G5T1	S1	
15	Northern Coastal Salt Marsh	CTT52110CA			G3	S3.2	
16	Point Reyes bird's-beak *Cordylanthus maritimus ssp. palustris*	PDSCR0J0C3			G4?T2	S2.2	1B.2
17	Ricksecker's water scavenger beetle *Hydrochara rickseckeri*	IICOL5V010			G1G2	S1S2	
18	San Francisco Bay spineflower *Chorizanthe cuspidata var. cuspidata*	PDPGN04081			G2T2	S2.2	1B.2
19	San Francisco Forktail Damselfly *Ischnura gemina*	IIODO72010			G2	S2	
20	San Francisco collinsia *Collinsia multicolor*	PDSCR0H0B0			G2	S2.2	1B.2
21	San Francisco garter snake *Thamnophis sirtalis tetrataenia*	ARADB3613B	Endangered	Endangered	G5T2	S2	
22	San Francisco lacewing *Nothochrysa californica*	IINEU12010			GNR	S1S3	
23	San Mateo thorn-mint *Acanthomintha duttonii*	PDLAM01040	Endangered	Endangered	G1	S1.1	1B.1

	Common Name/Scientific Name	Element Code	Federal Status	State Status	GRank	SRank	CDFG or CNPS
24	San Mateo woolly sunflower *Eriophyllum latilobum*	PDAST3N060	Endangered	Endangered	G1	S1.1	1B.1
25	Santa Cruz kangaroo rat *Dipodomys venustus venustus*	AMAFD03042			G4T1	S1	
26	Serpentine Bunchgrass	CTT42130CA			G2	S2.2	
27	arcuate bush mallow *Malacothamnus arcuatus*	PDMAL0Q0E0			G2Q	S2.2	1B.2
28	bent-flowered fiddleneck *Amsinckia lunaris*	PDBOR01070			G2	S2.2	1B.2
29	coastal marsh milk-vetch *Astragalus pycnostachyus var. pycnostachyus*	PDFAB0F7B2			G2T2	S2.2	1B.2
30	double-crested cormorant *Phalacrocorax auritus*	ABNFD01020			G5	S3	SC
31	fountain thistle *Cirsium fontinale var. fontinale*	PDAST2E161	Endangered	Endangered	G2T1	S1.1	1B.1
32	fragrant fritillary *Fritillaria liliacea*	PMLIL0V0C0			G2	S2.2	1B.2
33	hoary bat *Lasiurus cinereus*	AMACC05030			G5	S4?	SC
34	monarch butterfly *Danaus plexippus*	IILEPP2010			G5	S3	
35	pallid bat *Antrozous pallidus*	AMACC10010			G5	S3	SC
36	saline clover *Trifolium depauperatum var. hydrophilum*	PDFAB400R5			G5T2?	S2.2?	1B.2
37	salt-marsh harvest mouse *Reithrodontomys raviventris*	AMAFF02040	Endangered	Endangered	G1G2	S1S2	
38	western leatherwood *Dirca occidentalis*	PDTHY03010			G2G3	S2S3	1B.2
39	western snowy plover *Charadrius alexandrinus nivosus*	ABNNB03031	Threatened		G4T3	S2	SC
40	white-rayed pentachaeta *Pentachaeta bellidiflora*	PDAST6X030	Endangered	Endangered	G1	S1.1	1B.1

Appendix G

Traffic Noise Levels

TRAFFIC NOISE LEVELS

Project Number:
Project Name: Burlingame Downtown Specific Plan

Background Information

Model Description:	FHWA Highway Noise Prediction Model (FHWA-RD-77-108) with California Vehicle Noise (CALVENO) Emission Levels.
Analysis Scenario(s):	Existing and Existing plus Project
Source of Traffic Volumes:	CHS Consluting Group
Community Noise Descriptor:	L_{dn}: ____ CNEL: x

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

Traffic Noise Levels

Analysis Condition Roadway Segment	Land Use	Lanes	Median Width	Peak Hour Volume	ADT Volume	Design Speed (mph)	Dist. from Center to Receptor[1]	Alpha Factor	Barrier Attn. dB(A)	Vehicle Mix Medium Trucks	Vehicle Mix Heavy Trucks	Peak Hou dB(A) L_{eq}	24-Hour dB(A) CNEL
Existing Conditions													
California	Residential	4	0	1,560	15,600	35	50	0	0	1.8%	0.7%	67.7	67.0
Howard	Commerical	2	0	812	8,120	25	30	0	0	1.8%	0.7%	63.9	63.1
El Camino	Residential	4	0	2,399	23,990	35	30	0	0	1.8%	0.7%	72.5	71.7
Peninsula	Residential	2	0	426	4,260	25	30	0	0	1.8%	0.7%	61.1	60.3
Year 2030 No Project													
California	Residential	4	0	1,763	17,630	35	50	0	0	1.8%	0.7%	68.3	67.5
Howard	Residential	2	0	868	8,680	25	30	0	0	1.8%	0.7%	64.2	63.4
El Camino	Residential	4	0	3,237	32,370	35	30	0	0	1.8%	0.7%	73.8	73.0
Peninsula	Residential	2	0	626	6,260	25	30	0	0	1.8%	0.7%	62.8	62.0
Year 2030 Option 1													
California	Residential	4	0	2,090	20,900	35	50	0	0	1.8%	0.7%	69.0	68.2
Howard	Residential	2	0	1,024	10,240	25	30	0	0	1.8%	0.7%	64.9	64.1
El Camino	Residential	4	0	3,325	33,250	35	30	0	0	1.8%	0.7%	73.9	73.1
Peninsula	Residential	2	0	635	6,350	25	30	0	0	1.8%	0.7%	62.8	62.0
Year 2030 Option 2													
California	Residential	4	0	2,173	21,730	35	50	0	0	1.8%	0.7%	69.2	68.4
Howard	Residential	2	0	966	9,660	25	30	0	0	1.8%	0.7%	64.6	63.9
El Camino	Residential	4	0	3,340	33,400	35	30	0	0	1.8%	0.7%	73.9	73.2
Peninsula	Residential	2	0	644	6,440	25	30	0	0	1.8%	0.7%	62.9	62.1

[1] Distance is from the centerline of the roadway segment to the receptor location.

Appendix H

Sandis Infrastructure Report

BURLINGAME DOWNTOWN SPECIFIC PLAN
INFRASTRUCTURE REPORT

OCTOBER 6, 2009

SANDIS CIVIL ENGINEERS & SURVEYORS
605 CASTRO STREET
MOUNTAIN VIEW, CA 94041

EXECUTIVE SUMMARY

Downtown Burlingame is located approximately 17 miles south of San Francisco on the San Francisco Peninsula. Having evolved over the years, much of the existing infrastructure is inadequate and in need of upgrades to meet City design standards and keep up with the development in the Downtown area.

The Downtown study area is approximately 250 acres in size and is comprised predominantly of dense residential and commercial buildings. Zoned for retail/service commercial use and dense residential, much of Downtown consists of multi-story buildings with associated parking and hardscape.

The purpose of this study is to analyze available record utility information and published reports to determine the condition of existing storm drainage, sanitary sewer and water supply infrastructure within the study area. The analysis is based upon record information, previously conducted technical studies by the City of Burlingame and other consultants, meetings/conversations with City staff, and field observations.

STORM DRAIN SYSTEM

The storm drain system conveys runoff from upstream residential tributary areas (which includes parts of Hillsborough) through the Downtown area, from where it continues east toward San Francisco Bay. Due to recent development over the years, the imperviousness of this watershed has increased, causing a proportional increase in rainwater runoff from large storms.

Designed and installed in the 1970's, the storm drainage system in and around the Downtown area has remained relatively untouched and is taxed well over its design capacity. Despite recent minor improvements within the past 5 years, the storm drainage system still remains inadequate, which makes the Downtown area prone to flooding during large storm events.

In 2004, the City of Burlingame published a report highlighting many of the flooding issues in the downtown area. During large storm events (such as those occurring in 1998), heavy flooding was experienced in the downtown area along the culverts at street crossings including Primrose Rd., Park Rd., Lorton Ave. and Burlingame Ave.

Based upon Record Drawings and existing topography, storm drainage predominantly flows in the Northeast direction toward the San Francisco Bay. In the Downtown area, three major systems collect and convey drainage toward the bay (*see Storm Drain exhibit for more information*):

- Storm drainage from the extreme western portion of the study area is tributary to a 54" transmission main in Oak Grove Ave. which terminates at the northwestern corner of the study area at the junction with Burlingame Creek where it then travels via. two 90" reinforced concrete pipes (RCP) to San Francisco Bay. Upstream from the Downtown area, tributary areas feed into this 54" main via. Terrance Creek.
- Storm drainage from the central portion of the study area is tributary to Ralston Creek and Burlingame Creek, which pass through the study area via. a network of large underground pipes and underground concrete box culverts. Both systems join near the intersection of Oak Grove Ave. and California Dr. where they combine and flow toward the San Francisco Bay outfall via. two underground 90" RCP pipes.
    - Ralston Creek enters the study area between Terrance Creek and Burlingame Creek and conveys water from the Hillsborough highlands as it collects water from the Downtown area. After passing through the Downtown area, it connects to Terrace Creek in Oak Grove Ave. prior to joining with Burlingame Creek and entering the twin 90" mains in Oak Grove Ave.
    - Like Ralston Creek, Burlingame Creek serves as a major transmission artery carrying water from the Hillsborough highlands down through the Downtown area then eventually out to the Bay. After entering the study area, Burlingame Creek passes through a network of underground box culverts through Downtown, then splits between a 54" main in Lorton Ave. and a box culvert until they both end up in an open channel parallel with the railroad tracks. The open channel joins with the Terrace/Ralston

creeks near the Oak Grove railroad crossing from which it travels to the Bay via twin 90" transmission mains.

- ♦ Storm drainage from the eastern portion of the study area is tributary to a system which exits the study area via a 48" main which runs to the North and eventually to the Bay. This system collects runoff from the eastern portion of the study area and conveys flow from a 36" main entering the study area from the southeast.
- ♦ Storm drainage from the Northern corner of the site (in the vicinity of Anita Rd.) exits via. one 12" and one 27" storm drain main which ultimately discharges into the two 90" mains carrying flow from the Western Drainage area outside of the study area downstream (North) of the Oak Grove railroad crossing.

Existing System Inadequacy

The City of Burlingame's requirements mandate that all transmission mains and channels are able to convey the 30-year storm (more accurately identified as the storm having a 1-in-30 chance of happening every year) without overtopping, and that all non-transmission mains be able to convey the 10-year storm. Analysis performed by Wilsey & Ham Engineers in 1992 and by Kleinfelder & Associates in 2000 have proven that the capacity of existing transmission facilities passing through the Downtown area have the capacity to handle a 10-year storm event and therefore do not meet City standards.

Burlingame Creek: Hydrologic and Hydraulic analysis by Klienfelder & Assoc. in 2000 found that the existing capacity of the Burlingame Creek system was such that it could only handle 75% of the 30-year storm flow (Q_{30}). Analysis found the Ralston Creek system is even worse and cannot handle the 10-year storm flow (Q_{10}).

From the Klienfelder Report:
Burlingame Creek Watershed:

-Watershed Q_{30} flowrate:	605cfs
-Existing Facilities flow capacity:	450cfs (74% of Q_{30})

Ralston Creek Watershed:

-Watershed Q_{30} flowrate:	330cfs
-Existing Facilities flow capacity:	180cfs (55% of Q_{30} and less than Q_{10})

The 2004 Stormdrain Improvements Report cited localized flooding instances in the Burlingame Ave. downtown business area, Ralston Creek area, and the residential area bounded by California Dr. and Rollins Rd.

Future Storm Drain Infrastructure Improvements

At a public hearing held on January 29, 2009, the Burlingame City Council authorized a storm drain fee ballot measure that would provide approximately $39 million dollars of funding for storm drainage infrastructure improvements. Having been approved on the May 5, 2009 mail ballot, the measure will provide funding for future improvements to storm drainage infrastructure. The detailed scope of future storm drainage improvements has yet to be determined, but improvements to infrastructure in the downtown area currently include:

- Installation of a new 60" Burlingame Creek bypass main:
  - To bring the Burlingame Creek system up to 30-year flood capacity, Klienfelder proposed the installation of a new $10M ($7.6M in 2000 + 4%/yr escalation) 60" bypass pipeline (*see Storm Drain exhibit for location*) to alleviate insufficiencies in the Burlingame Creek culvert system. The new 60" bypass main is planned to divert flow at El Camino Real and travel along Howard Ave in the Northeasterly direction and ultimately discharge directly into the San Francisco Bay.
- Installation of a new 60" Ralston Creek bypass main:
  - To mitigate the existing bottleneck in the Ralston Creek channel between Foribunda Ave. and Oak Grove Ave., a new $2.0M ($1.4M in 2000 + 4%/yr escalation) 60" bypass pipeline is proposed to branch off of the existing Ralston creek culvert and continue North along Foribunda Ave. to the existing open channel along the railroad tracks.

Future Development Guidelines

The existing condition of the Downtown Burlingame area is predominantly impervious surfaces. The reconstruction/replacement of impervious surfaces in the Downtown area will not result in a significant increase of stormwater runoff due to the high level of existing imperviousness, however, significant redevelopment should attempt to reduce stormwater flow to the system by promoting the use of on-site detention/retention and infiltration. Due to the restrictive setback requirements (and in many cases, zero-lot line setback) in the Downtown area, requiring on-site detention/retention downtown becomes a logistical problem due to the overall lack of space for large detention basins and/or ponds. It's likely that detention will be provided in the form of underground tanks; finding space for them on tight sites and locating them appropriately may be challenging. Since the storm flows causing Downtown flooding already exist prior to reaching downtown, a reduction of runoff from the Downtown area will have a significantly lesser impact on reducing local flooding when compared to the impact of mitigating bottlenecks in the system by the installation of large transmission mains provided by the City.

The State of California has implemented regulations (Provision C.3) for developments that involve the removal or replacement of over 10,000 square feet of impervious surfaces. This measure requires that storm water quality treatment measures be implemented to cleanse runoff prior to leaving the site. This may be achieved through mechanical means (e.g. hydrodynamic separators and media filters) or "natural" means (e.g. bioswales, bio-retention planters, detention basins) or a "hybrid" system combining elements of both. Landscape based treatment measures can also serve a dual-purpose by slowing and reducing the rate and quantity of stormwater runoff from small storm events.

SANITARY SEWER SYSTEM

Recently in the past four years, the City of Burlingame has focused on improving the sanitary sewer systems in and around the western portion of the Downtown study area. The eastern portion of the study area (areas east of Chapin Ave. and Donnelly Ave.), however, feeds into an ageing, 60-100 year-old system that is not currently scheduled to be rehabilitated. *See Sanitary Sewer exhibit for the project areas*.

Recent System Rehabilitation

Through pipe bursting and open-trench replacement, much of the sanitary sewer system on the western half of the study area has either been rehabilitated or is currently in the process of being rehabilitated as part of the City's "California Ave. and Oak Grove Ave. Sewer & Rehabilitation" capital improvement project. As part of the project, many of the 6" vitrified clay pipe mains were replaced with 8" high-density polyethylene (HDPE) mains and service laterals, which effectively doubled the capacity of the feeder mains. The project also involved the installation of new, larger trunk mains in Oak Grove Ave. to ensure adequate capacity is provided for the large amount of flow generated by upstream development (*See Sanitary Sewer system maps for the project areas)*. The addition of the new piping increased the overall performance of the system by increasing capacity, and reducing blockages and rainwater/groundwater infiltration.

Existing System Inadequacy and Future Recommendations

The sanitary sewer system serving the central and eastern half of the Downtown study area has remained untouched for the past 60+ years. Cracking, pipe sagging, and infiltration of tree roots are all problems associated with mains of this age and contribute to a reduction of flow capacity and frequent blockages. Due to the condition of these mains, wet weather infiltration of rainwater and groundwater into the sanitary sewer system is worst in these areas.

During the rainy season, sanitary sewer flow at the waste water treatment plant serving the Downtown area has reported to increase by 600%, exceeding the treatment capacity of the system and damaging cultures of beneficial bacteria necessary for proper sanitary sewage treatment at the plant. To address this issue, the City is planning to construct a 1.5 million gallon retention basin (to be completed by September 2011) to increase wet weather capacity at the plant. The project is currently awaiting approval of a State Revolving Fund Loan from the State to fund the $7 million dollar project.

Although the central portion of the Downtown Study Area was previously planned to undergo rehabilitation in 2010 and the eastern portion in 2019-2021, it is unknown when the remainder of the Downtown area's sanitary sewer lines will be repaired due to recent budget cuts. However, the replacement of certain sections of sanitary sewer main may be advanced to coincide with other streetscape/beautification projects (i.e. Burlingame Ave. and Howard Ave.) to minimize the impact on surrounding neighborhoods, take advantage of construction equipment on-site, and of course, to avoid future utility work and trenching in newly paved streets.

Recent capital improvement projects were derived from the findings from the 1999 Sanitary Sewer Study and Master Plan. Due to recent development, the master plan is outdated and is currently being revised and updated; the final draft expected to be completed in December of 2009 and will shape future improvements to the sanitary sewer system. This study is based upon flow monitoring data collected in the winter of 2008. Zoning changes resulting in significant changes in development may affect existing design assumptions; these factors will need to be addressed and modeled during the design phase of future CIP projects.

Since most of the future development in the downtown area will be feeding into the aged sanitary sewer system, developers of larger projects (resulting in a significant increase of sanitary sewer effluent above existing) will need to work closely with the City Engineers to determine if improvements to public sanitary sewer infrastructure may be necessary.

WATER SYSTEM

The existing water system in Downtown Burlingame is served from the Rivera Tanks and is transported via. an interconnected pipe network throughout the Downtown area. Four major lines supply the majority of the water to the Downtown area from the existing turn-outs from the SFPUC Hetch-Hetchy supply lines:

- 12” PVC main running in Oak Grove Ave.
- 12” Cast Iron (CI) main in Almer Rd./Bellevue Ave.
- 12”→10” CI main in Howard Ave.
- 12” PVC main in Penninsula Ave.

Existing System Inadequacy

Based on hydrant flowtesting results on hydrants connected to larger (10”+ diameter) water mains, is evident that the deficiencies in the system lie in the restrictions attributed to the smaller mains 4” and 6” mains. *See the Water System exhibit for more information.*

As a typical rule of thumb, the minimum diameter for public mains is 8” and larger, as 4” and 6” mains typically do not have enough capacity to provide ample flow for fire suppression purposes. Although the California Fire Code/Uniform Building Code allows a percentage reduction in fire flow demands, the maximum flow that is provided by the smaller 4” and 6” mains is only sufficient for single-family dwellings and the smallest of commercial buildings (if the maximum reduction is allowed). Much of the secondary piping in the Downtown area consists of 4” and 6” cast iron pipe, which has inadequate flow capacity for fire suppression needs. If the requirements for fire protection supply are not met, additional measures such as fire water storage tanks and booster pumps may need to be incorporated into the building design.

Using flow and pressure data supplied by the City from recent hydrant flowtests, the deficiencies in flow capability of the 4” and 6” mains was confirmed. Field flowtesting has shown that the 4” main on Floribunda Ave, for instance, only is able to supply 675gpm @ 20psi (90psi static and 650 GPM @ 25 psi residual as tested). Another hydrant connected to the 6” main in Chapin Ave. is only able to supply 780gpm @ 20psi (90psi static and 750 GPM @ 25 psi residual as tested). Data collected from hydrants connected to 8” and larger mains recorded relatively good static pressures and flows capable of providing fire service to larger buildings. A hydrant connected to a 8” main on Primrose Rd. recorded a 1960gpm @ 20psi (90psi static and 1050 GPM @ 70 psi residual as tested). Another hydrant connected to the 12” main in Lorton Ave. is able to supply 4300 gpm @ 20psi (88psi static and 1475 GPM @ 80 psi residual as tested).

Future Water System Recommendations

To ensure fire flow requirements are met for future development in the Downtown area, the existing 6" and smaller mains need to be enlarged to 8" and possibly 10" mains, depending on projected demands. If large enough to warrant a main upgrade for fire protection purposes, future subdivision and/or retail developments could be conditioned to upgrade mains at their own cost if necessary for fire protection purposes. Development needs to be evaluated on a case-by-case basis to determine whether new construction will trigger the need for fire line upgrades if booster pumps and fire water storage tanks cannot be provided on-site.

Per the recommendations by Erler and Kalinowski, Inc. (EKI) (see Appendix F), the City has plans to upgrade an existing 6" main in Burlingame Avenue and the main in Howard Avenue (timeframe TBD pending decisions on CIP budgets and scope). Upgrading the existing 4" piping in the Downtown area has also been proposed by EKI to enhance the flows available for fire suppression.

CONCLUSION

Given the state of the existing infrastructure in the Downtown study area, it is clear to see that upgrades are vital to rehabilitate and upgrade the ageing municipal utility infrastructure. The capacity of the systems also needs to be examined, taking into account the existing condition of pipes and culverts and their capacity to meet current and future demand.

The *Storm Drainage* system in downtown is currently under capacity and no longer can provide adequate flood protection due to an increase in impervious areas in the watersheds. Bypass mains need to be installed to increase the capacity of the system and alleviate flow at critical bottlenecks.

The *Sanitary Sewer* system in the western half of the study area has recently been upgraded/rehabilitated and similar maintenance construction on systems in the central portion is scheduled in the near future. The systems in the eastern half of the study area, however, are 60-100 years old and are in need of rehabilitation due to cracking, sagging, and groundwater infiltration.

The *Water* System in the downtown area does not provide adequate fire protection for areas not immediately adjacent to the large transmission mains. Some of the feeder mains are 4" and 6", which does not afford enough flow per the current fire protection standards. Upgrading these mains to 8" or larger will increase the available flow for fire protection purposes.

Even though some of the responsibility for infrastructure upgrades could be funded by large developments in the Downtown area, much of the improvements will be handled through the City's Capital Improvements program. Due to the funding situation, however, much of the needed upgrades are not scheduled to happen soon. Future development in the Downtown Specific Plan study area needs to acknowledge the strengths and weaknesses of the infrastructure currently in place and will serve as a framework for the design and implementation of necessary improvements. It would also be advantageous to coordinate underground utility upgrades with other cosmetic projects such as streetscape improvements and repaving of roads.

REFERENCES

"Citywide Facilities Improvements: Storm Drain Improvements Report 2004" by the City of Burlingame, 2004
"Citywide Storm Drainage Masterplan Study, Part 1 of 2-Hydrology, Facilities Analysis, Improvements, Budget Cost Estimate" by Kleinfelder & Associates, April 10, 2000
"Storm Drainage study City of Burlingame" by Wilsey & Ham Engineering and Planning Services, August 1992
"Technical Memorandum No. 9" by Erler & Kalinowski, Inc., April 2, 2004

Appendix I

Water Supply Technical Study

City Of Burlingame

WATER SUPPLY TECHNICAL STUDY

for the

DOWNTOWN SPECIFIC PLAN

FINAL

April 2010

Prepared By:

PBS&J

353 Sacramento Street, Suite 1000
San Francisco, CA 94111

PBS&J Project Number: 0D4136500

REGISTERED PROFESSIONAL ENGINEER
DOUGLAS P. GILLINGHAM
No. C39567
Exp. 12-31-11
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STATE OF CALIFORNIA

Douglas P. Gillingham, P.E., BCEE
Study Manager

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SUMMARY AND FINDINGS

The City of Burlingame is considering the approval of the Downtown Specific Plan (DSP), which will update and modify land use designations in downtown Burlingame to provide an overall vision for future development. If adopted, the DSP would allow for higher levels of commercial and residential development relative to existing land use plans for the DSP area. Specifically, the DSP would allow for up to 183,843 square feet (sf) of additional commercial retail space, 248,702 sf of additional office space, and 875 additional residential dwelling units (1,232 if the City also revises downtown parking standards as part of the DSP). This additional development (with current parking standards) would generate average additional water demands of approximately 136,600 gallons per day (gpd), or approximately 153 acre-feet per year (AF/yr). If the City revises downtown parking standards, the DSP would generate average additional water demands of approximately 186,600 gpd, or approximately 209 AF/yr.

The City relies on purchases from the San Francisco Public Utilities Commission (SFPUC) for all of its water supply. SFPUC projections indicate that during average years, it will be able to serve all of the normal water demands of its service area, including the City. However, SFPUC projections indicate that during dry years, its supply availability will be reduced by up to 20 percent.

As explained in its 2005 Urban Water Management Plan (UWMP), the City has developed a Water Shortage Contingency Plan to address the projected dry-year reductions in supply from SFPUC. The Contingency Plan includes four stages, to be implemented progressively as needed. The 2005 UWMP describes these stages as follows:

- Stage I (5% to 10% supply reductions) calls for a low level of informational outreach and enforcement of the permanent water use ordinances.
- In Stage II (10% to 20%) there will be a stepped up outreach effort and the adoption of some additional water use restrictions. Drought rate schedules will be implemented.
- Stage III (20% to 35%) calls for increased outreach activities and additional emergency water use restrictions. Drought rates in each block would increase from those in Stage II. Fines and penalties would be applied to users in violation of water usage restrictions. In some cases, water flow restriction devices would be installed on customers' meters.
- Stage IV (35% to 50%) requires very close management of the available water supplies. Allocations of water for each customer will be introduced. Informational outreach activities would be operating at a very high level. Severe water use restrictions and a restrictive penalty schedule would be implemented.

The proposed DSP will add approximately 0.14 to 0.19 million gallons per day (mgd) of average-day water demand to the City, increasing the City's projected 2030 demands from 5.03 mgd to 5.22 mgd, an increase of approximately 3.8 percent.

Findings

Regarding the availability of water supplies to serve the DSP, the City finds as follows:

1. In years of average and above-average water supply, the City has adequate supplies to serve 100 percent of normal-year demands, inclusive of the DSP.

2. In dry-year and multiple-dry-year events, when SFPUC imposes reductions in its normal supply to the City, the City has in place a Water Shortage Contingency Plan sufficient to maintain a balance of supplies and demands. With the DSP in place, the City projects the need to implement Stage I reductions during a single dry-year shortage event, and Stage II reductions during subsequent years of a multiple-dry-year shortage event. These are the same Contingency Plan implementation stages the City would need to implement without the DSP in place.

3. The City therefore finds it has sufficient water available to serve the DSP in addition to its existing and planned customers. Further, the City finds that this water availability extends through its current water management planning horizon of 2030, and that it extends to average year, dry-year, and multiple-dry-year conditions.

1.0 INTRODUCTION

The City of Burlingame is considering the approval of the Downtown Specific Plan (DSP), which will update and modify land use designations in downtown Burlingame to provide an overall vision for future development. The DSP will allow for increased development relative to existing approved land uses and it is probable the project will result in an increase in water use. Recently enacted California laws (SB 610 and SB 221 of the 2001 legislative session) require the preparation of Water Supply Assessments for projects of 500 or more residential units and certain other large projects, but these laws apply at the project level and not to General Plans and related land planning activities.

The City is conducting an environmental review under the requirements of the California Environmental Quality Act (CEQA) for the proposed DSP and maximum allowable development. This water availability analysis (WAA) will provide information for use in the CEQA analysis to assist the City with evaluating and documenting water use and water supply for the DSP area.

The City provides retail water service within its municipal boundaries. The City purchases 100 percent of its supply from SFPUC, which also provides wholesale water service to other Peninsula retail water agencies. Burlingame and the other SFPUC wholesale customers are all members of the Bay Area Water Supply and Conservation Agency (BAWSCA), which coordinates and negotiates directly with SFPUC on behalf of its members.

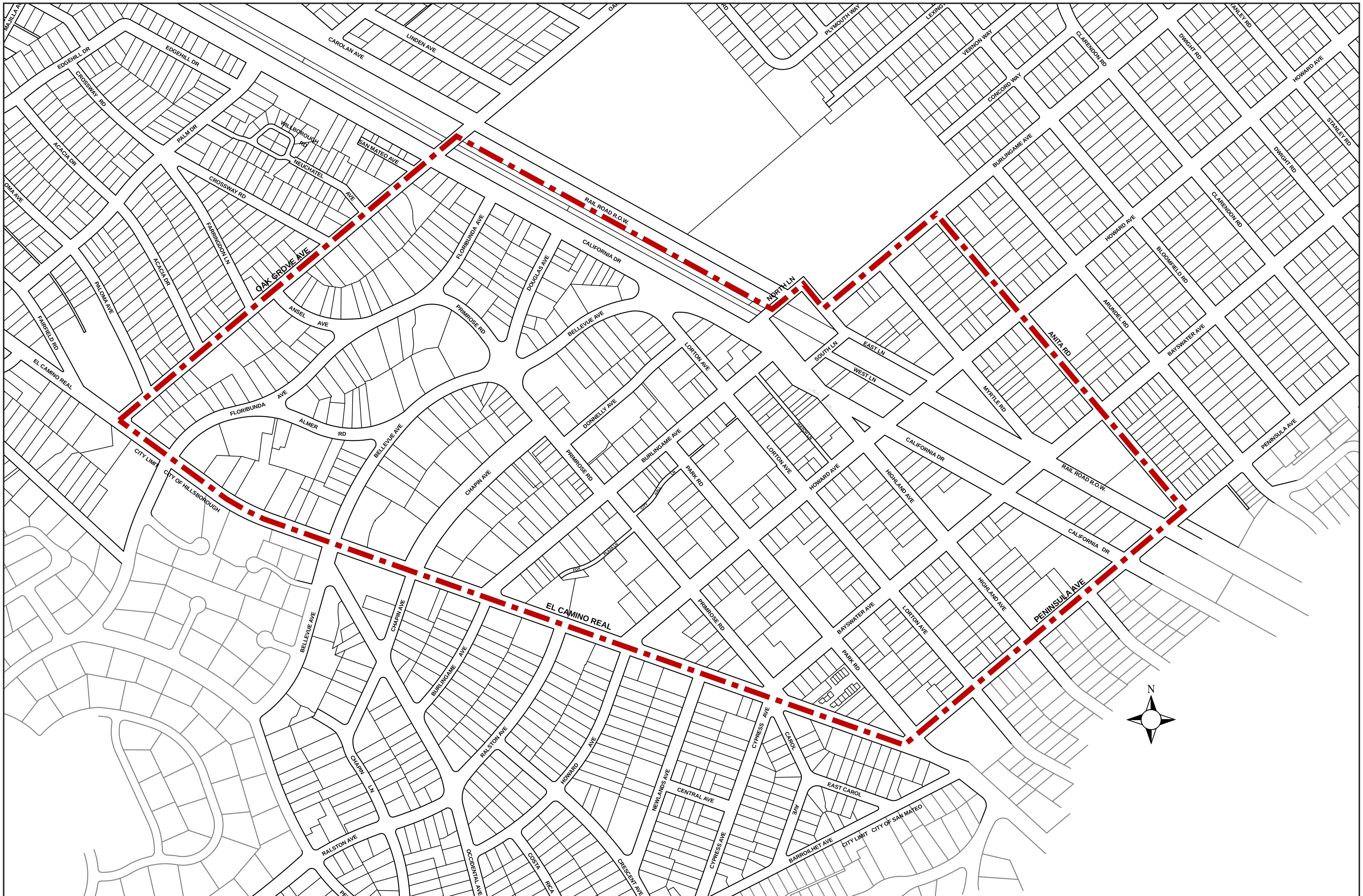
This document is divided into four sections as follows:

1. Introduction
2. Water Supply
3. Water Demands
4. Supply and Demand Comparison

1.1 Project Area and Location

The City is in San Mateo County, located west of the Santa Cruz Mountains and east of the San Francisco Bay. The City lies approximately 10 miles south of San Francisco and 30 miles north of San Jose. Burlingame is surrounded by the City of Millbrae to the northwest, San Francisco Bay to the east, the City of San Mateo to the southeast, and the City of Hillsborough to the southwest. Highway 101 runs north-south within Burlingame, Interstate 280 (I-280) runs north-south along the western boundary of the City, and El Camino Real, or State Route 82 (SR 82) traverses the City and runs north-south along the southwest boundary of the Specific Plan Area. San Francisco International Airport is within one-mile of the City limits.

The DSP is a largely urbanized area within the City of Burlingame and is generally bounded by Oak Grove Avenue to the northeast, the Caltrain right-of-way (Caltrain ROW) and Anita Road to the northeast, Peninsula Avenue to the southeast, and El Camino Real to the southwest. Figure 1-1 shows the limits of the Project.



PBS&J®

FIGURE 1-1
Project Location

Source: Kevin Gardiner & Associates, 2008.

D41365.00

1.2 Project Description

The City of Burlingame is considering the approval of the DSP as an update and modification to land use designations and densities within downtown. Buildout of the DSP will occur by 2030 and would include the development of vacant parcels and the redevelopment of underutilized parcels. Potential new development within the Specific Plan Area would increase existing development by approximately 875 residential units, 183,843 square feet of commercial retail space, and 248,702 square feet of office space. The proposed project metrics are listed in **Table 1-1**.

Table 1-1: Project Components

Project Component	Net Change in Count / Size	Notes / Description
Commercial	183,843 sf	Net increase in commercial floor space
Office	248,702 sf	Net increase in office floor space
Residential - with current parking standards	875 units	Net increase in residential units based on current parking standards and design criteria
Residential - with revised parking standards	1,232 units	Net increase in residential units if parking standards and design criteria are revised

The DSP plans to create a creek-like surface water feature in one of the open space areas. The water feature would be similar to one developed in the Park Place at Bay Meadows development in San Mateo. As a recirculating water feature, there would be a one-time filling of the pond, but approximately less than one acre-foot per year of demand (approximately 6 feet per year of net evaporation and complete change-outs of the water four times per year). This is less than one percent of the total projected increase in water demand resulting from the DSP.

2.0 WATER SUPPLY

This section reviews the City of Burlingame's water supply entitlements and/or contracts. The City relies on purchases from SFPUC for all of its water supply.

2.1 San Francisco Public Utilities Commission

In 1934, San Francisco combined the Hetch Hetchy system and Spring Valley system to create the San Francisco Public Utilities Commission (SFPUC) system. The rights to local diversions were originally held by the Spring Valley Water Company, which was formed in 1862. The SFPUC is owned and operated by the City and County of San Francisco. At present, the SFPUC System consists of three regional water supply and conveyance systems: the Hetch Hetchy, the Alameda, and the Peninsula system, which are all connected. Approximately 85 percent of the SFPUC water supply is served through deliveries from the Hetch Hetchy system. The balance of the SFPUC water supply, approximately 15 percent, comes from diversions on a variety of streams and stored in local reservoirs, as listed in **Table 2-1**.

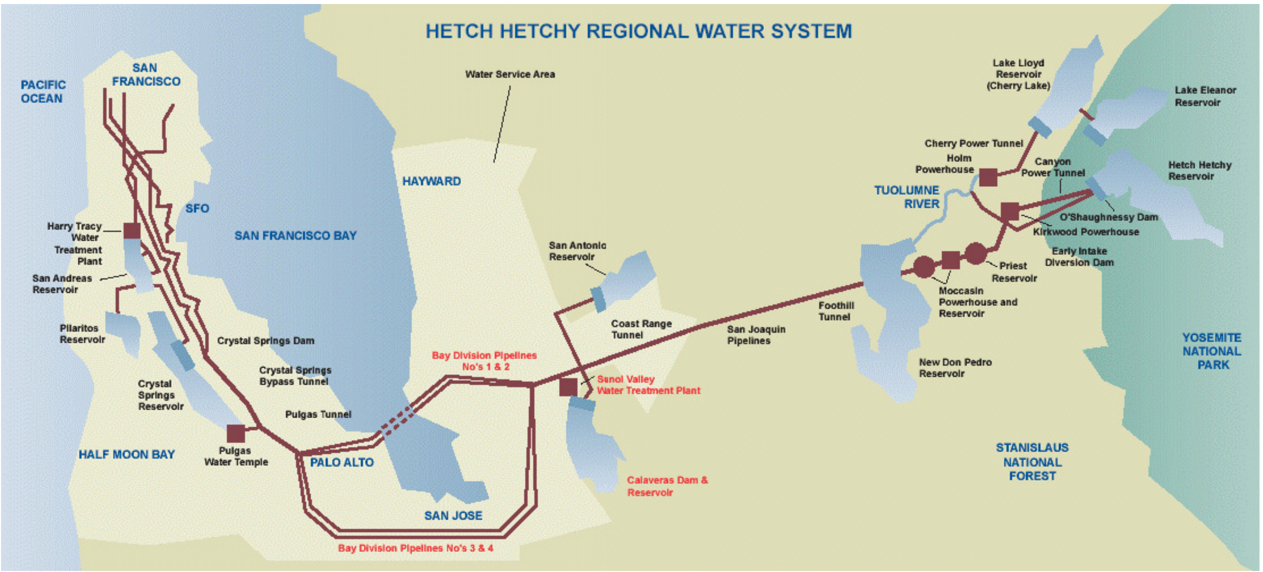
Table 2-1: Supply Sources and System-Wide Reductions

SFPUC Water Sources	Origin/System	Normal Year Supply Source		Approximate Multiple Dry-Year Supply Source (20% System-wide Reduction)	
		mgd	% of Supply	mgd	% of Supply
Local Source	Alameda System Peninsula System	39.75	15%	14.84	7%
Imported Source	Hetch Hetchy System	225.25	85%	197.16	93%
Total		**265.00**	**100%**	**212.00**	**100%**

Source: San Francisco Public Utilities Commission. 2005. Urban Water Management Plan. p. 11.

On the San Francisco Peninsula, SFPUC utilizes Crystal Springs Reservoirs, San Andreas Reservoir, and Pilarcitos Reservoir to capture local watershed runoff. In the Alameda Creek watershed, the SFPUC constructed the Calaveras Reservoir and San Antonio Reservoir. In addition to capturing runoff, these facilities also provide storage for Hetch Hetchy diversions, and serve as an emergency water supply in the event of an interruption to Hetch Hetchy diversions. **Figure 2-1** shows the SFPUC regional water supply system.

Figure 2-1: SFPUC Regional Water Supply System



2.1.1 SFPUC Water Supply Contracts and Agreements

In 1984, the SFPUC executed the Settlement Agreement and Master Water Sales Contract (MSA) with the 27 member agencies of the Bay Area Water Supply and Conservation Agency (BAWSCA). The BAWSCA members purchase approximately two-thirds of the water delivered by the SFPUC system and the balance is delivered to the City of San Francisco and its retail customers. The MSA primarily addresses the rate-making methodology used by SFPUC in setting wholesale water rates for its wholesale customers, in addition to addressing water supply and water shortages within the regional water system. The MSA provides 184 mgd as an annual average of "Supply Assurance" to all BAWSCA wholesale customers but is subject to reductions in the event of droughts, water shortage, earthquake, other acts of God or system maintenance and rehabilitation.[1] Each member holds an individual water supply contract and the MSA governs the contract. The previous twenty-five year contract ended on June 30, 2009. SFPUC has approved the new MSA twenty-five year contract and each BAWSCA agency is in the process of approving its individual contract with SFPUC. Upon approval, this new MSA expires on June 30, 2034.

Section 7.01 of the 1984 MSA states "Supply Assurance continues in effect indefinitely, even after expiration of the MSA in 2009" and this is still the case in the new MSA. The condition is a reflection of case law, which holds that a municipal utility acts in a trust capacity with respect to water supplied to outside communities. Expiration of the MSA does not mean that the SFPUC can terminate water supplied to the suburbs, whose entire communities have developed in reliance on these water supplies. Consequently, the Supply Assurance of up to 184 mgd shall survive the termination of the MSA and the Individual Contracts.

Additional agreements and plans have been developed over the last twenty-five years and are summarized in **Appendix A**. In the early 1990's, for planning and reliability purposes, BAWSCA negotiated, and then formally adopted in 1993, the Supply Assurance Allocation (SAA) that quantifies SFPUC's contract obligation to supply water to each of the members. The MSA does

[1] San Francisco Public Utilities Commission. April 2000. *Water Supply Master Plan*. p. 23.

not guarantee that SFPUC will meet peak or hourly demands if the individual wholesaler's annual usage exceeds the SAA. The SAA helps the wholesaler plan for future demands and growth within their service area; for that reason, the SAA transcends the MSA expiration and continues indefinitely. The SAA for Burlingame secures 5.23 mgd for Normal year deliveries.[2] However, some Wholesale agencies have been guaranteed the ability to increase water demands at the potential expense of other communities. Hayward, for instance, does not have a limit on its SAA; the MPMWD can increase its water demands based on a 1962 Agreement with SFPUC. SFPUC is contractually bound to meet these increasing demands. This agreement stipulates that if Hayward purchases 22.1 mgd for three consecutive years, then SFPUC will recalculate the supply deliveries to the other BAWSCA agencies with an appropriate reduction. This has the potential in the future to affect the SAA for other communities, such as Burlingame. Hayward's 2007-2008 supply purchase was 19.1 mgd.

In terms of water supply reliability, the SFPUC's UWMP assumes "firm" delivery "as amount the system can be expected to deliver during historically experienced drought periods."[3] The 1987 to 1992 drought is the basis for this plan, plus an additional period of limited water availability.[4] The SFPUC plans its water deliveries assuming that the worst drought experience is likely to reoccur and then adds an additional period of limited water availability. An 8.5-year drought scenario is referred to as the "design drought" and is ultimately, the basis for SFPUC water resource planning and modeling. The "design drought" is based on the 1986-1992 drought plus 2.5 years of "prospective drought", which includes 6 months of recovery period. [5]

In 2000, the Water Supply Master Plan identified a 239 mgd annual average delivery over a hydrologic period equivalent to that experienced from 1921 to 1999 with no deficiencies.[6] Currently, under existing operations, the SFPUC system has a firm delivery capability of 219 mgd.[7] Actual annual deliveries exceed this quantity. This reduction is due to the 2001 Department of Safety of Dams operational restrictions on Calaveras Dam. As of this writing, the environmental review for the Calaveras Dam Replacement project is currently on going.

According to the SFPUC's UWMP, there is sufficient water to meet all expected future demand in normal and wet hydrologic periods; however, the MSA allows the SFPUC to curtail deliveries during droughts, emergencies and scheduled maintenance activities.[8] SFPUC system operations are designed to allow sufficient water remaining in SFPUC reservoirs after six years of drought to provide some ability to continue delivering water, although at significantly reduced levels.[9] This differs from the "design drought", which is a water supply planning tool and as previously stated is based on the 1986-1992 drought plus 2.5 years of "prospective drought", which includes 6 months of recovery period.[10] SFPUC is currently delivering approximately 265 mgd[11], about 46 mgd above firm delivery capabilities; consequently, if SFPUC declares a

2 Bay Area Water Supply and Conservation Agency, January 2009. Annual Survey: FY 2007-08. p. 15
3 San Francisco Public Utilities Commission. December 2005. *Urban Water Management Plan*. p. 21.
4 San Francisco Public Utilities Commission. December 2005. *Urban Water Management Plan*. p. 21.
5 San Francisco Public Utilities Commission. April 2000. *Water Supply Master Plan*. p. 22.
6 San Francisco Public Utilities Commission. April 2000. *Water Supply Master Plan*. p. 22.
7 City and County of San Francisco: San Francisco Planning Department. June 2007. *Draft Program Environmental Impact Report for the San Francisco Public Utilities Commission Water System Improvement Program*. p. 5.1-12.
8 San Francisco Public Utilities Commission. 2005. *Urban Water Management Plan*. p. 15.
9 San Francisco Public Utilities Commission. April 2000. *Water Supply Master Plan*. p. 20.
10 San Francisco Public Utilities Commission. April 2000. *Water Supply Master Plan*. p. 22.
11 San Francisco Public Utilities Commission. 2005. *Urban Water Management Plan*. p. 11.

shortage, rationing would be necessary. Supply reliability will increase following Crystal Springs and Calaveras Reservoir improvements expected to be completed by 2012.[12]

The SFPUC and the wholesale members developed a long-term strategy to accommodate or rectify the potential of future water shortages throughout its wholesale and retail operations.[13] The methodology for determining water supply reliability during drought years is the Interim Water Shortage Allocation Plan (IWSAP). In 2000, the SFPUC and BAWSCA members agreed upon and adopted the IWSAP. Under this plan, the SFPUC will determine the available water supply in drought years for shortages up to 20 percent on an average, system-wide basis. The IWSAP will remain in effect through June 2009.

Under the current MSA, reductions to wholesale customers are to be based on each agency's proportional purchases of water from the SFPUC during the year immediately preceding the onset of shortage, unless this formula is supplanted by a water conservation plan agreed to by all parties. The IWSAP was necessary because the MSA's default formula discouraged the wholesale customers from reducing purchases during normal or wet years by applying demand management programs (conservation measures) or pursuing alternative supplies (groundwater, water recycling, transfers, etc.).

The IWSAP has two components. The Tier One component of the IWSAP allocates water between San Francisco and the wholesale customer agencies collectively. The Tier Two component of the IWSAP allocates the collective wholesale customer share among each of the 28 wholesale customers. This allocation is based on a formula that considers three factors, the first two of which are fixed: (1) each agency's Supply Assurance from SFPUC, with certain exceptions, and (2) each agency's purchases from SFPUC during the three years preceding adoption of the Plan. The third factor is the agency's rolling average of purchases of water from SFPUC during the three years immediately preceding the onset of shortage.[14]

Burlingame buys all of its water from the SFPUC and has a SAA of 5.23 mgd.[15] Table 3 shows Burlingame's projected demands based on the 2005 Urban Water Management Plan. The Tier One (SFPUC to BAWSCA) and Tier Two (BAWSCA to retailer agencies) allocation plans were used to determine supply reductions in single and multiple dry year scenarios. As stated previously, the 2009 MSA is undergoing region-wide approval; the 2009 MSA allocates wholesale supplies up to 184.0 mgd to 2018; therefore, the Tier One supplies shown in Table 2-2 are held constant to 184 mgd through 2015.

Prior to 2018, SFPUC will re-assess its regional supply capacities in order to evaluate the RWS's reliability. At this point in time, SFPUC, in its efforts to provide water supply projections to the BAWSCA agencies, is likely to present new water supply planning data out to 2030. Because this information is currently unknown, the Tier One and Two supply projections reflect the information from the Demand Study.

This supply is subject to reductions in critical dry years or over multiple dry years. Based on the BAWSCA Annual Survey, Burlingame requested 4.50 mgd from SFPUC to meet customer needs in 2007.

12 San Francisco Public Utilities Commission. 2005. *Urban Water Management Plan.* p. 27.
13 San Francisco Public Utilities Commission. 2005. *Urban Water Management Plan.* p. 22.
14 San Francisco Public Utilities Commission. 2005. *Urban Water Management Plan.* p. 81.
15 Bay Area Water Supply and Conservation Agency, January 2009. Annual Survey: FY 2007-08. p. 15

Table 2-2: SFPUC Allocations to Burlingame in Normal, Dry and Multiple Dry Years

2009 MSA Supply Allocations	Normal Year Purchase Request		One Critical Dry Year		Multiple Dry Year Event					
					Year 1		Year 2		Year 3	
2010	**mgd**	**%**	**mgd**	**%**	**mgd**	**%**	**mgd**	**%**	**mgd**	**%**
BAWSCA Allocation	184.0	100%	152.6	82.9%	152.6	82.9%	132.5	72.0%	132.5	72.0%
Burlingame	4.78	100%	4.51	94.4%	4.51	94.4%	3.93	82.2%	3.93	82.2%
2020										
BAWSCA Allocation	184.0	100%	152.6	82.9%	152.6	82.9%	132.5	72.0%	132.5	72.0%
Burlingame	4.95	100%	4.71	95.2%	4.71	95.2%	4.11	83.0%	4.11	83.0%
2030										
BAWSCA Allocation	184.0	100%	152.6	82.9%	152.6	82.9%	132.5	72.0%	132.5	72.0%
Burlingame	5.03	100%	5.01	99.6%	5.01	99.6%	4.37	86.9%	4.37	86.9%

Notes:
1. 2009 MSA is undergoing region-wide approval; the 2009 MSA allocates wholesale supplies up to 184 mgd to 2018; Supplies are assumed to continue at 184 mgd after 2018 as a conservative planning approach.
2. Burlingame projected demands based on the 2005 Urban Water Management Plan, Table 8.

2.1.2 Water Supply Improvement Project

The SFPUC Urban Water Management Plan (UWMP) states that the ability of SFPUC to meet additional demands is based upon renewed supply contracts and the expectation that SFPUC will be able to secure local sources, expand recycled water programs, improve conjunctive groundwater uses, or increase diversions from the Tuolumne River.[16] These additional supplies, which are necessary to meet increased demands in the future, are outlined in the Water System Improvement Program (WSIP). The WSIP is a multiple year, system-wide capital improvements program aimed at firming up the SFPUC's ability to meet its water service goals. As stated previously, regional demands are anticipated to increase to 300 mgd by 2030.

The SFPUC prepared a Program Environmental Impact Report (PEIR) under CEQA for the WSIP. The PEIR evaluates the potential environmental impacts of the proposed WSIP associated with thirty-seven regional seismic, water quality and other projects and identifies potential mitigations to those impacts. The PEIR also evaluates several alternatives to meet the SFPUC service area's projected increase in water demand between now and 2030. As the PEIR was being prepared it became apparent that a major political and environmentally charged issue would arise if the additional supplies were simply diverted off the Tuolumne River. Therefore, in March 2008, SFPUC presented a variation of the original WSIP that became the Phased WSIP Variant. The Phased WSIP Variant PEIR was certified in October 2008.

The "Phased WSIP Variant," studied as part of this environmental analysis, establishes a mid-term planning milestone (the year 2018) when the SFPUC would re-evaluate water demands through 2030 in the context of then-current information, analysis and available water resources. Under this alternative, the SFPUC would construct and operate all proposed regional WSIP facility projects while limiting water delivery to an average annual 265 mgd from SFPUC's Sierra and Bay Area watersheds through 2018. The Phased WSIP Variant would not provide water supply to meet the projected 300 mgd average annual water delivery in 2030 as proposed under the original WSIP. Rather, the SFPUC would supply no more than an average annual 265 mgd from watersheds through 2018 and the SFPUC and wholesale customers would collectively

16 San Francisco Public Utilities Commission. 2005. Urban Water Management Plan for the City and County of San Francisco. p. 22-29.

develop 35 mgd (10 mgd in the City and County and an additional 10 mgd within the BAWSCA agencies – the remaining balance, 15 mgd, comes from similar ongoing efforts within the BAWSCA agencies) in additional conservation, recycling, and groundwater projects to meet demand in 2018 and out to 2030. Before 2018, the SFPUC would engage in a new planning process to re-evaluate water system demands and supply options, including conducting additional studies and environmental reviews necessary to address water supply needs after 2018.

Due to the important nature of the WSIP and based on projects identified in WSMP, SFPUC completed some capital improvement projects and engaged in the environmental review process of other qualifying improvement projects. As of preparation of this WSA, many projects are currently undergoing environmental review.

Some of the water supply improvement options being investigated are:

- SFPUC Regional Water System Conjunctive Use Program: South Westside Groundwater Basin.
- SFPUC Regional Water System Water Transfers from the Tuolumne River Districts.
- SFPUC Regional Water System Recovery of Storage: Restoration of Calaveras and Crystal Springs Reservoirs.

The water supply options being investigated as part of the Phased WSIP Variant, listed above, are assumed to be available to the SFPUC Regional Water System in its 2005 UWMP. These additional supplies, as identified in the WSIP, are assumed to be available in the volumes and timeframes shown in **Table 2-3**.

Table 2-3: Water Supply Options Outlined in the WSIP and Assumed to be Available

Water Supply Options	2010	2020	2030
Crystal Springs Reservoir Storage Recovered to 22 Billion Gallons	Yes	Yes	Yes
Conjunctive Use/Westside Basin Groundwater (AFA)	4,500	8,100	8,100
Calaveras Reservoir Storage Recovered to 31.5 Billion Gallons	No	Yes	Yes
Water Transfers (AFA)	23,200	29,000	29,000

Source: San Francisco Public Utilities Commission. 2005. Urban Water Management Plan for the City and County of San Francisco. p. 36.

The WSIP also investigated the potential options of developing local water resources such as water recycling, groundwater, desalination and improved conservation to meet SFPUC purchase requests or demands. These resources, which are expected to provide an additional 10 mgd, are potential opportunities that exist throughout the regional water system and could be used to meet customer demands over the next 25 years.[17]

On October 30, 2008, SFPUC certified a Final PEIR for the WSIP, adding an additional measure of certainty to the project. However, it is important to note that as with any planned project, there remains some relative risk associated with assuming the availability of the supplies outlined in the WSIP. This is especially true for the water transfer component of the WSIP, for which there are no agreements in place at this time. Further, even with certification of the PEIR, individually qualifying projects are still subject to project-level CEQA review.

[17] San Francisco Public Utilities Commission. 2005. Urban Water Management Plan for the City and County of San Francisco. p. 22-24.

With this understanding, the additional supplies produced by implementation of the WSIP are considered relatively secure and have been included in this WSA.

2.1.3 Effect of Climate Change on SFPUC Supply Availability

One potential factor that may affect water supply reliability for Burlingame is climate change. The term “climate change” refers to the anticipated change in the average weather of the earth, which can be measured by wind patterns, storms, precipitation, and temperature. Historical records have shown that temperature changes have occurred in the past, such as during previous ice ages. A 2007 assessment report for the Intergovernmental Panel on Climate Change indicates that the increase in global average temperature since the mid-20th century is very likely due to an observed increase in anthropogenic greenhouse gas concentrations. California Health and Safety Code Section 38501(a) recognizes that “[climate change] poses a serious threat to the economic well-being, public health, natural resources, and the environment of California,” and notes, “the potential adverse impacts of [climate change] include…reduction in the quality and supply of water to the state from the Sierra snowpack.” As most of the state depends on surface water supplies originating in the Sierra Nevada, including the San Francisco peninsula area, this water supply reduction is a concern.

SFPUC recognizes that climate change may cause increased uncertainty in precipitation and the Sierra snowpack, and a higher chance of water shortages in the Bay Area. SFPUC’s initial steps to address climate change include “engaging national climate change experts to study the potential effects of reduced snowpack, rising seas and hotter temperatures on the SFPUC’s water supplies, wastewater collection and energy generation…”[18] SFPUC’s current plans to augment and improve reliability for regional water supplies include conjunctive use plans, reservoir improvements, recycled water plans, and investigation of desalination opportunities.[19]

Most of the scientific models addressing the climate change issue show that the primary effect on California’s climate would be a reduced snow pack and a shift in stream-flow seasonality. A higher percentage of the winter precipitation in the mountains would likely fall as rain and, as a result, peak runoff would likely come a month or so earlier. The end result of this would be that the state may not have sufficient surface storage to capture the resulting early runoff, and so a portion of the current supplies would be lost to the oceans, rather than be available for use in the state’s water delivery systems.

While there are models that indicate a reduced snow pack and a shift in stream-flow seasonality, this potential effect of climate change would be experienced sooner at lower elevations than at higher elevations. This issue was discussed by Dr. Bruce McGurk, Operations Manager at Hetch Hetchy Water and Power, during a November 28, 2006 meeting with the SFPUC. The SFPUC system is composed of three higher elevation reservoirs (Hetch Hetchy, Cherry Lake, and Eleanor), the Don Pedro reservoir, and five local area reservoirs. The higher elevation reservoirs and the Don Pedro reservoir are dependent on snow melt and the local area reservoirs are dependent on rainfall. About 15 to 30 percent of SFPUC supply is from the local area reservoirs; therefore, most of the SFPUC water supply is from higher elevation reservoirs. For example, the Hetch Hetchy reservoir is a very large and very high elevation water source for the SFPUC; it reaches up to 12,000 feet in elevation and 87 percent of its stored water is above 6,000 feet, which is where the snow line is typically located in January or

19 San Francisco Public Utilities Commission website. Accessed July 2007. http://sfwater.org/detail.cfm/MC_ID /18/MSC_ID/114/MTO_ID/342/C_ID/3124/Keyword/climate%20change.

19 San Francisco Public Utilities Commission. 2005. Draft Water System Improvement Program.

February. Thus, high elevation of the Hetch Hetchy reservoir makes it less vulnerable to potential shifts in stream-flow seasonality, as compared to lower elevation reservoirs. The actual effects of global warming on future SFPUC water supply availability are unknown at this time.

2.2 Recycled Water

The City currently uses approximately 300,000 gpd of recycled water for internal use within their wastewater treatment plant (WWTP). The City does not currently have the treatment capabilities to meet the Title 22, Article 3 criteria for re-use of the recycled water for non-potable uses such as irrigation. The City does not use recycled water outside of the WWTP and does not currently have any plans to expand the use of recycled water.

2.3 Groundwater

Historically, the City has not utilized groundwater as a drinking water source (i.e., as described above, the sole source of the City's drinking water has been wholesale later supplied by the SFPUC). However, the City has constructed one groundwater supply well located near Washington Park, which was intended to be used to irrigate portions of City-owned landscaping and parks, including Washington Park, City Hall, Alpine Park, Victoria Park, and Burlingame High School. However, the well has not been put into operation due to technical issues related to the performance of the well system. Additionally, the well was not constructed for drinking water purposes and is not rated as a drinking water well.

3.0 WATER DEMAND ANALYSIS

This section shows the calculated water demand for the DSP as well as projected demand for the entire system.

3.1 Water Demand of Proposed Project

The DSP proposes increasing the total office and commercial space within the downtown area, as well as adding new residential units. The City's current parking standards dictate the residential density allowed within a development. The City may revise their parking standards, which would allow more residential units to be developed within the same area. **Table 3-1** presents the additional water demand resulting from the DSP, if developed according to existing parking standards. **Table 3-2** presents the additional water demand from the DSP if parking standards are revised and more residential units are developed. If the DSP is developed according to revised parking standards, allowing more residential units to be developed, it will increase the City's water demand by 186,600 gpd. The City anticipates development of the DSP will not occur prior to 2010 and demands are presented for 2020 (50 percent buildout) and 2030 (full buildout).

Table 3-1: Projected Water Demand Increase for DSP – Current Parking Standards

Land Use	Net Increase in Development	Density	Net Increase in Population	Unit Demand	Net Increase in Water Demand
<u>2020</u>					
Residential	438 units	2.2 person/unit	964	63.6 gpcd	61,300 gpd
Commercial	91,922 sf	330 sf/person	281	10.8 gpcd	3,000 gpd
Office	124,351 sf	330 sf/person	377	10.8 gpcd	4,100 gpd
2020 Increase					**68,400 gpd**
<u>2030</u>					
Residential	875 units	2.2 person/unit	1,925	63.6 gpcd	122,400 gpd
Commercial	183,843 sf	330 sf/person	561	10.8 gpcd	6,100 gpd
Office	248,702 sf	330 sf/person	754	10.8 gpcd	8,100 gpd
2030 Increase					**136,600 gpd**

Notes:
1. Density and population projections based on 2007 Association of Bay Area Governments data.
2. Office demand assumes 260 occupied days per year.
3. Unit demands based on Water Conservation Implementation Plan Final Report, Brown and Caldwell, September 2009
4. Buildout of DSP at 2020 assumed to be 50 percent complete.

Table 3-2: Projected Water Demand Increase for DSP – Revised Parking Standards

Land Use	Net Increase in Development	Density	Net Increase in Population	Unit Demand	Net Increase in Water Demand
2020					
Residential	616 units	2.2 person/unit	1,355	63.6 gpcd	86,200 gpd
Commercial	91,922 sf	330 sf/person	281	10.8 gpcd	3,000 gpd
Office	124,351 sf	330 sf/person	377	10.8 gpcd	4,100 gpd
2020 Increase					**93,300 gpd**
2030					
Residential	1,232 units	2.2 person/unit	2,710	63.6 gpcd	172,400 gpd
Commercial	183,843 sf	330 sf/person	561	10.8 gpcd	6,100 gpd
Office	248,702 sf	330 sf/person	754	10.8 gpcd	8,100 gpd
2030 Increase					**186,600 gpd**

Notes:
1. Density and population projections based on 2007 Association of Bay Area Governments data.
2. Office demand assumes 260 occupied days per year.
3. Unit demands based on Water Conservation Implementation Plan Final Report, Brown and Caldwell, September 2009
4. Buildout of DSP at 2020 assumed to be 50 percent complete.

One of the development scenarios for the DSP includes a 120-bed hotel. The hotel would replace approximately 100,000 sf of the proposed increase in office floor space. **Table 3-3** presents the additional water demand from the DSP if the hotel scenario is developed. To be conservative, the hotel scenario is evaluated assuming the DSP is developed with the revised parking standards.

Table 3-3: Projected Water Demand Increase for DSP – Hotel Scenario

Land Use	Net Increase in Development	Density	Net Increase in Population	Unit Demand	Net Increase in Water Demand
2020					
Residential	616 units	2.2 person/unit	1,355	63.6 gpcd	86,200 gpd
Commercial	91,922 sf	330 sf/person	281	10.8 gpcd	3,000 gpd
Office	74,351 sf	330 sf/person	225	10.8 gpcd	2,400 gpd
2020 Increase					**91,600 gpd**
2030					
Residential	1,232 units	2.2 person/unit	2,710	63.6 gpcd	172,400 gpd
Commercial	183,843 sf	330 sf/person	561	10.8 gpcd	6,100 gpd
Office	148,702 sf	330 sf/person	451	10.8 gpcd	4,900 gpd
Hotel	120 rooms			105 gpd/room	12,600 gpd
2030 Increase					**196,000 gpd**

Notes:
1. Density and population projections based on 2007 Association of Bay Area Governments data.
2. Office demand assumes 260 occupied days per year.
3. Unit demands based on Water Conservation Implementation Plan Final Report, Brown and Caldwell, September 2009
4. Buildout of DSP at 2020 assumed to be 50 percent complete.

The Association of Bay Area Governments (ABAG) provided data and projections for the City in years 2010, 2020, and 2030, including residential density (persons per household), and employment density (square feet of space per employee. Unit demands for the residential, commercial, and office areas were based on the Water Conservation Implementation Plan (Implementation Plan) Final Report (Brown and Caldwell, September 2009). The study evaluated metered demands and populations for residential and non-residential areas within the City and determined indoor water usage on a per capita basis.

Since the sites targeted for new development are currently developed and contain some landscaped areas, the land use plans for the DSP do not result in any net increase in landscaped area, and consequently the water use projections for the project do not include an increase in water use for landscape irrigation. Also, the water use projections assume the projection will result in no net increase in water system losses and other unaccounted-for water, as compared to losses in the existing water system facilities serving the area. This assumption may be conservative, in that utility system improvements accompanying the DSP redevelopment projects could result in a net decrease in system losses.

3.2 City Demand Forecasts

The Implementation Plan analyzed water demands associated with each customer sector and then forecasted demands over a twenty-five year planning horizon. The projections were developed to establish a base-year water demand at the end-use level (such as toilets and showers) and forecast future water demand based on projected demands of existing water service accounts and future growth in the number of service accounts. The forecasts incorporate effects of the plumbing and appliance code on existing and future accounts.

The DSP demands are considered new, unplanned demands on the City's water system as they are not accounted for in the City's UWMP demand projections. **Table 3-4** shows total demand in the City, including projected DSP demands.

Table 3-4: Burlingame Projected Demands

	Demands (mgd)		
	2010	**2020**	**2030**
Burlingame Demands	4.78	4.95	5.03
DSP Demands	0.00	0.09	0.19
Total	**4.78**	**5.04**	**5.22**

Notes:
1. Burlingame projected allocation based on the 2005 Urban Water Management Plan, Table 11.
2. Burlingame projected demands based on the 2005 Urban Water Management Plan, Table 8.

3.3 Water Conservation Best Management Practices

The City's UWMP lists the following water conservation measures currently in effect. The City estimates these water conservation programs will help reduce overall demands throughout the City by the year 2030.

- Water Surveys for Single Family and Multi-Family Residential Customers
- Residential Plumbing Retrofit
- System Water Audits, Leak Detection, and Repair
- Metering
- Large Landscape Conservation Program and Incentives
- High-Efficiency Appliance Promotion Programs
- Public Information Programs
- School Education Programs
- Conservation Programs for Commercial, Industrial, Institutional Customers
- Wholesale Agency Assistance Programs
- Non-Promotional Water Pricing Programs
- Water Conservation Coordinator
- Waste Water Prohibition
- Residential Ultra Low Flush Toilet Replacement

3.4 Water Shortage Contingency Plan

As explained in the City's 2005 UWMP, the City has developed a Water Shortage Contingency Plan (WSCP) to address possible dry-year reductions in supply from SFPUC. The WSCP includes four stages, to be implemented progressively as needed. The 2005 UWMP describes these stages as follows:

- Stage I (5% to 10% supply reductions) calls for a low level of informational outreach and enforcement of the permanent water use ordinances. The City anticipates a 5 percent reduction in demand is achievable through development of public awareness campaigns to inform customers of the drought conditions.

- In Stage II (10% to 20%) there will be a stepped up outreach effort and the adoption of some additional water use restrictions. Drought rate schedules will be implemented. The City estimates an overall 10 percent reduction in demands could be achieved.
- Stage III (20% to 35%) calls for increased outreach activities and additional emergency water use restrictions. Drought rates in each block would increase from those in Stage II. Fines and penalties would be applied to users in violation of water usage restrictions. In some cases, water flow restriction devices would be installed on customers' meters.
- Stage IV (35% to 50%) requires very close management of the available water supplies. Allocations of water for each customer will be introduced. Informational outreach activities would be operating at a very high level. Severe water use restrictions and a restrictive penalty schedule would be implemented.

During dry-year conditions, when SFPUC reduces its supply allocations to the City, the City plans to implement the WSCP in progressive stages as needed to maintain a positive balance of supplies and demands. The City notes that these reductions would be over and above long-term conservation savings already achieved in the City.

3.5 On-Site Conservation Measures

In addition to relying on the WSCP, the City could also consider the adoption and implementation of additional water conservation measures. These measures, if adopted by the City, would reduce the net increase in water use projected to result from buildout under the DSP project.

Possible on-site measures for reducing potable water use in the DSP project area include incorporating advanced conservation measures and using recycled water for irrigation use.

3.5.1 Incorporate advanced conservation measures

In addition to the standard water conservation measures incorporated into the current plumbing code (low-volume toilets and low-flow faucets and shower heads), the DSP could also adopt advanced water conservation measures as shown in **Table 3-5**:

Table 3-5. Advanced Water Conservation Measures

Measure	Notes
Residential Indoor Measures:	
high-efficiency washing machines	included with units; CC&Rs to require
high-efficiency dishwashers	included with units; CC&Rs to require
Other Measures	
individually metered multi-family units	with maintenance per CC&Rs
smart meters (w/ leak detection)	with maintenance per CC&Rs

High-efficiency clothes washers and dishwashers use advanced designs to achieve significant water use savings as compared to conventional models. The incorporation of sub-metering, in which each multi-family unit would have its own smart water meter with leak detection capability, reduces water use by maintaining price signals to the consumer and by minimizing water loss due to leaking toilets and other fixtures. Together, these measures may offer further reductions in overall potable water demand.

The adoption of the advanced indoor conservation measures reduces per capita residential indoor use to approximately 45 gpd, as documented in studies by the American Water Works Association (AWWA). This is a per capita reduction of approximately 12 gpd compared to baseline levels as shown in **Table 3-6**.

Table 3-6. Per Capita Residential Indoor Water Use With Conservation

Indoor Use Component	U.S. Average		With Current Code Conservation		With Advanced Conservation	
	gpcd	(%)	gpcd	(%)	gpcd	(%)
Showers	11.6	17%	8.8	15%	8.8	19%
Clothes Washers	15.0	22%	15.0	26%	10	22%
Dishwashers	1.0	1%	1.0	2%	0.7	2%
Toilets	18.5	27%	9.6	17%	8.2	18%
Baths	1.2	2%	1.2	2%	1.2	3%
Leaks	9.5	14%	9.5	17%	4	9%
Faucets	10.9	16%	10.8	19%	10.8	24%
Other Domestic Uses	1.6	2%	1.6	3%	1.6	4%
Total	**69.3**	**100%**	**57.5**	**100%**	**45.3**	**100%**

Source: Handbook of Water Use and Conservation, AWWA / Amy Vickers, 2001

The incorporation of these advanced conservation measures would reduce indoor potable water demands in new residential developments by approximately 20 percent.

3.5.2 Incorporate recycled water.

Recycled water, if available in the DSP area, could be utilized for landscape irrigation, per recommendations in the City's 2009 Climate Action Plan. This measure assumes the City has access to recycled water supplies, and has or would construct recycled water transmission and distribution facilities to serve the DSP area.

4.0 SUPPLY AND DEMAND COMPARISON

This section compares the City's water supplies and demands for each of three project scenarios.

- Scenario 1 – No Project: represents the demands of the City alone, without implementation of the DSP
- Scenario 2 – DSP with Current Parking Standards: represents the demands of the City and the DSP, assuming full buildout and occupancy by 2030 and developed with current City parking standards.
- Scenario 3 – DSP with Revised Parking Standards: represents the demands of the City and the DSP, assuming full buildout and occupancy by 2030 and developed with revised City parking standards.

4.1 Supply and Demand Comparison

The SFPUC can meet the current and future demands of its retail and wholesale customers in years of average and above-average precipitation. The MSA and IWSAP allow the SFPUC to reduce water deliveries to wholesale customers during periods of water shortage. The SFPUC used the historical hydrologic record from 1920 to 2002 to compare water supplies and demands into the future. This methodology assumes that the historical hydrologic record is representative of future conditions.

During dry-year water supply reductions from SFPUC, the City plans to implement its WSCP in progressive stages as needed to achieve a positive balance of supplies and demands. To maintain a positive supply for the City and DSP by 2030, this results in demand reductions of up to 4 percent in a single dry-year and up to 18 percent in subsequent years of a multiple dry-year event. These reduction levels correspond to implementation Stages I and II, respectively, of the City's WSCP.

Table 4-1 includes the projected future supply and demands of the City, without implementation of the DSP, by varying hydrologic conditions through 2030. Projected supply and demands of the City including the DSP, developed according to current and revised parking standards, are shown in **Table 4-2** and **Table 4-3**, respectively. Projected supply and demands of the City including the DSP with the hotel scenario are shown in **Table 4-4**.

Table 4-1: Supply and Demand Comparison for Normal, Dry, and Multiple Dry Years – Scenario 1: No Project Alternative

	Normal Year		Dry Year		Multiple Dry Year Event					
					Year 1		Year 2		Year 3	
	mgd	%	mgd	%	mgd	%	mgd	%	mgd	%
2010										
SFPUC Supply Allocation	**5.23**		**4.51**		**4.51**		**3.93**		**3.93**	
Burlingame Normal Demands	4.78		4.78		4.78		4.78		4.78	
Dry-Year Demand Reduction	0.00	0%	0.27	6%	0.27	6%	0.85	18%	0.85	18%
Burlingame Reduced Demand	**4.78**		**4.51**		**4.51**		**3.93**		**3.93**	
Surplus/(Deficit)	**0.45**		**0.00**		**0.00**		**0.00**		**0.00**	
2020										
SFPUC Supply Allocation	**5.23**		**4.71**		**4.71**		**4.11**		**4.11**	
Burlingame Normal Demands	4.95		4.95		4.95		4.95		4.95	
Dry-Year Demand Reduction	0.00	0%	0.24	5%	0.24	5%	0.84	17%	0.84	17%
Burlingame Reduced Demand	**4.95**		**4.71**		**4.71**		**4.11**		**4.11**	
Surplus/(Deficit)	**0.28**		**0.00**		**0.00**		**0.00**		**0.00**	
2030										
SFPUC Supply Allocation	**5.23**		**5.01**		**5.01**		**4.37**		**4.37**	
Burlingame Normal Demands	5.03		5.03		5.03		5.03		5.03	
Dry-Year Demand Reduction	0.00	0%	0.02	0.4%	0.02	0.4%	0.66	13%	0.66	13%
Burlingame Reduced Demand	**5.03**		**5.01**		**5.01**		**4.37**		**4.37**	
Surplus/(Deficit)	**0.20**		**0.00**		**0.00**		**0.00**		**0.00**	

Notes:
1. Burlingame projected allocation based on the 2005 Urban Water Management Plan, Table 11.
2. Burlingame projected demands based on the 2005 Urban Water Management Plan, Table 8.

Table 4-2: Supply and Demand Comparison for Normal, Dry, and Multiple Dry Years – Scenario 2: Proposed Project with Current Parking Standards

	Normal Year		Dry Year		Multiple Dry Year Event					
					Year 1		Year 2		Year 3	
	mgd	%	mgd	%	mgd	%	mgd	%	mgd	%
<u>2010</u>										
SFPUC Supply Allocation	**5.23**		**4.51**		**4.51**		**3.93**		**3.93**	
Burlingame Normal Demands	4.78		4.78		4.78		4.78		4.78	
DSP Demands	0.00		0.00		0.00		0.00		0.00	
Burlingame Normal Demand w/ Project	4.78		4.78		4.78		4.78		4.78	
Dry-Year Demand Reduction	0.00	0%	0.27	6%	0.27	6%	0.85	18%	0.85	18%
Burlingame Reduced Demand w/ Project	**4.78**		**4.51**		**4.51**		**3.93**		**3.93**	
Surplus/(Deficit)	**0.45**		**0.00**		**0.00**		**0.00**		**0.00**	
<u>2020</u>										
SFPUC Supply Allocation	**5.23**		**4.71**		**4.71**		**4.11**		**4.11**	
Burlingame Normal Demands	4.95		4.95		4.95		4.95		4.95	
DSP Demands	0.07		0.07		0.07		0.07		0.07	
Burlingame Normal Demand w/ Project	5.02		5.02		5.02		5.02		5.02	
Dry-Year Demand Reduction	0.00	0%	0.31	6%	0.31	6%	0.91	18%	0.91	18%
Burlingame Reduced Demand w/ Project	**5.02**		**4.71**		**4.71**		**4.11**		**4.11**	
Surplus/(Deficit)	**0.21**		**0.00**		**0.00**		**0.00**		**0.00**	
<u>2030</u>										
SFPUC Supply Allocation	**5.23**		**5.01**		**5.01**		**4.37**		**4.37**	
Burlingame Normal Demands	5.03		5.03		5.03		5.03		5.03	
DSP Demands	0.14		0.14		0.14		0.14		0.14	
Burlingame Normal Demand w/ Project	5.17		5.17		5.17		5.17		5.17	
Dry-Year Demand Reduction	0.00	0%	0.16	3%	0.16	3%	0.80	15%	0.80	15%
Burlingame Reduced Demand w/ Project	**5.17**		**5.01**		**5.01**		**4.37**		**4.37**	
Surplus/(Deficit)	**0.06**		**0.00**		**0.00**		**0.00**		**0.00**	

Notes:
1. Burlingame projected allocation based on the 2005 Urban Water Management Plan, Table 11.
2. Burlingame projected demands based on the 2005 Urban Water Management Plan, Table 8.

Table 4-3: Supply and Demand Comparison for Normal, Dry, and Multiple Dry Years – Scenario 3: Proposed Project with Revised Parking Standards

	Normal Year		Dry Year		Multiple Dry Year Event					
					Year 1		Year 2		Year 3	
	mgd	%	mgd	%	mgd	%	mgd	%	mgd	%
<u>2010</u>										
SFPUC Supply Allocation	**5.23**		**4.51**		**4.51**		**3.93**		**3.93**	
Burlingame Normal Demands	4.78		4.78		4.78		4.78		4.78	
DSP Demands	0.00		0.00		0.00		0.00		0.00	
Burlingame Normal Demand w/ Project	4.78		4.78		4.78		4.78		4.78	
Dry-Year Demand Reduction	0.00	0%	0.27	6%	0.27	6%	0.85	18%	0.85	18%
Burlingame Reduced Demand w/ Project	**4.78**		**4.51**		**4.51**		**3.93**		**3.93**	
Surplus/(Deficit)	**0.45**		**0.00**		**0.00**		**0.00**		**0.00**	
<u>2020</u>										
SFPUC Supply Allocation	**5.23**		**4.71**		**4.71**		**4.11**		**4.11**	
Burlingame Normal Demands	4.95		4.95		4.95		4.95		4.95	
DSP Demands	0.09		0.09		0.09		0.09		0.09	
Burlingame Normal Demand w/ Project	5.04		5.04		5.04		5.04		5.04	
Dry-Year Demand Reduction	0.00	0%	0.33	7%	0.33	7%	0.93	18%	0.93	18%
Burlingame Reduced Demand w/ Project	**5.04**		**4.71**		**4.71**		**4.11**		**4.11**	
Surplus/(Deficit)	**0.19**		**0.00**		**0.00**		**0.00**		**0.00**	
<u>2030</u>										
SFPUC Supply Allocation	**5.23**		**5.01**		**5.01**		**4.37**		**4.37**	
Burlingame Normal Demands	5.03		5.03		5.03		5.03		5.03	
DSP Demands	0.19		0.19		0.19		0.19		0.19	
Burlingame Normal Demand w/ Project	5.22		5.22		5.22		5.22		5.22	
Dry-Year Demand Reduction	0.00	0%	0.21	4%	0.21	4%	0.85	16%	0.85	16%
Burlingame Reduced Demand w/ Project	**5.22**		**5.01**		**5.01**		**4.37**		**4.37**	
Surplus/(Deficit)	**0.01**		**0.00**		**0.00**		**0.00**		**0.00**	

Notes:
1. Burlingame projected allocation based on the 2005 Urban Water Management Plan, Table 11.
2. Burlingame projected demands based on the 2005 Urban Water Management Plan, Table 8.

Table 4-4: Supply and Demand Comparison for Normal, Dry, and Multiple Dry Years – Scenario 4: Proposed Project with Hotel Scenario

	Normal Year		Dry Year		Multiple Dry Year Event					
					Year 1		Year 2		Year 3	
	mgd	%	mgd	%	mgd	%	mgd	%	mgd	%
2010										
SFPUC Supply Allocation	**5.23**		**4.51**		**4.51**		**3.93**		**3.93**	
Burlingame Normal Demands	4.78		4.78		4.78		4.78		4.78	
DSP Demands	0.00		0.00		0.00		0.00		0.00	
Burlingame Normal Demand w/ Project	4.78		4.78		4.78		4.78		4.78	
Dry-Year Demand Reduction	0.00	0%	0.27	6%	0.27	6%	0.85	18%	0.85	18%
Burlingame Reduced Demand w/ Project	**4.78**		**4.51**		**4.51**		**3.93**		**3.93**	
Surplus/(Deficit)	**0.45**		**0.00**		**0.00**		**0.00**		**0.00**	
2020										
SFPUC Supply Allocation	**5.23**		**4.71**		**4.71**		**4.11**		**4.11**	
Burlingame Normal Demands	4.95		4.95		4.95		4.95		4.95	
DSP Demands	0.09		0.09		0.09		0.09		0.09	
Burlingame Normal Demand w/ Project	5.04		5.04		5.04		5.04		5.04	
Dry-Year Demand Reduction	0.00	0%	0.33	7%	0.33	7%	0.93	18%	0.93	18%
Burlingame Reduced Demand w/ Project	**5.04**		**4.71**		**4.71**		**4.11**		**4.11**	
Surplus/(Deficit)	**0.19**		**0.00**		**0.00**		**0.00**		**0.00**	
2030										
SFPUC Supply Allocation	**5.23**		**5.01**		**5.01**		**4.37**		**4.37**	
Burlingame Normal Demands	5.03		5.03		5.03		5.03		5.03	
DSP Demands	0.20		0.20		0.20		0.20		0.20	
Burlingame Normal Demand w/ Project	5.23		5.23		5.23		5.23		5.23	
Dry-Year Demand Reduction	0.00	0%	0.22	4%	0.22	4%	0.86	16%	0.86	16%
Burlingame Reduced Demand w/ Project	**5.23**		**5.01**		**5.01**		**4.37**		**4.37**	
Surplus/(Deficit)	**0.00**		**0.00**		**0.00**		**0.00**		**0.00**	

Notes:
1. Burlingame projected allocation based on the 2005 Urban Water Management Plan, Table 11.
2. Burlingame projected demands based on the 2005 Urban Water Management Plan, Table 8.

4.2 Findings

Regarding the availability of water supplies to serve the DSP, the City finds as follows:

1. In years of average and above-average water supply, the City has adequate supplies to serve 100 percent of normal-year demands, inclusive of the DSP.

2. In dry-year and multiple-dry-year events, when SFPUC imposes reductions in its normal supply to the City, the City has in place a Water Shortage Contingency Plan sufficient to maintain a balance of supplies and demands. With the DSP in place, the City projects the need to implement Stage I reductions during a single dry-year shortage event, and Stage II reductions during subsequent years of a multiple-dry-year shortage event. These are the same Contingency Plan implementation stages the City would need to implement without the DSP in place.

3. The City therefore finds it has sufficient water available to serve the DSP in addition to its existing and planned customers. Further, the City finds that this water availability extends through its current water management planning horizon of 2030, and that it extends to average year, dry-year, and multiple-dry-year conditions.

APPENDIX A

Contracts/Agreements and Allocations

Table A-1: Contracts/Agreements, Allocations, Plans and Programs						
Document	**Contract Source/ Agreement**	**Wholesalers**	**Year Established**	**Supply Quantity**	**Expiration**	**Terms of Plan/Contract/Agreement**
Settlement Agreement & Master Sales Contract (MSA)	City and County of San Francisco	All members	1984; 2009	184 mgd (annual avg.)	2034	Rate making methodology, wholesale rates for wholesale customers; addresses water supply and water shortages; doesn't guarantee SFPUC will peak daily or hourly demands when customer usage exceeds the SAA (See - Section Supply Reliability)
Individual Water Supply Contract	City and County of San Francisco	Burlingame	1984;2009	--	2034	Establishes terms and conditions to deliver water. Appendix A
Supply Assurance Allocation (SAA)	City and County of San Francisco	All members	1994	184 mgd (annual avg.)	Continues indefinitely	Quantified SFPUC's obligation to supply water to its individual wholesale customers (all members adopted the SAA; each wholesale customer has a specified quantity)
		Burlingame	1994	5.23 mgd	Continues indefinitely	SFPUC can meet the demands of customers in years of average and above-average precipitation. Appendix A
Water Supply Master Plan	SFPUC	BAWSCA	2000	219 mgd due to recent operating restrictions on Calaveras Dam	N/A	Planning/guiding document - identified WSIP, CIP - cooperative effort b/w SFPUC and BAWSCA
Water Supply Improvement Program (WSIP)	SFPUC	Regional Water System	PEIR Certified October 30, 2008	Identifies water supply options to meet projected 2030 demand of 300 mgd	N/A	SFPUC capital improvement program to "firm-up" supplies and ensure supply reliability to meet customer purchase requests during both drought and non-drought years; 35 mgd demand increase expected by 2030; options include increased diversions and conservation, water recycling, and groundwater supply programs
Interim Water Shortage Allocation Plan (IWSAP)	BAWSCA	Burlingame	2000	Allocates 20% System-Wide Reduction	2018	Two Tier Plan, 1) Allocates and distributes Water b/w SFPUC and BAWSCA - based on level of supply shortage. 2) Allocates the collective wholesale customer share. Allocation is based on SAA, purchases during 3 years preceding adoption of the IWSAP, and rolling averages of purchases during 3 years immediately preceding onset of shortage

Source: Developed by PBS&J January 2006 – Updated June 2009.

Appendix J

Inventory of Historic Resources

CAREY & CO. INC.
ARCHITECTURE

INVENTORY OF HISTORIC RESOURCES
Burlingame Downtown Specific Plan

October 6, 2008

INTRODUCTION & METHODOLOGY

The City of Burlingame has engaged Carey & Co. to complete an inventory of historic resources for the Downtown Specific Plan Area. Specifically, Carey & Co. was asked to conduct a comprehensive survey of the Plan Area to determine which structures appear eligible for listing on the California Register of Historical Resources (CRHR) or the National Register of Historic Places (NRHP).

Beginning with parcel data provided by the City, Carey & Co. conducted a field survey during the summer of 2007 of all parcels (more than 500) in the Plan Area. For each property that appeared to be 50 years old or more, Carey and Co. created a detailed record that summarized building type, construction materials, notable features and evident alterations. Carey and Co. also took a digital photograph of the main façade of each building. These records were then assembled into a single database of parcels.

In conjunction with this field work, Carey & Co. conducted archival research at the Burlingame Public Library and Burlingame Historical Society to develop a general history of the Plan Area and to assess the potential significance of historically prominent buildings within it. Carey & Co. consulted historic Sanborn Fire Insurance Maps, Burlingame City Directories, historical photographs and newspaper articles, and historical references such as the Burlingame Historical Society's *Burlingame: Living Memories* and Constance Lister's 1934 *A History of Burlingame*.

The Draft Inventory of Historic Resources includes:

1. **Historic Context.** Based on previous histories and our own archival research, we have compiled a brief context statement that summarizes the early history of Burlingame and provides a framework for understanding the significance of its historic resources.

2. **List of Historic Resources.** This list includes those structures in the Plan Area that appear to be eligible for either the CRHR or the NRHP. The list includes summary information on each eligible building's primary architectural features and historic significance. Once finalized, this list of properties will serve, for CEQA purposes, as a complete list of historical resources in the Plan Area.

3. **List of Buildings of Interest.** This list includes buildings that do not appear California or National Register-eligible, but that still convey certain aspects of Burlingame's history and architectural heritage. None of these structures should be considered historic resources for purposes of CEQA based on the information in this report.

4. **Parcel Database.** This spreadsheet is the repository of all information that Carey & Co. collected on the buildings in the Plan Area over the course of the field survey. It provides architectural and, where available, historical information on each structure in the Plan Area, including Carey & Co.'s finding of historic significance. This spreadsheet has been submitted as a separate Microsoft Excel file.

5. **Survey Photos.** As part of the field survey, Carey & Co. photographed every building in the survey area, apart from a few structures that were obviously new. These photographs have been submitted separately on three CD-ROMs.

6. **Historic Photos.** While conducting archival research, Carey & Co. accumulated several photographs of historic Burlingame, including both photographs of individual buildings and historic street views. These photographs, most of which were drawn from the collection at the Burlingame Historical Society, have been submitted in digital format on a separate CD-ROM.

SUMMARY OF FINDINGS

Based on archival research (to assess historic significance) and site reconnaissance (to evaluate current condition), 23 structures within the Plan Area appear to be eligible for the CRHR and the NRHP:

- 201 Anita Road
- 1300 Bayswater Avenue
- 1310 Bayswater Avenue
- 1422 Bellevue Avenue
- 1021 Burlingame Avenue
- 1100 Burlingame Avenue
- 1435 Burlingame Avenue
- 1480 Burlingame Avenue
- 220 California Drive (Painted Sign)
- 290 California Drive
- 1427 Chapin Avenue
- 1214 Donnelly Avenue
- 1124 Douglas Avenue
- 1128 Douglas Avenue
- 1132 Douglas Avenue
- 1452 Floribunda Avenue
- 1500 Floribunda Avenue
- 1443 Howard Avenue
- 12 Lorton Avenue
- 283-287 Lorton Avenue
- 1421 Oak Grove Avenue
- 1449 Oak Grove Avenue
- 220 Park Road

These are the structures that, for CEQA purposes, should be considered historic resources. The Burlingame Railroad Station at 290 California Drive, and the Severn Lodge Dairy wall advertisement at 220 California Drive are already listed on the California Register.

In addition, Carey & Co. found 51 structures in the Plan Area that, although not California or National Register-eligible, still convey certain aspects of Burlingame's history and architectural heritage:

- 506 Almer Road
- 514 Almer Road
- 205-207 Anita Road
- 221-223 Anita Road
- 237-241 Anita Road
- 1105 Bayswater Avenue
- 1224 Bellevue Avenue
- 1236 Bellevue Avenue
- 1401 Bellevue Avenue
- 1466 Bellevue Avenue
- 1101-1105 Burlingame Avenue
- 1111 Burlingame Avenue
- 1120 Burlingame Avenue
- 1200-1204 Burlingame Avenue
- 1210 Burlingame Avenue
- 1375 Burlingame Avenue
- 1403 Burlingame Avenue
- 1420 Burlingame Avenue
- 1426 Burlingame Avenue
- 1461-1465 Burlingame Avenue
- 1471-1475 Burlingame Avenue
- 261 California Drive
- 297 California Drive
- 333 California Drive
- 361 California Drive
- 417 California Drive
- 421 California Avenue
- 625 California Drive
- 1101 Douglas Avenue
- 1134 Douglas Avenue
- 1138 Douglas Avenue
- 500 El Camino Real
- 600 El Camino Real
- 1401 Floribunda Avenue
- 25 Highland Avenue
- 27 Highland Avenue
- 107 Highland Avenue
- 908 Howard Avenue
- 936-948 Howard Avenue
- 8 Lorton Avenue
- 35 Lorton Avenue
- 327 Lorton Avenue
- 329 Lorton Avenue
- 1201 Oak Grove
- 2 Park Road
- 49 Park Road
- 241 Park Road
- 249 Primrose Road
- 251-277 Primrose Road
- 337-341 Primrose Road
- 480 Primrose Road

Based on a thorough survey of the Plan Area, these structures are of two main types: (1) commercial buildings on or near Burlingame Avenue that date from the city's founding or shortly thereafter but, due to alteration, do not have sufficient integrity to be California or National Register-eligible; and (2) residential structures from the early part of the twentieth century that, because they are not associated with a significant historical figure, event, or significant architectural design, do not appear California or National Register-eligible. None of these structures should be considered historic resources for purposes of CEQA based on the information in this report.

I. HISTORIC CONTEXT – THE EARLY HISTORY OF BURLINGAME

Pre-History

Indigenous Californians once accounted for the densest and most linguistically and culturally diverse populations in all of the territory that now makes up the continental United States. Approximately 300,000 people who spoke between sixty-four and eighty languages lived within the boundaries of modern-day California. Before the European settlement of Burlingame and the greater San Francisco Bay Area, the region was occupied by many discrete tribes of Native

Americans known collectively as the Ohlone, whom the Spanish referred to as *Costanoans*. The tribe's territory extended along the coast from the mouth of San Francisco Bay in the north to Carmel in the south, and as far as sixty miles inland. The Ohlone are believed to have inhabited the area since 500 AD or earlier.[1]

Like most California tribes, the Ohlone were a hunter-gatherer and "basket-maker" society that did not develop a written language or build permanent architecture. They lived in conical-shaped huts made with poles, woven reeds, and grass thatch and depended on acorns and seafood for sustenance. Traveling in *balsas*, a type of canoe made of tule reeds, the Ohlone fished the bay for their main food source: fish, mussels, oysters, and seals. Their diet also included seeds, berries, roots, land mammals, waterfowl, reptiles, and insects. The Ohlone are known to have used bows and arrows, cordage, bone tools, and twined basketry to procure and process their foodstuffs. Though not an agricultural society, the Ohlone managed the production of various plants through controlled burning (a practice that was later halted by the Spanish to the detriment of the local environment).[2] The Ohlone inhabited a natural environment of grasslands and oak forests in the Burlingame area. They settled in communities that the Spanish later termed *rancherias*, which were small villages of unrelated family groups that collaborated in hunting, harvesting, and religious practices. Ohlone shell mounds were once located along Mills, Easton, Sanchez, and Burlingame Creeks in Burlingame.[3]

Spanish Period

Indigenous Californians and their ways of life survived virtually intact for nearly two hundred years after Christopher Columbus happened upon the West Indies in 1492 and European powers established Colonial empires in North and South America. With a vast desert in the southeast, formidable mountain ranges along lengthy stretches of the eastern and western borders, and difficult tides and winds to navigate, California's natural landscape deterred Spain, the closest colonial power, to invest much time or energy in this region. The few disastrous explorations of California that Europeans made during the sixteenth and early seventeenth centuries – to find a northwest water passage through the continent, to find gold, or to find a safe harbor – simply reinforced conclusions that settling California presented far more difficulties that it was worth. As historians James Rawls and Walter Bean wrote, California presented little more than "a barren and dangerous coast that a ship sailed past once a year."[4]

In 1765, Visitor-General José de Gàlvez, exploited the Spanish crown's desire to expand its wealth in New Spain as well as the crown's fears of the incursion into its lands of other European powers, including England, the Netherlands, and Russia, to embark on his own mission to settle California. He convinced the crown to fund an expedition that would lead to the establishment of missions, a well-established colonial institution that ostensibly served to convert the natives to Christianity and divest them of their indigenous ways, thereby rendering a region more amenable to imperial rule. Missions also included a military unit, or *presidio*, and essentially functioned as towns, or *pueblos*. In 1769 Captain Gaspar de Portolá led three ships and two land contingents on this "Sacred Expedition," and a Franciscan priest named Junípero Serra served as

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[1] Richard Levy, "Costanoan," in *California*, ed. R. F. Heizer, Handbook of North American Indians, vol. 8., general ed. W. C. Sturtevant (Washington, DC: Smithsonian Institution, 1978), 485–495.
[2] Ibid.
[3] Beverly Evans, "Historical Background," in *Burlingame Lively Memories: A Pictorial Review*, ed. Beverley L. Evans (Burlingame, CA: The Burlingame Historical Society, 1977), 2.
[4] James J. Rawls and Walton Bean, *California: An Interpretive History*, 7th ed. (New York: McGraw Hill, 1998), 20-26.

the religious leader. A year later, after many disasters small and large, the Spaniards built a presidio and mission at Monterey Bay, establishing the crown's sovereignty over Alta California.[5]

Civilian settlement of the area came several years later. In 1776, the De Anza Expedition arrived in Monterey. The settlers, lead by Juan Bautista de Anza, consisted of men, women, and children who had traveled from Arizona to populate the new Spanish territory in *Alta* (Upper) California. The majority was peasant-class Spanish citizens, and many were of mixed Spanish, Mexican, and indigenous heritage.[6] As the first recorded expedition in the location known as Burlingame, the group camped in an area de Anza described as a dry arroyo half a league north from "arroyo San Matheo," or Burlingame Creek.[7] The site is near the present intersection of Burlingame Avenue and El Camino.[8]

Today's Burlingame is situated between the two strongholds that Spain established to secure the San Francisco Bay against enemy occupation. On June 29, 1776 (five days before the Declaration of Independence was signed in Philadelphia), Junípero Serra founded Mission San Francisco de Asis, popularly known as Mission Dolores, in the area known as San Francisco. A presidio at the southern end of the entrance to the bay and a pueblo named Yerba Buena completed the northern stronghold. Members of the Anza Expedition settled the second stronghold, a pueblo named San José, and thereby established the first civil community in Alta California. Borrowing from the combined resources of the missions in Monterey and San Francisco, Father de la Peña founded Mission Santa Clara de Asís in 1777 in connection with the San José pueblo. The Ohlone in the greater Burlingame Area fell under the purview of Mission Dolores when its missionaries established the San Mateo/Burlingame area as a farm.[9]

Mexican Period

The Mexican Period officially started in 1821, when Mexico declared its independence from Spain; however, the effects of this took a number of years to reach colonial California. Over the next dozen years the Mexican government created laws that secured the transfer of power. The Mexican Colonization Law of 1824 and the Reglamento of 1828, for instance, encouraged civilian settlement in California by creating guidelines for the establishment of land grants.[10] The true shift in power from Spanish to Mexican rule occurred in 1833 with the Secularization Act. This act officially wrested control of mission lands from the Catholic Church and made them available for the private ownership of Mexican citizens. Mission Delores was secularized in 1834,; the land and property at Mission Santa Clara, one of the last missions to undergo secularization, was dispersed in 1836.

The City of Burlingame straddles two ranchos granted to private landowners following the Secularization Act, Rancho San Mateo to the south and the Buri Buri Rancho to the north. A Mexican governor, Pio Pico, granted Rancho San Mateo, an area of land including present-day Burlingame, to his secretary, Cayetano Arenas. Arenas and his father quickly sold the rancho to

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[5] Ibid., 26-35.

[6] Mary Jo Ignoffo, *Milestones: A History of Mountain View, California.* (Cupertino, CA: California History Center & Foundation, 2002), 22.

[7] Russ Cohen, "A Brief History of Burlingame: How the City of Burlingame Came to Be…" City of Burlingame, 2007. http://www.burlingamehistorical.org/page181.htm (accessed January 11, 2008).

[8] Constance Lister and Geoffrey A. Currall, eds., *A History of Burlingame: published serially in the San Mateo Times beginning August 25, 1934*. (Burlingame: The Burlingame Historical Society, 1978), 17.

[9] Cohen, "A Brief History of Burlingame."

[10] Dorothy Krell, ed., *The California Missions* (Menlo Park, CA: Lane Publishing Company, 1989), 172.

Howard & Mellus, a San Francisco based mercantile company, following the Bear Flag Revolt of 1846. William Davis Merry Howard then bought out his partner and gained ownership of the rancho, where he established a dairy farm and retired with his wife.[11] Buri Buri Rancho was provisionally granted to Jose Antonio Sanchez, a soldier from Sinaloa, Mexico, in 1835.[12] Sanchez constructed a house along El Camino Real at the current border of Burlingame and Millbrae, and his land extended from San Bruno Mountain in the north to Sanchez Creek in the south.[13]

Just twenty-five years after securing its sovereignty from Spain, Mexico found itself battling to save its territory. War erupted between the United States and Mexico in 1846, largely over the independence of Texas and its border. The United States overran Mexico with troops and won in a decided fashion. The war officially ended on February 2, 1848, with the signing of the Treaty of Guadalupe Hidalgo, which ceded California (and other territories) to the United States and guaranteed that Mexicans residing in the territory at the time of the treaty could continue to reside there and would retain all rights to their property. Even rights to land that belonged to Mexican proprietors who did not reside on it would be "inviolably respected" as long as a contract for that land could be produced.[14] The signers of the treaty did not know, however, that gold had been discovered along the American River nine days earlier.

The Gold Rush and Early Burlingame

United States possession of California territory coincided with the discovery of vast quantities of gold in the foothills of the Sierra Nevada. On January 24, 1848, John Marshall, an employee of a ranch and mill owner named John Sutter, discovered gold on the American River. News of Marshall's discovery spread like wildfire and soon, as the saying goes, the world rushed in. Half of California's population descended upon the region between San Francisco and the Sierra foothills, with the former's population alone growing from fewer than 1,000 people at the opening of 1848 to more than 26,000 by year's end. Huge waves of migrants from the East Coast and immigrants from Europe, Central and South America, and Asia commenced the following year. These settlers regularly squatted on already claimed land. By 1850, California's population was sufficiently large that the territory could apply for statehood.

Despite the terms of the Treaty of Guadalupe Hidalgo, Mexican landowners quickly lost their property rights after the Gold Rush. The earliest settlers were ignorant – or disdainful – of the treaty and its protection of Mexican property rights, forcing rightful owners to undertake strenuous and ultimately futile legal battles to prove their claims. The Land Act of 1851 attempted to solve conflicts of land ownership, but it did not enforce the treaty and placed the burden of proof on land owners. Although Mexicans kept paper records, including written contracts and maps, of land grants, their system was not as rationalized as the American parcel system, which divided land systematically into surveyed grids and kept a paper trail of titles. Mexicans relied on natural features as boundaries, and their title records were usually incomplete. These obstacles, combined with language barriers, usually resulted in losses by the Mexicans. Most disputes also took decades to resolve; those Mexicans who did win their legal battles often had to sell the property to pay for the legal fees. The case of the Sanchez family

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[11] Russ Cohen, "A Brief History of Burlingame."
[12] Carey & Co., "Historic Resource Evaluation: Burlingame Safeway, Burlingame, California." Prepared for Environmental Science Associates, October 24, 2001; Russ Cohen, "A Brief History of Burlingame."
[13] Russ Cohen, "A Brief History of Burlingame.
[14] Rawls and Bean, *California*, 85-89; Treaty of Guadalupe Hidalgo, February 2, 1848, Article VIII, http://www.yale.edu/lawweb/avalon, accessed August 1, 2007.

illustrates perfectly the impact of the Gold Rush and the Land Act on the Californio ranchos. Following a lengthy and expensive lawsuit, the Sanchez family lost control of their land after it was divided among several landowners. In comparison, the Howards retained their land holdings in Rancho San Mateo after winning their title dispute.[15]

Incorporation and Growth

Upon his death in 1856, William Howard bequeathed one-third of his property to his father in-law, Joseph E. Poett, and the remaining two-thirds to his wife and son. El Camino Real, running north-south, separated the two parcels to the east and west. William C. Ralston, a prominent banker, acquired the Howard's holdings west of El Camino Real.[16] Ralston earned his fortunes in the mining industry, including the discovery of the Comstock Lode in Nevada during the 1860s, and purchased the land. He intended to establish a new suburban development in San Mateo County, which had been incorporated in 1856.[17] Ralston called his personal estate Belmont.

Anson Burlingame, a congressman from Massachusetts and a former United States Minister to China under President Lincoln, visited Ralston in 1866 and purchased over one thousand acres to establish his own villa. In honor of his friend's acquisition, Ralston named the new town site Burlingame and began laying out streets, including Burlingame Avenue. In addition, he recommended that eucalyptus trees be planted along the avenues to serve as a windbreak and to beautify the streets.[18] Eucalyptus trees had first been planted in the Bay Area as early as the 1850s and became a prominent landscape feature by the 1870s.[19] Ralston purchased the land in 1870 following his friend's untimely death.[20]

The San Francisco and San Jose Railroad formed in 1859, and its chairman, W. T. Gough, soon met with residents of San Mateo County to establish a line servicing the Peninsula. The railroad company gained the right-of-way to construct a railroad line through the San Mateo Rancho, which it completed in 1863.[21] The Southern Pacific Railroad eventually acquired the peninsula line and maintained a shed at the "Oak Grove Crossing" for passengers boarding at Burlingame.[22] A permanent depot was not constructed until 1894.

Following Ralston's death in 1875, Senator William Sharon purchased the property and had town lots surveyed in 1876; however, Burlingame remained sparsely settled until the late 1800s. Early residents of Burlingame included William Corbitt, a coffee importer, and John Donnelly, a carpenter and builder. Corbitt purchased Poett's land east of El Camino Real and established the San Mateo Stock Farm in 1875. Additionally, he constructed a house between Oak Grove and Burlingame Avenues. He then sold 4.5 acres to Donnelly the following year on which Donnelly constructed the city's first small home at the northeast corner of Burlingame Avenue and Primrose Road.[23] Although early residents had already established dairy farms and ranches as

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[15] Russ Cohen, "A Brief History of Burlingame.
[16] Lister and Currall, *A History of Burlingame*, 30-1.
[17] Lister and Currall, *A History of Burlingame*, 8; Cohen, "A Short History of Burlingame."
[18] Lister and Currall, *A History of Burlingame*, 4 and 31.
[19] Michael R. Corbett, "Historical and Cultural Resource Survey: East Alameda County." Prepared for Lisa Asche, Planner, Alameda County Community Development Agency, June 17, 2005.
[20] Carey & Co., "Burlingame Safeway."
[21] Lister and Currall, *A History of Burlingame*, 33-4.
[22] Ibid., 38.
[23] Evans, "Historical Background," 3.

well as smaller homes, the area still did not have any commercial businesses. Residents traveled to San Mateo or Millbrae to purchase groceries.[24]

Francis Newland, Sharon's son in-law, inherited his estate upon his death in 1885 and envisioned a new country club to spur growth in Burlingame.[25] The Burlingame Country Club was founded in 1893, and membership included the state's wealthiest residents.[26] The following year, the club largely funded the construction of Burlingame's landmark railroad station. George H. Howard, son of William Howard, and J. B. Matthews designed the building in a Mission Revival style and incorporated clay roof tiles from the Mission San Antonio de Padua in Jolon and the Mission Dolores Asistencia in San Mateo.[27] Burlingame's first post office was also established in 1894.[28]

Burlingame began to grow at the turn of the century following the establishment of the railroad station and post office. In 1901 the city's first two businesses, a combination bank and post office and a grocery store, opened on Burlingame Square.[29] George W. Gates, the city's first station manager and an early postmaster, constructed the drug store and post office on a parcel now adjacent to the Bank of Burlingame on California Drive.[30] Despite this growth, Burlingame Avenue remained a tree-lined dirt road. Only gravel paths meant for pedestrian and bicycle use extended from the avenue and led to open fields cultivated with oats, wheat, and beets.[31]

A new streetcar line complementing the service provided by the Southern Pacific Railroad further spurred development in Burlingame. In 1903 the Market Street Railway established Line 40, which ran south from San Francisco through the peninsula and stimulated growth in Burlingame and other cities in San Mateo County. Development radiated out from Burlingame's railroad station, and additional land was surveyed and subdivided. That same year, the Burlingame Land Company hired Davenport Bromfield to survey and plat an area bounded by Oak Grove Avenue to the north, El Camino Real to the west, Burlingame Avenue to the south, and the Southern Pacific Railroad tracks to the east. Two years later, he subdivided the area on behalf of the company, and it became the city's downtown hub.[32]

Burlingame sustained little damage during the 1906 earthquake and fires; thus, residents from San Francisco quickly moved south to the town and bought hundreds of city lots. The town's population grew from 200 in 1906 to around 1,000 in 1907 as a result of this new settlement.[33] Additionally, several influential social clubs, including the Burlingame Advancement League and the Burlingame Women's Club, were established. Other civic and religious organizations

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[24] Lister and Currall, *A History of Burlingame*, 42 and 46.
[25] Cohen, "A Brief History of Burlingame."
[26] Carey & Co., "Burlingame Safeway."
[27] David Gebhard, Eric Sandweiss, and Robert Winter, *The Guide to Architecture in San Francisco and Northern California* (Salt Lake City: Gibbs M. Smith, 1985), 133.
[28] Lister and Currall, 49.
[29] Cohen, "A Short History of Burlingame."
[30] Lister and Currall, *A History of Burlingame*, 51.
[31] Burlingame Historical Society, "Burlingame Heritage Tour: Downtown" (Burlingame: Burlingame Historical Society, 1976).
[32] Robert Bruce Anderson and Thomas Rex Hardy, "1427 Chapin Avenue, Burlingame, California: Historic Resource Evaluation" (Prepared for Baseline Environmental Consulting, November 3, 2005), 4.
[33] Lister and Currall, *A History of Burlingame*, 54; Carey & Co., "Burlingame Safeway."

were also established around this time, including the town's first church, the First Baptist Church, in 1906, the first volunteer fire department in 1907, and the first free library in 1908.[34]

In 1908 residents voted to incorporate the Town of Burlingame and elected the first board of trustees and supervisors. By 1910, the neighboring town of Easton, on the former Buri Buri Rancho, was annexed to the town as well. That same year, residents living near the Burlingame Country Club incorporated their own town, Hillsborough, in order to preserve their country setting.[35] Burlingame's town trustees first met in a vacant building on Burlingame Square but soon moved to Weinberg Hall on Lorton Avenue. The trustees occupied the upper story, and other city officials, such as the tax collector and superintendent of streets, occupied the first story.[36] The town retained Charles Peter Weeks, a noted Bay Area architect, to design the two-story brick city hall on Park Road near Burlingame Avenue. City officials moved into the new building after its completion in 1914.[37]

Burlingame experienced explosive growth following its incorporation in 1908, and its population reached over 4,100 residents by 1920.[38] As a result, numerous new businesses were established along Burlingame Avenue, and many new homes were constructed in the surrounding neighborhoods.[39] By the mid-1930s, the city boasted of having over 4,000 single-family homes, 83 apartment buildings, 15 duplexes, and over 250 businesses. The town evolved into a mature city with fire and police departments, a new jail, several newspapers, six elementary schools, and one high school. Over fifty civic, religious, and social organizations had been established to serve the 13,000 residents.[40] Burlingame continued to grow over the twentieth century and currently has a population of approximately 28,000 residents.

Notable Architects

Ernest L. Norberg

Ernest L. Norberg (1890-1979) was Burlingame's most prolific architect and won many awards and citations for his work over the seventy-two years he resided in the city. Norberg moved to Burlingame at age seventeen with his family following the 1906 earthquake and fires in San Francisco. He commuted to San Francisco to attend high school and lived in temporary quarters until his family constructed a home at 605 Howard Avenue in Burlingame. Ernest and his brother John studied architecture and eventually opened an office together first in San Francisco and then in the Bank of Burlingame Building. He designed numerous schools, commercial buildings, residences, and hotels in Burlingame, Hillsdale, and San Mateo. According to a 1930 newspaper article, Norberg's "work could almost be called synonymous with the growth" of Burlingame and San Mateo.[41] He met his wife Perry Hollis Pratt in 1916, and they married the following year. They lived for many years in a house of his own design at 407 Occidental Avenue in Burlingame. Norberg achieved the rank of Lt. Colonel after serving thirty-two years in the Army Corps of Engineers and was known locally as "Colonel Norberg." He was a member of the

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[34] Lister and Currall, *A History of Burlingame*, 69-70.
[35] Cohen, "A Brief History of Burlingame.
[36] Lister and Currall, *A History of Burlingame*, 74.
[37] Ibid., 116.
[38] Ibid., 86.
[39] Ibid., 86.
[40] Ibid., 120-139.
[41] "Norberg Designs Packard's Home," *Burlingame Advance Star*, March 6, 1930.

Park and later Planning Commissions for twenty-two years.[42] He was named a "Citizen of the Year" in 1976. Ernest Norberg died in 1979 at the age of 89.[43]

George H. Howard, Jr.
Born in 1864 to George Henry Howard and Agnes Poett-Howard (widow of William Davis Merry Howard), George Henry Howard, Jr., became a prominent architect in Burlingame and Hillsborough. Additionally, he was a founding member of the Burlingame Country Club in 1893 and was elected to the town's Board of Trustees. He designed over seventy-five buildings during his career most notably in the Tudor/Gothic Revival style.[44] Additionally, Howard and John McLaren, a noted landscape architect, designed the plans for San Mateo Park, a residential community just south of Burlingame. Their design featured gently winding streets and lush plantings of a wide variety of trees.[45] After retiring in 1927, he moved to Paris where he died in 1932. His most prominent commission was the Burlingame Train Station, which he designed in 1894 with J. B. Matthews.[46]

II. HISTORIC RESOURCES WITHIN THE PLAN AREA

The Plan Area includes several structures that, based on state and national significance criteria, appear to be eligible for listing on the California Register of Historical Resources (CRHR) and the National Register of Historic Places (NRHP).

Federal Criteria
National Register Bulletin Number 15, *How to Apply the National Register Criteria for Evaluation*, describes the Criteria for Evaluation as being composed of two factors. First, the property must be "associated with an important historic context."[47] The National Register identifies four possible context types, of which at least one must be applicable at the national, state, or local level. As listed under Section 8, "Statement of Significance," of the National Register of Historic Places Registration Form, these are:

A. Property is associated with events that have made a significant contribution to the broad patterns of our history.

B. Property is associated with the lives of persons significant in our past.

C. Property embodies the distinctive characteristics of a type, period, or method of construction or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components lack individual distinction.

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[42] Martha Rosman, "Colonel and Mrs. Ernest L. Norberg," in *Burlingame Lively Memories: A Pictorial Review,* ed. Beverley L. Evans (Burlingame, CA: The Burlingame Historical Society, 1977), 12-13.
[43] Ibid.
[44] The Burlingame Historical Society has identified twenty-five of his buildings.
[45] "San Mateo Park: History." San Mateo Park. http://www.sanmateopark.org/History (accessed January 17, 2008).
[46] Historic property records, Burlingame Historical Society.
[47] National Park Service, National Register Bulletin 15, 3.

D. Property has yielded, or is likely to yield, information important to prehistory or history.[48]

Certain resources are not usually considered for listing in the National Register:

a. religious properties
b. moved properties
c. birthplaces and graves
d. cemeteries
e. reconstructed properties
f. commemorative properties
g. properties that have achieved significance within the past fifty years

These properties can be eligible for listing, however, if they meet special requirements, called Criteria Considerations (A-G), in addition to meeting the regular requirements (that is, being eligible under one or more of the four significance criteria and possessing integrity).

Generally, such properties will qualify for the National Register if they fall within the following seven criteria considerations:

a. A religious property deriving primary significance from architectural or artistic distinction or historical importance; or

b. A building or structure removed from its original location but which is significant primarily for architectural value, or which is the surviving structure most importantly associated with a historic person or event; or

c. A birthplace or grave of a historical figure of outstanding importance if there is no appropriate site or building directly associated with his or her productive life; or

d. A cemetery which derives its primary significance from graves of persons of transcendent importance, from age, from distinctive design features, or from association with historic events; or

e. A reconstructed building when accurately executed in a suitable environment and presented in a dignified manner as part of a restoration master plan, and when no other building or structure with the same association has survived; or

f. A property primarily commemorative in intent if design, age, tradition, or symbolic value has invested it with its own exceptional significance; or

g. A property achieving significance within the past 50 years if it is of exceptional importance.

Second, for a property to qualify under the National Register's Criteria for Evaluation, it must also retain "historic integrity of those features necessary to convey its significance."[49] While a property's significance relates to its role within a specific historic context, its integrity refers to "a

[48] National Park Service, National Register Bulletin 16A, 75.
[49] National Park Service, National Register Bulletin 15, 3.

property's physical features and how they relate to its significance."[50] To determine if a property retains the physical characteristics corresponding to its historic context, the National Register has identified seven aspects of integrity:

> Location is the place where the historic property was constructed or the place where the historic event occurred.
>
> Design is the combination of elements that create the form, plan, space, structure, and style of a property.
>
> Setting is the physical environment of a historic property.
>
> Materials are the physical elements that were combined or deposited during a particular period of time and in a particular pattern or configuration to form a historic property.
>
> Workmanship is the physical evidence of the crafts of a particular culture or people during any given period in history or prehistory.
>
> Feeling is a property's expression of the aesthetic or historic sense of a particular period of time.
>
> Association is the direct link between an important historic event or person and a historic property.[51]

Since integrity is based on a property's significance within a specific historic context, an evaluation of a property's integrity is typically only done once historic significance has been established.[52]

State Criteria

California Office of Historic Preservation's Technical Assistance Series #6, *California Register and National Register: A Comparison*, outlines the differences between the federal and state processes. The context types to be used when establishing the significance of a property for listing on the California Register of Historical Resources are very similar, with emphasis on local and state significance. They are:

1. It is associated with events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the United States; or

2. It is associated with the lives of persons important to local, California, or national history; or

3. It embodies the distinctive characteristics of a type, period, or method of construction or represents the work of a master, or possesses high artistic values; or

[50] Ibid., 44.
[51] Ibid., 44-45.
[52] Ibid., 45.

4. It has yielded, or is likely to yield, information important to prehistory or history of the local area, California, or the nation.[53]

Like the NRHP, evaluation for eligibility to the California Register requires an establishment of historic significance before integrity is considered. California's integrity threshold is slightly lower than the federal level. As a result, some resources that are historically significant but do not meet NRHP integrity standards may be eligible for listing on the California Register.[54]

California's list of special considerations is shorter and more lenient than the NRHP. It includes some allowances for moved buildings, structures, or objects, as well as lower requirements for proving the significance of resources that are less than 50 years old and a more elaborate discussion of the eligibility of reconstructed buildings.[55]

In addition to separate evaluations for eligibility to the California Register, the state will automatically list resources if they are listed or determined eligible for the NRHP through a complete evaluation process.[56]

California Historical Resource Status Codes
The California Historic Resource Status Codes (status codes) are a series of ratings created by the California Office of Historic Preservation (SHPO) to quickly and easily identify the historic status of resources listed in the state's historic properties database. The following are the seven major status code headings:

1. Properties listed in the National Register or the California Register.
2. Properties determined eligible for listing in the National Register or the California Register.
3. Appears eligible for National Register or California Register through Survey Evaluation.
4. Appears eligible for National Register or California Register through other evaluation.
5. Properties recognized as historically significant by local government.
6. Not eligible for listing or designation.
7. Not evaluated for National Register or California Register or needs revaluation.

The descriptions below include background information on each eligible building, which is intended to identify each building's primary architectural features and elucidate its historic significance. Once finalized, this list of properties would serve, for CEQA purposes, as a complete list of historical resources in the Plan Area.

201 Anita Road
This one-and-one-half story Folk Victorian house has a rectangular plan and a hipped roof clad in asphalt shingles. Wood horizontal boards clad the building, and vertical wood boards run along the foundation. The house features numerous gabled dormers, a wide eave overhang, and several bay windows. The primary window type is one-over-one, wood-sash, double-hung with lamb's tongues. A gabled entry porch on the northeast façade has wood square supports and patterned wood shingles in the pediment.

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[53] California Office of Historic Preservation, Technical Assistance Series 6, 1.
[54] Ibid., 1.
[55] Ibid., 2.
[56] All State Historical Landmarks from number 770 onward are also automatically listed on the California Register. (California Office of Historic Preservation, Technical Assistance Series 5, 1.)

While Assessor's records list the house's construction date as 1912, the Burlingame Historical Society has identified a chain of title back to 1903, and it may be one of the oldest extant houses in Burlingame. A 1920 city directory lists the occupant as J. M. Vickerson, a contractor and builder.[57] The house appears to be significant as an older residence dating to the early development of Burlingame before its incorporation. It retains the characteristics of Folk Victorian cottages, including its small scale, wood horizontal cladding, and patterned shingles. Therefore, it appears to be eligible for listing in the California and National Registers under Criterion C/3 as a representative example of an early Folk Victorian style residence in Burlingame that retains a high level of integrity.

1300-1310 Bayswater Avenue (St. Catherine's of Siena Catholic Church and School)
St. Catherine's of Siena Catholic Church and School is located along Bayswater Avenue between Park and Primrose Roads and includes a church, a rectory, and a school building. The Gothic Revival church building has a rectangular plan and a dash coat stucco cladding. Clay tile clads the steeply-pitched, parapeted gable roof. The building's notable features include large Gothic arched windows with tracery, stylized buttresses, and an attached tower with a copper spire. The L-shaped rectory features stucco cladding and a parapeted cross-gable roof clad in clay tile. It contains metal-sash, multi-pane, double-hung windows with drip molding. Additionally, it has several oriel windows and an attached garage. The two-story, U-shaped school building has a symmetrical façade with a central oriel window located above an arched entrance. Wood-sash awning or casement windows at each story flank the entrance and oriel window. The stucco-clad school building's nearly symmetrical northeast elevation contains a similar oriel window and entrance at each end with wood-sash awning windows spanning between them. The building has a parapeted cross-gable roof clad in clay tile except for a two-story addition with a flat roof that projects southwest from the building's rear and wraps around the its northwest wing.

In 1908 Reverend Patrick W. Riordan, Archbishop of San Francisco, appointed Father James A. Grant parish priest of the newly organized St. Catherine's of Siena Catholic Church. The congregation celebrated its first mass on September 14, 1908, and erected its first church in 1909 at Howard Avenue and Park Road. A rectory was constructed two years later. In 1925 the congregation moved to Bayswater Avenue and relocated and expanded the church and rectory buildings at its new site. On September 12, 1938, the church celebrated the opening of a new school designed by architect H. A. Minton and staffed by the Sisters of Mercy. A new rectory was built in 1950, and the old rectory was moved to Peninsula Avenue and later demolished. In 1951 the congregation commissioned architect Martin Rist to design the current Gothic Revival style church, which complements the school building.[58] In 1959, the school building received a rear addition with a flat roof that served as a convent.[59] The church complex appears to be eligible for listing in the California and National Registers under Criteria Consideration A and Criteria C/3 as representative examples of Gothic Revival style architecture in Burlingame.

1422 Bellevue Avenue
This six-story, Italian Renaissance style apartment building is located along Bellevue Avenue between Almer Road and Primrose Road. The building has an irregularly shaped plan and a flat roof with a parapet. Clad in stucco on the upper stories and cast stone on the first story, it features cast stone quoining and a cast stone brick motif at the window surrounds of its paired windows. The primary window type is wood-sash, one-over-one, double-hung with additional

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[57] Burlingame Historical Society.
[58] Historic property files, Burlingame Historical Society.
[59] George S. Dolim, Letter to William Meeker, City of Burlingame, 15 May 2008.

eight-over-one and four-over-one windows located throughout. The building also has three, five-story oriel windows on the east and west elevations. The upper story features a shield motif above each window. Engaged colonnettes separate each window or paired window and end in a finial at the roofline.

Constructed in 1929, this apartment building was initially known as "The Chateau." However, a 1930 city directory lists the building as the Marion Apartments.[60] The building was constructed during a period of explosive growth in Burlingame when several other large-scale apartment buildings were constructed in the neighborhood during the 1930s and 1940s. It retains a high level of integrity, including it fenestration, plan, cast stone features, and plaster motifs at the roofline. Therefore, it appears to be eligible for listing in the California and National Registers under Criterion C/3 as a representative example of an Italian Renaissance style apartment building in Burlingame.

1021 Burlingame Avenue (Packard Showroom)

The former Packard Showroom is a two-story, brick building located at the northeast corner of Burlingame Avenue and East Lane. The building has a roughly rectangular plan and a flat roof with a parapet, which is stepped on the northeast elevation. The building's two entrances on the northwest and southeast corners feature multi-pane double doors flanked by sidelights. A hopper transom window with a decorative grille and crenellation is located above each door. The building also features large and small pointed arch windows and multi-pane, metal-sash casement windows with thick wood lintels. A stucco-clad octagonal tower situated on the roof's southwest corner has a clay tile roof and is topped by a steel lattice tower. The building's interior features include a flagstone floor and a beamed ceiling.[61]

Ernest L. Norberg, a prolific architect in Burlingame, designed the building in what he called a "modified Moorish" style. At the time of its construction in 1929, owner Earle C. Anthony billed the building as the largest Packard motor car showroom.[62] Anthony installed a steel tower on the roof, which originally supported a sign spelling "PACKARD" in large red letters. He intended to broadcast a radio signal from the tower but was never able to do so due to the Depression.[63] After the car lost popularity following World War II, the building housed a variety of car dealerships, including the Burlingame Motor Company, the Rector Motor Company, and Lee Oldsmobile."[64] Therefore, the building appears to be eligible for listing in the California and National Registers under Criterion A/1 for its association with the development of the automobile industry in Burlingame. It also appears to be eligible under Criterion C/3 as an important work of the prolific Burlingame architect Ernest Norberg. The building stands as a landmark with its large pointed arch windows, crenellation, brick cladding, and steel lattice tower.

1100 Burlingame Avenue (Bank of Burlingame/American Trust Company)

The landmark Bank of Burlingame building is located at the southwest corner of California Drive and Burlingame Avenue. The two-story flatiron building has a flat roof with a parapet and

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[60] Burlingame Historical Society.
[61] Paul D. Buchanan, "Rediscovering San Mateo: Uncovering a most intriguing edifice at Burlingame and East," *San Mateo Daily Journal*, July 16, 2001.
[62] *Preliminary Historic Inventory, City of Burlingame* (Prepared for Burlingame Planning Commission review, July 26, 1982), 1.
[63] Buchanan, "Rediscovering San Mateo."
[64] *Preliminary Historic Inventory, City of Burlingame*, 1.

a projecting cornice with brackets and dentils. A cartouche sits at roofline above the former corner entrance. Colusa stone clads the building. The primary window type is wood-sash fixed on the first story and wood-sash, one-over-one, double-hung with lamb's tongues and an asymmetrical upper sash on the second story. Although the corner entrance retains its flanking columns, it has been filled in with windows and the entrance relocated to the east elevation. Pilasters separate the bays on each elevation.

Noted San Francisco-based architect William H. Weeks designed this commercial building around 1908 for the Bank of Burlingame, which had been chartered the previous year as the city's first bank. In addition to the first bank, the building housed the city's first library on the second floor. It became the Mercantile Trust Company in 1926 and the American Trust Company in 1927. The American Trust Company relocated to Primrose Road in 1955 and became a Wells Fargo bank in 1960.[65] Although it has been modified slightly since its construction, including the replacement of its windows and the conversion of the entrance into a window unit, it still retains its massing, form, cladding, and a number of architectural details. The modifications are largely in keeping with original design, and the architectural rhythm has been maintained. Therefore, the building appears to retain sufficient integrity for listing in the California and National Registers under Criterion A/1 for its role in the early commercial development of Burlingame and under Criterion C/3 as a Classical Revival commercial building in the town's downtown.

1435 Burlingame Avenue (First Interstate Bank)
This two-story Art Deco bank building faces southeast on Burlingame Avenue between Primrose Road and El Camino Real and shares party walls with adjacent buildings. Clad in travertine, the building's symmetrical façade features a large, centrally-located, semicircular awning sheltering a set of double doors flanked by sidelights. A transom runs above the entrance, and a large carved stone relief and tripartite window are located above the awning. Additional windows are four-pane, metal-sash with horizontal muntins and rolled stone lintels. Approximately four-foot tall marble planters extend from the entrance along the façade.

Built in 1936, this building housed the San Francisco Bank's first branch outside of San Francisco. The bank was one of California's oldest banks dealing solely in home financing and claimed to handle most of San Mateo County's business. According to newspaper accounts in 1936, it was "the last word" in banks as evident in its plush interior with marble floors and counters.[66] Gold leaf covers the ceiling and the interior pilasters. The building also retains its original interior decorative plaster friezes. The bank claimed to have concealed microphones leading from burglar-proof vaults directly to the police station on Lorton Avenue. A metal grill displaying the sign "Burglar Alarm" is still located on the façade above the second story windows. Three Burlingame residents were top employees at the bank: Lorenz H. Hansen, manager; Claude J. Hirschey, assistant manager; and Richard A. Hearst, assistant manager and cashier. The building currently houses a Wells Fargo bank, and the only apparent alteration includes a new sign on the façade.[67] It remains a distinct example of Art Deco architecture in Burlingame, and as such, appears to be eligible for listing in the California and National Registers under Criterion C/3.

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[65] *Preliminary Historic Inventory, City of Burlingame*, 2.
[66] *Ibid.*, 2-3.
[67] *Ibid.*, 2-3.

1480 Burlingame Avenue (Pacific Telephone & Telegraph Company Building)
This four-story commercial building is located at the northwest corner of El Camino Real and Burlingame Avenue. Clad in brick, the building has a slightly irregular plan, a flat roof with a parapet, and a projecting cornice with simple brackets and dentils. A slightly projecting belt course with dentils and a decorative stone motif separates the first two stories. Simple belt courses separate the upper stories. The primary type windows on the first story are wood-sash casement with segmental-arched, brick lentils, and the primary type windows on the upper stories are wood-sash, three-over-three, double-hung with vertical muntins. The second-story windows have a molded lentil and stone spandrel beneath. The third-story windows have an inset stone panel above them. The building also features brick quoins.

Constructed around 1925, this building originally housed the Pacific Telephone & Telegraph Company plant.[68] It appears to be eligible for listing in the California and National Registers under Criterion C/3 as a an early large-scale commercial building in Burlingame, and it retains a high level of integrity, including its scale, cladding, fenestration, and cornice.

220 California Drive (Severn Lodge Dairy Wall Advertisement)
The Severn Lodge Dairy Wallscape is a 14-foot by 53-foot painted advertisement. It dates from approximately 1917, when the Severn Lodge Dairy, based in Hillsborough, opened a creamery and distribution plant at 220 California Drive. The wallscape, which was rediscovered in 2000 when the adjacent Regan Building was demolished, was recently restored by the Burlingame Historical Society. It is a State Point of Historical Interest and has been listed in the California Register.

290 California Drive (Railroad Station)
The Burlingame Railroad Station stands on a triangular parcel bounded by railroad tracks to the north, South Lane to the east, California Drive to the south, and North Lane to the west. The Mission Revival station has a complex plan, stucco cladding, and a combination gable roof clad in clay tile and a flat roof lined with clay tile. Additionally, it has shaped parapets at the gable ends and a square tower with a hipped roof clad in clay tile. The tiles were taken from the Mission San Antonio de Padua and the San Mateo Assistencia.[69] An arcade runs along the north façade and extends west from the building, and an additional arcade with rounded arch openings extends across the south elevation. The building has a variety of window types, including multi-pane, wood-sash casement and wood-sash, three-over-three, double-hung with vertical muntins and lamb's tongues. The eaves overhang exposing thin rafter tails.

The Burlingame Railroad Station is listed as California State Landmark No. 846, and is on the National Register of Historic Places under Criterion C as the first permanent example of the Mission Revival sty1e architecture. Architects George H. Howard, Jr., and J. B. Mathison designed the building for the Southern Pacific Railroad Company and the Burlingame Country Club. The station became the center of Burlingame's early growth after it opened on October 10, 1894. It housed an early post office, the offices of Wells Fargo Express and Western Union, and

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[68] Burlingame Historical Society.
[69] Donald P. Ringler, "History of Burlingame Avenue, 1857-1920" in *Burlingame Lively Memories, A Pictorial Review*, ed. Burlingame Historical Society (Burlingame, CA: Burlingame Historical Society, 1976), 50.

the Burlingame Women's Club's first meetings.[70] The railroad station retains a high level of integrity with no apparent alterations except for the addition of an arcade on the north façade.[71]

1427 Chapin Avenue (Farrell Residence)
The two-story George Farrell residence faces northwest on Chapin Avenue between Primrose Road and El Camino Real. The building has a T-shaped plan with a hipped roof clad in asphalt shingles. Farrell incorporated several different colors, shapes, and types of brick to create a variety of details and textures throughout the house. Brick types include common brick, clinker brick, molded brick, and circle brick. He also used molded terra cotta ornament. The building's second story is clad in field brick laid in a Flemish Bond, while the first story is clad in a 5-course base of clinker brick.[72] Brick quoins are located at the corners and around the windows.

The primary window type is wood-sash, one-over-one, double-hung with lamb's tongues. The windows have lintels with masonry jack arches and brick voussoirs.[73] Additionally, Farrell incorporated several oval windows, including one located on the second story of the northeast façade and framed by radial bricks.[74] Other features of the house include a flat-roof porch with brick column supports that extends across the northwest façade's eastern half, a wide eave overhang, and a small brick chimney on the roof.

In 1905 George Farrell, an experienced bricklayer, began constructing the first clinker brick house on the peninsula for his family. After the 1906 earthquake and fires partially destroyed the house, Farrell rebuilt it in 1907 and interlaced heavy wire, S-shaped anchors between each course of bricks to strengthen the walls. The Farrell's daughter, Irene Palamountain, occupied the house until 1964.[75] In 1968 the adjacent Burlingame Garden Center acquired the building and converted it to retail use. The Garden Center also demolished a garage and rear one-story residence, and constructed a 500-square foot addition on the house's southeast corner. [76] It appears that this addition has been demolished. A historic resource evaluation prepared in 2005 by Robert Bruce Anderson and Thomas Rex Hardy found the house eligible for listing in the California Register for its "sophisticated composition, artistic expression, and masterful detailing of brickwork rarely found in Burlingame's early residential construction."[77] It appears eligible for the California and National Registers under Criterion C/3.

1214 Donnelly Avenue (George W. Gates House)
The George W. Gates House faces southeast on Donnelly Avenue between Lorton Avenue and Primrose Road. The Shingle style, two-story house has an L-shaped plan with a one-story portion that curves around the southeast corner and includes a large entry porch with wood column supports and brick patio. The building also has a tower on the south corner and a hipped roof clad in asphalt shingles. Wood shingles clad the building, and the primary window type is wood-sash, one-over-one, double-hung. An exterior, shingle-clad chimney is located on the southwest elevation.

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[70] *Preliminary Historic Inventory, City of Burlingame*, 1-2.
[71] Donald P. Ringler, "History of Burlingame Avenue," 53.
[72] Anderson and Hardy, "1427 Chapin Avenue," 9-10.
[73] Ibid., 9.
[74] Ibid.
[75] Ibid., 2.
[76] Ibid.
[77] Ibid.

Born in 1874 in San Francisco, George W. Gates was a pioneer resident of Burlingame. After arriving in Burlingame in 1895, Gates became the town's first postmaster and third stationmaster, and lived with his family in the railroad station's south wing.[78] Gates commissioned the house in 1902-3 after resigning as stationmaster. Originally located on Burlingame Avenue as one of only three houses, the Gates moved the house to its present location around 1917.[79] After retiring as both station manager and postmaster, he became a noted business man through his involvement in real estate.[80]

Although the building has been converted from a single-family house into a commercial business, it appears to retain a high level of integrity. Alterations include the shingle-clad chimney and the replacement of some windows on secondary elevations. Like the houses at 1124 and 1128 Douglas Avenue, the Gates House is important as a particularly early example of a Burlingame residence. All three houses were located originally on Burlingame Avenue, but were moved soon after their construction to accommodate the growing central business district. The residence appears to retain sufficient integrity for listing in the California and National Registers under Criterion A/1 for its association with the early residential development of Burlingame and under Criteria B/2 for its association with George W. Gates, an early resident of Burlingame integrally involved in the town's first post office and train station. Because it was so early in the building's history, the building's relocation by Gates does not affect its eligibility for listing in both registers.

1124 Douglas Avenue (A.L. Offield Residence)
The A. L. Offield Residence faces east on Douglas Avenue between California Drive and Primrose Avenue. Square in plan, the two-story residence has wood-shingle cladding and a gable roof clad in asphalt shingles. T1-11 boards run along the foundation. The symmetrical façade has a central entrance with multi-pane, wood double doors flanked by wood-sash, multi-pane sidelights and a four-pane, wood-sash transom. A full-width shed dormer spans the façade and has two groupings of wood-sash, multi-pane casement windows. An exterior brick chimney is located on the south elevation. The parcel also contains a rear, two-story apartment building with an L-shaped plan and a hipped roof.

This house was constructed in 1904 at 1210 Burlingame Avenue, on land belonging to Frederick Gates, father of George W. Gates. The house served as the first home of Dr. Archie L. Offield, the town's first doctor, who came to Burlingame in 1907. In 1914, when Dr. Offield decided to build a commercial block on the property (the Offield Building), this house, along with the Murphy residence (see below), were moved to their present locations on Douglas Avenue.[81] The house may have contained an open-air porch that has since been enclosed with the addition of the double doors. The current owner Larry Stevenson states that the house contains a single offset entry door that once had a doorbell. This door is located behind the double doors in the building's interior.[82]

The building is significant as a particularly early home in Burlingame with a high level of integrity. The building stands adjacent to 1128 and 1132 Douglas Avenue, which appear to be

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[78] Ringler, "History of Burlingame Avenue," 78.
[79] Lister and Currall, *A History of Burlingame*, 50; *Preliminary Historic Inventory, City of Burlingame*, 6.
[80] Ibid.
[81] Ringler, "History of Burlingame Avenue," 76; City of Burlingame, "Burlingame Heritage Tour."
[82] Larry Stevenson, Letter to the City of Burlingame, no date. Carey & Co. conducted the survey from the public right of way and did not have access to the building's interior or its rear elevation.

California Register-eligible, and the notable residences at 1134 and 1138 Douglas Avenue. The building appears to retain sufficient integrity for listing in the California and National Registers under Criterion A/1 for its association with the early residential development of Burlingame and under Criteria B/2 for its association with Dr. Archie L. Offield, a prominent resident of Burlingame and the town's first doctor. Because it was so early in the building's history, the building's relocation by Dr. Offield does not affect its eligibility for listing in both registers.

1128 Douglas Avenue (James R. Murphy Residence)
The James R. Murphy Residence is a two-story, rectangular-in-plan structure that faces east on Douglas Avenue between California Drive and Primrose Avenue. Wood shingles clad this residence, which has a gable roof clad in rolled asphalt and a rear addition with a shed roof. The primary window type is wood-sash, one-over-one, double-hung with lamb's tongues. The nearly symmetrical façade has a centrally located entrance sheltered by an inset porch and a shed wall dormer with four double-hung windows directly above. The inset porch has square shingle-clad supports and is enclosed on its south elevation by a wood-sash, multi-pane picture window. Two similar picture windows are located on the façade's northern portion and on the north elevation. An exterior brick chimney and a bay window are also located on the north elevation. Similar to 1124 Douglas Avenue, the parcel also contains a rear, two-story apartment building with an L-shaped plan and a hipped roof.

Mr. and Mrs. James R. Murphy commissioned this house in 1903-4 at 1208 Burlingame Avenue as their family home. According to the Murphy family, their house was the seventh constructed in Burlingame.[83] "Sunny Jimmy" Murphy was the Millbrae railroad stationmaster and Burlingame's city clerk from 1910 to 1930. He also served as justice of the peace and jailer, managed the water department, and ran his own express company, Murphy's Transfer. Mrs. Murphy served as one of the first park commissioners. The Murphy's moved their house to its present site on Douglas Avenue in 1914, when commercial development increased along Burlingame Avenue.The building has undergone subsequent remodeling and expansion, and further archival research would need to be conducted to ascertain the precise extent of the alterations.[84] Historic photographs do reveal that an open air porch originally spanned the façade. The porch has been partially enclosed at its northern portion. Additionally, a bracketed planter located underneath the façade's dormer window has been removed.[85]

Like 1124 Douglas Avenue, the building is significant as a particularly early home in Burlingame with a high level of integrity. The building stands adjacent to 1124 and 1132 Douglas Avenue, which appear to be California Register-eligible, and the notable residences at 1134 and 1138 Douglas Avenue. The building appears to retain sufficient integrity for listing in the California and National Registers under Criterion A/1 for its association with the early residential development of Burlingame and under Criteria B/2 for its association with James Murphy, a prominent resident of Burlingame involved broadly in many aspects of the town's government following its incorporation in 1908. Because it was so early in the building's history, the building's relocation by James Murphy does not affect its eligibility for listing in both registers.

1132 Douglas Avenue (Everett J. Savill Residence)
The Everett J. Savill Residence is a two-story, rectangular-in-plan building that faces east on Douglas Avenue between California Drive and Primrose Avenue. Asphalt shingles clad the

[83] Historic property files, Burlingame Historic Society.
[84] Ringler, "History of Burlingame Avenue," 75; City of Burlingame, "Burlingame Heritage Tour."
[85] Historic photographs of 1128 Douglas Avenue, Burlingame Historical Society.

steeply-pitched, front-gable roof, which has slightly flared eaves and a wide eave overhang. A large shed dormer sits on each side of the roof. Horizontal, beveled wood boards clad the first story and dormers, while wood shingles clad the gables. The façade features an enclosed porch on the southern portion with brick steps and a metal railing. A cutaway bay window clad in T1-11 boards sits north of the porch. Wood-sash, one-over-one, double-hung windows with lamb's tongues are located throughout the building except at the bay window and the north elevation. An exterior chimney is located on the west elevation, and T1-11 boards run along the north elevation's foundation.

The Murphy family initially owned this parcel as part of their lot at 1128 Douglas Avenue, but they sold it to the president of the Peninsula Meat Company as a stable yard for the firm's horses and carts. Everett J. Savill, manager of the meat company's Burlingame branch, commissioned the house in 1910.[86] Historic photographs reveal that the building appears to retain a high level of integrity with some minor alterations. The porch has been enclosed with the addition of windows and a screen door, and the small balconet spanning the façade's second story windows has been replaced. Corner brackets have recently been removed from the bay window, which is now clad in T1-11 boards. T1-11 boards have recently been added along the north elevation's foundation. Wood-sash double-hung windows have recently been replaced at the bay window and the north elevation.[87]

The building is significant as an early home in Burlingame with a high level of integrity. The building stands adjacent to 1124 and 1128 Douglas Avenue, which appear to be California Register-eligible, and the notable residences at 1134 and 1138 Douglas Avenue. The building appears to be eligible for listing in the California and National Registers under Criterion A/1 for its association with the early residential development of Burlingame and under Criteria C/3 as a simple Queen Anne style residence in Burlingame. The steeply-pitched roof, the cutaway bay window, and the inset porch with a simple spindlework frieze are characteristic of this style. The slightly flared eave and wide shed dormers are reminiscent of Tudor Revival style residences.

1452 Floribunda Avenue
1500 Floribunda Avenue

The apartment buildings at 1452 and 1500 Floribunda Avenue stand adjacent to each other, just north of the intersection of Floribunda and Almer Road. 1452 Floribunda is larger of the two buildings and is located east of 1500 Floribunda. Both feature elements of French Eclectic style architecture, and they appear to have been built in conjunction, along with two nearly identical apartment buildings located just northwest at 1421 Oak Grove Avenue.

The apartment building at 1452 Floribunda has a rectangular plan and a flat roof with a false-mansard roof on the front portion clad in asphalt shingles and with finials at its corners, which gives the impression that the entire building has a mansard roof. Dentils run along the cornice. The building is clad in smooth stucco with parallel horizontal incised lines at the first story and has two shallow projections at the corners with stucco quoins. The primary window type is wood-sash, four-over-four, double-hung with lamb's tongues. Wood-sash, two-over-two, double-hung with lamb's tongues flank the central window on the projections. The façade has three centrally located, arched, louvered vents on the roof and a garage entrance at the first story with a stucco shield motif directly above.

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[86] Ringler, "History of Burlingame Avenue," 76; City of Burlingame, "Burlingame Heritage Tour."
[87] Historic photographs of 1132 Douglas Avenue, Burlingame Historical Society.

Smaller in size, 1500 Floribunda Avenue has an L-shaped plan and a similar combination flat and mansard roof with finials. It also has a similar cladding, dentils along the cornice, and arched, louvered vents. However, the façade is arranged with two setbacks instead of with shallow projections. It has a similar window type, although with wood, louvered shutters on the second and third stories. It does not have garage at first story.

These apartment buildings, along with the two apartment buildings located adjacent but facing Oak Grove Avenue, are an impressive grouping of residential buildings and retain a high level of integrity. Built in 1940, these buildings were constructed during a period of tremendous growth in Burlingame when its population was increasing rapidly. The buildings appear to be eligible for listing in the California and National Registers under Criterion C/3 as representative examples of large-scale, French Eclectic style apartment buildings in Burlingame.

1443 Howard Avenue (First Methodist Church)
The United Methodist Church stands at the northeast corner of El Camino Real and Howard Avenue. The Spanish Eclectic style building has a complex plan and a smooth stucco cladding. A wood louvered cupola with a cross sits atop the central octagonal crossing. Three wings extend from this and have gable roofs clad in clay tile. Wood-sash, rounded arch windows are located throughout the building, and large rose windows are located above the entrance on the façade and on the southwest elevation. The façade has three entrances, which consist of wood, paneled double doors with a rounded arch transom window set in a deep entryway with engaged spiral colonettes. A similar entrance is located around the corner on the southwest elevation. A corbelled scallop motif runs along the cornice. A two-story addition with a flat roof extends northeast and southeast from the church building. A small school with a rectangular plan, stucco cladding, a flat roof, and wood-sash windows stands southeast of the church.

Established in 1908, the First Methodist Church initially occupied a Mission Revival building at the corner of Burlingame Avenue and Primrose Road. In 1915 the church enlarged the building to accommodate a growing congregation. By 1923, it had grown too large for the site and decided to move the church building to a new location at the corner of Howard Avenue and El Camino Real. In 1925 the church commissioned architect Rollin S. Tuttle to design a new church building and William Leadley, a contractor in San Mateo, to build it.[88] Based on archival research, it appears that the 1908 church was demolished to make room for the existing building. The church complex appears to be eligible for listing in the California and National Registers under Criteria Consideration A for religious properties and Criterion C/3. The church complex stands as a representative example of Spanish Eclectic style in Burlingame, as evident in its clay tile-clad roof, stucco cladding, and the arched entryways.

12 Lorton Avenue
This two-story, Craftsman style residence faces southwest on Lorton Avenue between Bayswater and Peninsula Avenues. The steeply-pitched, front-gable roof is clad in wood shingles and features wood brackets and a wide eave overhang. Two large gabled dormers sit on each side of the roof. Wood shingles clad the rectangular-in-plan building. The primary window type is wood-sash casement. Three wood louvered vents sheltered by a small awning are located in the gable peak. A centrally located, tripartite window and a leaded glass transom with diamond-shaped panes are located below the vents. The façade also features a front entry porch with wood square column supports. The stairway and entrance on the northwest elevation were most likely

[88] Adell Meacham, "Seventeen Churches in Burlingame" in *Burlingame Lively Memories: A Pictorial Review*, ed. Beverley L. Evans (Burlingame, CA: Burlingame Historical Society, 1977), 41.

added when the single-family residence was converted into a duplex. The parcel also contains two rear residential buildings that are both rectangular in plan with gable roofs.

Constructed in 1909, the house dates to Burlingame's incorporation. A 1925 city directory lists the house as the residence of Kate D. Moynihan.[89] Originally a single-family house, it has been converted to a duplex. However, the building appears to retain a high level of integrity, including its plan, massing, cladding, and fenestration, and is an important early example of a Burlingame residence. Therefore, it appears to be eligible for listing in the California and National Registers under Criterion C/3 as a significant example of Craftsman style architecture in Burlingame.

283-287 Lorton Avenue (Burlingame Hotel)
The Burlingame Hotel sits at the south corner of Burlingame and Lorton Avenues. The three-story, reinforced concrete commercial building has a rectangular plan, a flat roof, and a projecting cornice with brackets and dentils. The façade has three stucco shields along the cornice. The first story has large, metal-sash, fixed storefront windows with arched transom windows, while the upper stories have wood-sash, one-over-one, double-hung windows with lamb's tongues. These windows are paired on the façade's four central bays and on the northeast and southeast elevations. The central third-story windows on the façade and northeast elevation are set in a rounded arch frame with a console bracket and are separated by a slender pilaster.

In 1911, Burlingame businessmen Frederick D. Lorton and John Rehe purchased this corner lot and later demolished the buildings in 1925.[90] They commissioned Ernest L. Norberg, a prolific architect in Burlingame, to design the Burlingame Hotel and the Rehe Building, located next door at 1207-9 Burlingame Avenue. The Burlingame Hotel was completed within a year (with the aid of a large steam shovel that was reportedly the first of its kind used on the Peninsula), and has remained one of the largest buildings in downtown Burlingame. According to the Burlingame Historical Society, the metal "Hotel" sign on the northeast elevation is original to the building. Along with the Burlingame Hotel, which was considered a first-class hotel, the structure houses several small stores. The Blue Bird Drug Company (later called Avenue Pharmacy) occupied the building from 1926 until the mid-1970s. The La Piñata restaurant occupied the ground floor from 1973 to 2002, and Sephora, a cosmetics retail store, currently occupies the store.[91] The building appears to be eligible for listing in the California and National Registers under Criterion C/3 as an important example of noted Burlingame architect Ernest L. Norberg's larger buildings and as an early commercial building with Italianate detailing, including the brackets and dentils at the cornice, the arched windows, and the quoins. The building appears to retain a high level of integrity, including its plan, fenestration, quoins and detailing at the cornice. The first story has been modified in some areas. The cladding and windows at the Sephora storefront have been replaced, and the arched windows on the northeast elevation have been filled in.

1421 Oak Grove Avenue
The apartment buildings at 1421 Oak Grove Avenue stand adjacent to each other facing Oak Grove Avenue, between Ansel Road and El Camino Real, and have a narrow addition connecting them in the middle. They appear to have been built in conjunction with two very similar apartment buildings located just southeast at 1452 and 1500 Floribunda Avenue.

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[89] Burlingame Historical Society.
[90] Ringler, "History of Burlingame Avenue," 83.
[91] Historic property files, Burlingame Historic Society.

The apartment buildings are nearly identical to the building addressed as 1452 Floribunda Avenue and feature elements of French Eclectic style architecture. They have rectangular plans and flat roofs with a false-mansard roof on the front portion clad in asphalt shingles and with finials at its corners. This gives the impression that the entire building has a mansard roof. Dentils run along the cornice. The buildings are clad in smooth stucco and have two shallow projections at the corners with stucco quoins. The primary window type is wood-sash, four-over-four, double-hung with lamb's tongues. Wood-sash, two-over-two, double-hung with lamb's tongues flank the central window on the projections. The façade has three centrally located, arched, louvered vents on the roof and a garage entrance at the first story with a stucco shield motif directly above.

These apartment buildings, along with the two apartment buildings located adjacent but facing Floribunda Avenue, are an impressive grouping of residential buildings and retain a high level of integrity. Built in 1940, these buildings were constructed during a period of tremendous growth in Burlingame when its population was increasing rapidly. The buildings appear to be eligible for listing in the California and National Registers under Criterion C/3 as representative examples of large-scale, French Eclectic style apartment buildings in Burlingame.

1449 Oak Grove Avenue (First Church of Christ, Scientist)
The First Church of Christ, Scientist stands just south of the intersection of Oak Grove Avenue and Acadia Drive. The building has a complex plan and consists of a central church with shorter, one-story additions extending to the northeast and southwest. The church has a cross-gable roof clad in red clay tile, while the additions have hipped roofs clad in clay tile. Stucco clads the building throughout. The central church has a deep entry porch that projects northwest. The porch has a central arch and paired columns with Corinthian capitals. It shelters three sets of wood, paneled double doors, and a pediment sits atop the central doors. Two square towers with quoins and clay tile-clad hipped roofs flank the entry porch. The church façade's cornice features brackets and dentils and a cross-shaped window in the gable centered above the porch. Overall, the building has a variety of window types, including wood-sash, three-over-three, double-hung with vertical muntins and vinyl casement.

In 1910 three families founded Burlingame's First Church of Christ, Scientist and began holding meetings in their homes. They later held services in the old Masonic Hall on Burlingame Avenue. In 1915 the church incorporated, and in 1917 it built a new church on Oak Grove Avenue. In 1926 this building was moved to an adjacent lot and used as a Sunday school after the current church was constructed.[92] W. H. Newman and Walter C. Falch, architects based in San Francisco, designed the building.[93] The congregation constructed a new Sunday school building in 1956.[94] The buildings appear to be eligible for listing in the California and National Registers under Criteria Consideration A and Criterion C/3 as a distinct blend of Spanish Eclectic elements, including the stucco cladding and clay tile-clad roof, and Classical Revival style elements, including the arched entry porch supported by Corinthian columns, the pediment above the entrance, and the decorative panels.

220 Park Road (United States Post Office)
The United States Post Office in Burlingame sits on a rectangular parcel bounded by Lorton Avenue to the northeast and Park Road to the southwest. The painted concrete building has a

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[92] Meacham, "Seventeen Churches in Burlingame," 42.
[93] Lister and Currall, *A History of Burlingame,* 50.
[94] Meacham, "Seventeen Churches in Burlingame," 42.

rectangular plan and a flat roof with a parapet. Two wings with clay tile-clad shed roofs extend northeast and southwest from the building. Entrances with metal double doors and a transom containing a decorative metal eagle are located adjacent to each wing. A large relief of a woman sits above each entrance. A garage addition constructed of CMUs with three bays and a flat roof extends northwest from the post office. The primary window type is metal-sash awning windows arranged in two vertical rows of five or six windows. A small relief depicting an eagle is located under each window on the northeast and southwest façades.

Burlingame's post office was constructed in 1941 under the direction of the Federal Works Administration. Supervising architect Louis A. Simon, who had been appointed to the position in 1934, and consulting architect Ulysses Floyd Rible oversaw the building's design.[95] From 1934 to 1939, the Office of the Supervising Architect of the Treasury, which had been established in 1853, designed all Federal buildings, including post offices. Although the Treasury Department reversed this policy in 1939 and began selecting private architects through regional competitions for certain projects, the supervising architect continued to oversee the design of many post offices. In 1939 the Office of the Supervising Architect was also transferred to the Federal Works Agency, although its function remained essentially the same. Around this time, federally-designed buildings were designed in a greater stylistic range that the dominant Beaux-Arts classicism. Instead of displaying national trends, post office buildings began to reflect regional characteristics. The Burlingame Post office's stucco cladding and clay tile roof reflect the Spanish Eclectic style then popular in California. The building also incorporates Art Deco elements, including the stylized reliefs found throughout its exterior. Simon incorporated less decoration than previous supervising architects and tended to use Art Deco-inspired motifs.[96] Despite the addition of the garage, the building appears to retain a high level of integrity, including its plan, cladding, fenestration, and plaster motifs. Burlingame's post office appears to be eligible for listing in the California and National Registers under Criterion C/3 as a distinct example of Art Deco style architecture and representing a transition toward a broader stylistic range, including Art Deco, in the design of federal post offices starting in 1934 under Louis Simon.

III. Buildings of Interest within the Plan Area

This list includes buildings that do not appear California or National Register-eligible, but that still convey certain aspects of Burlingame's history and architectural heritage. Based on a thorough survey of the Plan Area, these structures are of two main types: (1) commercial buildings on or near Burlingame Avenue that date from the city's founding or shortly thereafter but, due to alteration, do not have sufficient integrity to be California or National Register-eligible; and (2) residential structures from the early part of the twentieth century that, because they are not associated with a significant historical figure, event, or significant architectural design, do not appear California or National Register-eligible.
Note: For purposes of CEQA, this list should not be considered a local register of historical resources, as defined in Section 5020.1(k) of the Public Resources Code, or an historical resource survey meeting the requirements of Section 5024.1(g) of the Public Resources Code.

[95] United States Postal Service, Western Regional Office, "U. S. Post Offices in California, 1900-1941, Thematic Resources," National Register of Historic Places Nomination Form, Jan 11, 1985.
[96] Ibid.

506 Almer Road
Constructed in 1904, this three-story apartment building with garages at the first story retains a high level of integrity, including its fenestration and plaster rosette and shield motifs. This building appears to be of local interest as an early apartment building dating to the turn of the century before the city's incorporation. Based on archival research, however, it does not appear to be associated with a significant event or person or possess a level of architectural distinction to be eligible for listing in the California or National Registers.

514 Almer Road
This two-story, Shingle style house constructed in 1907 dates to the city's incorporation. A 1920 City directory lists the occupant as C. J. Wellman, a manager of Bradstreets in San Francisco.[97] Although it retains its wood shingle cladding, steeply pitched roof, and polygonal wall dormer, the building's windows have been replaced, and therefore it does not appear to retain sufficient integrity for listing in the California or National Registers.

205-207 Anita Road
Constructed in 1911, this small, one-story Spanish Eclectic style duplex has large, pointed arch picture windows and entry doors on the façade, stucco cladding, and a clay tile clad roof. The building appears to be of local interest for its distinct architectural features, but does not appear to be associated with a sufficiently significant person, event, or architectural style to be eligible for listing in the California or National Registers.

221-223 Anita Road
This 1917 bungalow's façade features a partial-width front porch with round column supports, a hipped dormer window, and wood bevel cladding. It appears to be of local interest as one of several bungalows dating to the early twentieth century in Burlingame. Due to the replacement of select windows, however, it does not appear to retain sufficient integrity to be eligible for the California or National Registers.

237-241 Anita Road
Constructed in 1913, this Shingle-style house has a steeply-pitched, front-gable roof and continuous wood shingle cladding. Additionally, it retains its original fenestration, including the wood-sash, one-over-one, double-hung windows with lamb's tongues. While the building is of local interest as an early twentieth century home in Burlingame, it does not appear to be associated with a sufficiently significant person or event, or appear to be a sufficiently representative example of the Shingle style to be eligible for listing in the California or National Registers.

1105 Bayswater Avenue
This two-story apartment building constructed in 1905 features decorative label molds with a flower motif above the first-story windows and a scalloped trim at the cornice. Although it retains these decorative features along with its original fenestration, the building does not appear to possess a sufficient level of architectural significance for listing in the California or National Registers. Additionally, initial archival research did not reveal an association with a significant person or event.

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[97] Burlingame Historical Society.

1224 Bellevue Avenue
This two-story, stucco-clad apartment building was constructed in 1921. The symmetrical façade features a full-width clay tile-clad awning and wood-sash, double-hung windows with lamb's tongues and distinctive craftsman muntins in the upper sash. The building is of local interest, because it dates to a period of tremendous growth in Burlingame. The town's population had grown to 4,100 residents by 1920 prompting the need for additional housing. However, the building does not appear to be associated with a specific person or event significant in Burlingame's history or to possess exemplary architectural features. Therefore, it does not appear to be eligible for listing in the California or the National Register.

1236 Bellevue Avenue
Constructed in 1912, this two-story, shingle-clad apartment building's has an entry porch with a slightly flared eave and brick square supports. Additionally, it has a wide eave overhang with thin exposed rafter tails and wood, louvered shutters on the façade. The building reflects Burlingame's rich architectural heritage of apartment buildings, but does not appear to be associated with a significant event or person, nor does it possess enough architectural distinction to be eligible for the California or National Registers.

1401 Bellevue Avenue
This Spanish Eclectic style house constructed in 1922 has a flat roof with a shaped parapet and stucco cladding. The enclosed entry porch has a distinctive clay tile-clad awning with brackets and large multi-pane, wood-sash picture windows with curved corners. Although it possesses these characteristics of Spanish Eclectic style buildings and retains a high level of integrity, it does not appear to be a significant example of this style. Furthermore, initial archival research did not reveal an association with a significant event or person, and as such, it does not appear to be eligible for the California or National Registers.

1466 Bellevue Avenue
Wood, multi-pane French doors dominate the symmetrical façade of this 1928 three-story apartment building. Engaged colonnettes separate paired, rounded arch windows on the first story, and a plaster shield motif is located in the gables. This apartment building appears to be of local interest as an early apartment building dating to a period of tremendous growth in Burlingame during the 1920s and for retaining a high level of integrity, including its fenestration, cladding, and plan. However, it does not appear to be associated with a significant person or event or possess architectural distinction to be eligible for the California or National Registers.

1101-1105 Burlingame Avenue (Hatch Building)
The commercial building at 1101-1105 Burlingame Avenue stands at the corner of Burlingame Avenue and California Drive. The three-story building designed by noted architect Ernest L. Norberg was constructed around 1929 and replaced an earlier wood-frame Hatch Building. Although this significant building retains its original fenestration and the shield and garland motif on the upper stories, its first story has been extensively altered, including the installation of new storefront windows. Therefore, it does not appear to possess sufficient integrity for listing in the California or National Registers.

1111 Burlingame Avenue
The commercial building at 1111 Burlingame Avenue stands at the southwest corner of Burlingame Avenue and Hatch Lane. The stucco-clad building has a combination flat and gable roof clad in clay tile. This building was designed by architect J. J. Foley and constructed in 1912

as the first post office building in Burlingame. (The Gates Building at 303 California Drive, which previously housed the post office, was constructed initially as a store.[98]) Joseph C. Beard became the postmaster that year.[99] The post office remained here until 1918, when it was moved around the corner to the one of the Hatch Buildings on Lorton Avenue.[100] According to city directories, U.S. Laundry occupied the building in 1920, followed by Davis & Clifton Real Estate in 1926. The building's interior features several Depression-era murals of Yellowstone National Park.[101] Its storefront windows have been altered extensively and a Roman brick veneer applied below them. Based on the significant alterations to the storefront, the building does not appear to retain sufficient integrity for listing in the California or National Registers.

1120 Burlingame Avenue (Masonic Hall)
This four-story commercial building stands near the center of the block and features a projecting cornice with dentils. Large arched windows dominate the façade on the upper stories, while the first two stories have been significantly altered. The adjacent building at 1110 Burlingame has a narrow, two-story addition on the roof that attempts to echo the historic features of this building. Architect Thomas Smith designed the building at 1120 Burlingame Avenue to house the Mason's Hall circa 1908-9. Burlingame's first tall building was used for meetings of Masons and later by the Burlingame Lodge of Oddfellows (I.O.O.F.). Tiddy Brothers Grocery Store was located on the street level in the building's early years; Burlingame High School dances took place upstairs in the 1930s. In 1974, under the design of architect J. Carson Bowler, the structure was developed into an arcade of approximately 25 shops, offices and boutiques. Due to significant alterations, including the removal of transom windows above the first-story storefront windows and a shallow balcony with a balustrade on the third story's southern most window, the building does not appear to retain sufficient integrity for listing in the California or National Registers.

1200-1204 Burlingame Avenue (Kirkbride Building/Miller Drug)
This two-story, Mission Revival style commercial building features a shaped parapet with a shield motif and a full-width, bracketed awning clad in clay tile across each façade. While the upper story appears to retain a high level of integrity, the first story has been altered extensively, including its cladding, windows, and corner entrance.

In 1912, Charles M. Kirkbride, San Mateo's first city attorney in 1895, commissioned architects W.H. Toepke and Havens to design the first Mission Revival style commercial building following the construction of the railroad depot in 1894. The building replaced a one-story, wood-frame structure on the site and was expanded to the north in the 1920s.[102] Harvey L. Miller founded the Miller Drug Company in 1906 and relocated his company from a building on California Drive across from the depot to the Kirkbride building in 1913. [103] The Miller Drug Company occupied the building from 1913 to 1976. The building appears to be of local interest as an early Mission Revival style building and an important commercial building in the development of Burlingame's downtown. However, it does not appear to retain sufficient integrity for listing in the California or National Registers due to significant modifications to the first story, including replacement storefront windows.

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[98] Ringler, "History of Burlingame Avenue," 66; Historic property files, Burlingame Historical Society.
[99] Lister and Currall, *A History of Burlingame*,132.
[100] John Henry "Harry" Hatch, a noted Burlingame pioneer, constructed at least six buildings, several of which are referred to as the Hatch Building. Ringler, "History of Burlingame Avenue," 57.
[101] Ringler, "History of Burlingame Avenue," 66; Historic property files, Burlingame Historical Society.
[102] Ringler, "History of Burlingame Avenue," 73-5.
[103] Burlingame Historical Society, "Burlingame Heritage Tour."

1210 Burlingame Avenue (A.L. Offield Building)
Designed by noted architect Ernest L. Norberg and constructed in 1914, the two-story A.L. Offield Building has a distinctive projecting cornice with four large consoles. A.L. Offield, Burlingame's first doctor, was also the medical superintendent of the San Mateo County Community Hospital and a member of the Burlingame Country Club.[104] While the building retains original features on the second story, the first story has been extensively altered, including replacement of the storefront windows and entrances and the addition of a full-width awning. Therefore, it does not appear to retain sufficient integrity for listing in the California or National Registers.

1375 Burlingame Avenue (Levy Bros. Department Store)
The Levy Bros. Department Store sits prominently at the east corner of Burlingame Avenue and Primrose Road. Ernest L. and John E. Norberg designed the two-story building around 1925 when the Levy Bros. expanded from San Mateo to Burlingame. The façade features three high arches supported by columns with Corinthian capitals at the entrance. Large arched windows behind the columns repeat the motif. John J. Donovan, A.I.A., in writing about the work of Ernest L. and John E. Norberg in *The Architect and Engineer*, Sept., 1928, stated, "The Levy Bros. store building shows thought and study; it indicates an honest effort to depart from the hackneyed easy-to-do store front city department store building. It is a little unusual in that it is inviting to the shopper, to the owner who occupies it the larger part of the day, to the employee who cannot fail to regard it as something better than a place to drudge all day long, and it must be regarded by the people of its city as an achievement exemplifying civic pride on the part of the owners and their respect for the good taste and patronage of their customers."[105] Although the building retains its hipped roof clad in clay tile and the front arcade, it has been extensively altered at the façade's first story and rear elevation. Therefore, it does not appear to retain sufficient integrity for listing in the California or National Registers.

1403 Burlingame Avenue (Piggly Wiggly Store)
This storefront is part of a larger building (1401-1411 Burlingame Avenue) constructed in 1925. This section remains fairly intact while the remainder of the building has been extensively altered. Most notably, 1403 Burlingame Avenue retains the wood-sash transom windows running above the storefront windows, the shield motif at the cornice, and other raised panels. However, the cartouche at each corner has been removed, and the storefront windows and entrances have been altered. This building housed a Piggly Wiggly store in the 1930s. Piggly Wiggly stores were the first on the West Coast to carry frozen foods and the first stores west of the Mississippi to have self-service groceries.[106] This building appears to be of local interest, since it retains a high level of exterior details in comparison to the adjacent building units. However, it has been altered slightly, including the removal of the corner cartouches and the alteration of the storefront windows, and does not appear to retain sufficient integrity to convey its historic significance. Therefore, it does not appear to be eligible for listing in the California or National Registers.

1420 Burlingame Avenue (Montgomery Ward & Co. Store)
Four wood-sash, sixteen-over-sixteen, double-hung windows dominate the upper story of this Colonial Revival commercial building. A bracketed hood caps the windows, and a wood

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[104] Ringler, "History of Burlingame Avenue," 76.
[105] John J. Donovan, "Recent Work of Ernest L. and John E. Norberg" (*Architect and Engineer* 94, no. 3 (September 1928), 35-41.
[106] Historic property files, Burlingame Historical Society.

balustrade runs beneath it. A gabled dormer sits above each window, and large dentils run along the cornice. This building, constructed in 1938, originally housed a Montgomery Ward & Co. department store. Its first story has been extensively altered, although the upper portion retains a number of significant features.[107] The building appears to be of local interest as a large Colonial Revival commercial building. However, it has been extensively modified at the first story and no longer retains sufficient integrity for listing in the California Register or the National Register.

1426 Burlingame Avenue
This Tudor Revival commercial building has a large, central hipped wall dormer with decorative half-timbering and an oriel window on the façade. A smaller, octagonal dormer flanks this central massing. Brick veneer clads the building's lower portion. This building was long the home of Robert W. Gates of Burlingame, a clothing store. Robert W. Gates, son of George W. Gates, was born in the house now located at 1214 Donnelly Avenue and established his first clothing store in 1921. He commissioned this building in 1941. This building, with its large windows on the façade, brick cladding, and height, stands as a distinct structure along Burlingame's downtown avenue. However, its first story has been altered significantly, and it does not appear to be associated with a significant event or person or possess a level of architectural significance for listing in the California or National Registers.

1461-1465 Burlingame Avenue
This Spanish Eclectic style commercial building has a flat roof with a parapet. A wide awning clad in clay tile runs across the entire façade at the roofline. Three tripartite windows flanked on each side by engaged spiral colonnettes are located below. According to Assessor's records, this building was constructed in 1927.[108] While the building retains significant features on the upper story, its first story has been altered, including the addition of brick veneer. Therefore, it does not appear to retain sufficient integrity for listing in the California or National Registers.

1471-1475 Burlingame Avenue
This Egyptian Revival style, two-story commercial building retains its distinctive columns with palm leaf capitals flanking the central entrance. The building also has an Egyptian cavetto cornice with a vertical leaf pattern. A similar cavetto and a panel with a sun disk motif are located above the entrance. The building's stucco cladding has been incised to resemble stonework. John W. Rutherdale constructed the building in 1923 during a second wave of Egyptian Revival architecture in the United States.[109] Tutankhamen's tomb had been discovered in 1922 and captured the public's imagination. Although the building retains a number of distinctive elements of this revival style, the first-story has been remodeled significantly. Although this building is of local interest as a distinct Egyptian Revival building in Burlingame, it does not appear to retain sufficient integrity for listing in the California or National Registers.

261 California Drive (Burlingame Photoplay Theater)
Architect J. J. Foley designed this building, also known as Roy's Photoplay, in 1913. George Roy leased the building from owner J. H. Hatch for use as a 460-seat movie theater. The theater opened on March 15, 1913 and featured five nickelodeon films. The Roy closed in 1918.[110] Currently a nightclub, the building retains a full-width ribbon window that spans the façade

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[107] Historic property files, Burlingame Historical Society.
[108] Burlingame Historical Society.
[109] Tom Carey, "A Not So Hidden Treasure on Burlingame Avenue," *The Record* (Burlingame Historical Society Newsletter), May 2001.
[110] Historic property files, Burlingame Historical Society.

above the entrance. Although this building is of local interest as an early theater designed by the local architect J. J. Foley, it does not appear to retain sufficient integrity for convey its historic significance. Therefore, it does not appear to be eligible for listing in the California or National Registers.

297 California Drive (Greyhound Depot)
The former Greyhound Depot sits on a small triangular parcel of land bounded by California Drive, Highland Avenue, and Howard Avenue. Constructed in 1939, this small Spanish Eclectic style building has a hipped roof clad in clay tile, stucco cladding, and a large, arched entrance. Greyhound Lines surrendered the lease in 1990 due to bankruptcy. In 1993 the building underwent a renovation that included sealing doors, adding replacement casement windows, adding a kitchenette and bathroom (with disabled accessibility), and refinishing the building's exterior stucco.[111] Despite this renovation, the building retains it original character and is of local interest in the development of public transportation in Burlingame. However, the building does not appear to possess a specific association with a significant person or event or possess a level of architectural significance sufficient for listing in the California or National Registers.

333 California Drive (Peninsula Motor Company/Dessin Garage)
This brick commercial building has a flat roof with a stepped parapet. The façade has a wide entrance with wood double doors and multi-pane sidelights and transom. Three large multi-pane, metal-sash windows are located above. The symmetrical northeast elevation also has a wide entrance with a large arched transom window above. The arch motif is repeated in the flanking windows. A historic photograph taken in 1943 reveals that stucco originally clad the building. Additionally, four small bracketed awnings clad in clay tile hung from the roofline, and clay tile lined the parapet peak.

H. G. Mansfield erected Burlingame's first garage, the Peninsula Motor Company, at 321 California Drive in 1911. The building originally faced Lorton Avenue and extended northwest only halfway in the lot. The following year, Wilkie J. Dessin took over the business and expanded the building to California Drive in 1913. Calwell and Wisnom designed the expansion. Wilkie and his brother Harry Dessin constructed the addition currently addressed as 333 California Drive around 1920. Wilkie Dessin became Burlingame Fire Chief in 1915, a position he held for many years.[112] It became the Auto Body and Paint Shop in 1976, and the Steelhead Brewing Company currently occupies the building. This building appears to be of local interest as an early building associated with Burlingame's automobile industry. However, it does not retain its original cladding or exterior detailing, such as the clay tile-clad awnings, and as such, does not retain sufficient integrity to be eligible for listing in the California or National Registers.

361 California Drive
This one-story commercial building constructed in 1924 occupies a prominent corner lot at the intersection of California Drive and Lorton Avenue. It features a wide brick frieze with raised decorative plaster panels. A former automobile showroom, this building had a wide transom window with clipped corners located above each storefront window. The transom windows are currently covered, and the storefront windows and entrances have been significantly altered. This building is of local interest as an early automobile showroom in Burlingame. However, it

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[111] Historic property files, Burlingame Historical Society.
[112] Ringler, "History of Burlingame Avenue," 60-1.

does not appear to retain sufficient integrity for listing in the California or National Registers due to the storefront alterations.

417 California Drive
Wood shingles predominantly clad this single-family house constructed in 1917, although wood bevel siding clads the façade. The house also has a steeply-pitched, side-gable roof with slightly flared eave and a prominent dormer with two windows on the façade. It retains its wood-sash, double-hung windows. This building appears to be of local interest as an early home in Burlingame with a sufficient level of integrity. However, it does not appear to be associated with a significant event or person or possess a level of architectural distinction sufficient for listing in the California or National Registers.

421 California Avenue
Constructed in 1924, this Spanish Eclectic style apartment building has stucco cladding with brick veneer rising to the window sills and a narrow arched entry porch. Clay tiles line the roof edge and clad shallow hoods above the second story windows. The primary window type is multi-pane, wood-sash casement. The building appears to retain a high level of integrity, although the brick veneer on the main façade is not original, and is of local interest as an apartment building constructed during a population boom in Burlingame. However, it does not appear to be associated with a significant event or person or possess a level of architectural distinction sufficient for listing in the California or National Registers.

625 California Drive
The one-story, Craftsman bungalows at 625 California Drive and 1201 Oak Grove stand adjacent to each other along Oak Grove Avenue. Wood shingles clad both buildings, which also have wide eave overhangs, knee brackets, thin exposed rafter tails, and wood-sash windows. Although almost identical in design, 625 California Drive is slightly larger than its neighbor. Both buildings date from 1914. The buildings appear to be of local significance as examples of bungalows with a high level of integrity in Burlingame. However, they do not appear to be sufficiently significant examples of this architectural style to be eligible for listing in the California or National Registers. Additionally, they do not appear to be associated with a significant event or person in local, state, or National history.

1101 Douglas Avenue
Formerly a single-family residence, this building has an asymmetrical gable roof, a wide eave overhang with knee brackets, and tail-cut vergeboards. An enclosed, gabled porch dominates the façade. Although city directories indicate this house was built around 1920, it may have been constructed earlier. A 1932 Assessor's report estimates the buildings age as twenty-two years, or as being built it 1910.[113] Although the building stands as a distinct Craftsman bungalow in Burlingame, it does not appear to be a significant example of this architectural style for listing in the California or National Register. Additionally, it does not appear to be associated with a significant event or person in local, state, or National history.

1134 Douglas Avenue
Constructed in 1910, this shingle-clad residence has a full-width porch with thick, square, brick-clad supports and a pyramidal hipped lantern with four wood-sash, one-over-one, double-hung windows on each side. The building stands adjacent to 1124, 1128 and 1132 Douglas Avenue, which appear to be California Register-eligible, and 1138 Douglas Avenue, another notable

[113] Burlingame Historical Society.

building. City directories list R. F. Allan, the owner of the Burlingame Dry Goods Company, as the occupant from 1918 to 1922.[114] This building appears to be of local interest as one of five adjacent homes constructed around the time of Burlingame's incorporation in 1908. However, it does not appear to be associated with a significant person or event or possess a level of architectural significance sufficient for listing in the California or National Registers.

1138 Douglas Avenue
This one-story bungalow has a wide eave overhang with projecting purlins and an enclosed, gabled entry porch with wood-sash, multi-pane windows. Clad in wood shingles, the building appears to retain its original wood-sash, double-hung windows with asymmetrical upper sashes. Constructed in 1914, it stands adjacent to 1124, 1128 and 1132 Douglas Avenue, which appear to be California Register-eligible, and 1134 Douglas Avenue, another notable building. According to city directories, this was the home of Walter M. and Ida High in the 1920s. Walter sold cars at a dealership at 1301 Howard.[115] This building appears to be of local interest as one of five adjacent homes constructed around the time of Burlingame's incorporation in 1908. However, it does not appear to be associated with a significant person or event or possess a level of architectural significance sufficient for listing in the California or National Registers.

500 El Camino Real
This early Modern style apartment building, among the first in Burlingame, is a two-story structure raised on concrete piers forming a parking lot underneath. Ribbon windows consisting of large metal-sash fixed or awning units run across the entire façade. The building, constructed in 1958, appears to retain its original "Viking" sign and ornamental wall sculpture. This building appears to be of local interest as an early Modern style apartment building in Burlingame, and retains a high level of integrity, including its fenestration, cladding, and ground level parking. However, it does not appear to be associated with a significant person or event or possess a level of architectural significance sufficient for listing in the California or National Registers.

600 El Camino Real
This three-story, stucco-clad apartment building was constructed just after World War II in 1947. The building retains its fenestration, including wood-sash, double-hung, four-over-four and two-over-two windows with horizontal muntins. The building appears to be of local interest as an post-war apartment building. However, it does not appear to be associated with a significant person or event or possess a level of architectural significance sufficient for listing in the California or National Registers.

1401 Floribunda Avenue
This three-story, Neoclassical apartment building has a central, two-story entry porch, dentils along the cornice, and a roof-line balustrade. The first story windows are set in an arched trim with a semi-circular scalloped relief and a prominent keystone. Constructed in 1929, the building was formerly known as the Aloise Apartments, for its first manager, Mrs. Aloise McPhee.[116] The building is of local interest as a large apartment building constructed during a period of tremendous growth in Burlingame. However, it does not appear to be associated with a significant person or event or possess a level of architectural significance sufficient for listing in the California or National Registers.

[114] Burlingame Historical Society.
[115] Burlingame Historical Society.
[116] Burlingame Historical Society.

25 Highland Avenue
Constructed in 1910, this two-story Folk Victorian residence has a wood-sash window flanked by Ionic pilasters and a cartouche in the front gable. Horizontal wood bevel boards clad the house, which is similar in scale and style to the house at 27 Highland Avenue. A 1922 city directory lists J. B. Meehan as the occupant.[117] This building is of local interest as an early Folk Victorian home in Burlingame, dating to the town's incorporation, and for possessing a high level of integrity. However, it does not appear to be associated with a significant event or person or possess sufficient architectural distinction to be eligible for listing in the California or National Registers.

27 Highland Avenue
This Folk Victorian cottage was constructed in 1906 and is similar to its neighbor at 25 Highland Avenue. An entry porch with simple wood column supports occupies the façade's southern portion, while a bay window occupies the northern half. The façade also has a small, hipped dormer and a large gable over the dormer window with a decorative bargeboard. A 1930 city directory lists J. A. Davidson as the occupant.[118] This building is of local interest as an early Folk Victorian home in Burlingame, dating to the town's incorporation, and for possessing a high level of integrity. However, it does not appear to be associated with a significant event or person or possess sufficient architectural distinction to be eligible for listing in the California or National Registers.

107 Highland Avenue
This small bungalow has a hipped roof with a wide eave overhang and thin exposed rafter tails. Clad in wood bevel siding, the building has a small inset porch with wood column supports. Constructed in 1912, the bungalow appears to retain a high level of integrity, assuming the windows are original. They were covered during the survey. It appears to be of local interest as one of several bungalows dating to the early twentieth century in Burlingame. However, it does not appear to be a distinguished example of bungalow style architecture, nor does it appear to be associated with a significant event or person. Therefore, it does not appear to be eligible for listing in the California or National Registers.

908 Howard Avenue
This large Craftsman residence was constructed in 1920 and features a wide eave overhang with thick brackets and exposed rafter tails. Wood shingles clad the house, which has a large entry porch with tapered supports on brick piers. Although the building stands as an residence in Burlingame dating to the early twentieth century, it does not appear to be a significant example of Craftsman style architectural or to be associated with a significant person or event. As such, it does not appear to be eligible for listing in the California or National Register.

936-948 Howard Avenue
This two-story commercial building stands at the corner of Howard Avenue and Myrtle Road. Clad in wood, horizontal boards, the building has a rectangular plan and a flat roof. The double-hung windows set in a wood trim appear to be non-historic. According to Assessor's records, this building was constructed around 1906 for Dorothy Boring. Her husband ran a grocery store for several decades, and the building is the longest continually-operating grocery in Burlingame. This building appears to be of local interest as an early commercial structure in Burlingame. However, it does not appear to be associated with a significant person, event, or architectural

[117] Burlingame Historical Society.
[118] Burlingame Historical Society.

style and does not appear to retain sufficient integrity for listing in the California or National Registers.

8 Lorton Avenue
Constructed in 1912, the façade of this large, single-family house has a full-width porch with wood column supports and a dominant gabled dormer. Wood shingles clad the building, which has paired, wood-sash, multi-pane windows. A detached garage stands behind the house. A 1920 city directory lists Willard V. and Ella M. Van Doren as the occupants. This building appears to be of local interest as an early home in Burlingame dating to the early twentieth century with a moderate level of integrity. However, it does not appear to be associated with a significant person, event, or architectural style and does not appear to retain sufficient integrity for listing in the California or National Registers.

35 Lorton Avenue
This Dutch Colonial Revival residence has a gambrel roof with a slightly flared eave. The façade has an inset entry flanked by a cutaway bay window to the south. The primary window type is wood-sash, one-over-one, double-hung with lamb's tongues. The first-story windows have a smaller upper sash. The house was constructed in 1907 and occupied by E. F. Anderson, a carpenter, in 1920. This buildings stands as a distinct example of Dutch Colonial Revival architecture in Burlingame dating to around the town's incorporation in 1908. However, it does not appear to be a significant example of the architectural style or to be associated with a sufficiently significant person or event for listing in the California or National Registers.

327 Lorton Avenue (Dodge Brothers Motor Cars Showroom)
The building sits at the west corner of Lorton and Donnelly Avenues. Clad in stucco, the showroom has a flat roof with a parapet, fluted pilasters, and a garland motif at the corners. Full-width awnings shelter large wood-sash windows and window boxes, which are all recent additions. Built around 1909, Wilkie J. and Harry Dessin acquired this building in 1915 to house a Dodge Brothers Motor Cars Showroom. It was used as an auto showroom for many years.[119] A two-story, stucco-clad apartment building with a commercial space at the first story stands adjacent to the showroom along Donnelly Avenue and shares the same parcel. Further research would need to be conducted to ascertain its relationship to the showroom. Although the building appears to be locally significant as an early automobile showroom in Burlingame, it does not appear to retain sufficient integrity, including the replacement of the large storefront windows, to convey its historic significance.

329 Lorton Avenue (Dodge Brothers Motor Cars Annex)
Located northwest of the showroom along Lorton Avenue, the annex is a one-story, brick building with a flat roof and stepped parapet. The marble cornice features an egg and dart motif. A segmental arched lintel with a marble keystone is located above the central entrance and flanking windows. The Dessin brothers constructed this annex around 1920.[120] Although this building appears to be of local interest for its contribution to the history of Burlingame's automobile industry, it does not appear retain sufficient integrity for listing in the California Register or the National Register due to the alteration of the storefront windows and entrances.

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[119] *Preliminary Historic Inventory, City of Burlingame*, 6; Ringler, "History of Burlingame Avenue,", 60-1.
[120] Ringler, "History of Burlingame Avenue," 60-1.

1201 Oak Grove
The one-story, Craftsman bungalows at 625 California Drive and 1201 Oak Grove stand adjacent to each other along Oak Grove Avenue. Wood shingles clad both buildings, which also have wide eave overhangs, knee brackets, thin exposed rafter tails, and wood-sash windows. Although almost identical in design, 1201 Oak Grove is slightly smaller than its neighbor. Both buildings date from 1914. The buildings appear to be of local significance as examples of bungalows with a high level of integrity in Burlingame. However, they do not appear to be sufficiently significant examples of this architectural style to be eligible for listing in the California or National Registers. Additionally, they do not appear to be associated with a significant event or person in local, state, or National history.

2 Park Road
Constructed in 1948, this large, two-story Neoclassical commercial building has a full-height entry porch with Doric columns and a pediment. The building also has stucco cladding, quoins, and dentils at the cornice and pediment. The building, designed by Richard Bates, was featured in *Western Architect & Engineer* in April 1948. This building is of local interest as a large Neoclassical style building in Burlingame that retains a high level of integrity. However, it does not appear to be associated with a significant event or person or possess a level of architectural significance sufficient for listing in the California or National Registers.

49 Park Road
Constructed in 1907, this small bungalow has a hipped roof and horizontal, wood cladding. The inset porch has turned spindle supports and a metal railing. It appears to retain its original wood-sash, one-over-one, double-hung windows with lamb's tongues and louvered shutters. Joe Savill, son of Everett J. Savill (see 1132 Douglas Avenue), was born at this house on November 12, 1907. This building later became the office of Harry Francis Davis, Burlingame's first real estate broker and developer. Davis was largely responsible for adding Ray Park, Burlingame Hills, Skyline Manor, and Burlingame Manor to the city. Although the building appears to retain some integrity, the extensive modifications to the front porch prevent it from being eligible for the California or National Registers.

241 Park Road (Burlingame Woman's Club)
Constructed in 1913, the Burlingame Women's Club is set back from the street and fronted by a small lawn with plantings and a concrete pathway leading to the building. Its modern façade was added in the 1950s and has a stucco cladding with incised lines forming a regular grid on the eastern half and a Roman brick veneer on the western half. A flat roofed entry porch with metal supports shelters metal-sash double doors on this portion. An exterior stucco-clad chimney is also located on this façade.

The Burlingame Woman's Club was organized on May 31, 1907, and held its first meetings at the railroad station. The women were interested in making "village improvements," and focused on passing anti-liquor laws in Burlingame and constructing a safety station for passengers boarding trains running to and from San Francisco. The club then met in the Baptist Sunday School tent and in each other's homes until the clubhouse was constructed in 1913. The Craftsman structure was clad with wood shingles and featured a wide eave overhang, exposed rafter tails, a wood pergola, and a small gabled dormer on the façade. The current façade was added in the 1950s, and the exterior brick chimney appears to be all that remains from the original façade.[121] Although the building appears to be of local interest for its association with the Burlingame

[121] *Preliminary Historic Inventory, City of Burlingame*, 9.

Women's Club, an early organization in Burlingame, it does not appear to retain sufficient integrity for listing in the California or National Registers.

249 Primrose Avenue (American Trust Company)
The former American Trust Company building is a two-story, flat-roofed structure constructed of reinforced concrete, brick veneer, and a wide aluminum trim.[122] Rectangular-in-plan, the primarily one-story building has a two-story portion that projects northwest at its rear. Designed in the International Style, the building's façade is characterized by the interchange of volumes and planes.

The American Trust Company, a bank based in San Francisco, commissioned the building in 1955 for its Burlingame branch.[123] The architecture firm of Stone, Mulloy, Marricini & Patterson designed the structure, and local contractors, Morris Daley & Sons, constructed it. The bank moved into its new offices that year, and five years later merged with Wells Fargo Bank to form Wells Fargo Bank American Trust Company. The company later changed its name to Wells Fargo Bank.[124] In 1976, Wells Fargo Bank celebrated its sixty-ninth anniversary of its Burlingame office.[125] The building currently stands vacant under the ownership of Safeway, Inc. The building appears to be of local interest as a Modern style building in Burlingame. However, it does not appear to be associated with a significant event or person or possess a level of architectural significance sufficient for listing in the California or National Registers.

251-277 Primrose Road
Constructed in 1937, this one-story commercial building has a gable roof clad in slate shingles at the front and a flat roof at the rear. The façade has a brick veneer cladding around the wood-sash storefront windows and two large gables with a broken pediment. The building also features clay tiles cladding the roof slope on the façade. This building appears to be of local interest as an early commercial building housing a variety of retail stores constructed during a period of tremendous growth in Burlingame and retains a good level of integrity. However, it does not appear to be associated with a significant event or person or possess a level of architectural significance sufficient for listing in the California or National Registers.

337-341 Primrose Road
This two-story commercial building constructed in 1928 retains a good level of integrity despite the extensive alterations at the first-story. The wood-sash, double-hung windows on the second story and the wood-sash, nine-pane awning windows running above the storefront windows appear to be original. Although the building retains a high level of integrity on the second story, the storefront modifications preclude the building from being eligible for the California or National Registers.

480 Primrose Road (Burlingame Public Library)
A bank building housed Burlingame's first library in 1908. However, the library quickly outgrew this space and the library board sought city funds to construct a new building at the corner of Primrose Road and Bellevue Avenue.[126] In 1930 voters finally approved a bond of $65,000 to

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[122] "*Bank to Open New Building Tomorrow*." *Advance-Star*. December 2, 1955.
[123] *Announcing the Opening of the New Burlingame Office of American Trust Company*," Open House Preview Announcement, 1955, and the County of San Mateo Assessor's Office.
[124] Historic property files, Burlingame Historical Society.
[125] Wells Fargo Ad, 1976.
[126] Lister and Currell, *A History of Burlingame*, 97.

construct a new library building. Noted Burlingame architect Ernest L. Norberg designed the Mission Revival style building, which featured stucco and tile cladding on the exterior and high ceilings with heavy wood beams and wood trim throughout the interior. Norberg regarded this as one of his favorite buildings and also designed the 1959 and 1971 additions, which nearly doubled the building's floor space.[127] The library was extensively remodeled in 1996. During the renovation, the central tower was raised, and the floor area was again expanded. Only portions of the reference and children's wings, including the roof and truss work, remain from the original building. Despite the extensive alterations, the library retains its inherent characteristics, including its stucco cladding, clay tile roof, and arched windows. Although this building stands as a local landmark in Burlingame's downtown, the library lacks sufficient integrity to be eligible for listing in the California or National Registers.

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[127] *Preliminary Historic Inventory, City of Burlingame*, 9.

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