PREPARED BY:
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PREPARED FOR:
County of Los Angeles Public Works

County of Los Angeles

Bicycle Master Plan

Appendices A-K

County of Los Angeles Bicycle Master Plan Appendices

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Appendix A. Bicycle Transportation Account (BTA) Check List

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The Bicycle Transportation Account (BTA) is an annual program that provides state funds for City and County projects that improve safety and convenience for bicycle commuters. The County must prepare and adopt a Bicycle Transportation Plan (BTP) that complies with Streets and Highways Code Section 891.2 to be eligible for BTA funds. **Table A-1** presents these eleven criteria and identifies the section of the Plan that contains each element.

Table A-1: County of Los Angeles Bicycle Master Plan BTA Requirement Check List

Approved	Required Plan Elements		Page(s)
	(a)	Existing and future bicycle commuters	
		Appendix B , Tables B-1 to B-10	p. B-3 to B-21
	(b)	Existing and proposed land use patterns description and maps	
		Description Chapter 1	p. 4
		Description by Planning Areas, Chapter 3	p. 27 to 145
		Figures D-1 to D-10	p. D-3 to D-12
	(c)	Existing and proposed bikeways description and maps	
		Table i-1	p. xv
		Description by Planning Areas, Chapter 3	p. 27
		Figures 3-2, 3-3, 3-4, 3-5	p. 35, 36, 37, 38
		Figures by Planning Areas: Figure 3-6 to 3-38	p. 43 to 145
	(d)	Existing and proposed bicycle parking description and map	
		Description, Appendix E	p. E-3
		Figures E-1- E-10	p. E-4, E-13
	(e)	Existing and proposed multimodal connections description and maps	
		Description by Planning Area, Chapter 3	p. 27
		Figures 3-6, 3-10, 3-14, 3-17, 3-21, 3-24, 3-27, 3-29, 3-32 & 3-36	p. 43 to 139
		Figures E-1 to E-10	p. E-4 to E-13
	(f)	Existing and proposed changing and storage facilities description and map	
		Description, Appendix E	p. E-3
		Figures E-1 to E-10	p. E-4 to E-13
	(g)	Bicycle safety and education programs with safety collision analysis	
		Description By Planning Area, Chapter 3	p. 27 to 145
		Description, Chapter 4	p. 147 to 162
	(h)	Citizen and community involvement	
		Description, Section 1.4	p. 7
	(i)	Consistency with transportation, air quality, and energy plans	
		Description, Chapter 2	p. 13 to 25
		Description, Appendix C	p. C-3 to C-32
	(j)	Proposed projects and priority implementation	
		Tables by Planning Areas: 3-5, 3-9, 3-13, 3-17, 3-21, 3-25, 3-29, 3-33, 3-36 & 3-40	p. 38 to 145
		Description, Chapter 5	p. 163
		Table 5-5	p. 170
		Appendix I	P. I-1

Table A-1: County of Los Angeles Bicycle Master Plan BTA Requirement Check List

Approved	Required Plan Elements		Page(s)
	(k)	Past expenditures for bicycle facilities and future financial needs	
		Description, Chapter 5	p. 163
		Appendix H	p. H-1 to H-6

Source: Alta Planning + Design, November 2011

Appendix B. Ridership and Air Quality Benefits

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This appendix presents an adjusted estimate of current bicycling levels within unincorporated areas of the County of Los Angeles. The analysis is based on County and U.S. Census data along with several adjustments for likely bicycle commuter underestimations. This study uses models to estimate the positive air quality impacts associated with existing and future bicycle and pedestrian travel within the study area. Non-motorized travel directly and indirectly translates into fewer vehicle trips and an associated reduction in vehicle miles traveled and auto emissions.

The model input variables generally follow industry standards for demand models, including study area population, employed persons and commute mode share. Other inputs include data on college student and school children commuting patterns. Additional assumptions were used to estimate the number of reduced vehicle trips and vehicle miles traveled, as well as vehicle emissions reductions. The analysis assumes that 73 percent of bicycling trips will directly replace vehicle trips for adults and college students, and a 53 percent reduction in vehicular trips for school children.

To estimate the reduction of existing and future vehicle miles traveled, this analysis assumes a bicycle roundtrip distance of eight miles for adults and college students, and one mile for school children. These distance assumptions are consistent with industry-standard non-motorized benefits models. The vehicle emissions reduction estimates also incorporate calculations commonly used in other models, and are identified in the footnotes of each table.

B.1 Antelope Valley Planning Area

The benefits model predicts that by 2030 the total number of bicycle commuters could increase from the current estimate of 744 to 2,714, resulting in an estimated decrease of 26 pounds of hydrocarbons per weekday, 18 pounds of mono-nitrogen oxides (NO_x) per weekday, 26 pounds of PM10 (particulate matter) per year, and 1,825,446 pounds of carbon dioxide (CO_2) per year by 2030.

Table B-1: Antelope Valley Planning Area Current / Future Demand and Air Quality Benefits Estimates

Variable	Current Value	Future Value	Source (1)	Source (2)
Demographics				
Study area population	103,451	255,364	*Los Angeles County General Plan Update(2008)*	
Employed population	41,648	110,202	*Estimate based on 2005-2007 American Community Survey, B0801 3-Year Percentages*	*Antelope Valley Area Plan Update, Background Report, April 2009*
Bike-to-work mode share	0.10%	0.15%	*2005-2007 American Community Survey, B0801 3-Year Estimates*	*Estimate of the potential mode share increase associated with planned/proposed bikeway system improvements*
Number of bike-to-work commuters	42	165	*Employed persons multiplied by bike-to-work mode share*	
Work-at-home mode share	3.50%	4.00%	*2005-2007 American Community Survey, S0801 3-Year Estimates*	*Estimate based on historic work-at-home population growth (or decline) trends*
Number of work-at-home bike commuters	3	88	*Assumes 0.2% of population working at home makes at least one daily bicycle trip*	*Assumes 2% of population working at home makes at least one daily bicycle trip*

Table B-1: Antelope Valley Planning Area Current / Future Demand and Air Quality Benefits Estimates (continued)

Variable	Current Value	Future Value	Source (1)	Source (2)
Transit-to-work mode share	0.60%	1.00%	*2005-2007 American Community Survey, S0801 3-Year Estimates*	*Estimate of the potential mode share increase (or decrease) associated with planned/proposed bikeway system improvements and transit service improvements/reductions*
Transit bicycle commuters	3	276	*Employed persons multiplied by transit mode share. Assumes 1.2% of transit riders access transit by bicycle*	*Employed persons multiplied by transit mode share. Assumes 25% of transit riders access transit by bicycle*
School children, ages 6-14 (grades K-8)	13,301	26,563	*2005-2007 American Community Survey, S0801 3-Year Estimates*	*Population-based estimate*
School children bicycling mode share	2.00%	4.00%	*National Safe Routes to School surveys, 2003.*	*Estimate of the potential mode share increase associated with planned/proposed bikeway system improvements*
School children bike commuters	266	1,063	*School children population multiplied by school children bike mode share*	*School children population multiplied by school children bicycling mode share*
Number of college students in study area	4,303	8,633	*2005-2007 American Community Survey, B14001 3-Year Estimates*	*Population-based estimate*
Estimated college bicycling mode share	10.00%	13.00%	*Review of bicycle commute share in seven university communities (source: National Bicycling & Walking Study, FHWA, Case Study No. 1, 1995).*	*Estimate of the potential mode share increase associated with planned/proposed bikeway system improvements*
College bike commuters	430	1,122	*College student population multiplied by college student bicycling mode share*	
Total number of bike commuters	744	2,714	*Total bike-to-work, school, college and utilitarian bike trips. Does not include recreation.*	
Total daily bicycling trips	1,487	5,427	*Total bicycle commuters x 2 (for round trips)*	
Current Estimated VMT Reductions				
Reduced Vehicle Trips per Weekday	488	1,567	*Assumes 73% of bicycle trips replace vehicle trips for adults/college students and 53% for school children*	
Reduced Vehicle Trips per Year	127,273	409,095	*Reduced number of weekday vehicle trips multiplied by 261 (weekdays in a year)*	
Reduced Vehicle Miles per Weekday	2,914	8,597	*Assumes average round trip travel length of 8 miles for adults/college students and 1 mile for schoolchildren*	
Reduced Vehicle Miles per Year	760,594	2,243,926	*Reduced number of weekday vehicle miles multiplied by 261 (weekdays in a year)*	
Current Air Quality Benefits Estimates				
Reduced Hydrocarbons (pounds/weekday)	9	26	*Daily mileage reduction multiplied by 1.36 grams per reduced mile*	
Reduced PM10 (pounds/weekday)	0	<1	*Daily mileage reduction multiplied by 0.0052 grams per reduced mile*	
Reduced PM2.5 (pounds/weekday)	0	<1	*Daily mileage reduction multiplied by 0.0049 grams per reduced mile*	
Reduced NO_X (pounds/weekday)	6	18	*Daily mileage reduction multiplied by 0.95 grams per reduced mile*	
Reduced CO (pounds/weekday)	80	235	*Daily mileage reduction multiplied by 12.4 grams per reduced mile*	

Table B-1: Antelope Valley Planning Area Current / Future Demand and Air Quality Benefits Estimates (continued)

Variable	Current Value	Future Value	Source (1)	Source (2)
Reduced CO_2 (pounds/weekday)	2,371	6,994	*Daily mileage reduction multiplied by 369 grams per reduced mile*	
Reduced Hydrocarbons (pounds/year)	2,280	6,728	*Yearly mileage reduction multiplied by 1.36 grams per reduced mile*	
Reduced PM10 (pounds/year)	9	26	*Yearly mileage reduction multiplied by 0.0052 grams per reduced mile*	
Reduced PM2.5 (pounds/year)	8	24	*Yearly mileage reduction multiplied by 0.0049 grams per reduced mile*	
Reduced NO_X (pounds/year)	1,593	4,700	*Yearly mileage reduction multiplied by 0.95 grams per reduced mile*	
Reduced CO (pounds/year)	20,793	61,343	*Yearly mileage reduction multiplied by 12.4 grams per reduced mile*	
Reduced CO_2 (pounds/year)	618,747	1,825,446	*Yearly mileage reduction multiplied by 369 grams per reduced mile*	

(Emissions rates from EPA report 420-F-05-022 "Emission Facts: Average Annual Emissions and Fuel Consumption for Gaso Fueled Passenger Cars and Light Trucks." 2005.)

B.2 East San Gabriel Valley Planning Area

The benefits model predicts that by 2030 the total number of bicycle commuters could increase from the current estimate of 4,198 to 11,401, resulting in an estimated decrease of 132 pounds of hydrocarbons per weekday, 92 pounds of mono-nitrogen oxides (NO_x) per weekday, 132 pounds of PM10 (particulate matter) per year, and 9,341,105 pounds of carbon dioxide (CO_2) per year.

Table B-2: East San Gabriel Valley Planning Area Current / Future Demand and Air Quality Benefits Estimates

Variable	Current Value	Future Value	Source (1)	Source (2)
Demographics				
Study area population	274,374	371,842	*Los Angeles County General Plan Update (2008)*	
Employed population	41,655	49,187	*LAFCO MSR Report*	
Bike-to-work mode share	2.00%	4.00%	*2005-2007 American Community Survey, B0801 3-Year Estimates*	*Estimate of the potential mode share increase associated with planned/proposed bikeway system improvements*
Number of bike-to-work commuters	814	1,967	*Employed persons multiplied by bike-to-work mode share*	
Work-at-home mode share	6.80%	8.60%	*2005-2007 American Community Survey, S0801 3-Year Estimates*	*Estimate based on historic work-at-home population growth (or decline) trends*
Number of work-at-home bike commuters	20	85	*Assumes 0.7% of population working at home makes at least one daily bicycle trip*	*Assumes 2% of population working at home makes at least one daily bicycle trip*

Table B-2: East San Gabriel Valley Planning Area Current / Future Demand and Air Quality Benefits Estimates (continued)

Variable	Current Value	Future Value	Source (1)	Source (2)
Transit-to-work mode share	9.60%	12.20%	*2005-2007 American Community Survey, S0801 3-Year Estimates*	*Estimate of the potential mode share increase (or decrease) associated with planned/proposed bikeway system improvements and transit service improvements/reductions*
Transit bicycle commuters	48	1,495	*Employed persons multiplied by transit mode share. Assumes 1.2% of transit riders access transit by bicycle*	*Employed persons multiplied by transit mode share. Assumes 25% of transit riders access transit by bicycle*
School children, ages 6-14 (grades K-8)	44,600	65,258	*2005-2007 American Community Survey, S0801 3-Year Estimates*	*Population-based estimate*
School children bicycling mode share	2.00%	4.00%	*National Safe Routes to School surveys, 2003.*	*Estimate of the potential mode share increase associated with planned/proposed bikeway system improvements*
School children bike commuters	892	2,610	*School children population multiplied by school children bike mode share*	*School children population multiplied by school children bicycling mode share*
Number of college students in study area	24,242	34,960	*2005-2007 American Community Survey, B14001 3-Year Estimates*	*Population-based estimate*
Estimated college bicycling mode share	10.00%	15.00%	*Review of bicycle commute share in seven university communities (source: National Bicycling & Walking Study, FHWA, Case Study No. 1, 1995).*	*Estimate of the potential mode share increase associated with planned/proposed bikeway system improvements*
College bike commuters	2,424	5,244	*College student population multiplied by college student bicycling mode share*	
Total number of bike commuters	4,198	11,401	*Total bike-to-work, school, college and utilitarian bike trips. Does not include recreation.*	
Total daily bicycling trips	8,396	22,803	*Total bicycle commuters x 2 (for round trips)*	
Estimated VMT Reductions				
Reduced Vehicle Trips per Weekday	2,851	6,710	*Assumes 73% of bicycle trips replace vehicle trips for adults/college students and 53% for school children*	
Reduced Vehicle Trips per Year	744,140	1,751,268	*Reduced number of weekday vehicle trips multiplied by 261 (weekdays in a year)*	
Reduced Vehicle Miles per Weekday	19,500	43,994	*Assumes average round trip travel length of 8 miles for adults/college students and 1 mile for schoolchildren*	
Reduced Vehicle Miles per Year	5,089,390	11,482,531	*Reduced number of weekday vehicle miles multiplied by 261 (weekdays in a year)*	
Air Quality Benefits Estimates				
Reduced Hydrocarbons (pounds/weekday)	58	132	*Daily mileage reduction multiplied by 1.36 grams per reduced mile*	
Reduced PM10 (pounds/weekday)	<1	1	*Daily mileage reduction multiplied by 0.0052 grams per reduced mile*	
Reduced PM2.5 (pounds/weekday)	<1	<1	*Daily mileage reduction multiplied by 0.0049 grams per reduced mile*	
Reduced NO_X (pounds/weekday)	41	92	*Daily mileage reduction multiplied by 0.95 grams per reduced mile*	
Reduced CO (pounds/weekday)	533	1,203	*Daily mileage reduction multiplied by 12.4 grams per reduced mile*	

Table B-2: East San Gabriel Valley Planning Area Current / Future Demand and Air Quality Benefits Estimates (continued)

Variable	Current Value	Future Value	Source (1)	Source (2)
Reduced CO_2 (pounds/weekday)	15,863	35,790	*Daily mileage reduction multiplied by 369 grams per reduced mile*	
Reduced Hydrocarbons (pounds/year)	15,259	34,428	*Yearly mileage reduction multiplied by 1.36 grams per reduced mile*	
Reduced PM10 (pounds/year)	58	132	*Yearly mileage reduction multiplied by 0.0052 grams per reduced mile*	
Reduced PM2.5 (pounds/year)	55	124	*Yearly mileage reduction multiplied by 0.0049 grams per reduced mile*	
Reduced NO_x (pounds/year)	10,659	24,049	*Yearly mileage reduction multiplied by 0.95 grams per reduced mile*	
Reduced CO (pounds/year)	139,130	313,902	*Yearly mileage reduction multiplied by 12.4 grams per reduced mile*	
Reduced CO_2 (pounds/year)	4,140,248	9,341,105	*Yearly mileage reduction multiplied by 369 grams per reduced mile*	

(Emissions rates from EPA report 420-F-05-022 "Emission Facts: Average Annual Emissions and Fuel Consumption for Gaso Fueled Passenger Cars and Light Trucks." 2005.)

B.3 Gateway Planning Area

The benefits model predicts that by 2030 the total number of bicycle commuters could increase from the current estimate of 1,673 to 4,717, resulting in an estimated decrease of 50 pounds of hydrocarbons per weekday, 35 pounds of mono-nitrogen oxides (NO_x) per weekday, 50 pounds of PM10 (particulate matter) per year, and 3,519,069 pounds of carbon dioxide (CO_2) per year.

Table B-3: Gateway Planning Area Current / Future Demand and Air Quality Benefits Estimates

Variable	Current Value	Future Value	Source (1)	Source (2)
Demographics				
Study area population	129,247	142,829	*Los Angeles County General Plan Update (2008)*	
Employed population	83,435	93,006	*Los Angeles County General Plan Update (2008)*	
Bike-to-work mode share	0.29%	1.00%	*2005-2007 American Community Survey, B0801 3-Year Estimates*	*Estimate of the potential mode share increase associated with planned/proposed bikeway system improvements*
Number of bike-to-work commuters	243	930	*Employed persons multiplied by bike-to-work mode share*	
Work-at-home mode share	1%	2.00%	*2005-2007 American Community Survey, S0801 3-Year Estimates*	*Estimate based on historic work-at-home population growth (or decline) trends*
Number of work-at-home bike commuters	5	74	*Assumes 0.44% of population working at home makes at least one daily bicycle trip*	*Assumes 4% of population working at home makes at least one daily bicycle trip*
Transit-to-work mode share	2%	4.00%	*2005-2007 American Community Survey, S0801 3-Year Estimates*	*Estimate of the potential mode share increase (or decrease) associated with planned/proposed bikeway system improvements and transit service improvements/reductions*

Table B-3: Gateway Planning Area Current / Future Demand and Air Quality Benefits Estimates (continued)

Variable	Current Value	Future Value	Source (1)	Source (2)
Transit bicycle commuters	17	930	*Employed persons multiplied by transit mode share. Assumes 1.2% of transit riders access transit by bicycle*	*Employed persons multiplied by transit mode share. Assumes 25% of transit riders access transit by bicycle*
School children, ages 6-14 (grades K-8)	23,406	26,083	*2005-2007 American Community Survey, S0801 3-Year Estimates*	*Population-based estimate*
School children bicycling mode share	2%	4.00%	*National Safe Routes to School surveys, 2003.*	*Estimate of the potential mode share increase associated with planned/proposed bikeway system improvements*
School children bike commuters	468	1,043	*School children population multiplied by school children bike mode share*	*School children population multiplied by school children bicycling mode share*
Number of college students in study area	9,397	11,592	*2005-2007 American Community Survey, B14001 3-Year Estimates*	*Population-based estimate*
Estimated college bicycling mode share	10%	15.00%	*Review of bicycle commute share in seven university communities (source: National Bicycling & Walking Study, FHWA, Case Study No. 1, 1995).*	*Estimate of the potential mode share increase associated with planned/proposed bikeway system improvements*
College bike commuters	940	1,739	*College student population multiplied by college student bicycling mode share*	
Total number of bike commuters	1,673	4,717	*Total bike-to-work, school, college and utilitarian bike trips. Does not include recreation.*	
Total daily bicycling trips	3,345	9,433	*Total bicycle commuters x 2 (for round trips)*	
Estimated VMT Reductions				
Reduced Vehicle Trips per Weekday	1,115	2,556	*Assumes 73% of bicycle trips replace vehicle trips for adults/college students and 53% for school children*	
Reduced Vehicle Trips per Year	291,032	667,008	*Reduced number of weekday vehicle trips multiplied by 261 (weekdays in a year)*	
Reduced Vehicle Miles per Weekday	7,184	16,574	*Assumes average round trip travel length of 8 miles for adults/college students and 1 mile for schoolchildren*	
Reduced Vehicle Miles per Year	1,874,972	4,325,807	*Reduced number of weekday vehicle miles multiplied by 261 (weekdays in a year)*	
Air Quality Benefits Estimates				
Reduced Hydrocarbons (pounds/weekday)	22	50	*Daily mileage reduction multiplied by 1.36 grams per reduced mile*	
Reduced PM10 (pounds/weekday)	0	0	*Daily mileage reduction multiplied by 0.0052 grams per reduced mile*	
Reduced PM2.5 (pounds/weekday)	0	0	*Daily mileage reduction multiplied by 0.0049 grams per reduced mile*	
Reduced NO_X (pounds/weekday)	15	35	*Daily mileage reduction multiplied by 0.95 grams per reduced mile*	
Reduced CO (pounds/weekday)	196	453	*Daily mileage reduction multiplied by 12.4 grams per reduced mile*	
Reduced $C0_2$ (pounds/weekday)	5844	13483	*Daily mileage reduction multiplied by 369 grams per reduced mile*	

Table B-3: Gateway Planning Area Current / Future Demand and Air Quality Benefits Estimates (continued)

Variable	Current Value	Future Value	Source (1)	Source (2)
Reduced Hydrocarbons (pounds/year)	5,622	12,970	*Yearly mileage reduction multiplied by 1.36 grams per reduced mile*	
Reduced PM10 (pounds/year)	21	50	*Yearly mileage reduction multiplied by 0.0052 grams per reduced mile*	
Reduced PM2.5 (pounds/year)	20	47	*Yearly mileage reduction multiplied by 0.0049 grams per reduced mile*	
Reduced NO_x (pounds/year)	3927	9060	*Yearly mileage reduction multiplied by 0.95 grams per reduced mile*	
Reduced CO (pounds/year)	51,257	118,256	*Yearly mileage reduction multiplied by 12.4 grams per reduced mile*	
Reduced $C0_2$ (pounds/year)	1,525,300	3,519,069	*Yearly mileage reduction multiplied by 369 grams per reduced mile*	

(Emissions rates from EPA report 420-F-05-022 "Emission Facts: Average Annual Emissions and Fuel Consumption for Gaso Fueled Passenger Cars and Light Trucks." 2005.)

B.4 Metro Planning Area

The benefits model predicts that by 2030 the total number of bicycle commuters could increase from the current estimate of 2,612 to 12,021, resulting in an estimated decrease of 95 pounds of hydrocarbons per weekday, 66 pounds of mono-nitrogen oxides (NO_x) per weekday, 95 pounds of PM10 (particulate matter) per year, and 6,722,256 pounds of carbon dioxide (CO_2) per year.

Table B-4: Metro Planning Area Current / Future Demand and Air Quality Benefits Estimates

Variable	Current Value	Future Value	Source (1)	Source (2)
Demographics				
Study area population	316,978	353,336	*Los Angeles County General Plan Update (2008)*	
Employed population	63,693	101,909	*LA County 2008 In-Fill Study*	*Estimate based on historic employment population growth (or decline) trends*
Bike-to-work mode share	0.30%	1.00%	*2005-2007 American Community Survey, B0801 3-Year Estimates*	*Estimate of the potential mode share increase associated with planned/proposed bikeway system improvements*
Number of bike-to-work commuters	191	1,019	*Employed persons multiplied by bike-to-work mode share*	
Work-at-home mode share	2.10%	4.00%	*2005-2007 American Community Survey, S0801 3-Year Estimates*	*Estimate based on historic work-at-home population growth (or decline) trends*
Number of work-at-home bike commuters	4	82	*Assumes 0.3% of population working at home makes at least one daily bicycle trip*	*Assumes 2% of population working at home makes at least one daily bicycle trip*
Transit-to-work mode share	12.70%	15.00%	*2005-2007 American Community Survey, S0801 3-Year Estimates*	*Estimate of the potential mode share increase (or decrease) associated with planned/proposed bikeway system improvements and transit service improvements/reductions*

Table B-4: Metro Planning Area Current / Future Demand and Air Quality Benefits Estimates (continued)

Variable	Current Value	Future Value	Source (1)	Source (2)
Transit bicycle commuters	97	3,822	*Employed persons multiplied by transit mode share. Assumes 1.2% of transit riders access transit by bicycle*	*Employed persons multiplied by transit mode share. Assumes 25% of transit riders access transit by bicycle*
School children, ages 6-14 (grades K-8)	43,216	76,375	*2005-2007 American Community Survey, S0801 3-Year Estimates*	*Population-based estimate*
School children bicycling mode share	2.00%	4.00%	*National Safe Routes to School surveys, 2003.*	*Estimate of the potential mode share increase associated with planned/proposed bikeway system improvements*
School children bike commuters	864	3,055	*School children population multiplied by school children bike mode share*	*School children population multiplied by school children bicycling mode share*
Number of college students in study area	14,559	26,956	*2005-2007 American Community Survey, B14001 3-Year Estimates*	*Population-based estimate*
Estimated college bicycling mode share	10.00%	15.00%	*Review of bicycle commute share in seven university communities (source: National Bicycling & Walking Study, FHWA, Case Study No. 1, 1995).*	*Estimate of the potential mode share increase associated with planned/proposed bikeway system improvements*
College bike commuters	1,456	4,043	*College student population multiplied by college student bicycling mode share*	
Total number of bike commuters	2,612	12,021	*Total bike-to-work, school, college and utilitarian bike trips. Does not include recreation.*	
Total daily bicycling trips	5,225	24,041	*Total bicycle commuters x 2 (for round trips)*	
Estimated VMT Reductions				
Reduced Vehicle Trips per Weekday	1,663	5,374	*Assumes 73% of bicycle trips replace vehicle trips for adults/college students and 53% for school children*	
Reduced Vehicle Trips per Year	434,125	1,402,690	*Reduced number of weekday vehicle trips multiplied by 261 (weekdays in a year)*	
Reduced Vehicle Miles per Weekday	10,100	31,660	*Assumes average round trip travel length of 8 miles for adults/college students and 1 mile for schoolchildren*	
Reduced Vehicle Miles per Year	2,636,069	8,263,317	*Reduced number of weekday vehicle miles multiplied by 261 (weekdays in a year)*	
Air Quality Benefits Estimates				
Reduced Hydrocarbons (pounds/weekday)	30	95	*Daily mileage reduction multiplied by 1.36 grams per reduced mile*	
Reduced PM10 (pounds/weekday)	<1	<1	*Daily mileage reduction multiplied by 0.0052 grams per reduced mile*	
Reduced PM2.5 (pounds/weekday)	<1	<1	*Daily mileage reduction multiplied by 0.0049 grams per reduced mile*	
Reduced NO_X (pounds/weekday)	21	66	*Daily mileage reduction multiplied by 0.95 grams per reduced mile*	
Reduced CO (pounds/weekday)	276	866	*Daily mileage reduction multiplied by 12.4 grams per reduced mile*	
Reduced $C0_2$ (pounds/weekday)	8,216	25756	*Daily mileage reduction multiplied by 369 grams per reduced mile*	

Table B-4: Metro Planning Area Current / Future Demand and Air Quality Benefits Estimates (continued)

Variable	Current Value	Future Value	Source (1)	Source (2)
Reduced Hydrocarbons (pounds/year)	7,904	24,776	*Yearly mileage reduction multiplied by 1.36 grams per reduced mile*	
Reduced PM10 (pounds/year)	30	95	*Yearly mileage reduction multiplied by 0.0052 grams per reduced mile*	
Reduced PM2.5 (pounds/year)	28	89	*Yearly mileage reduction multiplied by 0.0049 grams per reduced mile*	
Reduced NO_X (pounds/year)	5,521	17307	*Yearly mileage reduction multiplied by 0.95 grams per reduced mile*	
Reduced CO (pounds/year)	72,063	225,897	*Yearly mileage reduction multiplied by 12.4 grams per reduced mile*	
Reduced $C0_2$ (pounds/year)	2,144,457	6,722,256	*Yearly mileage reduction multiplied by 369 grams per reduced mile*	

(Emissions rates from EPA report 420-F-05-022 "Emission Facts: Average Annual Emissions and Fuel Consumption for Gaso Fueled Passenger Cars and Light Trucks." 2005.)

B.5 San Fernando Valley Planning Area

The benefits model predicts that by 2030 the total number of bicycle commuters could increase from the current estimate of 708 to 1,583, resulting in an estimated decrease of 21 pounds of hydrocarbons per weekday, 15 pounds of mono-nitrogen oxides (NO_x) per weekday, 21 pounds of PM10 (particulate matter) per year, and 1,470,980 pounds of carbon dioxide (CO_2) per year.

Table B-5: San Fernando Valley Planning Area Current / Future Demand and Air Quality Benefits Estimates

Variable	Current Value	Future Value	Source (1)	Source (2)
Demographics				
Study area population	27,634	34,505	*Los Angeles County General Plan Update (2008)*	
Employed population	24,820	26,785	*Los Angeles County General Plan Update (2008)*	
Bike-to-work mode share	1.00%	2.00%	*2005-2007 American Community Survey, B0801 3-Year Estimates*	*Estimate of the potential mode share increase associated with planned/proposed bikeway system improvements*
Number of bike-to-work commuters	246	536	*Employed persons multiplied by bike-to-work mode share*	
Work-at-home mode share	4.00%	5.00%	*2005-2007 American Community Survey, S0801 3-Year Estimates*	*Estimate based on historic work-at-home population growth (or decline) trends*
Number of work-at-home bike commuters	11	54	*Assumes 1.1% of population working at home makes at least one daily bicycle trip*	*Assumes 4% of population working at home makes at least one daily bicycle trip*
Transit-to-work mode share	1.00%	2.00%	*2005-2007 American Community Survey, S0801 3-Year Estimates*	*Estimate of the potential mode share increase (or decrease) associated with planned/proposed bikeway system improvements and transit service improvements/reductions*

Table B-5: San Fernando Valley Planning Area Current / Future Demand and Air Quality Benefits Estimates (continued)

Variable	Current Value	Future Value	Source (1)	Source (2)
Transit bicycle commuters	3	134	*Employed persons multiplied by transit mode share. Assumes 1.2% of transit riders access transit by bicycle*	*Employed persons multiplied by transit mode share. Assumes 25% of transit riders access transit by bicycle*
School children, ages 6-14 (grades K-8)	6,235	7,230	*2005-2007 American Community Survey, S0801 3-Year Estimates*	*Population-based estimate*
School children bicycling mode share	2.00%	4.00%	*National Safe Routes to School surveys, 2003.*	*Estimate of the potential mode share increase associated with planned/proposed bikeway system improvements*
School children bike commuters	125	289	*School children population multiplied by school children bike mode share*	*School children population multiplied by school children bicycling mode share*
Number of college students in study area	3,234	3,805	*2005-2007 American Community Survey, B14001 3-Year Estimates*	*Population-based estimate*
Estimated college bicycling mode share	10.00%	15.00%	*Review of bicycle commute share in seven university communities (source: National Bicycling & Walking Study, FHWA, Case Study No. 1, 1995).*	*Estimate of the potential mode share increase associated with planned/proposed bikeway system improvements*
College bike commuters	323	571	*College student population multiplied by college student bicycling mode share*	
Total number of bike commuters	708	1,583	*Total bike-to-work, school, college and utilitarian bike trips. Does not include recreation.*	
Total daily bicycling trips	1,416	3,166	*Total bicycle commuters x 2 (for round trips)*	
Estimated VMT Reductions				
Reduced Vehicle Trips per Weekday	490	1,000	*Assumes 73% of bicycle trips replace vehicle trips for adults/college students and 53% for school children*	
Reduced Vehicle Trips per Year	127,798	261,029	*Reduced number of weekday vehicle trips multiplied by 261 (weekdays in a year)*	
Reduced Vehicle Miles per Weekday	3,455	6,928	*Assumes average round trip travel length of 8 miles for adults/college students and 1 mile for schoolchildren*	
Reduced Vehicle Miles per Year	901,634	1,808,199	*Reduced number of weekday vehicle miles multiplied by 261 (weekdays in a year)*	
Air Quality Benefits Estimates				
Reduced Hydrocarbons (pounds/weekday)	10	21	*Daily mileage reduction multiplied by 1.36 grams per reduced mile*	
Reduced PM10 (pounds/weekday)	0	0	*Daily mileage reduction multiplied by 0.0052 grams per reduced mile*	
Reduced PM2.5 (pounds/weekday)	0	0	*Daily mileage reduction multiplied by 0.0049 grams per reduced mile*	
Reduced NO_x (pounds/weekday)	7	15	*Daily mileage reduction multiplied by 0.95 grams per reduced mile*	
Reduced CO (pounds/weekday)	94	189	*Daily mileage reduction multiplied by 12.4 grams per reduced mile*	
Reduced $C0_2$ (pounds/weekday)	2,810	5,636	*Daily mileage reduction multiplied by 369 grams per reduced mile*	
Reduced Hydrocarbons (pounds/year)	2,703	5,421	*Yearly mileage reduction multiplied by 1.36 grams per reduced mile*	

Table B-5: San Fernando Valley Planning Area Current / Future Demand and Air Quality Benefits Estimates (continued)

Variable	Current Value	Future Value	Source (1)	Source (2)
Reduced PM10 (pounds/year)	10	21	*Yearly mileage reduction multiplied by 0.0052 grams per reduced mile*	
Reduced PM2.5 (pounds/year)	10	20	*Yearly mileage reduction multiplied by 0.0049 grams per reduced mile*	
Reduced NO_X (pounds/year)	1,888	3,787	*Yearly mileage reduction multiplied by 0.95 grams per reduced mile*	
Reduced CO (pounds/year)	24,648	49,431	*Yearly mileage reduction multiplied by 12.4 grams per reduced mile*	
Reduced $C0_2$ (pounds/year)	733,484	1,470,980	*Yearly mileage reduction multiplied by 369 grams per reduced mile*	

(Emissions rates from EPA report 420-F-05-022 "Emission Facts: Average Annual Emissions and Fuel Consumption for Gaso Fueled Passenger Cars and Light Trucks." 2005.)

B.6 Santa Clarita Valley Planning Area

The benefits model predicts that by 2030 the total number of bicycle commuters could increase from the current estimate of 754 to 3,217, resulting in an estimated decrease of 37 pounds of hydrocarbons per weekday, 26 pounds of mono-nitrogen oxides (NO_x) per weekday, 37 pounds of PM10 (particulate matter) per year, and 2,653,579 pounds of carbon dioxide (CO_2) per year.

Table B-6: Santa Clarita Valley Planning Area Current / Future Demand and Air Quality Benefits Estimates

Variable	Current Value	Future Value	Source (1)	Source (2)
Demographics				
Study area population	85,326	170,085	*Los Angeles County General Plan Update (2008)*	
Employed population	37,652	47,065	*2006-2008 American Community Survey, B0801 3-Year Estimates*	*Los Angeles County General Plan Update (2008)*
Bike-to-work mode share	0.20%	1.00%	*2005-2007 American Community Survey, B0801 3-Year Estimates*	*Estimate of the potential mode share increase associated with planned/proposed bikeway system improvements*
Number of bike-to-work commuters	62	471	*Employed persons multiplied by bike-to-work mode share*	
Work-at-home mode share	2.80%	3.50%	*2005-2007 American Community Survey, S0801 3-Year Estimates*	*Estimate based on historic work-at-home population growth (or decline) trends*
Number of work-at-home bike commuters	2	33	*Assumes 0.2% of population working at home makes at least one daily bicycle trip*	*Assumes 2% of population working at home makes at least one daily bicycle trip*
Transit-to-work mode share	1.40%	2.00%	*2005-2007 American Community Survey, S0801 3-Year Estimates*	*Estimate of the potential mode share increase (or decrease) associated with planned/proposed bikeway system improvements and transit service improvements/reductions*
Transit bicycle commuters	7	235	*Employed persons multiplied by transit mode share. Assumes 1.2% of transit riders access transit by bicycle*	*Employed persons multiplied by transit mode share. Assumes 25% of transit riders access transit by bicycle*

Table B-6: Santa Clarita Valley Planning Area Current / Future Demand and Air Quality Benefits Estimates (continued)

Variable	Current Value	Future Value	Source (1)	Source (2)
School children, ages 6-14 (grades K-8)	11,814	30,850	*2005-2007 American Community Survey, S0801 3-Year Estimates*	*Population-based estimate*
School children bicycling mode share	2.00%	3.00%	*National Safe Routes to School surveys, 2003.*	*Estimate of the potential mode share increase associated with planned/proposed bikeway system improvements*
School children bike commuters	236	925	*School children population multiplied by school children bike mode share*	*School children population multiplied by school children bicycling mode share*
Number of college students in study area	4,472	11,942	*2005-2007 American Community Survey, B14001 3-Year Estimates*	*Population-based estimate*
Estimated college bicycling mode share	10.00%	13.00%	*Review of bicycle commute share in seven university communities (source: National Bicycling & Walking Study, FHWA, Case Study No. 1, 1995).*	*Estimate of the potential mode share increase associated with planned/proposed bikeway system improvements*
College bike commuters	447	1,552	*College student population multiplied by college student bicycling mode share*	
Total number of bike commuters	754	3,217	*Total bike-to-work, school, college and utilitarian bike trips. Does not include recreation.*	
Total daily bicycling trips	1,508	6,434	*Total bicycle commuters x 2 (for round trips)*	
Estimated VMT Reductions				
Reduced Vehicle Trips per Weekday	498	1,991	*Assumes 73% of bicycle trips replace vehicle trips for adults/college students and 53% for school children*	
Reduced Vehicle Trips per Year	130,102	519,758	*Reduced number of weekday vehicle trips multiplied by 261 (weekdays in a year)*	
Reduced Vehicle Miles per Weekday	3,111	12,498	*Assumes average round trip travel length of 8 miles for adults/college students and 1 mile for schoolchildren*	
Reduced Vehicle Miles per Year	812,022	3,261,905	*Reduced number of weekday vehicle miles multiplied by 261 (weekdays in a year)*	
Air Quality Benefits Estimates				
Reduced Hydrocarbons (pounds/weekday)	9	37	*Daily mileage reduction multiplied by 1.36 grams per reduced mile*	
Reduced PM10 (pounds/weekday)	0	0	*Daily mileage reduction multiplied by 0.0052 grams per reduced mile*	
Reduced PM2.5 (pounds/weekday)	0	0	*Daily mileage reduction multiplied by 0.0049 grams per reduced mile*	
Reduced NO_x (pounds/weekday)	7	26	*Daily mileage reduction multiplied by 0.95 grams per reduced mile*	
Reduced CO (pounds/weekday)	85	342	*Daily mileage reduction multiplied by 12.4 grams per reduced mile*	
Reduced $C0_2$ (pounds/weekday)	2,531	10,167	*Daily mileage reduction multiplied by 369 grams per reduced mile*	
Reduced Hydrocarbons (pounds/year)	2,435	9,780	*Yearly mileage reduction multiplied by 1.36 grams per reduced mile*	
Reduced PM10 (pounds/year)	9	37	*Yearly mileage reduction multiplied by 0.0052 grams per reduced mile*	

Table B-6: Santa Clarita Valley Planning Area Current / Future Demand and Air Quality Benefits Estimates (continued)

Variable	Current Value	Future Value	Source (1)	Source (2)
Reduced PM2.5 (pounds/year)	9	35	*Yearly mileage reduction multiplied by 0.0049 grams per reduced mile*	
Reduced NO_X (pounds/year)	1,701	6,832	*Yearly mileage reduction multiplied by 0.95 grams per reduced mile*	
Reduced CO (pounds/year)	22,199	89,172	*Yearly mileage reduction multiplied by 12.4 grams per reduced mile*	
Reduced $C0_2$ (pounds/year)	660,585	2,653,579	*Yearly mileage reduction multiplied by 369 grams per reduced mile*	

(Emissions rates from EPA report 420-F-05-022 "Emission Facts: Average Annual Emissions and Fuel Consumption for Gaso Fueled Passenger Cars and Light Trucks." 2005.)

B.7 Santa Monica Mountains Planning Area

The benefits model predicts that by 2030 the total number of bicycle commuters could increase from the current estimate of 210 to 897, resulting in an estimated decrease of 11 pounds of hydrocarbons per weekday, 7 pounds of mono-nitrogen oxides (NO_x) per weekday, 11 pounds of PM10 (particulate matter) per year, and 750,588 pounds of carbon dioxide (CO_2) per year.

Table B-7: Santa Monica Mountains Planning Area Current / Future Demand and Air Quality Benefits Estimates

Variable	Current Value	Future Value	Source (1)	Source (2)
Demographics				
Study area population	21,925	32,888	*Los Angeles County General Plan Update (2008)*	
Employed population	16,277	17,854	*Los Angeles County General Plan Update (2008)*	
Bike-to-work mode share	0.20%	0.60%	*2005-2007 American Community Survey, B0801 3-Year Estimates*	*Estimate of the potential mode share increase associated with planned/proposed bikeway system improvements*
Number of bike-to-work commuters	26	107	*Employed persons multiplied by bike-to-work mode share*	
Work-at-home mode share	3.30%	4.80%	*2005-2007 American Community Survey, S0801 3-Year Estimates*	*Estimate based on historic work-at-home population growth (or decline) trends*
Number of work-at-home bike commuters	2	9	*Assumes 0.3% of population working at home makes at least one daily bicycle trip*	*Assumes 1% of population working at home makes at least one daily bicycle trip*
Transit-to-work mode share	0.50%	0.80%	*2005-2007 American Community Survey, S0801 3-Year Estimates*	*Estimate of the potential mode share increase (or decrease) associated with planned/proposed bikeway system improvements and transit service improvements/reductions*
Transit bicycle commuters	1	34	*Employed persons multiplied by transit mode share. Assumes 1.2% of transit riders access transit by bicycle*	*Employed persons multiplied by transit mode share. Assumes 25% of transit riders access transit by bicycle*
School children, ages 6-14 (grades K-8)	2,873	7,098	*2005-2007 American Community Survey, S0801 3-Year Estimates*	*Population-based estimate*

Table B-7: Santa Monica Mountains Planning Area Current / Future Demand and Air Quality Benefits Estimates (continued)

Variable	Current Value	Future Value	Source (1)	Source (2)
School children bicycling mode share	2.00%	4.00%	*National Safe Routes to School surveys, 2003.*	*Estimate of the potential mode share increase associated with planned/proposed bikeway system improvements*
School children bike commuters	57	284	*School children population multiplied by school children bike mode share*	*School children population multiplied by school children bicycling mode share*
Number of college students in study area	1,240	3,093	*2005-2007 American Community Survey, B14001 3-Year Estimates*	*Population-based estimate*
Estimated college bicycling mode share	10.00%	15.00%	*Review of bicycle commute share in seven university communities (source: National Bicycling & Walking Study, FHWA, Case Study No. 1, 1995).*	*Estimate of the potential mode share increase associated with planned/proposed bikeway system improvements*
College bike commuters	124	464	*College student population multiplied by college student bicycling mode share*	
Total number of bike commuters	210	897	*Total bike-to-work, school, college and utilitarian bike trips. Does not include recreation.*	
Total daily bicycling trips	420	1,795	*Total bicycle commuters x 2 (for round trips)*	
Estimated VMT Reductions				
Reduced Vehicle Trips per Weekday	141	574	*Assumes 73% of bicycle trips replace vehicle trips for adults/college students and 53% for school children*	
Reduced Vehicle Trips per Year	36,833	149,698	*Reduced number of weekday vehicle trips multiplied by 261 (weekdays in a year)*	
Reduced Vehicle Miles per Weekday	916	3,535	*Assumes average round trip travel length of 8 miles for adults/college students and 1 mile for schoolchildren*	
Reduced Vehicle Miles per Year	239,022	922,659	*Reduced number of weekday vehicle miles multiplied by 261 (weekdays in a year)*	
Air Quality Benefits Estimates				
Reduced Hydrocarbons (pounds/weekday)	3	11	*Daily mileage reduction multiplied by 1.36 grams per reduced mile*	
Reduced PM10 (pounds/weekday)	0	0	*Daily mileage reduction multiplied by 0.0052 grams per reduced mile*	
Reduced PM2.5 (pounds/weekday)	0	0	*Daily mileage reduction multiplied by 0.0049 grams per reduced mile*	
Reduced NO_X (pounds/weekday)	2	7	*Daily mileage reduction multiplied by 0.95 grams per reduced mile*	
Reduced CO (pounds/weekday)	25	97	*Daily mileage reduction multiplied by 12.4 grams per reduced mile*	
Reduced $C0_2$ (pounds/weekday)	745	2,876	*Daily mileage reduction multiplied by 369 grams per reduced mile*	
Reduced Hydrocarbons (pounds/year)	717	2,766	*Yearly mileage reduction multiplied by 1.36 grams per reduced mile*	
Reduced PM10 (pounds/year)	3	11	*Yearly mileage reduction multiplied by 0.0052 grams per reduced mile*	
Reduced PM2.5 (pounds/year)	3	10	*Yearly mileage reduction multiplied by 0.0049 grams per reduced mile*	
Reduced NO_X (pounds/year)	501	1,932	*Yearly mileage reduction multiplied by 0.95 grams per reduced mile*	

Table B-7: Santa Monica Mountains Planning Area Current / Future Demand and Air Quality Benefits Estimates (continued)

Variable	Current Value	Future Value	Source (1)	Source (2)
Reduced CO (pounds/year)	6,534	25,223	*Yearly mileage reduction multiplied by 12.4 grams per reduced mile*	
Reduced $C0_2$ (pounds/year)	194,446	750,588	*Yearly mileage reduction multiplied by 369 grams per reduced mile*	

(Emissions rates from EPA report 420-F-05-022 "Emission Facts: Average Annual Emissions and Fuel Consumption for Gaso Fueled Passenger Cars and Light Trucks." 2005.)

B.8 South Bay Planning Area

The benefits model predicts that by 2030 the total number of bicycle commuters could increase from the current estimate of 747 to 2,030, resulting in an estimated decrease of 25 pounds of hydrocarbons per weekday, 17 pounds of mono-nitrogen oxides (NO_x) per weekday, 25 pounds of PM10 (particulate matter) per year, and 1,768,883 pounds of carbon dioxide (CO_2) per year.

Table B-8: South Bay Planning Area Current / Future Demand and Air Quality Benefits Estimates

Variable	Current Value	Future Value	Source (1)	Source (2)
Demographics				
Study area population	78,254	86,880	*Los Angeles County General Plan Update (2008)*	
Employed population	20,346	21,767	*Los Angeles County General Plan Update (2008)*	
Bike-to-work mode share	0.80%	1.20%	*2005-2007 American Community Survey, B0801 3-Year Estimates*	*Estimate of the potential mode share increase associated with planned/proposed bikeway system improvements*
Number of bike-to-work commuters	170	255	*Employed persons multiplied by bike-to-work mode share*	
Work-at-home mode share	3.10%	4.40%	*2005-2007 American Community Survey, S0801 3-Year Estimates*	*Estimate based on historic work-at-home population growth (or decline) trends*
Number of work-at-home bike commuters	4	479	*Assumes 0.7% of population working at home makes at least one daily bicycle trip*	*Assumes 50% of population working at home makes at least one daily bicycle trip*
Transit-to-work mode share	3.30%	4.50%	*2005-2007 American Community Survey, S0801 3-Year Estimates*	*Estimate of the potential mode share increase (or decrease) associated with planned/proposed bikeway system improvements and transit service improvements/reductions*
Transit bicycle commuters	8	246	*Employed persons multiplied by transit mode share. Assumes 1.2% of transit riders access transit by bicycle*	*Employed persons multiplied by transit mode share. Assumes 25% of transit riders access transit by bicycle*
School children, ages 6-14 (grades K-8)	8,397	9,848	*2005-2007 American Community Survey, S0801 3-Year Estimates*	*Population-based estimate*
School children bicycling mode share	2.00%	4.00%	*National Safe Routes to School surveys, 2003.*	*Estimate of the potential mode share increase associated with planned/proposed bikeway system improvements*
School children bike commuters	168	394	*School children population multiplied by school children bike mode share*	*School children population multiplied by school children bicycling mode share*

Table B-8: South Bay Planning Area Current / Future Demand and Air Quality Benefits Estimates (continued)

Variable	Current Value	Future Value	Source (1)	Source (2)
Number of college students in study area	3,965	4,377	*2005-2007 American Community Survey, B14001 3-Year Estimates*	*Population-based estimate*
Estimated college bicycling mode share	10.00%	15.00%	*Review of bicycle commute share in seven university communities (source: National Bicycling & Walking Study, FHWA, Case Study No. 1, 1995).*	*Estimate of the potential mode share increase associated with planned/proposed bikeway system improvements*
College bike commuters	397	657	*College student population multiplied by college student bicycling mode share*	
Total number of bike commuters	747	2,030	*Total bike-to-work, school, college and utilitarian bike trips. Does not include recreation.*	
Total daily bicycling trips	1,494	4,061	*Total bicycle commuters x 2 (for round trips)*	
Estimated VMT Reductions				
Reduced Vehicle Trips per Weekday	506	1,224	*Assumes 73% of bicycle trips replace vehicle trips for adults/college students and 53% for school children*	
Reduced Vehicle Trips per Year	132,019	319,480	*Reduced number of weekday vehicle trips multiplied by 261 (weekdays in a year)*	
Reduced Vehicle Miles per Weekday	3,423	8,331	*Assumes average round trip travel length of 8 miles for adults/college students and 1 mile for schoolchildren*	
Reduced Vehicle Miles per Year	893,531	2,174,396	*Reduced number of weekday vehicle miles multiplied by 261 (weekdays in a year)*	
Air Quality Benefits Estimates				
Reduced Hydrocarbons (pounds/weekday)	10	25	*Daily mileage reduction multiplied by 1.36 grams per reduced mile*	
Reduced PM10 (pounds/weekday)	0	<1	*Daily mileage reduction multiplied by 0.0052 grams per reduced mile*	
Reduced PM2.5 (pounds/weekday)	0	<1	*Daily mileage reduction multiplied by 0.0049 grams per reduced mile*	
Reduced NO_X (pounds/weekday)	7	17	*Daily mileage reduction multiplied by 0.95 grams per reduced mile*	
Reduced CO (pounds/weekday)	94	228	*Daily mileage reduction multiplied by 12.4 grams per reduced mile*	
Reduced $C0_2$ (pounds/weekday)	2,785	6777	*Daily mileage reduction multiplied by 369 grams per reduced mile*	
Reduced Hydrocarbons (pounds/year)	2,679	6,519	*Yearly mileage reduction multiplied by 1.36 grams per reduced mile*	
Reduced PM10 (pounds/year)	10	25	*Yearly mileage reduction multiplied by 0.0052 grams per reduced mile*	
Reduced PM2.5 (pounds/year)	10	23	*Yearly mileage reduction multiplied by 0.0049 grams per reduced mile*	
Reduced NO_X (pounds/year)	1,871	4554	*Yearly mileage reduction multiplied by 0.95 grams per reduced mile*	
Reduced CO (pounds/year)	24,427	59,442	*Yearly mileage reduction multiplied by 12.4 grams per reduced mile*	

Table B-8: South Bay Planning Area Current / Future Demand and Air Quality Benefits Estimates (continued)

Variable	Current Value	Future Value	Source (1)	Source (2)
Reduced CO_2 (pounds/year)	726,893	1,768,883	*Yearly mileage reduction multiplied by 369 grams per reduced mile*	

(Emissions rates from EPA report 420-F-05-022 "Emission Facts: Average Annual Emissions and Fuel Consumption for Gaso Fueled Passenger Cars and Light Trucks." 2005.)

B.9 West San Gabriel Valley Planning Area

The benefits model predicts that by 2030 the total number of bicycle commuters could increase from the current estimate of 1,643 to 4,408, resulting in an estimated decrease of 50 pounds of hydrocarbons per weekday, 35 pounds of mono-nitrogen oxides (NO_x) per weekday, 50 pounds of PM10 (particulate matter) per year, and 3,563,556 pounds of carbon dioxide (CO_2) per year.

Table B-9: West San Gabriel Valley Planning Area Current Future Demand and Air Quality Benefits Estimates

Variable	Current Value	Future Value	Source (1)	Source (2)
Demographics				
Study area population	117,913	157,371	*Los Angeles County General Plan Update (2008)*	
Employed population	57,179	62,897	*Los Angeles County General Plan Update (2008)*	
Bike-to-work mode share	0.60%	1.00%	*2005-2007 American Community Survey, B0801 3-Year Estimates*	*Estimate of the potential mode share increase associated with planned/proposed bikeway system improvements*
Number of bike-to-work commuters	336	629	*Employed persons multiplied by bike-to-work mode share*	
Work-at-home mode share	3.50%	4.70%	*2005-2007 American Community Survey, S0801 3-Year Estimates*	*Estimate based on historic work-at-home population growth (or decline) trends*
Number of work-at-home bike commuters	12	59	*Assumes 0.6% of population working at home makes at least one daily bicycle trip*	*Assumes 2% of population working at home makes at least one daily bicycle trip*
Transit-to-work mode share	2.90%	4.00%	*2005-2007 American Community Survey, S0801 3-Year Estimates*	*Estimate of the potential mode share increase (or decrease) associated with planned/proposed bikeway system improvements and transit service improvements/reductions*
Transit bicycle commuters	20	631	*Employed persons multiplied by transit mode share. Assumes 1.2% of transit riders access transit by bicycle*	*Employed persons multiplied by transit mode share. Assumes 25% of transit riders access transit by bicycle*
School children, ages 6-14 (grades K-8)	17,314	24,833	*2005-2007 American Community Survey, S0801 3-Year Estimates*	*Population-based estimate*
School children bicycling mode share	2.00%	4.00%	*National Safe Routes to School surveys, 2003.*	*Estimate of the potential mode share increase associated with planned/proposed bikeway system improvements*
School children bike commuters	346	993	*School children population multiplied by school children bike mode share*	*School children population multiplied by school children bicycling mode share*
Number of college students in study area	9,283	13,969	*2005-2007 American Community Survey, B14001 3-Year Estimates*	*Population-based estimate*

Table B-9: West San Gabriel Valley Planning Area Current Future Demand and Air Quality Benefits Estimates (continued)

Variable	Current Value	Future Value	Source (1)	Source (2)
Estimated college bicycling mode share	10.00%	15.00%	*Review of bicycle commute share in seven university communities (source: National Bicycling & Walking Study, FHWA, Case Study No. 1, 1995).*	*Estimate of the potential mode share increase associated with planned/proposed bikeway system improvements*
College bike commuters	928	2,095	*College student population multiplied by college student bicycling mode share*	
Total number of bike commuters	1,643	4,408	*Total bike-to-work, school, college and utilitarian bike trips. Does not include recreation.*	
Total daily bicycling trips	3,285	8,816	*Total bicycle commuters x 2 (for round trips)*	
Estimated VMT Reductions				
Reduced Vehicle Trips per Weekday	1115	2,559	*Assumes 73% of bicycle trips replace vehicle trips for adults/college students and 53% for school children*	
Reduced Vehicle Trips per Year	291,054	667,793	*Reduced number of weekday vehicle trips multiplied by 261 (weekdays in a year)*	
Reduced Vehicle Miles per Weekday	7,636	16,783	*Assumes average round trip travel length of 8 miles for adults/college students and 1 mile for schoolchildren*	
Reduced Vehicle Miles per Year	1,993,124	4,380,493	*Reduced number of weekday vehicle miles multiplied by 261 (weekdays in a year)*	
Air Quality Benefits Estimates				
Reduced Hydrocarbons (pounds/weekday)	23	50	*Daily mileage reduction multiplied by 1.36 grams per reduced mile*	
Reduced PM10 (pounds/weekday)	<1	<1	*Daily mileage reduction multiplied by 0.0052 grams per reduced mile*	
Reduced PM2.5 (pounds/weekday)	<1	<1	*Daily mileage reduction multiplied by 0.0049 grams per reduced mile*	
Reduced NO_X (pounds/weekday)	16	35	*Daily mileage reduction multiplied by 0.95 grams per reduced mile*	
Reduced CO (pounds/weekday)	209	459	*Daily mileage reduction multiplied by 12.4 grams per reduced mile*	
Reduced $C0_2$ (pounds/weekday)	6212	13,653	*Daily mileage reduction multiplied by 369 grams per reduced mile*	
Reduced Hydrocarbons (pounds/year)	5976	13,134	*Yearly mileage reduction multiplied by 1.36 grams per reduced mile*	
Reduced PM10 (pounds/year)	23	50	*Yearly mileage reduction multiplied by 0.0052 grams per reduced mile*	
Reduced PM2.5 (pounds/year)	22	47	*Yearly mileage reduction multiplied by 0.0049 grams per reduced mile*	
Reduced NO_X (pounds/year)	4174	9,174	*Yearly mileage reduction multiplied by 0.95 grams per reduced mile*	
Reduced CO (pounds/year)	54487	119,751	*Yearly mileage reduction multiplied by 12.4 grams per reduced mile*	
Reduced $C0_2$ (pounds/year)	1,621,418	3,563,556	*Yearly mileage reduction multiplied by 369 grams per reduced mile*	

(Emissions rates from EPA report 420-F-05-022 "Emission Facts: Average Annual Emissions and Fuel Consumption for Gaso Fueled Passenger Cars and Light Trucks." 2005.)

B.10 Westside Planning Area

The benefits model predicts that by 2030 the total number of bicycle commuters could increase from the current estimate of 431 to 1,489, resulting in an estimated decrease of 19 pounds of hydrocarbons per weekday, 14 pounds of mono-nitrogen oxides (NO_x) per weekday, 19 pounds of PM10 (particulate matter) per year, and 1,374,433 pounds of carbon dioxide (CO_2) per year.

Table B-10: Westside Planning Area Current / Future Demand and Air Quality Benefits Estimates

Variable	Current Value	Future Value	Source (1)	Source (2)
Demographics				
Study area population	31,777	40,949	*LA County General Plan Update (2008)*	
Employed population	17,637	18,459	*LA County General Plan Update (2008)*	
Bike-to-work mode share	0.30%	1.00%	*2005-2007 American Community Survey, B0801 3-Year Estimates*	*Estimate of the potential mode share increase associated with planned/proposed bikeway system improvements*
Number of bike-to-work commuters	46	185	*Employed persons multiplied by bike-to-work mode share*	
Work-at-home mode share	5.80%	8.80%	*2005-2007 American Community Survey, S0801 3-Year Estimates*	*Estimate based on historic work-at-home population growth (or decline) trends*
Number of work-at-home bike commuters	2	33	*Assumes 0.2% of population working at home makes at least one daily bicycle trip*	*Assumes 2% of population working at home makes at least one daily bicycle trip*
Transit-to-work mode share	2.00%	4.00%	*2005-2007 American Community Survey, S0801 3-Year Estimates*	*Estimate of the potential mode share increase (or decrease) associated with planned/proposed bikeway system improvements and transit service improvements/reductions*
Transit bicycle commuters	4	185	*Employed persons multiplied by transit mode share. Assumes 1.2% of transit riders access transit by bicycle*	*Employed persons multiplied by transit mode share. Assumes 25% of transit riders access transit by bicycle*
School children, ages 6-14 (grades K-8)	2,984	5,396	*2005-2007 American Community Survey, S0801 3-Year Estimates*	*Population-based estimate*
School children bicycling mode share	2.00%	4.00%	*National Safe Routes to School surveys, 2003.*	*Estimate of the potential mode share increase associated with planned/proposed bikeway system improvements*
School children bike commuters	60	216	*School children population multiplied by school children bike mode share*	*School children population multiplied by school children bicycling mode share*
Number of college students in study area	3,192	5,811	*2005-2007 American Community Survey, B14001 3-Year Estimates*	*Population-based estimate*
Estimated college bicycling mode share	10.00%	15.00%	*Review of bicycle commute share in seven university communities (source: National Bicycling & Walking Study, FHWA, Case Study No. 1, 1995).*	*Estimate of the potential mode share increase associated with planned/proposed bikeway system improvements*
College bike commuters	319	872	*College student population multiplied by college student bicycling mode share*	
Total number of bike commuters	431	1,489	*Total bike-to-work, school, college and utilitarian bike trips. Does not include recreation.*	
Total daily bicycling trips	862	2,979	*Total bicycle commuters x 2 (for round trips)*	

Table B-10: Westside Planning Area Current / Future Demand and Air Quality Benefits Estimates (continued)

Variable	Current Value	Future Value	Source (1)	Source (2)
Estimated VMT Reductions				
Reduced Vehicle Trips per Weekday	300	909	*Assumes 73% of bicycle trips replace vehicle trips for adults/college students and 53% for school children*	
Reduced Vehicle Trips per Year	78225	237,316	*Reduced number of weekday vehicle trips multiplied by 261 (weekdays in a year)*	
Reduced Vehicle Miles per Weekday	2,176	6,473	*Assumes average round trip travel length of 8 miles for adults/college students and 1 mile for schoolchildren*	
Reduced Vehicle Miles per Year	568,008	1,689,518	*Reduced number of weekday vehicle miles multiplied by 261 (weekdays in a year)*	
Air Quality Benefits Estimates				
Reduced Hydrocarbons (pounds/weekday)	7	19	*Daily mileage reduction multiplied by 1.36 grams per reduced mile*	
Reduced PM10 (pounds/weekday)	<1	<1	*Daily mileage reduction multiplied by 0.0052 grams per reduced mile*	
Reduced PM2.5 (pounds/weekday)	<1	<1	*Daily mileage reduction multiplied by 0.0049 grams per reduced mile*	
Reduced NO_X (pounds/weekday)	5	14	*Daily mileage reduction multiplied by 0.95 grams per reduced mile*	
Reduced CO (pounds/weekday)	59	177	*Daily mileage reduction multiplied by 12.4 grams per reduced mile*	
Reduced $C0_2$ (pounds/weekday)	1,770	5,266	*Daily mileage reduction multiplied by 369 grams per reduced mile*	
Reduced Hydrocarbons (pounds/year)	1,703	5,066	*Yearly mileage reduction multiplied by 1.36 grams per reduced mile*	
Reduced PM10 (pounds/year)	7	19	*Yearly mileage reduction multiplied by 0.0052 grams per reduced mile*	
Reduced PM2.5 (pounds/year)	6	18	*Yearly mileage reduction multiplied by 0.0049 grams per reduced mile*	
Reduced NO_X (pounds/year)	1,190	3,539	*Yearly mileage reduction multiplied by 0.95 grams per reduced mile*	
Reduced CO (pounds/year)	15,528	46,187	*Yearly mileage reduction multiplied by 12.4 grams per reduced mile*	
Reduced $C0_2$ (pounds/year)	462,078	1,374,433	*Yearly mileage reduction multiplied by 369 grams per reduced mile*	

(Emissions rates from EPA report 420-F-05-022 "Emission Facts: Average Annual Emissions and Fuel Consumption for Gaso Fueled Passenger Cars and Light Trucks." 2005.)

Appendix C. Relationship to Existing Plans and Policies

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The Plan coordinates with the existing plans and policies of the State of California, Los Angeles County and other agencies. During development of the Plan, other state, county and local plans and policies were reviewed and are outlined in this Appendix. This Plan was developed to be consistent with these policies and plans to the greatest extent possible. Close coordination with other jurisdictions will be necessary during the implementation of this plan.

Appendix C presents a summary of the following existing plans and policies:

State Legislation and Policies

- State Legislation: AB 32 (Global Warming Solutions Act), SB 375 (Sustainable Communities and Climate Protection Act of 2008), AB 1358 (Complete Streets Act of 2008)

Countywide Plans and Policies:

- Draft County of Los Angeles General Plan
- Unincorporated Area wide and Community Specific Plans
- County of Los Angeles Plan of Bikeways (1975)
- Los Angeles River Master Plan (1996)
- San Gabriel River Corridor Master Plan (2006)
- Los Angeles County Code
- Metro Bicycle Transportation Strategic Plan (2006)

Municipal Bicycle Planning Documents:

- City of Burbank Bicycle Master Plan Update (2009)
- Claremont Bicycle Plan (2007)
- City of Glendale Bikeway Master Plan (1995)
- City of San Fernando Bicycle Master Plan (2007)
- City of Santa Clarita Non-Motorized Transportation Master Plan (2008)
- Whittier Bicycle Transportation Plan (2008)
- Los Angeles River Revitalization Master Plan (2007)
- West Hollywood Bicycle and Pedestrian Master Plan (2003)
- Temple City Bicycle Master Plan (2011)
- City of Los Angeles Bicycle Master Plan Update (2011)
- Pasadena Bicycle Master Plan
- Culver City Bicycle and Pedestrian Master Plan (in progress)

Relevant Planning Studies:

- Enhanced Public Outreach Project (2004)
- Eastside Light Rail Bike Interface Plan (2006)
- Coyote Creek Trail Master Plan (2008)
- Bicycle Plans in Adjacent Counties

C.1 State Legislation and Policies

In recent years the State of California has enacted numerous pieces of legislation that directly or indirectly affect the development of a bicycle network in the County of Los Angeles. Recent regulatory initiatives including Assembly Bill 32 (AB 32) and Senate Bill 375 (SB 375) have created a mandate to consider project impacts upon greenhouse gas (GHG) emissions to limit the effects of global warming. A key issue related to GHG emissions is that vehicular travel contributes significantly to overall emissions. Statewide, transportation emissions from vehicles generate over one-third of overall emissions. At a municipal level, transportation may contribute more than 50 percent to citywide or countywide emissions. AB 32, passed in 2006, directed the California Air Resources Board (ARB) to begin developing early action plans to reduce greenhouse gas emissions and to develop a scoping plan to identify how to achieve the 2020 greenhouse gas emissions reductions. Senate Bill 375, which was signed into law September 2008, implements AB 32 by addressing emissions related to land-use and transportation.

This Bicycle Master Plan will play a major role in promoting non-motorized transportation. Addressing transportation emissions can include encouraging walking, bicycling, and utilizing transit, in turn reducing passenger vehicle trips - "the largest single source of greenhouse gas emissions in California, accounting for 30 percent of the total[i]." When developing strategies to reduce GHG emissions through increased use of alternative transportation, it is also important to differentiate between recreational walking and bicycling and utilitarian non-motorized transportation. Replacing a regular, utilitarian automobile trip with a non-motorized trip allows the traveler to fulfill the same trip purpose, whether it is work, school, or shopping travel, among others. However, while infrastructure may increase bicycling trips as a recreational activity, these trips do not necessarily replace other irregular or infrequent recreational trips using automobiles.

C.1.1 SB 375: Redesigning Communities to Reduce Greenhouse Gasses

Senate Bill 375 enhances California's ability to reach its AB 32 goals by promoting good planning with the goal of more sustainable communities. Under the law, the California Air Resources Board (ARB) has until September 2010 to develop regional GHG emission reduction targets for passenger vehicles, which account for a third of the state's GHG emissions. ARB is required to establish targets for 2020 and 2035 for each region covered by one of the State's 18 metropolitan planning organizations (MPOs). Each of California's MPOs will then prepare a "sustainable communities strategy (SCS)" that demonstrates how the region will meet its GHG reduction target through integrated land use, housing and transportation planning. Once adopted by the MPO, the SCS will be incorporated into that region's federally enforceable regional transportation plan (RTP). ARB is also required to review each final SCS to determine whether it would, if implemented, achieve the GHG emission reduction target for its region.

On June 30, 2010, ARB released its *Draft Regional Greenhouse Gas Emission Reduction Targets for Automobiles and Light Trucks Pursuant to Senate Bill 375*. In the draft report, the Southern California Association of Governments (SCAG), the MPO for the project area, agreed to preliminary per capita reduction targets of 3% and 6% at years 2020 and 2035, respectively, compared to base year 2005 per capita emissions levels. Official reduction targets were recommended in the fall of 2010. For the SCAG region, individual sub regions will develop their own SCS.

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[i] *http://gov.ca.gov/fact-sheet/10707/*

SB 375 offers subregions the flexibility to develop appropriate strategies to address the region's GHG reduction goals, including the use of land use and transportation policy.[ii] The implementation of the Bicycle Master Plan can be a supporting policy to the SCS. The County of Los Angeles participates in multiple SCAG subregions and will have to coordinate closely with other subregional bodies in the development of the SCS. The close alignment of the strategies to achieve both increased bicycle use and a reduction in GHG emissions offers an opportunity for garnering the necessary support to implement the Bicycle Master Plan.

C.1.2 AB 1358: The Complete Streets Act of 2008

AB 1358 was signed into law in September, 2008. Commencing on January 1, 2011, the bill will require that complete street policies be included in the circulation element of city and county general plans when they undergo a substantive revision. Complete streets are defined as highways and city streets that provide routine accommodation to all users of the transportation system, including motorists, pedestrians, bicyclists, individuals with disabilities, seniors, and users of public transportation.

The adoption of complete streets policy language has goals in common with both the greenhouse gas bills (AB 32 and SB 375) as well as the Bicycle Master Plan. As described in the Section 2.g of AB 1358: "In order to fulfill the commitment to reduce greenhouse gas emissions, make the most efficient use of urban land and transportation infrastructure, and improve public health by encouraging physical activity, transportation planners must find innovative ways to reduce vehicle miles traveled and to shift from short trips in the automobile to biking, walking, and use of public transit."

Of note and related to AB 1358, the California Department of Transportation (Caltrans) adopted two policies in recent years relevant to bicycle planning initiatives such as this Bicycle Master Plan. Similar to AB 1358, Deputy Directive 64 (DD-64-R1) sets forth that Caltrans addresses the "safety and mobility needs of bicyclists, pedestrians, and transit users in all projects, regardless of funding."

In a more specific application of complete streets goals, Traffic Operations Policy Directive 09-06 features bicycle detection requirements. Specifically, 09-06 requires that new and modified signal detectors provide bicyclist detection if they are to remain in operation. Further, the standard states that new and modified bicycle path approaches to signalized intersections provide bicycle detection or a bicyclist pushbutton if detection is required.

C.2 Countywide Plans and Policies

This section describes the countywide plans and policies which most directly influence the development of the County of Los Angeles Bicycle Master Plan. These plans and policies have been reviewed to ensure that the Bicycle Master Plan is consistent with existing County of Los Angeles plans and policies. A summary of countywide plans and policies follows.

[ii] *According to the SCAG Framework and Guidelines for Subregional Sustainable Communities Strategy*

http://www.scag.ca.gov/sb375/pdfs/SB375_FrameworkGuidelines040110.pdf

C.2.1 Draft County of Los Angeles General Plan (2010)

The County of Los Angeles is currently updating its General Plan and a draft is available for public review at http://planning.lacounty.gov.

The primary theme of the General Plan is sustainability and includes many policies that promote healthy, livable, and sustainable communities. Of the five major goals of the plan, bicycling can help address three:

- Smart Growth
- Adequate Community Services and Infrastructure
- Healthy, Livable and Equitable Communities

C.2.1.1 Mobility Element

As a sub-element to the Mobility Element, the Bicycle Master Plan will conform most closely to the goals and policies of that element. However, the Bicycle Master Plan will also support the goals and policies of other General Plan elements. **Table C-1** shows the Mobility Element Goals, Policies and Implementation Actions most relevant to the development of the Bicycle Master Plan. The text below reflects the Mobility Element's focus on multi-modal and active transportation.

> *Mobility policies create a well-connected transportation network; help walking and biking become more practical modes of transport; support increased densities and a mix of uses in transit-oriented and pedestrian districts; conserve energy resources; reduce greenhouse gas emissions and air pollution; and continue to accommodate auto mobility on the County's streets and highways. The California Complete Streets Act of 2007 requires that the transportation plans of California communities meet the needs of all users of the roadway including pedestrians, bicyclists, users of public transit, motorists, children, the elderly, and the disabled. Complete Streets planning requires planning for all modes of travel, with the goal of making roads that are safer and more convenient places to walk, ride a bike, or take transit. Additionally, safer roads enable more people to gain the health benefits of choosing an active form of transportation, and benefit everyone by reducing traffic congestion, auto-related air pollution, and the production of climate-changing greenhouse gases.*

Table C-1: Relevant Goals, Policies and Implementation Actions from the County of Los Angeles General Plan Mobility Element

GOAL M-1: An accessible transportation system that ensures the mobility of people and goods throughout the County.

Policy M 1.1: Expand the availability of transportation options throughout the County.
Policy M 1.2: Encourage a range of transportation services at both the regional and local levels, especially for transit dependent populations.
Policy M 1.3: Sustain an affordable countywide transportation system for all users.
Policy M 1.4: Maintain transportation right-of-way corridors for future transportation uses.
Policy M 1.5: Support the linking of regional and community level transportation systems.

GOAL M-2: An efficient transportation system that effectively utilizes and expands multimodal transportation options.

Policy M 2.1: Encourage street standards that embrace the complete streets concept, which designs roadways for all users equally including pedestrians, bicyclists, motorists, people with disabilities, seniors, and users of public transit.
Policy M 2.2: Expand transportation options throughout the County that reduce automobile dependence.
Policy M 2.3: Reduce Vehicle Miles Traveled (VMT) and vehicle trips through the use of alternative modes of transportation…
Policy M 2.4: Support smart-growth street design, such as traditional street grid patterns and alleyways.
Policy M 2.5: Expand bicycle infrastructure and amenities throughout the County for both transportation and recreation
Policy M 2.6: Ensure bike lanes, bike paths, and pedestrian connectivity in all future street improvements.
Policy M 2.7: Reduce parking footprints.
Policy M 2.8: Require a maximum level of connectivity in transportation systems and community-level designs.

Implementation Action M 2.1: Establish a task force to study and evaluate the design guidelines and standards for sidewalks, bike lanes and roads in the County.

GOAL M-4: A transportation system that ensures the safety of all County residents.

Policy M 4.1: Design roads and intersections that protect pedestrians and bicyclists and reduce motor vehicle accidents.

Implementation Action M 4.1: Develop a traffic calming initiative to increase the safety and use of alternative modes of transportation that targets intersection improvements and residential streets. Change the County code to allow narrower roads and enhanced sidewalks where appropriate.

GOAL M-5: A financially sustainable countywide transportation system.

Policy M 5.1: Support dedicated funding streams for the maintenance and improvement of County transportation systems.

GOAL M-6: Effective inter-jurisdictional coordination and collaboration in all aspects of transportation planning.

Policy M 6.1: Expand inter-jurisdictional cooperation to ensure a seamless, inter-modal, and multimodal regional transportation system.
Policy M 6.3: Support the County Bikeway Plan and continue development of a regional coordinated system of bikeways and bikeway facilities.
Policy M 6.4: Encourage local bikeway proposals and community bike plans.

Implementation Action M 6.1: Develop a TDM Management Ordinance that requires bicycle parking in schools, public buildings, major employment centers, and major commercial districts. This ordinance could also apply to select new developments adjacent to transit centers, major employment centers, and major commercial districts to promote alternatives to the automobile.

Implementation Action M 6.2: Participate in the creation of the County Bicycle Master Plan Update Program with the Department of Public Works.

The Mobility Element notes the importance of linking transportation and land use planning to create sustainable communities. The County has historically planned with the goal of moving the highest number of automobiles as possible, but the updated Mobility Element envisions a multimodal transportation system with a greater investment in transit, pedestrian, and bicycle infrastructure.

> *For any transportation system to be effective, all aspects – streets, freeways, public transit, highways, sidewalks, bicycle facilities, and freight movement – must be comprehensively coordinated with land use planning. Land use and mobility are inextricably linked: low density sprawl with single use development encourages driving. Alternatively, denser, communities with a mix of land uses that encourages transit use, walking, and biking are healthier and sustainable…*
>
> *Congested roadways and high on-street parking demand create insufficient space adjacent to the road to accommodate widening for bike lanes. In addition, a frequent complaint of bicyclists is the absence of adequate facilities to secure their bicycles at public and private buildings or facilities. Many of the commercial corridors in the mature urban areas are underutilized and in need of redevelopment. Strengthening mixed land uses and promoting compact development in these areas, in concert with design standards for rights-of-way, will help encourage walking and bicycling for shorter trips, as well as make transit more accessible.*

C.2.1.2 Land Use Element

The Land Use Element of the General Plan addresses Public Health, due to the growing awareness of how land use development affects public health issues at the community level. Improving the overall condition of the County's public health and well-being through innovative and health-conscious land use planning is a goal of the General Plan. According to the Centers for Disease Control and Prevention (CDC), there has been a dramatic increase in obesity in the United States during the past 20 years.[iii] The CDC has underscored the connection between urban planning and public health, given the evidence that certain urban design and land use policies significantly increase the amount of time people engage in physical activity.

The goal of the Bicycle Master Plan is to promote an active and healthy lifestyle by encouraging more people to ride bicycles, and providing more bikeways and bicycle infrastructure within the County to accommodate bicyclists. Expansion of the bikeway network within the County will also result in improving the safety of existing road users. According to Statewide Integrated Traffic Records System (SWITRS) data, there were over 50,000 motor vehicle collisions involving bicyclists and pedestrians between 2003 and 2008 statewide.

Some of the relevant Goals and Policies from the Land Use Element are shown below:

Goal LU-8: Land use patterns and community infrastructure that promote health and wellness.

- **Policy LU 8.1:** Promote community health for all neighborhoods.
- **Policy LU 8.2:** Direct resources to areas that lack amenities, such as transit, clean air, grocery stores, bike lanes, parks, and other components of a healthy community.
- **Policy LU 8.3:** Encourage patterns of development, such as sidewalks and walking and biking paths that promote physical activity and discourage automobile dependency.

[iii] *Centers for Disease Control and Prevention report on Obesity Trends:*http://www.cdc.gov/obesity/data/trends.html

C.2.1.3 Air Quality Element

By encouraging active transportation, the Bicycle Master Plan can also help reduce mobile source emissions throughout the County of Los Angeles. Some of the relevant goals and policies are shown below:

Goal AQ-2: The reduction of air pollution and mobile source emissions through coordinated land use, transportation and air quality planning.

- Policy AQ 2.4: Enhance incentive programs for County employees to utilize alternative transportation options, particularly active transportation such as walking and biking.
- Policy AQ 2.8: Reduce emissions due to traffic congestion and vehicle trips through increased infrastructure that supports alternative modes of transportation.

C.2.1.4 General Plan Implementation

The County General Plan will be implemented in three phases. Phase 1 indicates the highest priority implementation programs, and should be initiated within the first two years of adoption of the General Plan. Phases 2 and 3 should be initiated three and five years from adoption, respectively. Programs designated as ongoing represent actions that must be done on an annual or ongoing basis for General Plan implementation. Table C-2 shows County General Plan implementation programs relevant to the County Bicycle Master Plan:

Table C-2: Plan Implementation

Implementation Program	Actions	General Plan Policies	Phase 1 (0-2 years)	Phase 2 (3-5 years)	Phase 3 (5-10 years)	Ongoing
Complete Streets Ordinance	Prepare a Complete Streets Ordinance that considers the following: Standards for streets, including rural streets, sidewalks, bike lanes and other road amenities to implement Complete Streets. Traffic calming measures for intersections and residential streets that increase the safety and use of alternatives modes of transportation.	Mobility Element Policies: 2.1, 2.2, 2.3, 2.8, 5.3, 6.6	-	X	-	-
Multimodal Transportation Incentives Ordinance*	Prepare a Multimodal Transportation Incentives Ordinance that encourages the provision of multimodal transportation amenities, such as bicycle parking in schools, public buildings, major employment centers, and commercial districts.	Economic Development Element Policies: 3.3	-	-	X	-

**The Department of Regional Planning is currently developing a Healthy Design Ordinance, which will include standards for bike related facilities.*

Alternative Transportation and Mobility Program

The Alternative Transportation and Mobility Program addresses the goal to provide communities with access to multi-modal transportation options. This program focuses on improving the pedestrian and mobility environment.

Responsible Agencies: DRP, DPW, Department of Parks and Recreation (DPR), Los Angeles County Metropolitan Transportation Authority (Metro), CEO

C.2.2 Unincorporated Area wide and Community Specific Plans

The Los Angeles County General Plan is the foundation for all other land use plans that are created in the unincorporated County. These community planning efforts are supplemental components of the General Plan and must be consistent with general Plan goals and policies.

Many of these plans include regional or community-level policies regarding circulation, recreational facilities and bikeway facilities. Additionally, certain area and community plans are currently being updated through comprehensive, community-based efforts. All potential bikeways and support facilities that have been identified in these plans and update efforts were reviewed, and included in the Bicycle Master Plan based on their feasibility and relevance to the countywide bikeway network. The County's supplemental land use plans are listed below:

- **Santa Clarita Valley Area Plan** (Adopted 1984; currently being updated)
- **Antelope Valley Area Plan** (Adopted 1986; currently being updated)
- **Hacienda Heights Community Plan** (Adopted 1978; currently being updated)
- **Rowland Heights Community Plan** (Adopted 1981)
- **Altadena Community Plan** (Adopted 1986)
- **Walnut Park Walnut Park Neighborhood Plan** (Adopted 1987)
- **East Los Angeles Community Plan** (Adopted 1988)
- **West Athens/Westmont Community Plan** (Adopted 1990)
- **Twin Lakes Community Plan** (Adopted 1991)
- **Santa Monica Mountains North Area Plan** (Adopted 2000)
- **Florence-Firestone Community Plan** (currently being created)
- **Santa Catalina Island Local Coastal Plan** (Adopted 1983);
- **Marina Del Rey Land Use Plan** (Adopted 1996);
- **Malibu Land Malibu Land Use Plan** (Adopted 1986; currently being updated as the Santa Monica Mountains Coastal Zone Plan).
- **Fair Oaks Ranch** (Adopted 1986)
- **Canyon Park Canyon Park**(Adopted 1986)
- **La Vina**(Adopted 1989)
- **Northlake** (Adopted 1993)
- **Newhall Ranch** (Adopted 1999)
- **East Los Angeles Third Street Specific Plan** (currently being created)

C.2.2.1 Antelope Valley Area Plan Mobility Element Goals and Policies

Travel Demand Management

Goal M 1: Land use patterns that promote alternatives to automobile travel.

Policy M 1.3: Encourage new parks, recreation areas, and public facilities to locate in existing rural towns and rural town centers.

Policy M 1.4: Promote alternatives to automotive transit in existing rural towns and rural town centers by linking adjoining areas through pedestrian walkways, trails, and bicycle routes.

Goal M 2: Reduction of vehicle trips and emissions through effective management of travel demand, transportation systems, and parking.

Policy M 2.4: Develop multi-modal transportation systems that offer alternatives to automobile travel by implementing the policies regarding regional transportation, local transit, bicycle routes, trails, and pedestrian access contained in this Mobility Element.

Policy M 2.5: As residential development occurs in communities; require transportation routes, including alternatives to automotive transit, link to important local destination points such as shopping, services, employment, and recreation.

Bikeways and Bicycle Routes

Goal M 9: A unified and well-maintained bicycle transportation system throughout the Antelope Valley with safe and convenient routes for commuting, recreation, and daily travel.

Policy M 9.1: Implement the adopted Bikeway Plan for the Antelope Valley in cooperation with the cities of Lancaster and Palmdale. Ensure adequate funding on an ongoing basis.

Policy M 9.2: Along streets and highways in rural areas, add safe bicycle routes that link to public facilities, a regional transportation hub in Palmdale, and shopping and employment centers in Lancaster and Palmdale.

Policy M 9.3: Ensure that bikeways and bicycle routes connect communities and offer alternative travel modes within communities.

Policy M 9.4: Encourage provision of bicycle racks and other equipment and facilities to support the use of bicycles as an alternative means of travel.

Pedestrian Access

Goal M 11: A continuous, integrated system of safe and attractive pedestrian routes linking residents to rural town centers, schools, services, transit, parks, and open space areas.

Policy M 11.2: Within rural town centers, require that highways and streets provide pleasant pedestrian environments and implement traffic calming methods to increase public safety for pedestrians, bicyclists, and equestrian riders.

Policy M 11.4: Within rural town centers, require that parking be located behind or beside structures, with primary building entries facing the street. Require direct and clearly delineated pedestrian walkways from transit stops and parking areas to building entries.

C.2.2.2 Santa Clarita Valley Area Plan (One Valley, One Vision)

Land Use Goals and Policies

Goal LU 3: Healthy and safe neighborhoods for all residents.

Policy LU 3.2.2: In planning residential neighborhoods, include pedestrian linkages, landscaped parkways with sidewalks, and separated trails for pedestrians and bicycles, where appropriate and feasible.

Goal LU 5: Enhanced mobility through alternative transportation choices and land use patterns.

Objective LU 5.1: Provide for alternative travel modes linking neighborhoods, commercial districts, and job centers.

Policy LU 5.1.1: Require safe, secure, clearly-delineated, adequately-illuminated walkways and bicycle facilities in all commercial and business centers.

Policy LU 5.1.2: Require connectivity between walkways and bikeways serving neighborhoods and nearby commercial areas and schools.

Circulation Goals and Policies

Goal C 1: An inter-connected network of circulation facilities that integrates all travel modes, provides viable alternatives to automobile use, and conforms with regional plans.

Objective C 1.1: Provide multi-modal circulation systems that move people and goods efficiently while protecting environmental resources and quality of life.

Policy C 1.1.1: Reduce dependence on the automobile, particularly single-occupancy vehicle use, by providing safe and convenient access to transit, bikeways, and walkways.

Policy C 1.1.4: Promote public health through provision of safe, pleasant, and accessible walkways, bikeways, and multi-purpose trail systems for residents.

Policy C 1.1.6: Provide adequate facilities for multi-modal travel, including but not limited to bicycle parking and storage, expanded park-and-ride lots, and adequate station and transfer facilities in appropriate locations.

Policy C 1.1.7: Consider the safety and convenience of the traveling public, including pedestrians and cyclists, in design and development of all transportation systems.

Goal C 6: A unified and well-maintained bikeway system with safe and convenient routes for commuting, recreational use and utilitarian travel, connecting communities and the region.

Objective C 6.1: Adopt and implement a coordinated master plan for bikeways for the Valley, including both City and County areas, to make bicycling an attractive and feasible mode of transportation.

Policy C 6.1.1: For recreational riders, continue to develop Class 1 bike paths, separated from the right-of-way, linking neighborhoods to open space and activity areas.

Policy C 6.1.2: For long-distance riders and those who bicycle to work or services, provide striped Class 2 bike lanes within the right-of-way, with adequate delineation and signage, where feasible and appropriate.

Policy C 6.1.3: Continue to acquire or reserve right-of-way and/or easements needed to complete the bicycle circulation system as development occurs.

Policy C 6.1.4: Where inadequate right-of-way exists for Class 1 or 2 bikeways, provide signage for Class 3 bike routes or designate alternative routes as appropriate.

Policy C 6.1.5: Plan for continuous bikeways to serve major destinations, including but not limited to regional shopping areas, college campuses, public buildings, parks, and employment centers.

Objective C 6.2: Encourage provision of equipment and facilities to support the use of bicycles as an alternative means of travel.

Policy C 6.2.1: Require bicycle parking, which can include bicycle lockers and sheltered areas, at commercial sites and multi-family housing complexes for use by employees and residents, as well as customers and visitors.

Policy C 6.2.2: Provide bicycle racks on transit vehicles to give bike-and-ride commuters the ability to transport their bicycles.

Policy C 6.2.3: Promote the inclusion of services for bicycle commuters, such as showers and changing rooms, as part of the review process for new development or substantial alterations of existing commercial or industrial uses, where appropriate.

C.2.2.3 Santa Monica North Area Plan (2000)

Goal VII 3: Alternative modes of travel for the single occupant automobile for local, commuter, and recreational trips.

Policy VII 22: Develop, and as part of new non-residential development, require the provision of priority park-and-ride lots and parking facilities for public transit vehicles, bicycles, and motorcycles to encourage these modes of transportation.

Policy VII 24: Promote bicycle use by requiring establishment of secure and adequate areas for the parking and storage of bicycles, showers, lockers, and other facilities at major employment and recreation destinations.

Policy VII 25: Develop and maintain a comprehensive system of bicycle routes within the planning area, as depicted on Map 8: Ventura Freeway Corridor Bikeway Plan, and provide appropriate support facilities for bicycle riders; incorporate bike lanes and/or bike use signage into local road designs wherever feasible.

C.2.2.4 Hacienda Heights Community Plan

Policy M 1.2: Promote the integration of multi-use regional trails, walkways, bicycle paths, transit stops, parks and local destinations.

Policy M 1.3: Ensure that bus stops are easily and safely accessible by foot, bicycle, or automobile.

Policy M 1.5: promote and expand the Park and Ride bus system, including providing bike parking facilities at Park and Ride locations.

Goal M 2: Safe and well-maintained bike routes and facilities.

Policy M 2.1: Upgrade existing Class III bike lane designations to Class II and make all new bike lanes Class II or better, where infrastructure permits.

Policy M 2.2: Install safe bike accommodations in appropriate places along Hacienda Boulevard, Colima Road and other well-traveled roads.

Policy M 2.3: Add and maintain new bike racks and lockers at major bus stops in commercial areas, and at all community facilities.

Policy M 2.4: Educate riders and motorists on how to safely share the road, for example through Share the Road signage and educational campaigns.

Implementation #6: Continue to improve traffic operations through signal upgrades, striping, signalization, improved public transit service, expanded bikeways and lanes, carpooling, pedestrian-friendly enhancements, and other improvements where needed.

Implementation # 11: Update Bikeway Master Plan for Unincorporated County Areas including Hacienda Heights.

C.2.2.5 Vision Lennox

- Hawthorne Green Line Station: add bike lane, station bicycle parking. Expanded bicycle storage facilities should be provided at the Green Line station. These facilities could include a bike station or automated bicycle parking at the station. (p. 21)
- Walking/jogging path along freeways. The Caltrans right-of-way just north of the I-105 freeway and the I-405 freeway is wide enough to construct a bike path that would connect four of the schools in Lennox. This bike path will need special crossing treatments at Inglewood Avenue and Hawthorne Boulevard. Access could be provided at the streets that currently end in cul-de-sacs. Interpretive signage, landscape, public art and other similar features could enhance this bike path into one of the most popular features in Lennox. (p. 25)
- Create a network of bikeways. Add bike lanes and bike routes along appropriate streets to develop an interconnected network that local cyclists could use to ride from home to school, the Green Line station, stores, Lennox Park, etc. Add the Class III bike routes (signed on-street bicycle routes) that are in the draft Countywide Bicycle Master Plan along 104th Street and 111th Street. Enhance these bike routes with "sharrows"– pavement markings indicating a shared bicycle lane – and destination signs. Add Class II bike lanes (striped on-street bike lanes) along Lennox Boulevard and Hawthorne Boulevard. Plan for a full bikeway network that may include Class III bike routes on other streets such as Buford Avenue, Firmona Avenue and Freeman Avenue.
- Construct pedestrian and bicycle improvements on school routes. Identify and construct street, sidewalk and intersection improvements that will enhance safety for students that walk or bicycle to school. Teach bicycle safety to students. Encourage students to walk and bicycle to school.(p. 26)
- Add bicycle parking. Install bicycle parking along retail corridors, at schools, Lennox Park, the Hawthorne Green Line Station, and other destinations. Given security concerns, bicycle parking at the Hawthorne Green Line Station will be best if done as a bike station with attendants or automated parking. (p. 26-27)

- Implement road diets and street reconfigurations. Remove travel lanes on appropriate streets to add bike lanes, widen sidewalks, improve pedestrian crossings, landscape, and enhance retail and/or residential neighborhoods (p. 27) See pages 27, 28 for configurations to add bike lanes along certain streets.
- Hold a periodic or regular "ciclovia" on Lennox Boulevard. On occasion, or on a regular basis, close all or part of Lennox Boulevard to cars, so that Lennox residents can use it to bicycle, walk, rollerblade, skateboard, relax, or hold farmers' markets, etc. (p. 30)
- Implementation Action: Station bicycle parking (p. 36)
- Implementation Action: Bike racks throughout Lennox, improve bicycle network (p. 39)

C.2.2.6 Florence-Firestone Vision Plan

- Allow shared spaces in alleys. Transform alleys into livable shared spaces that may be used by cars, bikes, pedestrians and trucks. Activities to achieve this could include improved paving, fencing and signage. (p. 58)
- Prepare and implement a bicycle network plan. Create and then implement a bicycle plan. Improvements should include adding bike lanes, bike routes, and bike paths along appropriate streets and corridors. The goal of these improvements should be to develop an interconnected network that local cyclists could use to ride from home to the Blue Line station, schools, stores, parks and other destinations. Adopt the recommendations from the study conducted for Metro by the Los Angeles County Bicycle Coalition or incorporate these ideas into the bicycle plan.
- Add bicycle parking in key locations. Install bicycle parking along retail corridors and at schools, parks and other destinations. (p. 74)
- Pedestrian and bicycle improvements on school routes - Identify and construct street, sidewalk and intersection improvements that will enhance safety for students that walk or bicycle to school. The County should seek federal and State grants from Safe Routes to Schools funding sources. (p. 75)
- Recommended streets for road diets in Florence-Firestone include Nadeau Street, Hooper Avenue, Compton Avenue, Holmes Avenue. Recommended improvements include adding bike lanes, widening sidewalks, improving pedestrian crossings, and adding landscaping. (p. 76)

C.2.3 County of Los Angeles Plan of Bikeways (1975)

The previous bicycle plan for the County of Los Angeles was developed in 1975. At the time this plan was developed, there were 78 incorporated cities in the County, none of whom had adopted Bicycle Master Plans. The 1975 Plan of Bikeways proposed a countywide network of bikeways in both incorporated and unincorporated areas. The plan included over 170 "major bikeway corridors" and a proposed network of over 1,500 miles of bikeways. The conditions along many of these proposed "major bikeway corridors" may have changed in the intervening decades, requiring an updated analysis to determine their desirability and feasibility. Additionally, the updated County of Los Angeles Bicycle Master Plan differs significantly from the 1975 Plan of Bikeways in scope, as it focuses only on unincorporated areas and other County-controlled properties. However, the goals and polices of the plan still have relevance today, and provided the framework for the goals, policies and implementation actions recommended in this Bicycle Master Plan. **Table C-3** lists the goals from the 1975 Plan of Bikeways.

Table C-3: County of Los Angeles Plan of Bikeways (1975) Goals

GENERAL GOAL 1: Provide safer, more convenient bicycle facilities throughout Los Angeles County for transportation and recreation, as a viable alternative to automobile travel.
Sub-Goal A: Promote citizen participation in the planning and financing of bicycle routes.
Sub-Goal B: Plan and implement a coordinated interconnected system of bikeways and bikeway support facilities to enhance bicycle transportation.
GOAL 2: Initiate a comprehensive safety education program for both bicyclists and motorists to improve safety on existing roadways.
Sub-Goal A: Educate bicyclists, motorists and enforcement agencies in the proper operation of bicycles on our roadway transportation system.
Sub-Goal B: Monitor accident and safety data to identify safety problems and their solutions.
GOAL 3: Interface the Plan of Bikeways with existing and future modes of transportation as they are planned and implemented to ensure the development of a balanced coordinated transportation system which meets the needs of all the citizens of this County.
Sub-Goal A: Coordinate the implementation of bikeways with other modes of transportation.

C.2.4 Los Angeles River Master Plan (1996)

The County Board of Supervisors requested the development of a master plan for the Los Angeles River and one of its major tributaries—the Tujunga Wash—in 1991 and the plan was completed in 1996. The Mission of the Los Angeles River Master Plan (LARMP) is to provide for "the optimization and enhancement of aesthetic, recreational, flood control and environmental values by creating a community resource, enriching the quality of life for residents and recognizing the rivers primary purpose for flood control." The plan envisions a continuous bikeway along both the LA River and the Tujunga Wash. Other LARMP recommendations would also improve the conditions for transportation and recreational bicycling along the river. Environmental quality recommendations such as planting a continuous greenway of trees along the river will improve the bicycling environment along existing and future river bike path segments by providing shade and visual relief along the corridor. Economic development policies related to zoning requirements and development incentives for properties along the river could potentially increase access to destinations.

Recommendations regarding the design and use of fencing along the river and at access points may also impact bicycling in the County. In addition to the LARMP, guidelines for signage, landscaping and maintenance along the LA River were developed. **Figure C-1** provides an example of projects recommended in the LARMP which include bike path landscaping and access improvements, among others. LARMP bikeway-related projects and general recommendations falling under County of Los Angeles jurisdiction were addressed in the design guidelines and project recommendations in this Bicycle Master Plan.

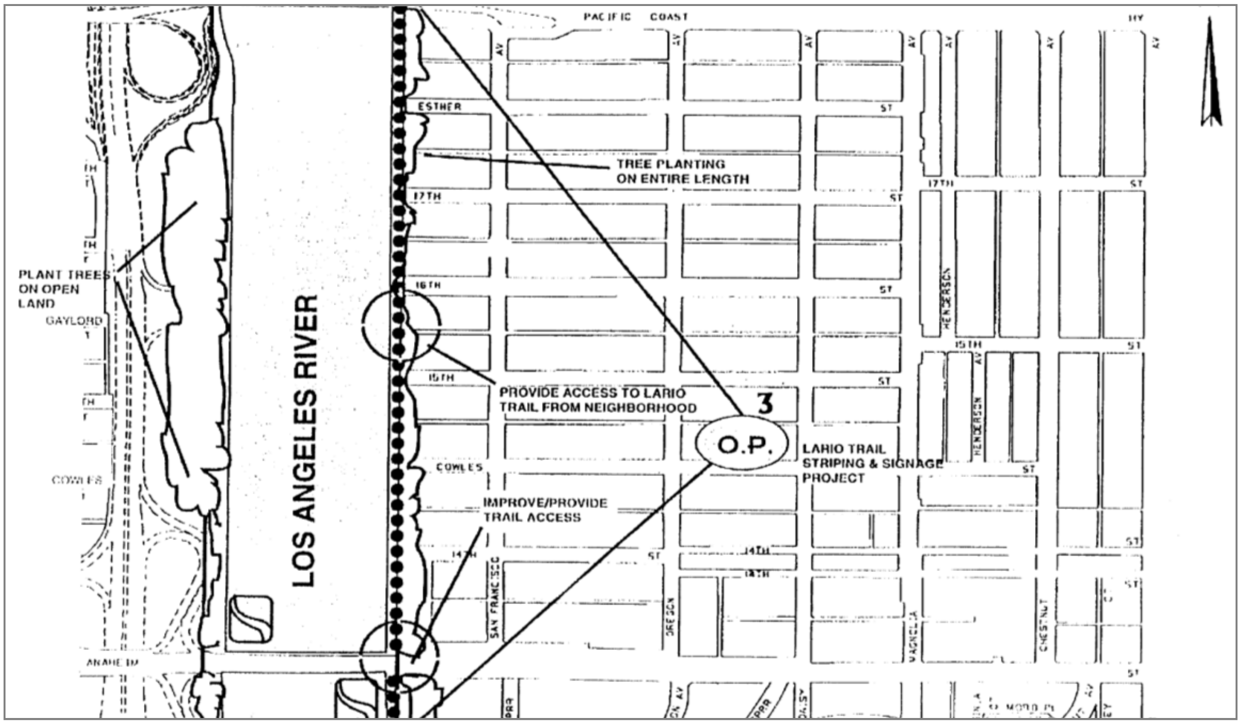

Figure C-1: Los Angeles River Master Plan Examples Project Sheet

C.2.5 San Gabriel River Corridor Master Plan (2006)

The San Gabriel River Corridor Master Plan (SGRCMP) has goals related to habitat, recreation, open space, flood protection, water quality, and economic development. A bicycle path (the San Gabriel River Trail) already exists along the full length of the river from the foothills of the San Gabriel Mountains in Azusa to Seal Beach. A primary objective of the SGRCMP is to enhance the San Gabriel River Trail. The plan identifies 27 "trail enhancement projects" within the corridor. **Figure C-2** identifies river enhancement projects along the corridor. The yellow dots indicate enhancements to the San Gabriel River Trail. The Bicycle Master Plan includes the San Jose Creek Bike Trail connection between the existing San Jose Creek Bike Trail and the San Gabriel River Bike Trail next to the Woodland Duck Farm Project proposed in the SGRCMP.

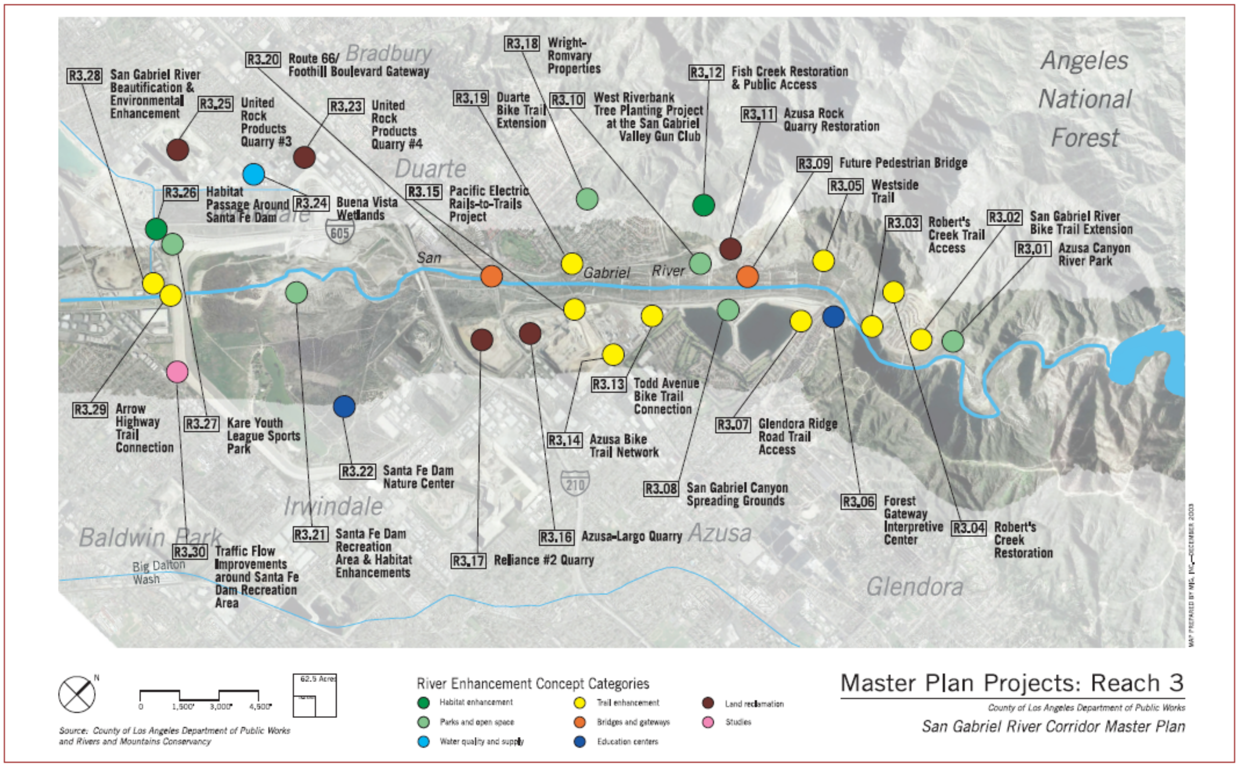

Figure C-2: San Gabriel Corridor Master Plan Projects

C.2.6 Los Angeles County Code

The Los Angeles County Code has numerous references to bicycling. Bicycle-related code is summarized in Table C-4 below.

Table C-4: Los Angeles County Code

Code	Summary
Chapter 15.52 Crosswalks and Bikeways	
15.52.030 Bicyclist roadway crossing restrictions	The commissioner may place signs where it has been determined that conditions of vehicular and bicycle traffic are such that a traffic hazard would exist if bicyclists were permitted to cross the roadway at these locations directing that bicyclists shall not cross at a location so indicated.
15.52.040 (A) Placement of bicycle lanes	If the commissioner finds that the width of a county highway and the amount of traffic thereon, is such that a separate lane could be provided to accommodate bicycle traffic, he may place appropriate markings and may erect and maintain appropriate signs indicating the bicycle lane.
15.52.040 (B) Prohibition of vehicle use of bicycle lanes	A person shall not operate a motor vehicle in the bicycle lane except to cross at a permanent or temporary driveway, or for the purpose of parking a vehicle where parking is permitted or where the vehicle is disabled.

Table C-4: Los Angeles County Code (continued)

Code	Summary
15.52.050-70 Pedestrian use of bicycle lanes restrictions, signage and conditions for prohibition	Pedestrians are prohibited from walking upon bicycle lanes, except when crossing, where appropriate signs or markings allow them to do so. Wherever sidewalks or other suitable areas are available for pedestrian use, the commissioner may place and maintain such signs and pavement markings. In any otherwise events where pedestrians walk in the bicycle lane, they are to stay close to the edge of the lane farthest from vehicular traffic.
Chapter 15.76 Miscellaneous Regulations	
15.76.080 Driving or riding vehicles on sidewalk.	A person shall not operate any bicycle on any sidewalk or parkway except at a permanent or temporary driveway or at specific locations thereon where the commissioner finds that such locations are suitable for, and has placed appropriate signs and/or markings permitting such operation or riding.
15.76.090 Riding on bicycle or motorcycle handlebars.	The operator of a bicycle shall not carry any other person upon the handlebars of such bicycle or motorcycle. A person shall not ride upon the handlebars of any bicycle.
15.76.100 Clinging to moving vehicles prohibited.	A person operating, riding or traveling upon any bicycle on any public highway shall not cling to or attach himself to, or his vehicle or device to, any other moving vehicle or streetcar.
Chapter 17.12 Beaches	
17.12.240 Bicycle paths.	The director may designate, by sign or postings, certain areas to be used exclusively by persons using or operating bicycles upon bicycle lanes or paths set aside for that use on the beach.
Chapter 19.12 Harbors	
19.12.1340 Bicycles operation and immobility	No person shall ride a bicycle on other than a paved vehicular road or path designated for that purpose. A bicyclist shall be permitted to wheel or push a bicycle by hand over any area normally reserved for pedestrian use. No person shall leave a bicycle or motorcycle lying on the ground or paving, or set against a building or tree, or in any place or position that may cause a person to trip over or be injured by it.
Chapter 22.20 Residential Zones	
Part 7 22.20.460 (4d) Residential Planned Development Zone Uses and development standards Open Space	Subject to the approval of the hearing officer, open space may include one or more of the following, designated for the use and enjoyment of all of the occupants of the planned residential development or appropriate phase thereof: - Present or future hiking, riding or bicycle trails

Table C-4: Los Angeles County Code (continued)

Code	Summary
Chapter 22.40 Special Purpose and Combining Zones	
Part 11. (9c) Mixed Use Development Parking and Access	Unless specifically waived or modified by the hearing officer, mixed use developments shall be subject to all of the following requirement for parking and access: there shall be adequate provision for and separation of different transportation modes including pedestrian, bicycle, automobile and truck.
22.40.520 (4d) Mixed Use Development Uses and development standards Open Space	Subject to the approval of the hearing officer, open space may include one or more of the following, designated for the use and enjoyment of all of the occupants of the planned mixed use development or appropriate phase thereof: - Present or future hiking, riding or bicycle trails
Chapter 22.46 Specific Plans	
Part 2. 22.46.220 & 630 Bicycle and Pedestrian Circulation plan for the Two Harbors area	A bicycle and pedestrian circulation plan shall be prepared which shows the location and design of bikeways and pedestrian walkways providing access to the Two Harbors area. The bicycle and pedestrian routes shall link with proposed residential areas, lodges, commercial development, piers and the proposed interpretive center.
Part 2. 22.46.1050 Marina Del Rey community identity elements	Notable elements within the Marina Del Rey area feature bicycle amenities that should be preserved with any further development. These include the Loop Road, with its own landscaped character, signs, lighting, the pedestrian promenade and bicycle trail; and the walkways and bicycle trails that are a primary means for access to activities in the Marina.
22.46.1100 Marina Del Rey bicycle circulation system	The pedestrian and bicycle system is an important component of the overall circulation system. The pedestrian promenade and bicycle path enhance shoreline access and implement a number of policies in the land use plan. Bicycle system features include: Connections to the South Bay Regional Bikeway; Access around the entire Marina area, to all land uses, including visitor-serving facilities and beaches; Identification striping, markers and signs; Smooth, continuous paving; Directories, bike racks, benches, drinking fountains, storage lockers at all land uses; Connections to other travel modes (bus stops, park and ride, transit stations, bus transportability). The bicycle system should maximize access without compromising safety. Separate right-of-way, minimizing driveways that interfere with the route and compatible intersection design are all necessary for ensuring a safe bicycle system.

Table C-4: Los Angeles County Code (continued)

Code	Summary
22.46.1190 (3) Conditions of approval	To fully mitigate traffic impacts, new developments are required to establish a functional transportation systems management (TSM)/Transportation Demand Management (TDM) program, or to participate in an existing TSM/TDM program. Consolidation of numerous TSM/TDM programs is highly desirable. Viable TSM/TDM possibilities include, but shall not be limited to: -- Carpools; -- Ridesharing; -- Vanpools; -- Modified work schedules/flex time; -- Increase use of bicycles for transportation; -- Bicycle racks, lockers at places of employment; -- Preferential parking for TSM/TDM participants; -- Incentives for TSM/TDM participants; -- Disincentives. The TSM/TDM program should follow the guidelines in the Transportation Improvement Program contained in Appendix G. An annual report on the effectiveness of the TSM/TDM program shall be submitted to the department of regional planning.
22.46.1850-80 Regional bicycle trail retention within the Marina Del Rey area	The regional bicycle trail shall be retained or reconstructed as part of any redevelopment affecting parcels in the Oxford Development Zone 6, the Admiralty Development Zone 7, the Bali Development Zone 8, or the Mindanao Development Zone 9.
22.46.1950 (C1) Coastal improvement fund. Use of Fund	Park and public access facilities, including, but not limited to: Bicycle paths
22.46.1970 (B1) Coastal improvement fund fee specified programs	The Marina del Rey Specific Plan identifies specific facilities which may be financed through the coastal improvement fund to mitigate the impacts of residential development in the existing Marina. The facilities include: Park and public access facilities, including, but not limited to: Bicycle paths

C.2.7 Metro Bicycle Transportation Strategic Plan (2006)

The Los Angeles County Metropolitan Transportation Authority (LACMTA) adopted their Bicycle Transportation Strategic Plan (BTSP) in June 2006. This plan was designed to be used by cities, the County and transit agencies in planning regionally significant bicycle facilities.

Volume 1 of the BTSP focuses primarily on methods for improving bicycle access to transit hubs and identifying gaps in the regional bikeway network. **Figure C-3** shows bike-transit hubs identified by LACMTA. **Figure C-4** and **Figure C-5** show gaps in the regional bikeway network identified by LACMTA. The County of Los Angeles Bicycle Master Plan will attempt to improve access to bike-transit hubs and close gaps in the regional bikeway network wherever possible within the County's jurisdictional authority.

Volume 2 of the BTSP compiled all existing and proposed bikeways under the jurisdiction of the County and the 88 incorporated cities within the County of Los Angeles. The volume was developed to provide compliance with the requirements of the Bicycle Transportation Account (CA Streets and Highways Code

Section 891.2), and to facilitate inter-jurisdictional coordination in bikeway planning efforts. In the development of the County of Los Angeles Bicycle Master Plan, the BTSP identified connection opportunities to existing and planned bikeways in adjacent jurisdictions. For example, **Figure C-6** shows the location of existing and proposed bicycle facilities surrounding the unincorporated areas of La Crescenta/Montrose and Altadena.

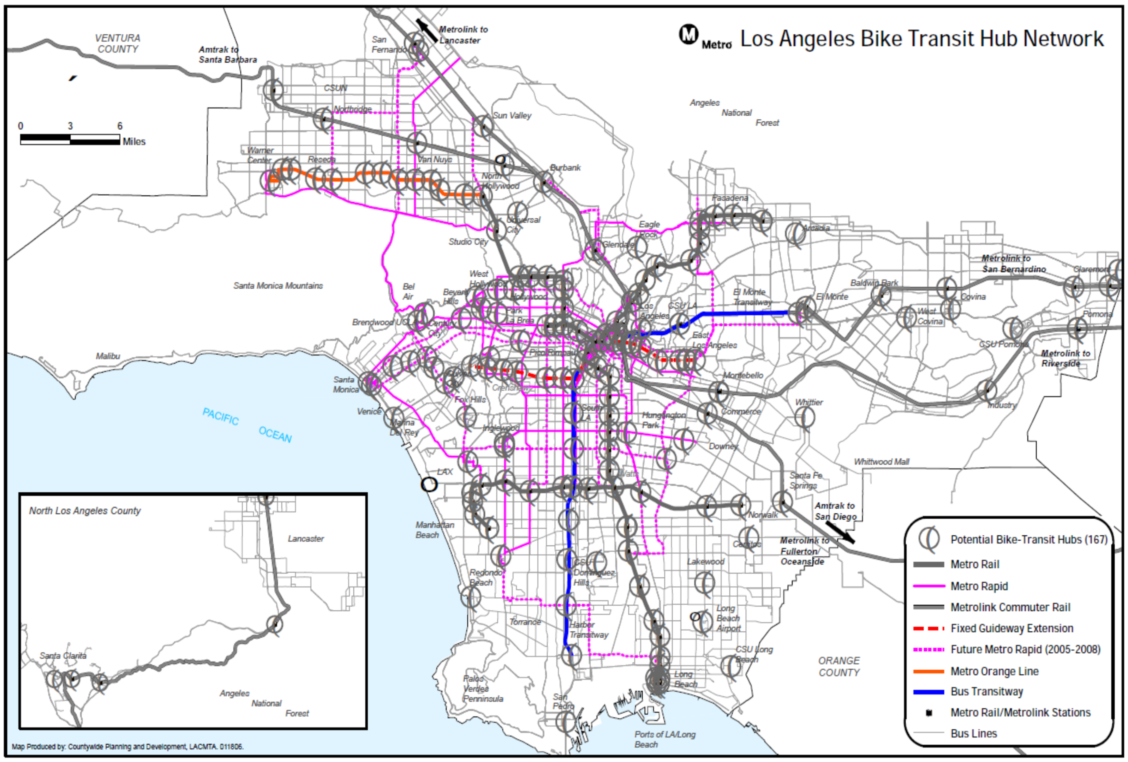

Figure C-3: Metro Bike Transit Hubs

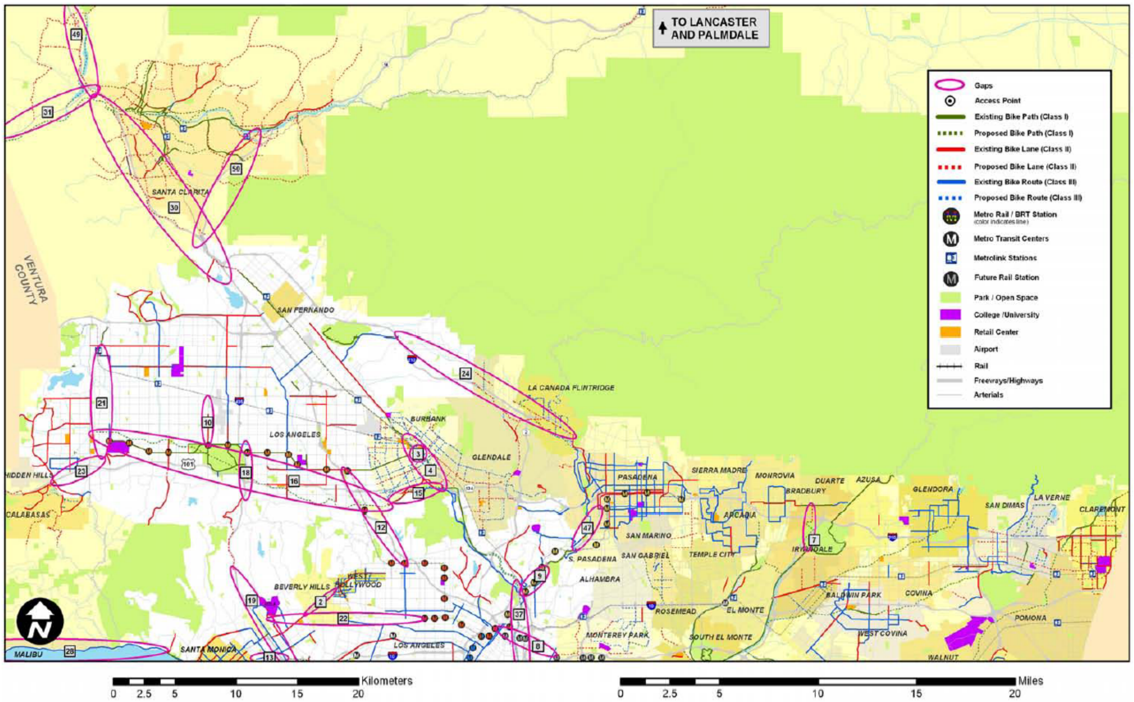

Figure C-4: North County Regional Bikeway Gaps

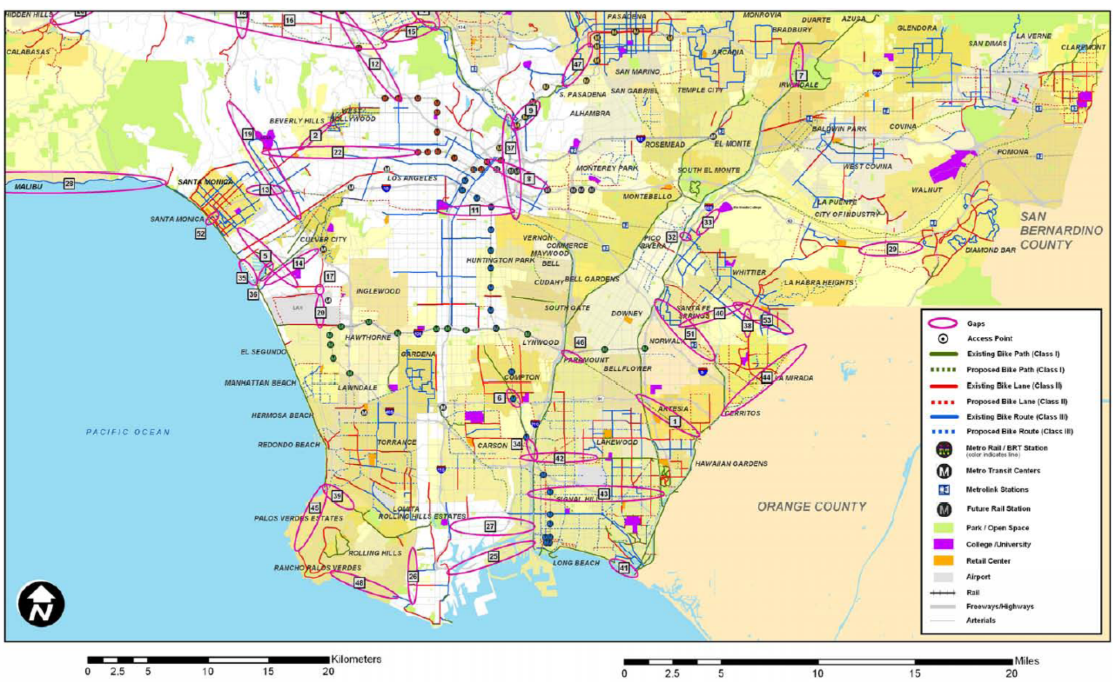

Figure C-5: South County Regional Bikeway Network Gaps

Figure C-6: Existing and Proposed Bikeways in Adjacent Jurisdictions

C.3 Municipal Bicycle Planning Documents

The Metro Bicycle Transportation Strategic Plan (BTSP) will be the primary tool for coordination with the bikeway infrastructure plans of other jurisdictions. However, the following bicycle planning documents are more recent than the BTSP. These plans have been either developed and adopted by incorporated cities, or are forthcoming and will be consulted for inter-jurisdictional coordination throughout the development of the County of Los Angeles Bicycle Master Plan. The following section describes these recent bicycle plans and identifies the specific projects within each plan that are relevant to the development of the County of Los Angeles Bicycle Master Plan.

C.3.1 City of Burbank Bicycle Master Plan Update (2009)

The City of Burbank adopted an update to its 2003 Bicycle Master Plan Update in December 2009. The City of Burbank is located in the western San Fernando Valley and does not border any unincorporated territory. Future segments of the Los Angeles River Bikeway will be located along the river near the city's southern border.

C.3.2 Claremont Bicycle Plan (2007)

The City of Claremont Bicycle Plan was adopted in November 2007. Claremont is located in the San Gabriel Valley at the eastern border of Los Angeles County. The City has borders with several small pockets of unincorporated County. A key element of the bikeway network is the Thompson Creek Regional Trail, which includes an existing section between Mount Baldy Road in the north to the south side of the 210 Freeway, as well as a proposed section extending south to Gary Avenue. The bike paths proposed in the County Bicycle

Master Plan along San Jose Creek and Thomson Creek will connect the City's existing and proposed bikeway network to the County's regional bikeway network.

C.3.3 Culver City Bicycle and Pedestrian Master Plan (2011)

Culver City is located in western Los Angeles County and shares its eastern border with the unincorporated areas of Baldwin Hills and Ladera Heights. The Ballona Creek bikeway carries a significant portion of the City's existing bicycle traffic. A focus of the Bicycle and Pedestrian Initiative is providing access to the future Exposition Light Rail Transit Line and bike path., This plan was adopted by the City Council on November 8, 2011.

C.3.4 City of Glendale Bikeway Master Plan (1995)

The City of Glendale completed its Bikeway Master Plan in 1995. The City of Glendale lies at the eastern end of the San Fernando Valley and shares borders with the City of Los Angeles, the City of Burbank, the City of La Cañada Flintridge and unincorporated La Crescenta-Montrose. The 1995 Bikeway identifies bikeways connecting to unincorporated areas along Foothill Boulevard, Rosemont Avenue, and Honolulu Avenue. The city is currently developing the Safe and Healthy Streets Plan to help implement policies contained in the Bikeway Master Plan.

C.3.5 City of Los Angeles Bicycle Master Plan Update (2011)

The City of Los Angeles is the most populous city in the county with approximately 3.8 million residents. The city spans much of the County's north-central and central area. The City borders numerous unincorporated areas including Kagel Canyon, East Los Angeles, City Terrace, Marina Del Rey, Baldwin Hills, View Park, Windsor Hills, Florence, Del Aire, Lennox, Westmont, Athens, Willowbrook, Walnut Park, and West Carson. Several major County-owned flood control channels fall largely within the Los Angeles City limits. The Plan was adopted by the City council on March 1, 2011. Many of the on-street facilities recommended in this plan include connections to unincorporated areas. Proposed bikeways along flood-control owned or maintained by the Los Angeles County Flood Control District also appeared in the draft maps including facilities along the Arroyo Seco, Brown's Canyon Wash, East Canyon Channel, Los Angeles River, Pacoima Diversion Canal, Pacoima Wash, and Tujunga Wash.

C.3.6 City of San Fernando Bicycle Master Plan (2007)

The City of San Fernando completed its first Bicycle Master Plan in January 2007. San Fernando is surrounded by the City of Los Angeles. Bike paths have been recommended along two flood control channels: the East Canyon Channel and the Pacoima Wash. The proposed bike path along the East Canyon Channel would be used to connect two proposed local bikeways. The proposed Pacoima Wash path extends along the entire western side of the channel within the City of San Fernando. A path along the eastern side of the channel is proposed between 4^{th} and 8^{th} streets. The Pacoima Wash path has potential to become a regional trail, as the City of Los Angeles's current Bicycle Master Plan has proposed bike paths along the Pacoima Wash that will connect to the bike path within the City of San Fernando.

C.3.7 City of Santa Clarita Non-Motorized Transportation Master Plan (2008)

The City of Santa Clarita is located on the northern edge of the county and is surrounded on all sides by unincorporated areas. The roadway network is dominated by curvilinear arterials which lead out beyond the city limits. Santa Clarita's plan proposes improvements to bicycle, pedestrian and trail facilities, including several which connect to County roads. The County plan proposes bikeway connections to the City of Santa Clarita in several locations to the east, including Bouquet Canyon Road, Sierra Highway, Sand Canyon Road and Soledad Canyon Road. To the west, the County is proposing bike lanes along The Old Road, which runs along the western boundary of the City of Santa Clarita and crosses several important arterials leading into the city. **Figure C-7** shows existing and proposed bicycle facilities and trails in Santa Clarita. Santa Clarita bicycle facilities connecting to unincorporated areas include:

- Santa Clarita River (Bike path)
- San Francisquito Creek Trail (Bike path)
- Copper Hill Drive (Bike lanes)
- Decoro Drive (Bike lanes)
- Bouquet Canyon Road (Bike lanes)
- Plum Canyon/Whites Canyon Road (Bike lanes)
- Sand Canyon Road (Bike path/lanes/route)
- Placerita Canyon Road (Bike route)
- Vasquez Canyon Road/Sierra Highway (Bike lanes)

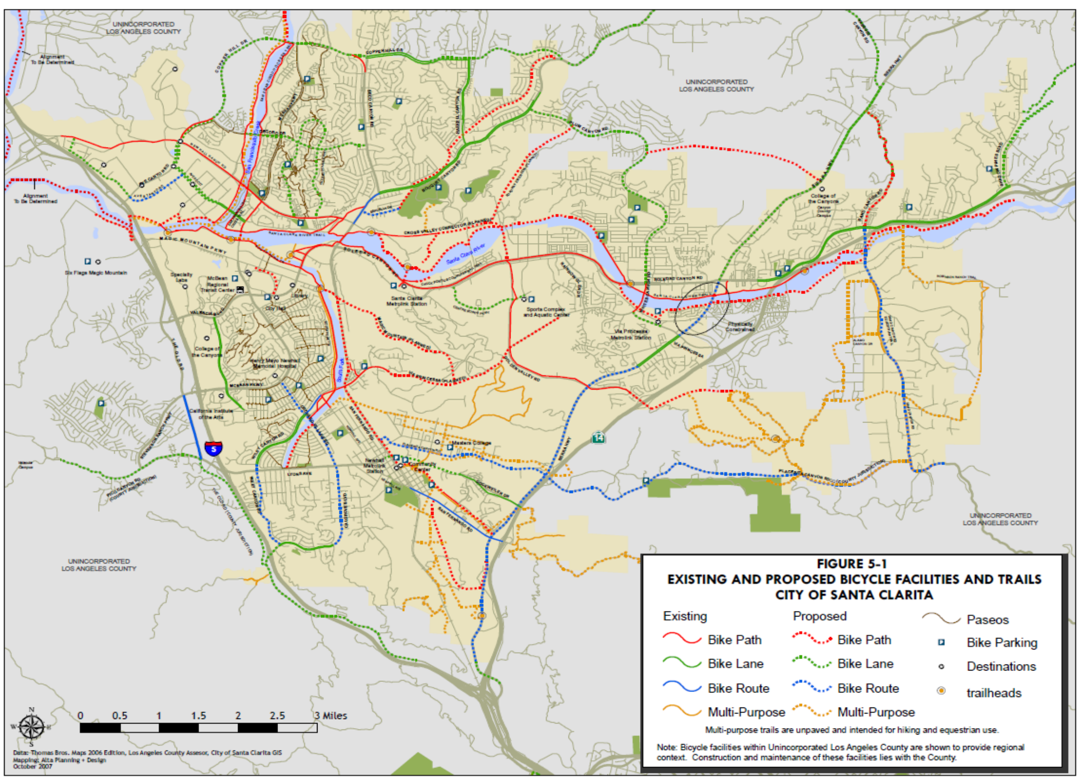

Figure C-7: Existing and Proposed Santa Clarita Bicycle Facilities and Trails

C.3.8 City of Temple City Bicycle Master Plan (2011)

On March 15, 2011, the City Council approved Temple City's first bicycle master plan, which includes a network of designated bikeways and other safety improvements that connect cyclists to key destinations like parks, schools, transit hubs and the regional Rio Hondo Bike Trail.

The plan includes:

- Bicyclist input from over 300 online surveys.
- A network of Class I, II, and II bikeways totaling 26.9 miles, which includes on-street and off-street bikeways.
- Direction on expanding the existing regional bikeway network and connecting gaps to ensure greater local and regional connectivity.
- Recommendations for education, encouragement, enforcement, and evaluation programs.
- A bicycle improvement list including potential funding sources; implementation is estimated at $6.9 million.
- An increase in bicycle commuting to over 3,200 local riders by the year 2030.

The city of Temple City Bicycle Master Plan proposes 26.9 miles of bicycle facilities to promote bicycling as a viable transportation alternative. Temple City lies within the West San Gabriel Valley Planning Area of Los Angeles County. Of the proposed facilities, there are some that link to the unincorporated county proposed facilities adjacent to the city limits of Temple City including:

- Proposed Class III facility on S. Golden West Avenue, connecting to the City of Arcadia
- Proposed Class II facility on Temple City Boulevard, connecting to the City of Arcadia
- Proposed Class II facility on Rosemead Boulevard, extending north toward City of Pasadena
- Proposed Class III facility on Longden Avenue, connecting to the City of San Gabriel
- Proposed Class III facility on Garibaldi Avenue, connecting to the City of San Gabriel
- Proposed Class III facility on Daines Drive, connecting to the City of Arcadia
- In addition the proposed Class I Eaton Wash Channel trail crosses over the western boarder of Temple City.

The recommendations in the City's Plan were developed to complement the recommendations being made by the County's Plan around and within the City's jurisdiction.

C.3.9 West Hollywood Bicycle and Pedestrian Plan (2003)

The City of West Hollywood is surrounded by Hollywood, the Hollywood Hills, Melrose and Beverly Hills. The Bicycle and Pedestrian Mobility Plan provides enhancements for a multi-modal bicycle- and pedestrian activity, while improving links to transit to better serve residents, commuters, shoppers, and visitors within this popular and active community.

- The Plan includes six primary goals:
- Promote Bicycle Transportation
- Develop an Enhanced Bikeway Network
- Enhance Bicycle Transportation Safety
- Enhance Pedestrian Mobility

- Enhance Pedestrian Safety
- Encourage More People to Walk

The existing bikeway network consists of 5.45 miles of bike lanes and routes, with an additional 11.30 miles of roadway enhancements proposed in the Plan. Santa Monica and Sunset Boulevards are specific arterial roads with high volumes of bicyclists and pedestrians. Plans for improving these corridors include widened sidewalks and add bicycle lanes to further accommodate and support an active community. The Plan also supports the development and implementation of supplemental educational and public outreach efforts. Overall estimated costs for the proposed projects and programs are $3,872,117.

C.3.10 Whittier Bicycle Transportation Plan (2008)

The City of Whittier updated its Bicycle Transportation Plan in 2008. Whittier is bordered by the unincorporated areas of West Whittier-Los Nietos, South Whittier and Hacienda Heights. This plan will be used to develop continuous on-street bikeway connections between the City of Whittier and these unincorporated areas of the County. The County plan proposes several bikeways connecting to, including: Workman Mill Road, Mills Avenue, Colima Road, 1st Avenue and Mulberry Drive (existing bike route, proposed bike lane). The proposed bike lane along Mills Avenue South Whittier-Sunshine Acres would connect the unincorporated community of South Whittier-Sunshine Acres to the southern terminus of the Whittier Greenway Trail. **Figure C-8** shows existing and proposed bicycle facilities in Whittier.

Whittier bicycle facilities connecting to unincorporated areas include:

- 1st Avenue (Bike lanes)
- Colima Road (Bike lanes/route)
- Leffingwell Road (Bike lanes/route)
- Pioneer Boulevard (Bike lanes/route)
- Santa Gertrudes Avenue/West Road (Bike lanes/route)
- Slauson Avenue/Mulberry Drive (Bike lanes/route)
- Whittier Greenway Trail (Bike path)

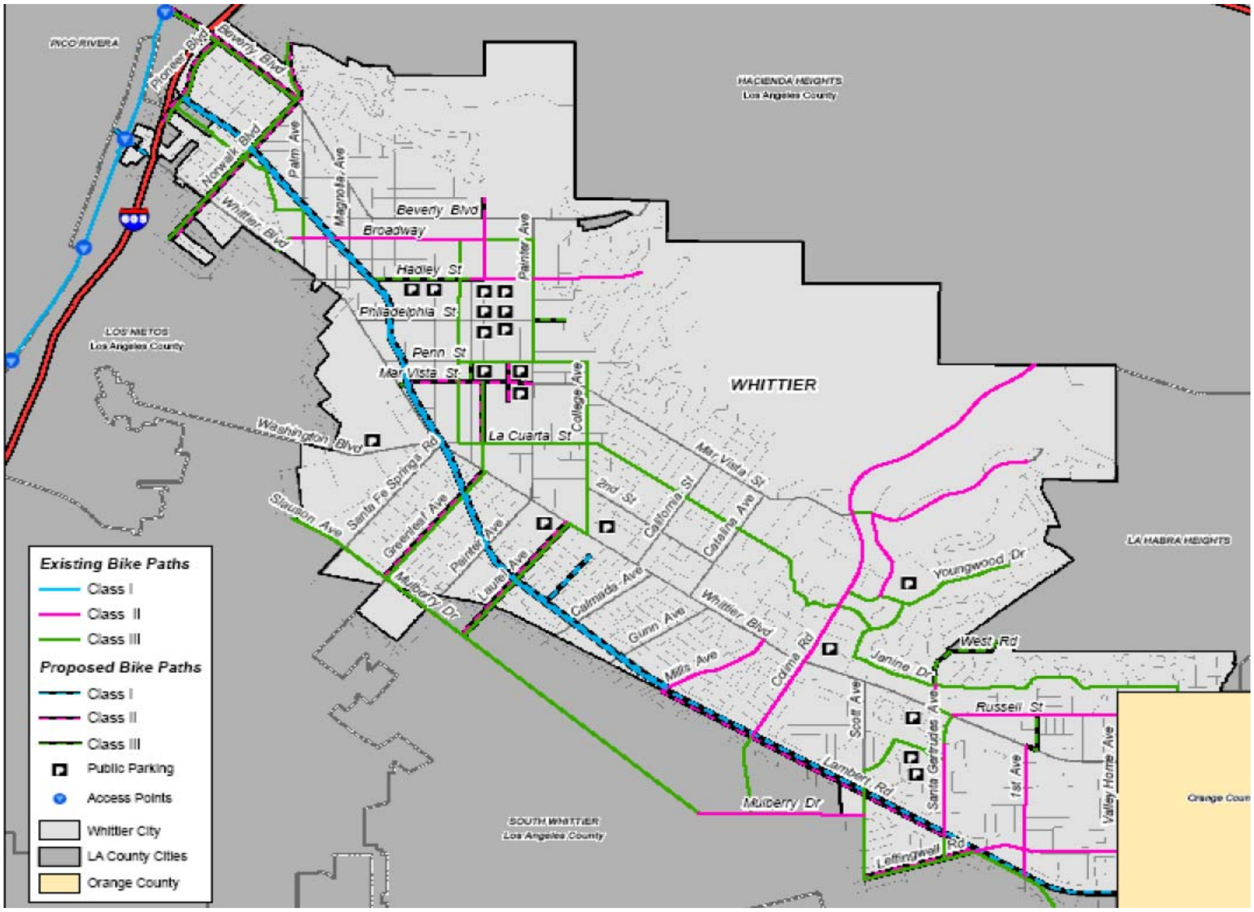

Figure C-8: Existing and Proposed Whittier Bicycle Facilities

C.3.11 Los Angeles River Revitalization Master Plan (2007)

The City of Los Angeles initiated the Los Angeles River Revitalization Master Plan (LARRMP) to identify opportunities for revitalizing the 32-mile stretch of the Los Angeles River that falls within the Los Angeles City limits. Like the 1996 County of Los Angeles LARMP, this plan envisions a continuous bikeway along the full length of the Los Angeles River and enhanced access to the corridor from surrounding neighborhoods, as shown in **Figure C-9**.

Goal: Create a Continuous River Greenway

Recommendation #5.1:
Provide opportunities for continuous and uninterrupted movement along the River.

Recommendation #5.2:
Establish a River Buffer area within and adjacent to the River that meets riparian or upland habitat requirements.

Recommendation #5.3:
Extend open space, bike paths, and multi-use trails into the tributaries.

Goal: Connect Neighborhoods to the River

Recommendation #5.4:
Provide green arterial connections to the River. Where suitable, landscaped areas should be designed to meet upland habitat requirements.

Recommendation #5.5:
Create safe, non-motorized routes between the River and cultural institutions, parks, civic institutions, transit-oriented development, schools, transit hubs, and commercial and employment centers within 1 mile of the River.

Recommendation #5.6:
Increase direct pedestrian and visual access to the River.

Figure C-9: Los Angeles River Revitalization Master Plan Goals

C.3.12 Pasadena Bicycle Master Plan (in progress)

The City of Pasadena is located in the San Gabriel Valley and borders the unincorporated communities of Altadena, East Pasadena-East San Gabriel, Kinneloa Mesa and San Pasqual. The Pasadena Bicycle Plan update is currently in progress and the consultant team will coordinate with the City of Pasadena to develop bikeway connections between Pasadena and the unincorporated areas of Altadena and East Pasadena. The County plan proposes many connections to the City of Pasadena, including the multi-jurisdictional bike path proposed along Eaton Wash, on-street bikeways along Woodbury Road, Windsor Avenue, Marengo Avenue, Lake Avenue and Washington Boulevard providing connections from the unincorporated community of Altadena; and Colorado Avenue, California Avenue, San Pasqual Street and Del Mar Avenue providing connections from the unincorporated community of East Pasadena-East San Gabriel.

C.3.13 Concurrent Bicycle Planning Efforts

Other cities may be developing new or updated bicycle plans in the near future (e.g., Baldwin Park, Bellflower, Burbank, and Lancaster). The project team will work with these jurisdictions as closely as possible to ensure that the development of the County of Los Angeles Bicycle Master Plan is coordinated with any concurrent municipal planning efforts. Relevant Planning Studies

The planning documents described in this section remain unadopted by the agency or agencies responsible for implementing their recommendations, but provide valuable analysis to assist the development of the County of Los Angeles Bicycle Master Plan. The use of these plans as guidance does not reflect County endorsement of specific proposals.

C.3.14 Enhanced Public Outreach Project (2004)

The Enhanced Public Outreach Project (EPOP) had two goals: (1) to significantly increase the level of public participation in the development of the LACMTABTSP; and (2) gain a better understanding of the needs, perceptions and travel behavior of all bicyclists, focusing on those in communities with low income and high transit use. Public input was collected through two surveys: a more general Countywide Bicycle Survey followed by an Origin and Destination Survey. Over 3,000 surveys were completed and analyzed. Many of the targeted communities included unincorporated areas such as Altadena, East Los Angeles, Florence-Firestone, Willowbrook, and Lennox. The findings of this report will be considered in the development of the County of Los Angeles Bicycle Master Plan, with specific attention to the data collected in or near unincorporated areas of the County. **Figure C-10** shows bicyclists origins and destinations collected through EPOP surveys.

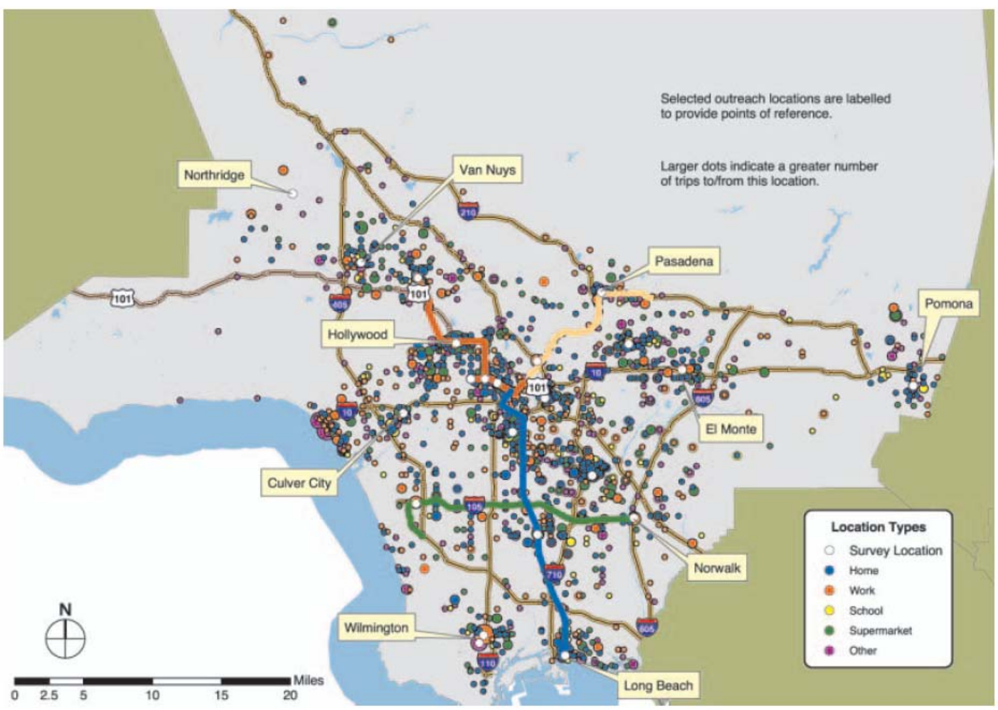

Figure C-10: Bicyclist Origins and Destinations (EPOP Surveys)

C.3.15 Eastside Light Rail Bike Interface Plan (2006)

The Eastside Light Rail Bike Interface Plan recommended bicycle transportation programs and infrastructure to promote bicycle access to future Gold Line stations. This study was led by LACMTA and funded by Caltrans. The study area included portions of the City of Los Angeles and the unincorporated County of Los Angeles. The plan has not been formally adopted by any agency. The County of Los Angeles received funding from LACMTA to develop bikeways along Arizona Avenue/Mednik Avenue, Woods Avenue, Ford Boulevard and Rowan Avenue. The purple lines in **Figure C-11** indicate the studied routes for access to the newly-opened Gold Line stations.

The County plan proposes bikeways to improve access to the new Gold Line stations are on the following roadways:

- 4th Street
- Arizona Avenue/Mednik Avenue
- Ford Boulevard
- Rowan Avenue/Eastern Avenue
- Woods Avenue

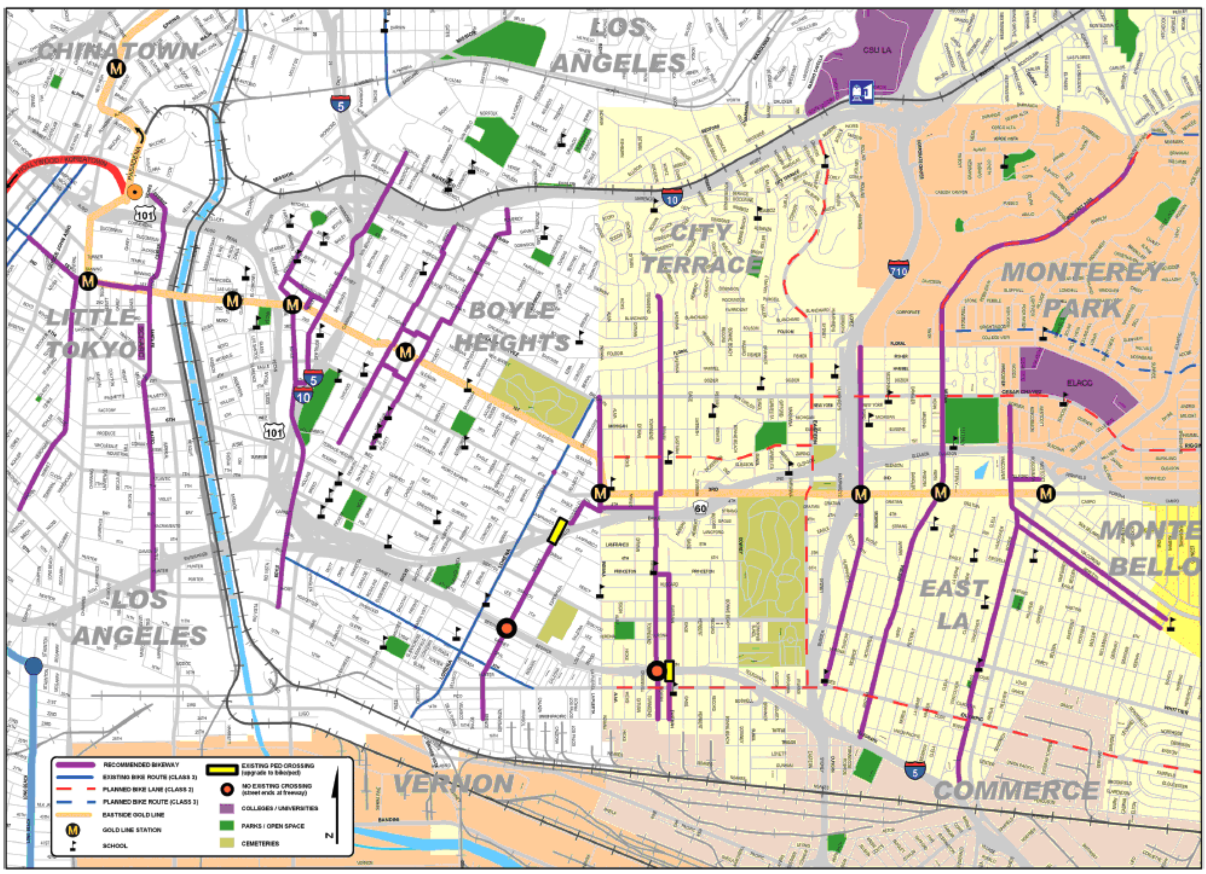

Figure C-11: Bikeway Connections to Eastside Gold Line Stations

C.3.16 Coyote Creek Trail Master Plan (2008)

Coyote Creek runs through the saw-toothed border of Los Angeles and Orange counties. As a result, the creek alternates repeatedly between the two counties and 12 incorporated cities (five in Los Angeles County and seven in Orange County) as it flows toward the San Gabriel River and ultimately the Pacific Ocean. **Figure C-12** shows the alignment of the Coyote Creek North Fork Extension and brief project descriptions. The Coyote Creek Trail Master Plan was developed by the San Gabriel and Lower Los Angeles Rivers and Mountains Conservancy to coordinate trail expansion and improvement projects across jurisdictions within the Coyote Creek watershed. In addition, the plan included a recommendation to extend the North Fork of the Coyote Creek bike path from its current terminus at Foster Road to just south of the Candlewood Country Club in the unincorporated area of South Whittier-Sunshine Acres. The County plan is including the northern extension of the bike path along Coyote Creek North Fork as a part of its recommendations.

Lower Coyote Creek Bikeway enhancements

Item	Project Description	Project Location	Jurisdiction*
94.	Extend Coyote Creek bike path northward on North Fork (a.k.a. La Cañada Verde Creek) to Candlewood Country Club.	West side of North Fork Coyote Creek from Foster Road to Coteau Dr at edge of Candlewood Country Club. T-Guide LA/OR 737, C2-C1-D1; LA 707, D7.	Santa Fe Springs and Los Angeles County
95.	Design and build inverted bike path undercrossings in the trapezoidal channel beneath an existing four-lane highway.	West side of North Fork at Foster Rd. T-Guide LA/OR 737, C2.	Santa Fe Springs
96.	Design and build inverted bike path undercrossings in the trapezoidal channel beneath three existing six-lane highways.	West side of North Fork Imperial Hwy, Meyer Rd and Leffingwell Rd. T-Guide LA/OR 737, C1-D1; LA 707, D7.	
97.	Construct a bike path bridge over North Fork Coyote Creek to provide access to bike path.	South edge of Candlewood Country Club from Ramset Dr to Coteau Dr.	

Figure C-12: Coyote Creek North Fork Extension

C.3.17 Bicycle Plans in Adjacent Counties

Bicycle plans in adjacent counties were consulted as necessary to identify cross-county linkages from unincorporated areas or other County of Los Angeles properties.

C.3.17.1 OCTA Commuter Bikeways Strategic Plan (2009)

The Orange County Transportation Authority (OCTA) updated its Commuter Bikeways Strategic Plan (CBSP) in 2009. The plan compiled the bikeway plans of all Orange County jurisdictions in order to identify all existing and proposed bikeways in the County. Other than the Coyote Creek Bikeway and the San Gabriel River Trail discussed above, key bikeway connections along the County of Los Angeles border include the Pacific Coast Highway, College Park Drive, Norwalk Avenue-Los Alamitos Boulevard, Wardlow Road-Ball Road, Carson Avenue-Lincoln Avenue, Del Amo Boulevard-Le Palma Avenue, Carmenita Road-Moody Street, South Street-Orange Thorpe Avenue, Walker Street, Rosecrans Avenue, Lambert Road, the Imperial Highway Path (La Habra), and Leffingwell Road-La Habra Boulevard.

C.3.17.2 Ventura Countywide Bicycle Master Plan (2007)

The Ventura County Transportation Commission (VCTC) developed a countywide bicycle plan to identify important regional bikeways. The proposed regional connections between Ventura County and the County of Los Angeles include: the Santa Paula Branch Line Trail, the Santa Susana Pass Road bike lanes, Thousand Oaks Boulevard bike lanes, and bike lanes along SR-1 between Las Posas Road and the Los Angeles County Line. The Santa Paula Branch Line Trail could potentially connect to a planned bikeway along the Santa Clara River in the County of Los Angeles.

C.3.17.3 San Bernardino County Non-Motorized Transportation Plan (2001)

The San Bernardino Association of Governments (SANBAG) developed this plan to coordinate bikeway planning among San Bernardino County jurisdictions. The proposed San Antonio Wash Bikeway and Southern Pacific Rail Trail are the regional bikeways which may impact the development of the County of Los Angeles Bicycle Master Plan. Bike lanes proposed for Orchard Street in San Bernardino County (Montclair) could be extended to Lincoln Avenue in County of Los Angeles (Pomona) to create a more local cross-county connection.

Appendix D. Existing Land Uses

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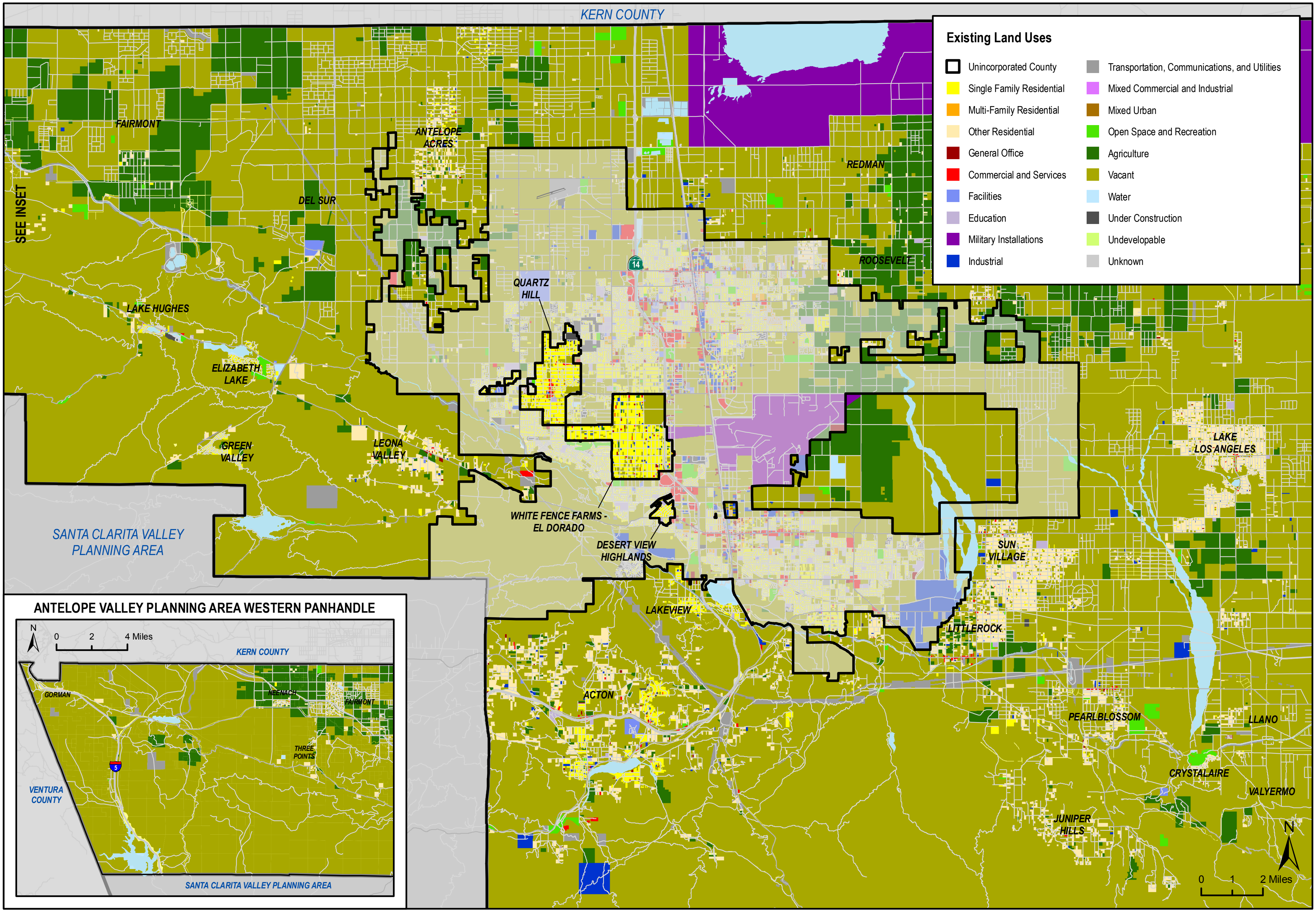

Figure D-1: Antelope Valley Planning Area Existing Land Uses

Los Angeles County Bicycle Master Plan

Source: SCAG (2008)

Date: 11/2/2010

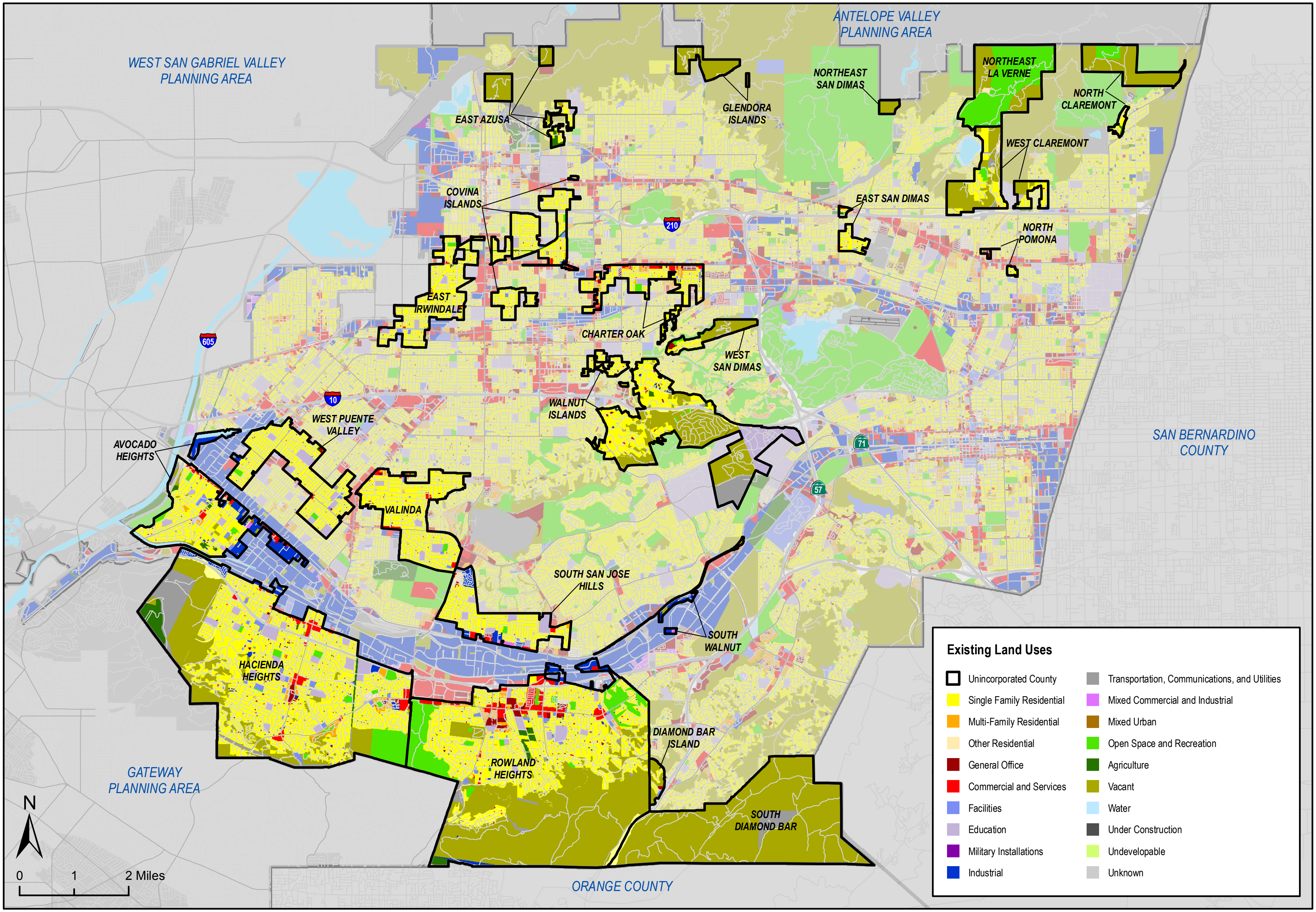

Figure D-2: East San Gabriel Valley Planning Area Existing Land Uses

Los Angeles County Bicycle Master Plan

Source: SCAG (2008)
Date: 11/2/2010

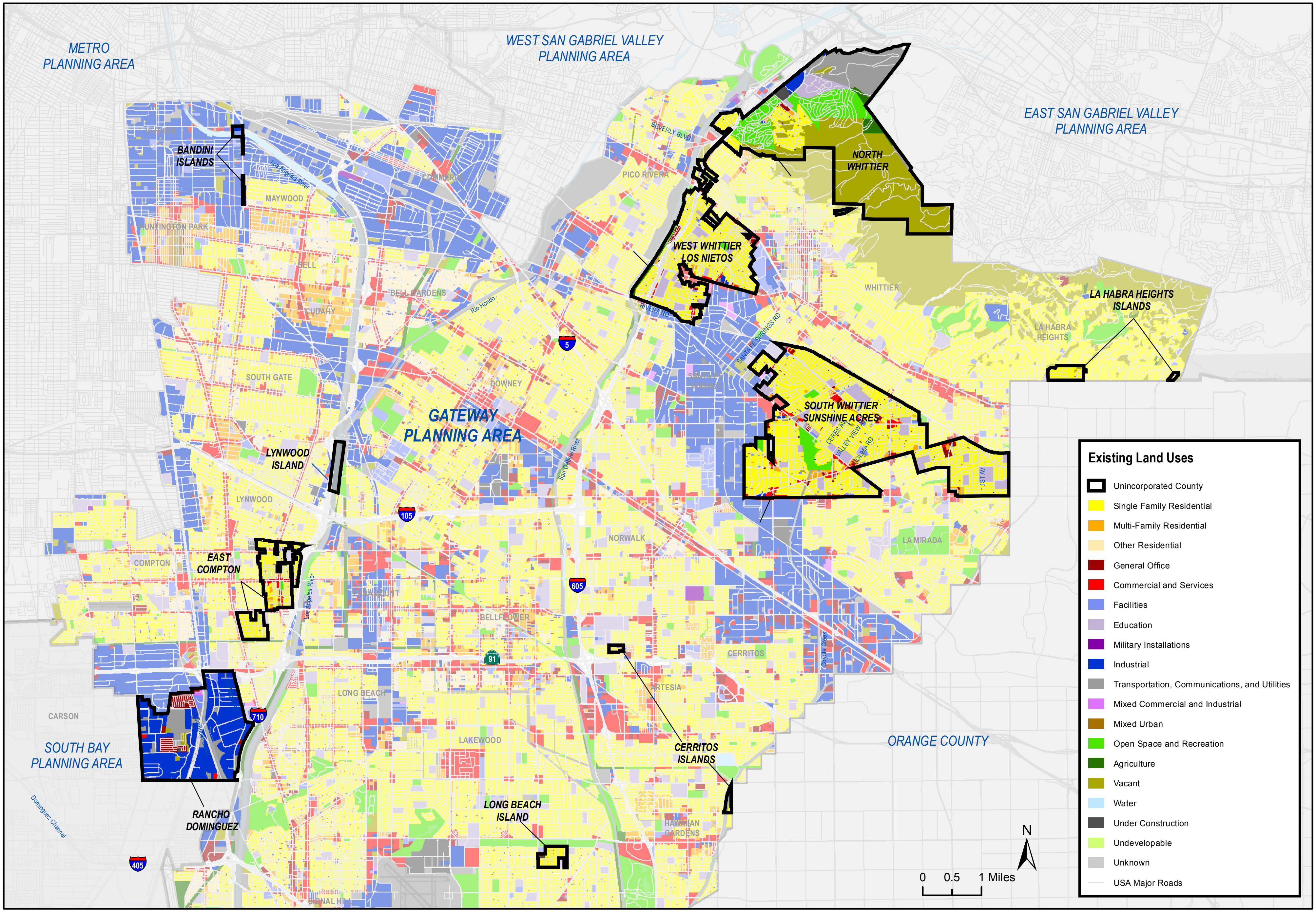

Figure D-3: Gateway Planning Area Existing Land Uses

Los Angeles County Bicycle Master Plan

Source: SCAG (2008)

Date: 9/30/2011

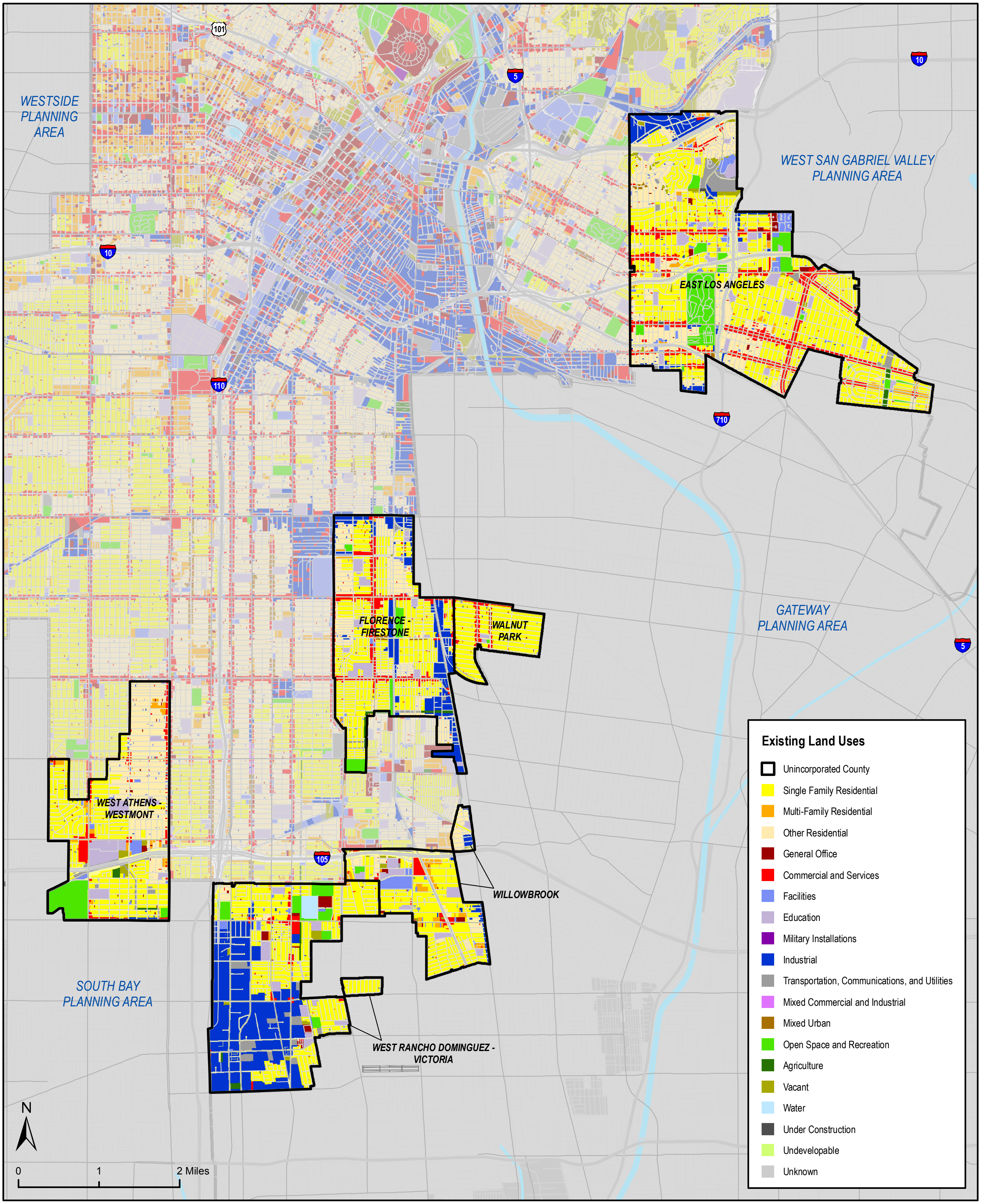

Figure D-4: Metro Planning Area Existing Land Uses

Source: SCAG (2008)
Date: 11/2/2010

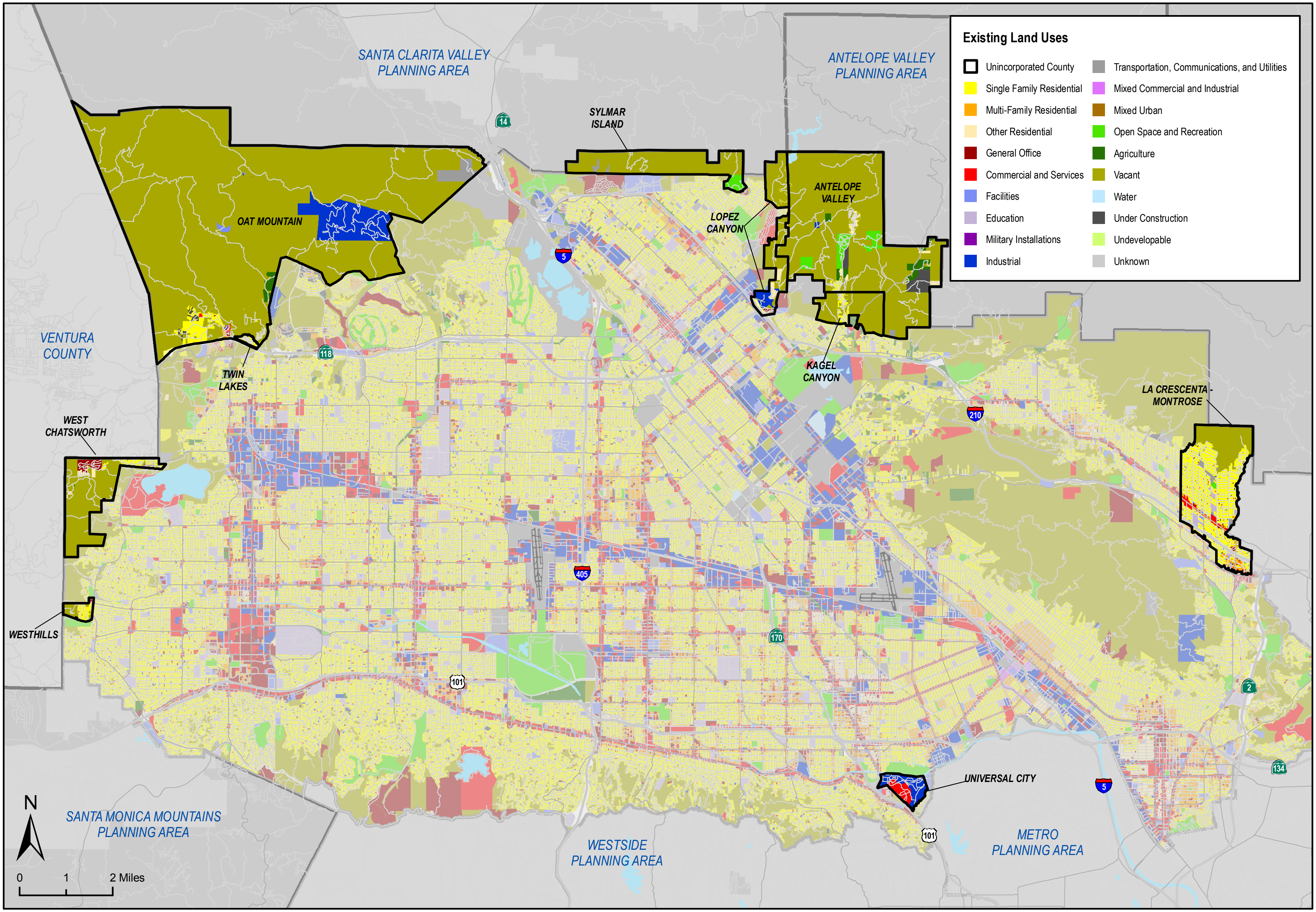

Figure D-5: San Fernando Valley Planning Area Existing Land Uses

Los Angeles County Bicycle Master Plan

Source: SCAG (2008)
Date: 11/2/2010

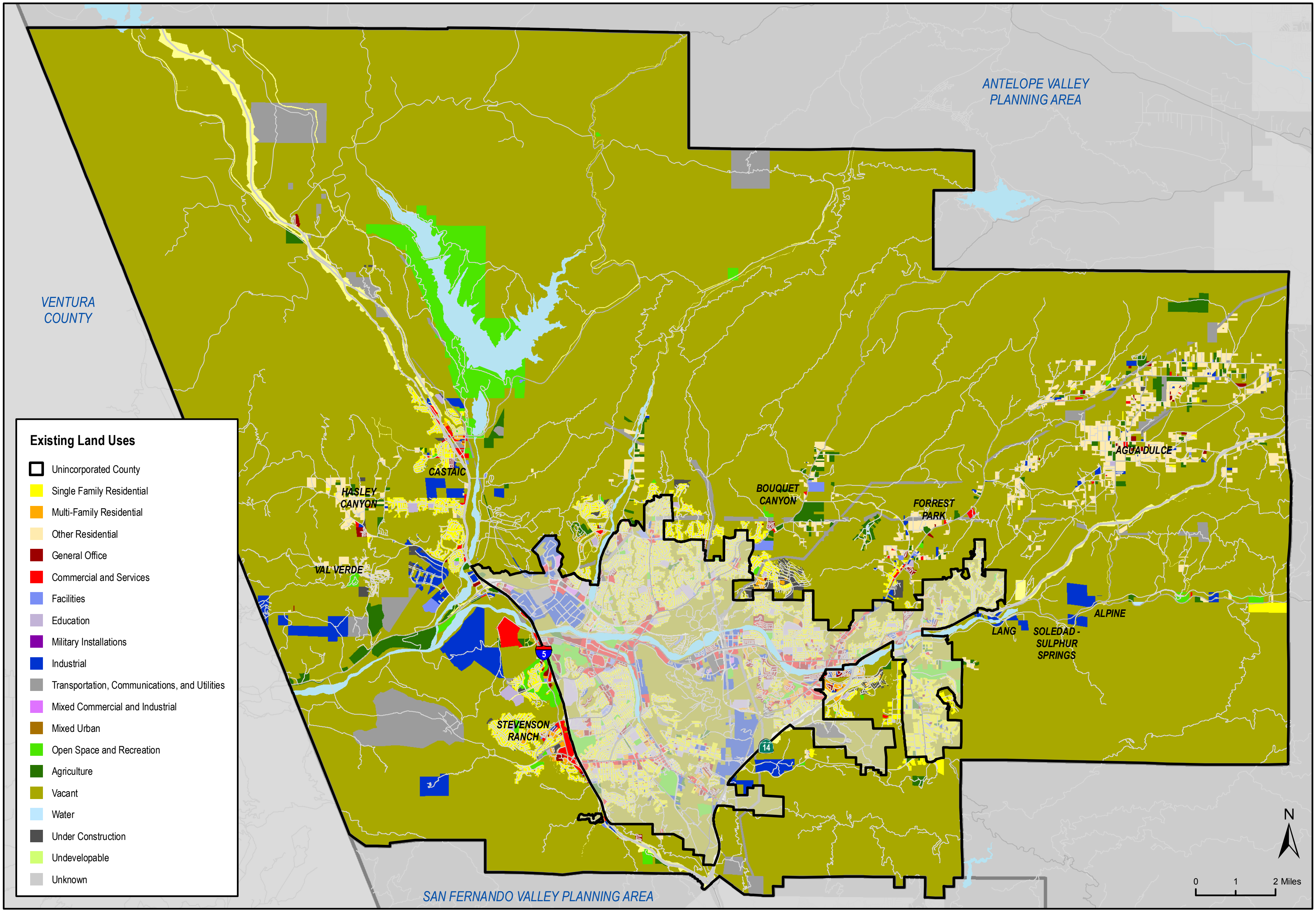

Figure D-6: Santa Clarita Valley Planning Area Existing Land Uses

Los Angeles County Bicycle Master Plan

Source: SCAG (2008)
Date: 11/2/2010

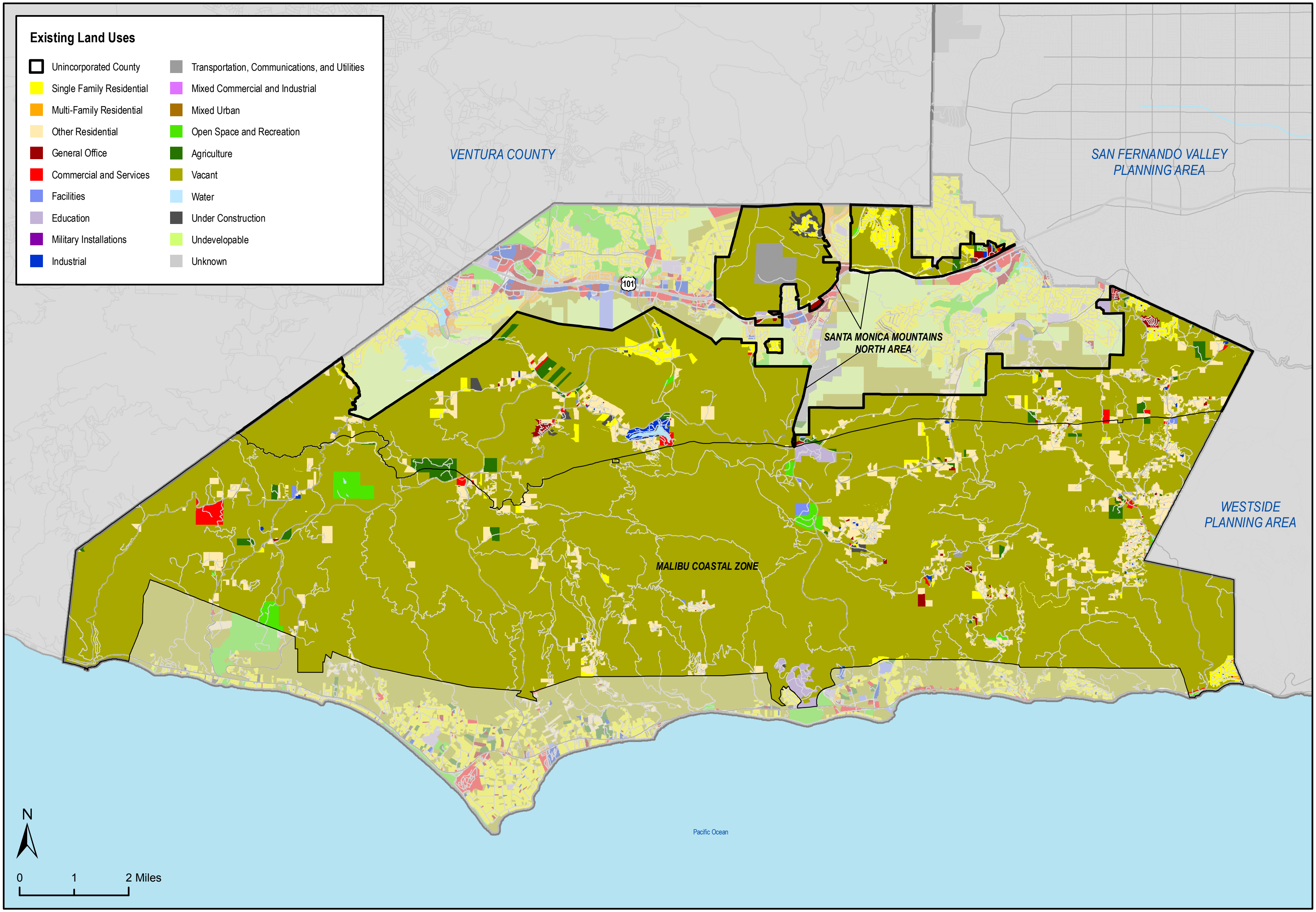

Figure D-7: Santa Monica Mountains Existing Land Uses

Los Angeles County Bicycle Master Plan
Source: SCAG (2008)
Date: 11/2/2010

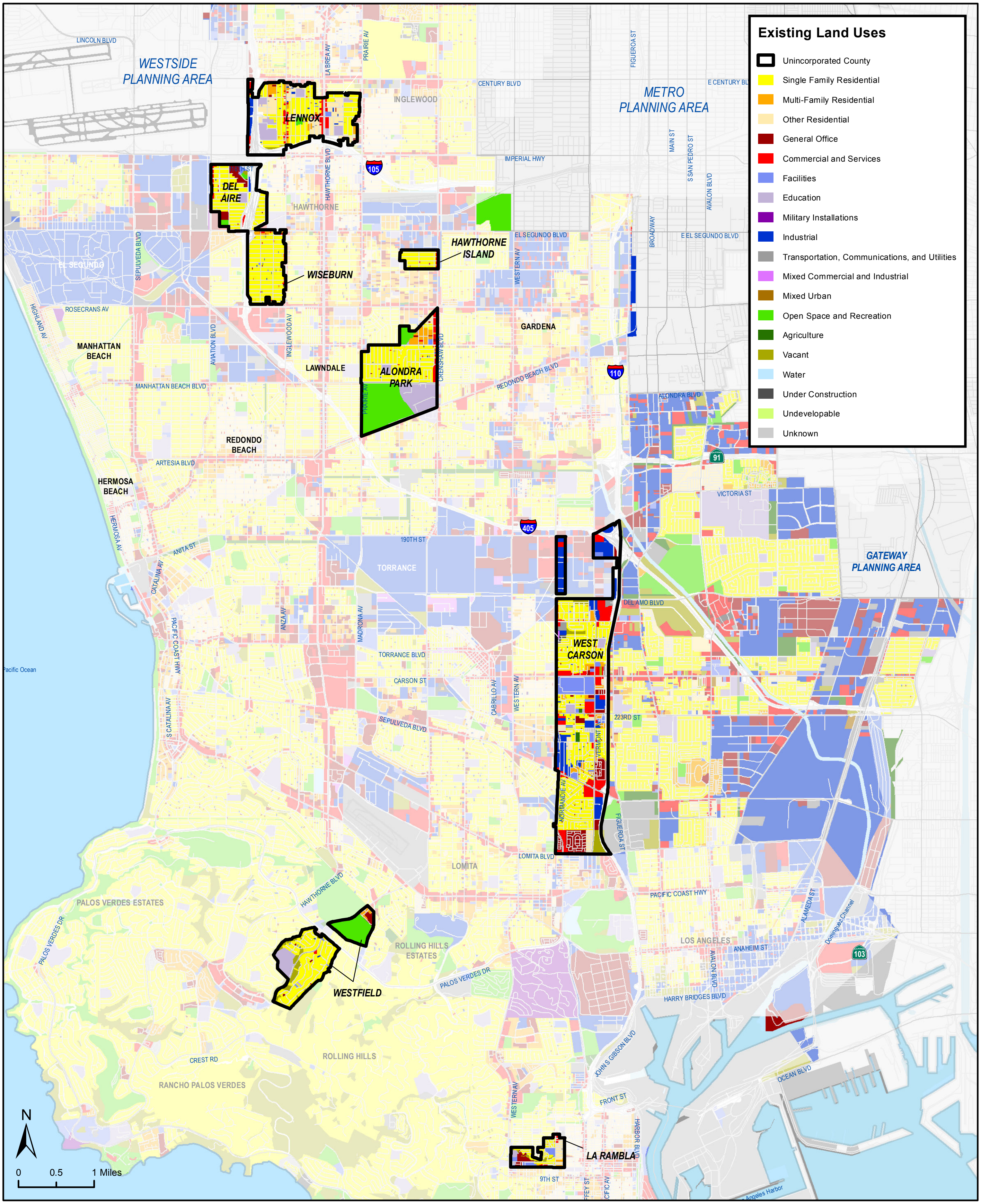

Figure D-8: South Bay Planning Area Existing Land Uses

Los Angeles County Bicycle Master Plan

Source: SCAG (2008)

Date: 9/30/2011

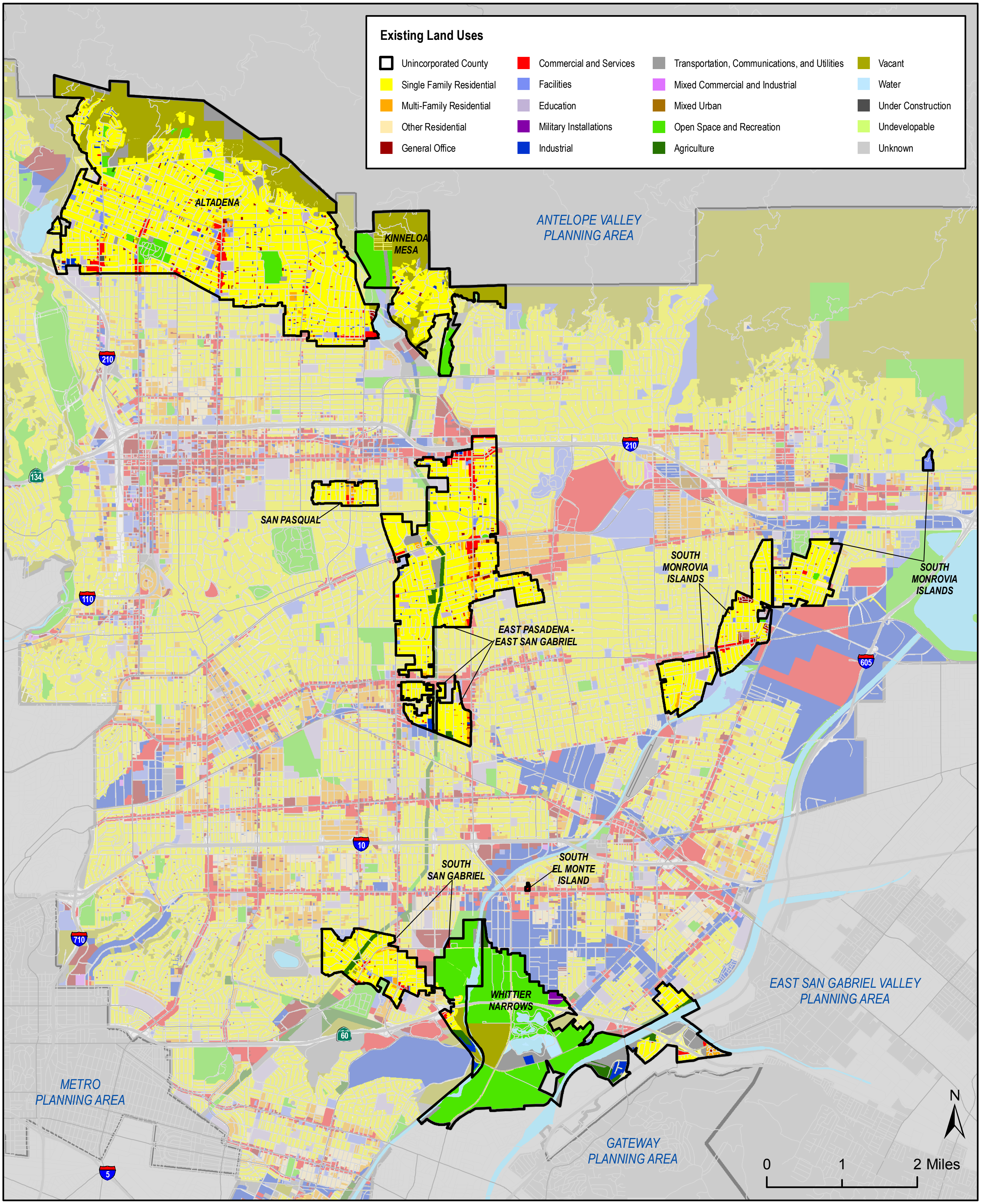

Figure D-9: West San Gabriel Valley Planning Area Existing Land Uses

Source: SCAG (2008)
Date: 11/2/2010

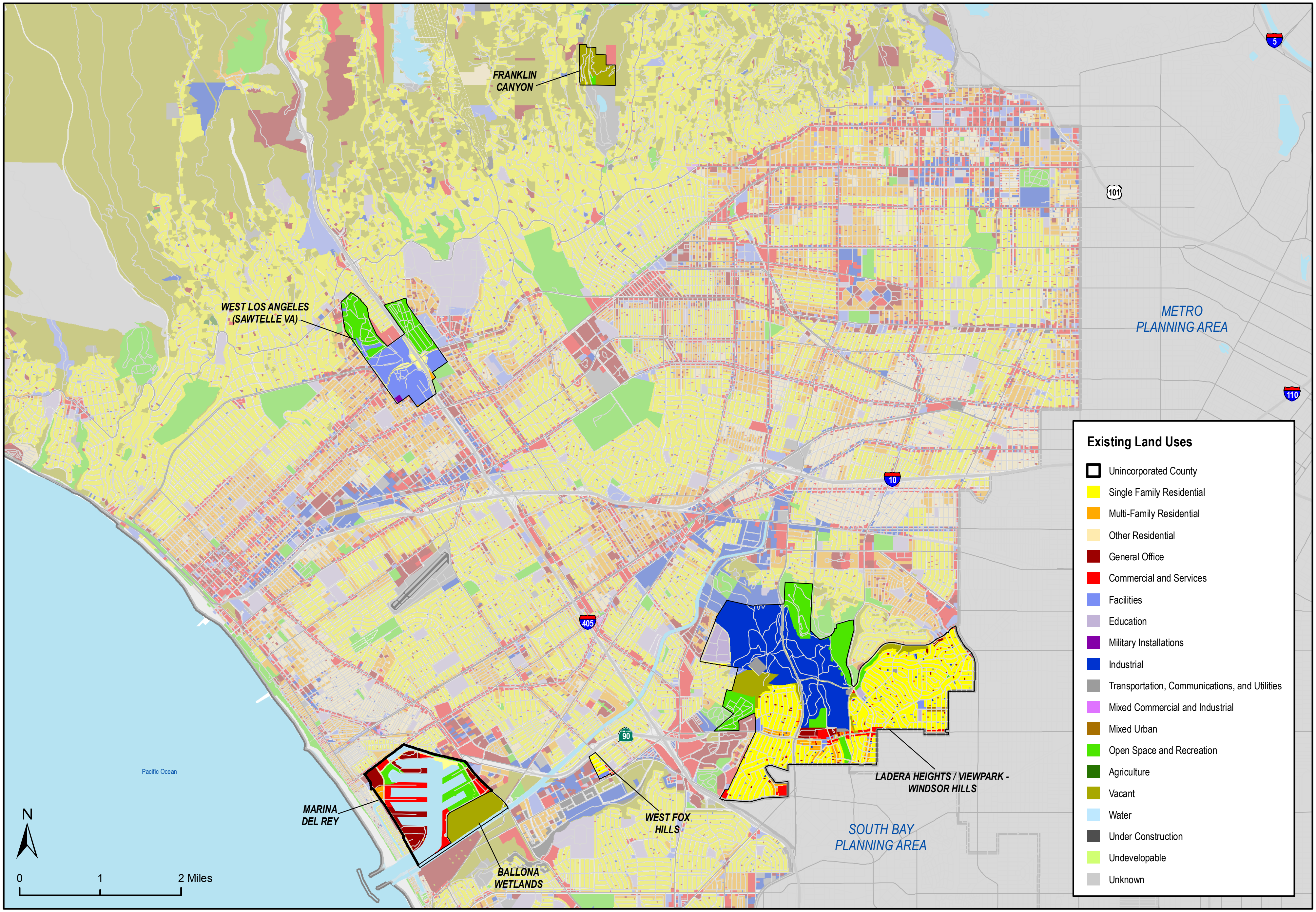

Figure D-10: Westside Planning Area Existing Land Uses

Los Angeles County Bicycle Master Plan

Source: SCAG (2008)
Date: 11/2/2010

Appendix E. End of Trip Facilities

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End of trip facilities are essential components of a bicycle system. Support facilities, such as bicycle parking racks, and showers and lockers for employees, further improve safety and convenience for bicyclists.

Bicyclists need secure, well-located bicycle parking to support nearly all utilitarian and many recreational bicycle trips. Lack of parking can be a major obstacle to using a bicycle. A robust bicycle parking program is one of the most important strategies that jurisdictions can apply to enhance the bicycling environment. The program can improve the bicycling environment and increase the visibility of bicycling in a relatively short time. Public bicycle parking programs can also be coordinated with property owners of commercial buildings to supply parking for employees and visitors.

The bicycle parking recommendations in subsequent sections were developed based upon proximity to land uses that attract bicycle trips including transit hubs and activity centers. Bicycle parking has been recommended for implementation at the following locations in unincorporated communities within the County of Los Angeles:

- Public transit stations (Metro and MetroLink)
- Mixed-use commercial
- Recreation areas
- Elementary, middle, and high schools
- Colleges/universities
- Airports
- Commercial/office areas
- Civic/government buildings

It is recommended that more secure bicycle parking options, such as bicycle lockers, be provided at particularly high-activity locations such as transit stations. For guidance on bicycle parking design issues, installation standards and types of short and long-term bicycle parking, please refer to the Bicycle Parking section in **Appendix F: Design Guidelines**.

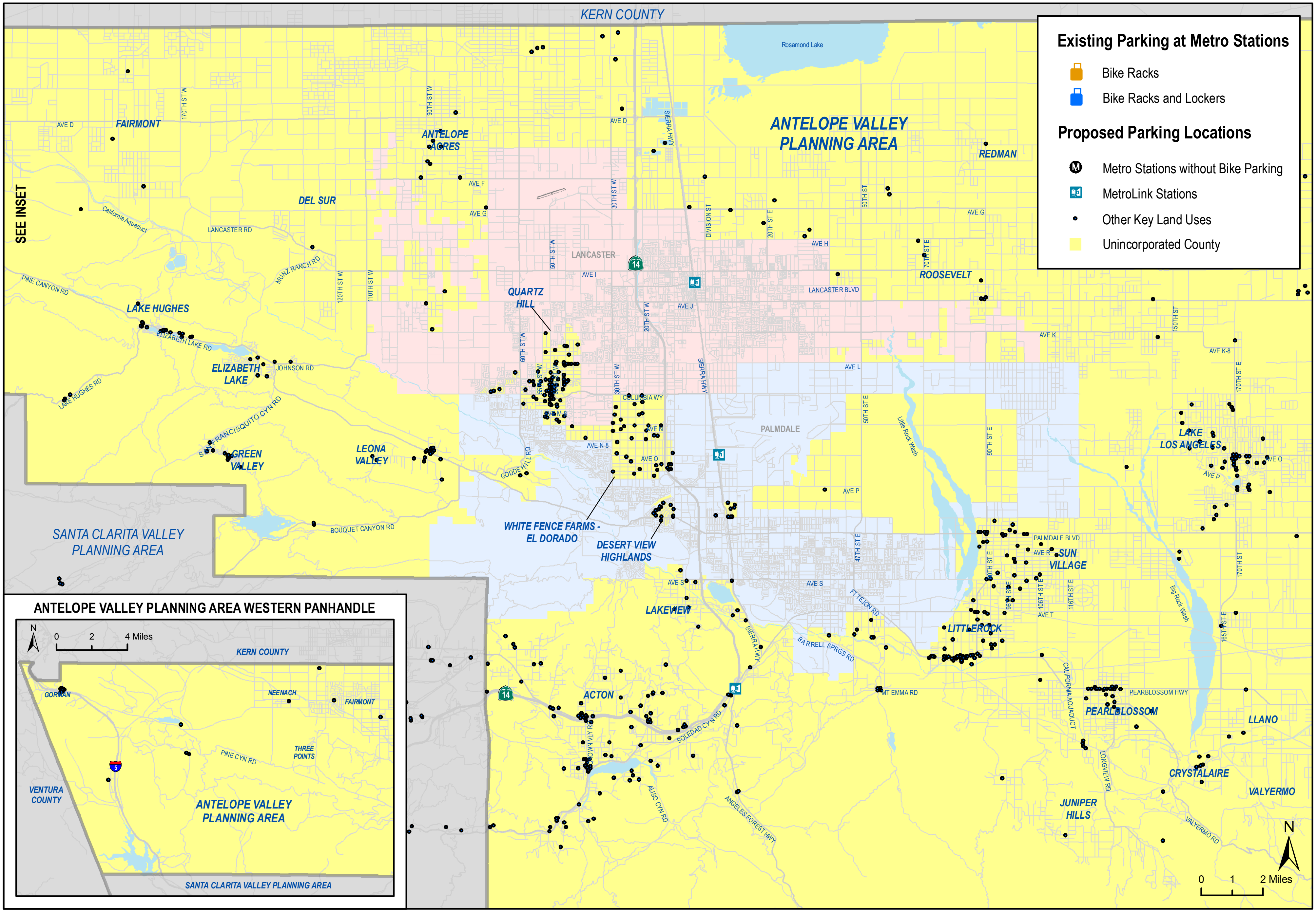

Figure E-1: Antelope Valley Planning Area Proposed Bicycle Parking

Los Angeles County Bicycle Master Plan

Source: Los Angeles Metro (2010); Alta Planning + Design (2010)

Date: 11/2/2010

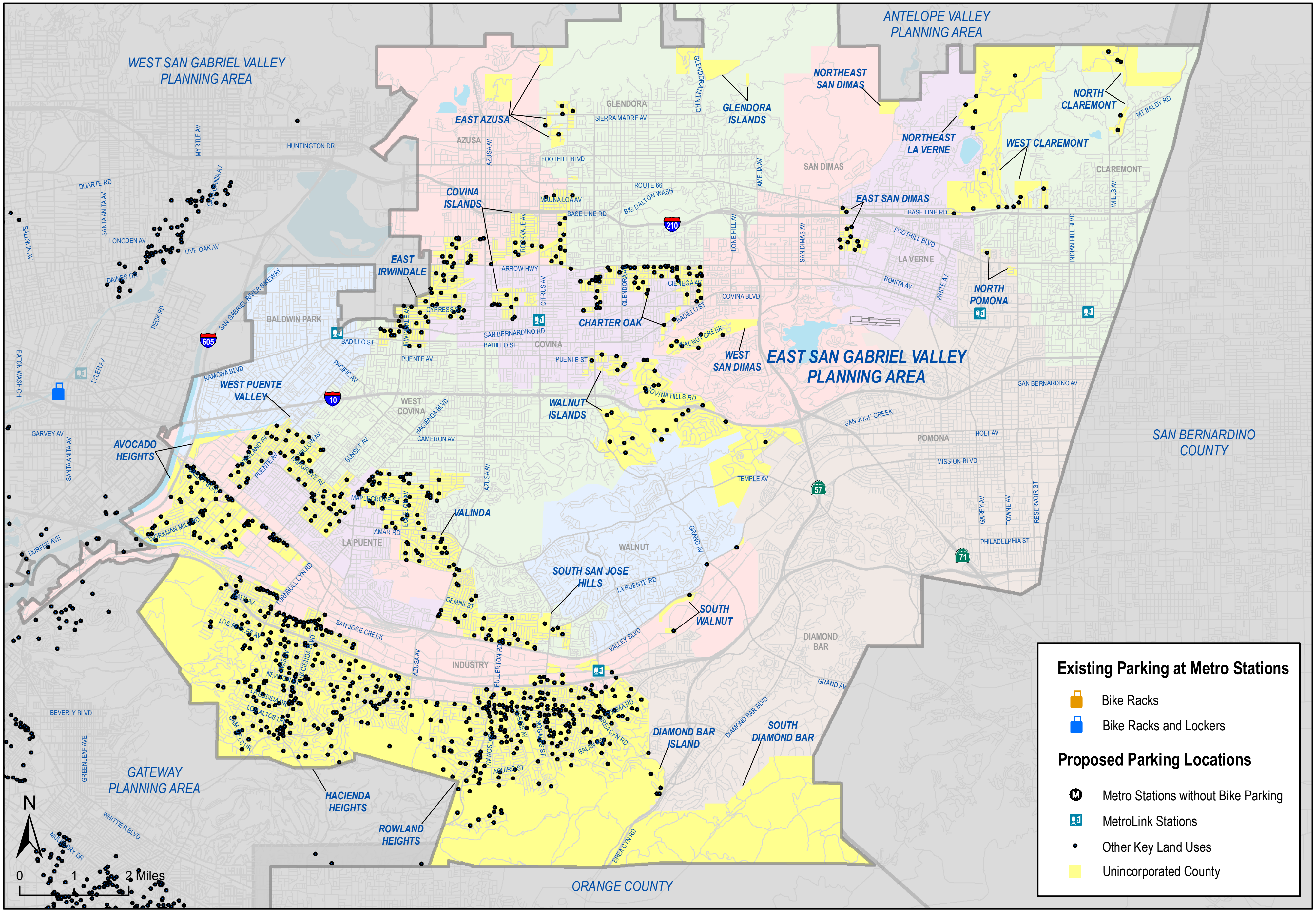

Figure E-2: East San Gabriel Valley Planning Area Proposed Bicycle Parking

Los Angeles County Bicycle Master Plan

Source: Los Angeles Metro (2010)
Date: 11/2/2010; Alta Planning + Design (2010)

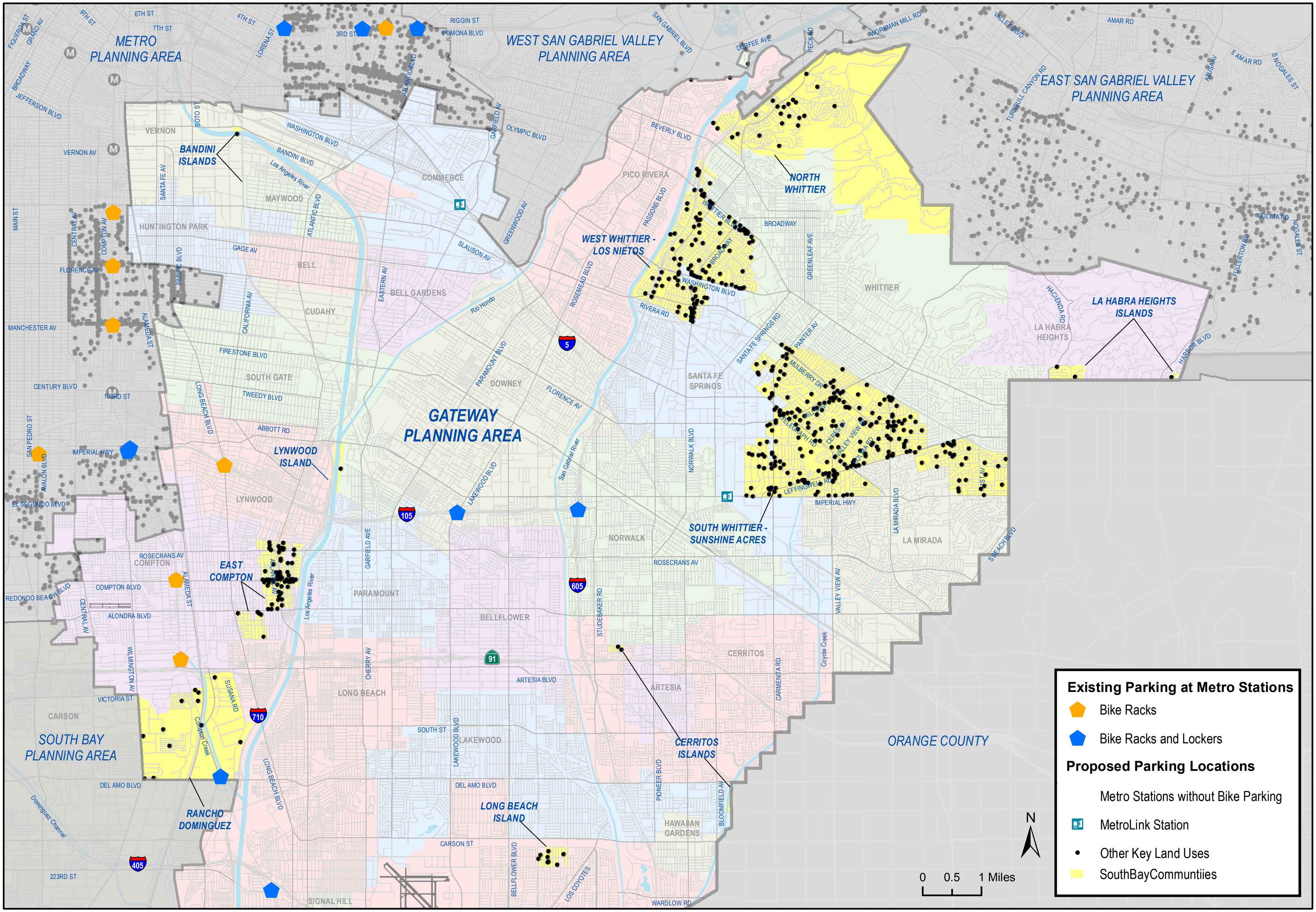

Figure E-3: Gateway Planning Proposed Bicycle Parking

Los Angeles County Bicycle Master Plan

Source: Los Angeles Metro (2010); Alta Planning + Design (2010)

Date: 10/05/11

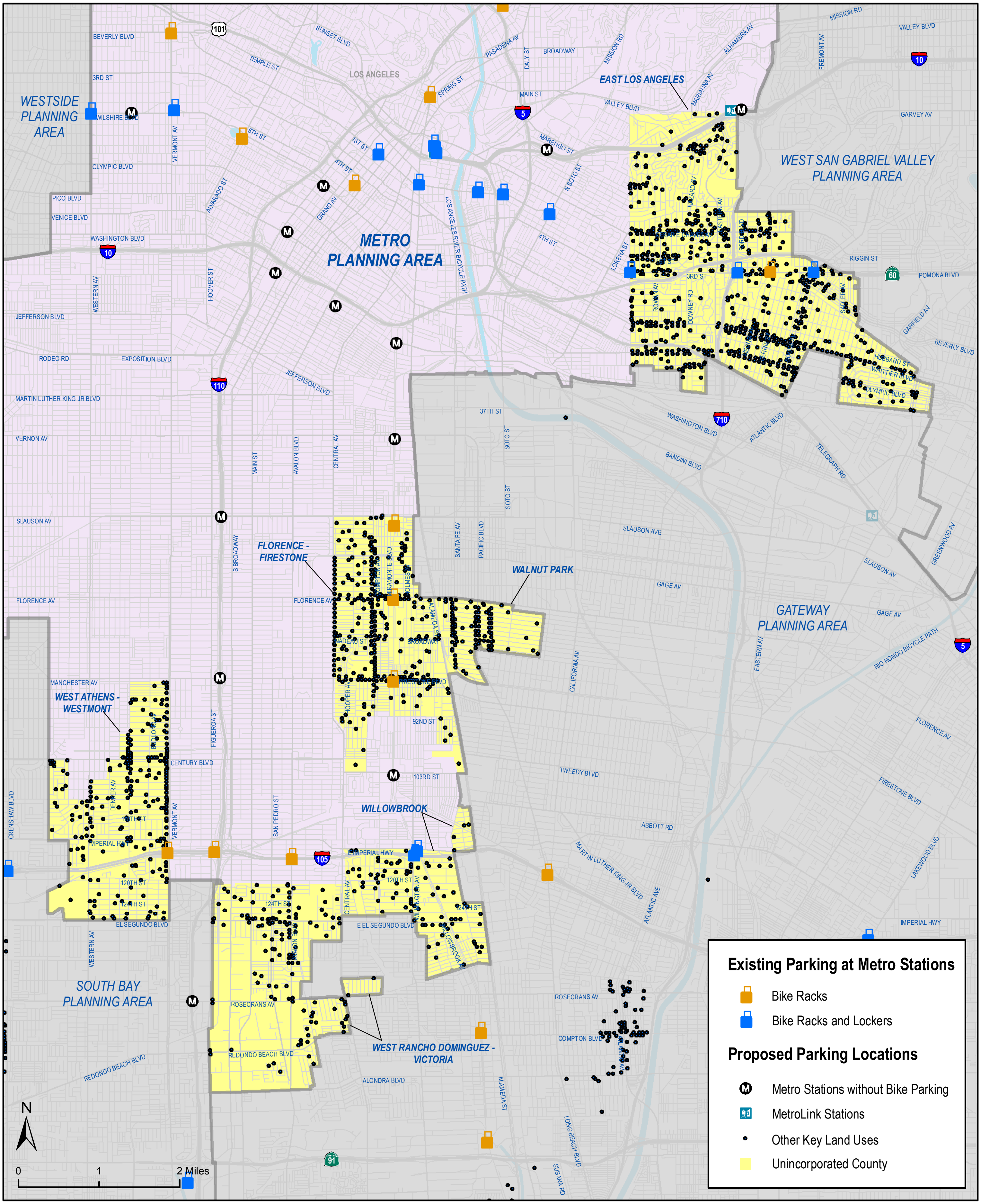

Figure E-4: Metro Planning Area Proposed Bicycle Parking

Los Angeles County Bicycle Master Plan

Source: Los Angeles Metro (2010); Alta Planning + Design (2010)
Date: 11/2/2010

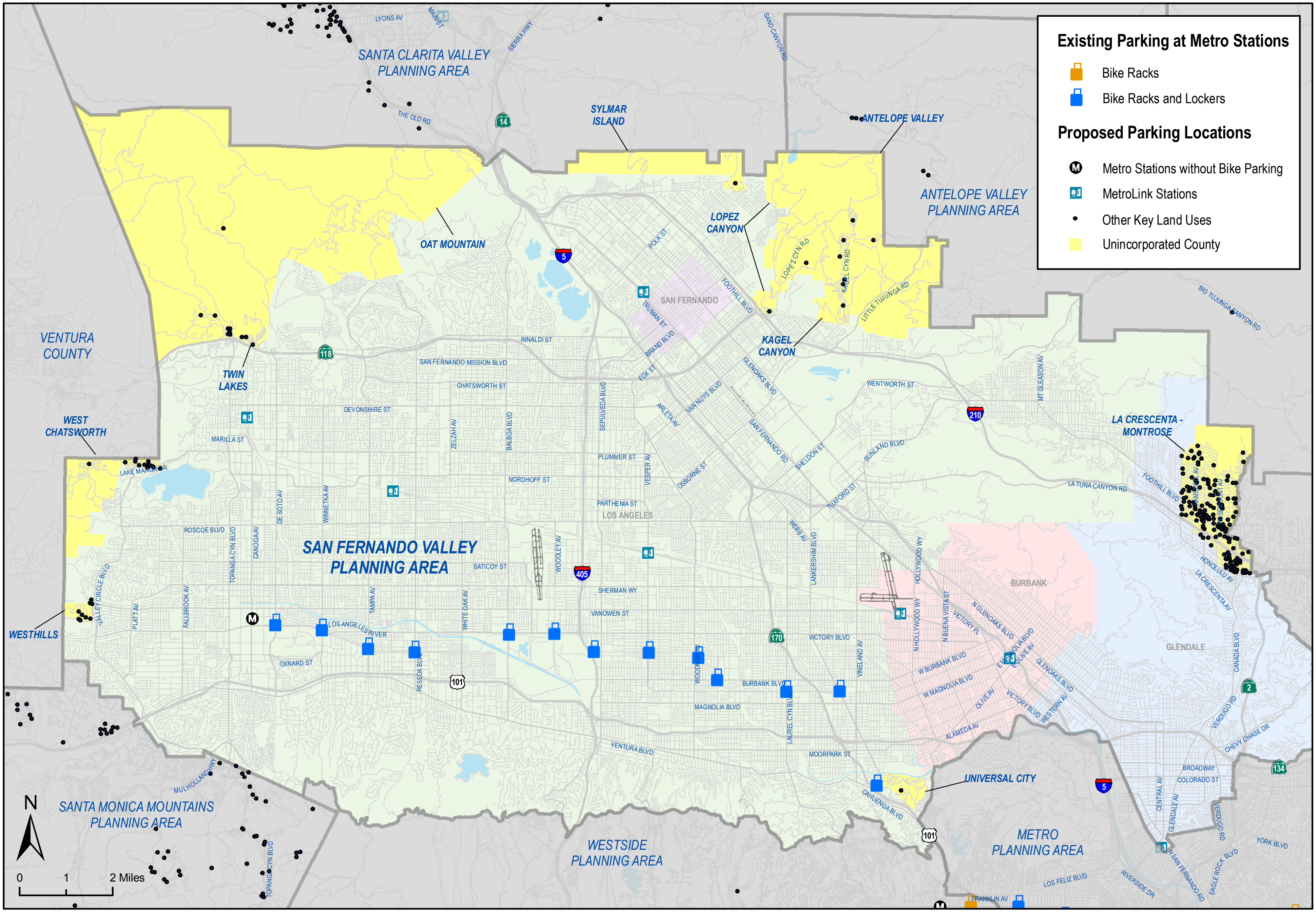

Figure E-5: San Fernando Valley Planning Area Proposed Bicycle Parking

Los Angeles County Bicycle Master Plan

Source: Los Angeles Metro (2010); Alta Planning + Design (2010)

Date: 11/2/2010

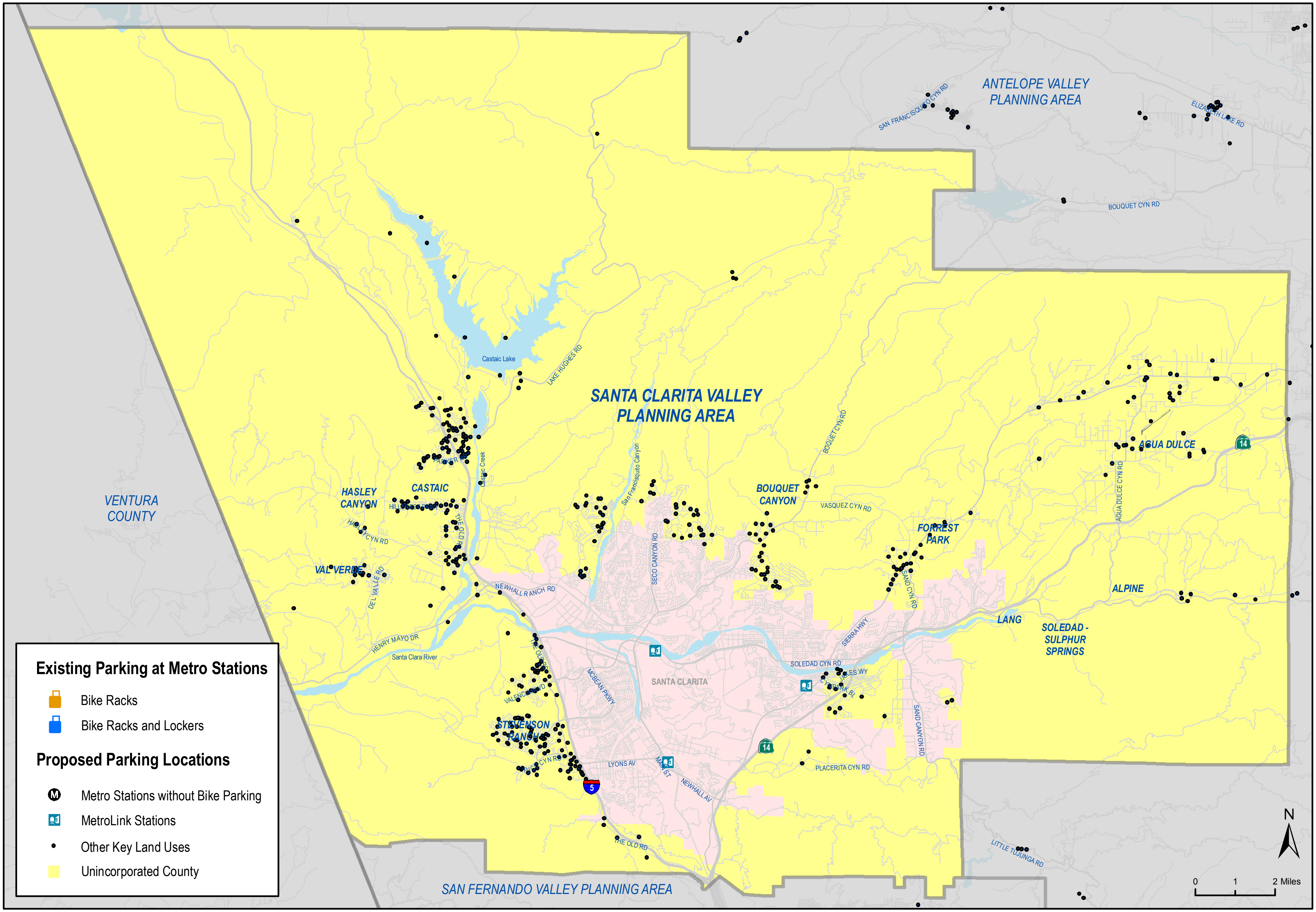

Figure E-6: Santa Clarita Valley Planning Area Proposed Bicycle Parking

Los Angeles County Bicycle Master Plan

Source: Los Angeles Metro (2010); Alta Planning + Design (2010)

Date: 11/2/2010

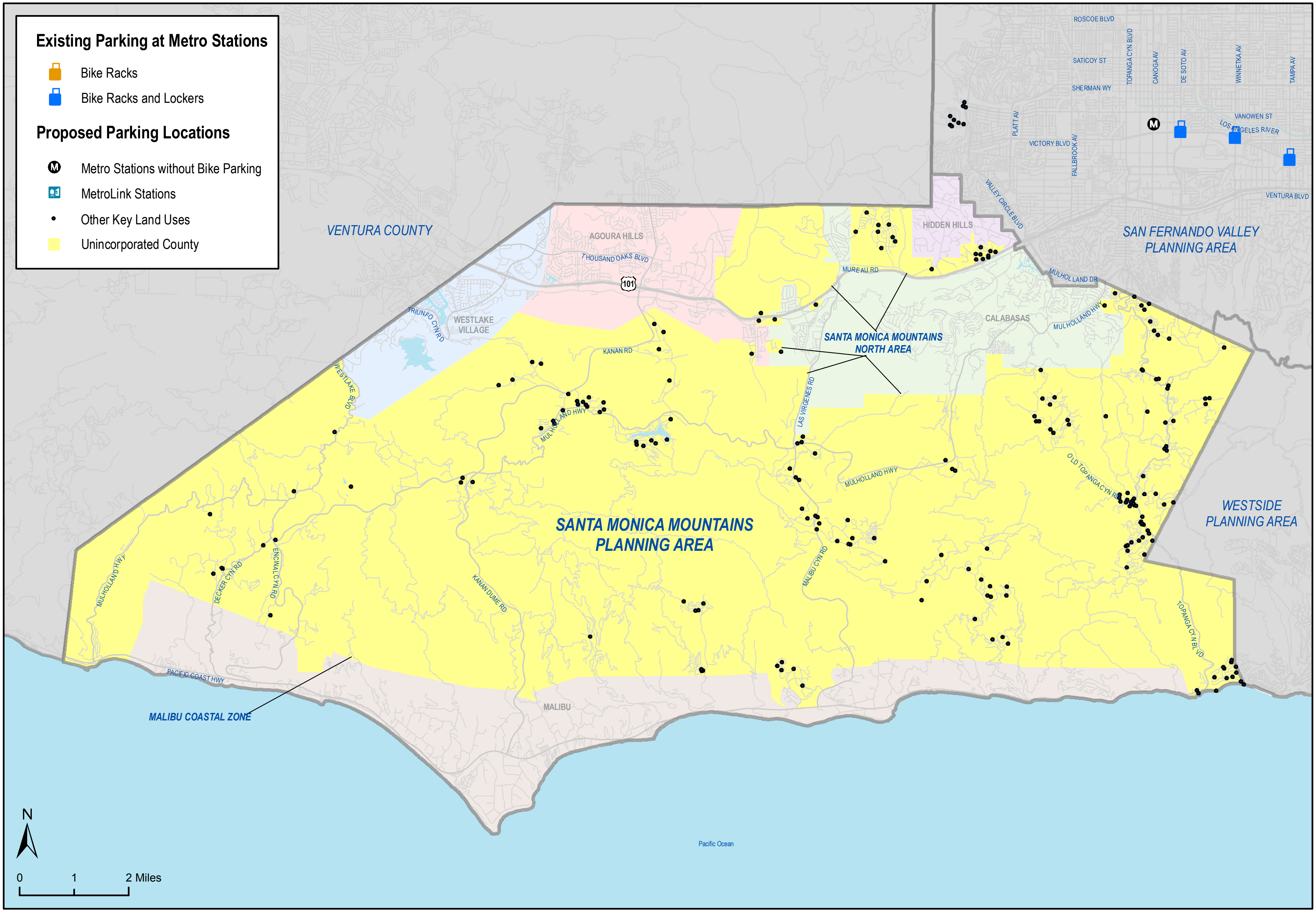

Figure E-7: Santa Monica Mountains Planning Area Proposed Bicycle Parking

Los Angeles County Bicycle Master Plan

Source: Los Angeles Metro (2010); Alta Planning + Design (2010)
Date: 11/2/2010

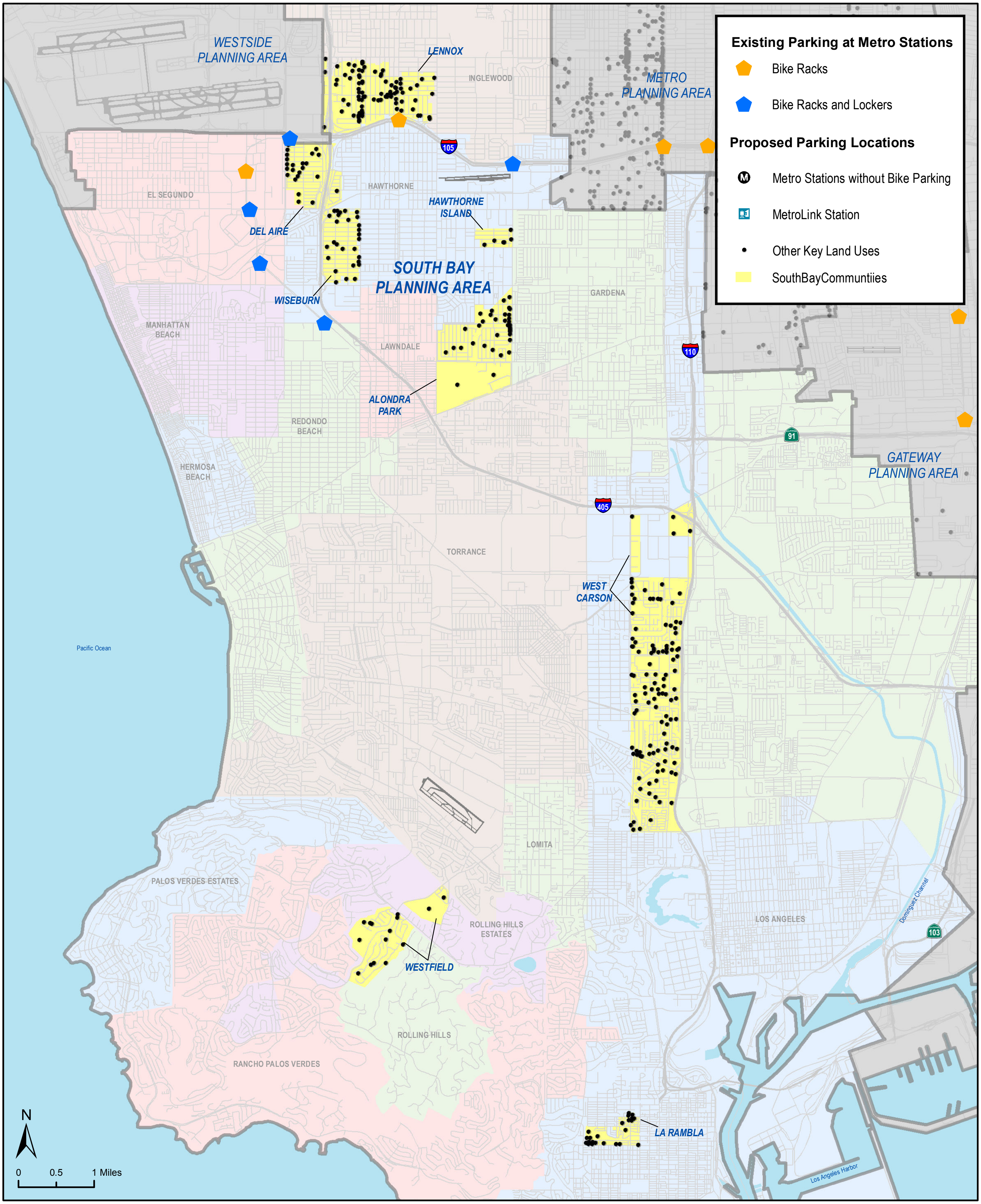

Figure E-8: South Bay Planning Area Proposed Bicycle Parking

Los Angeles County Bicycle Master Plan

Source: Los Angeles Metro (2010); Alta Planning + Design (2010)
Date: 10/05/11

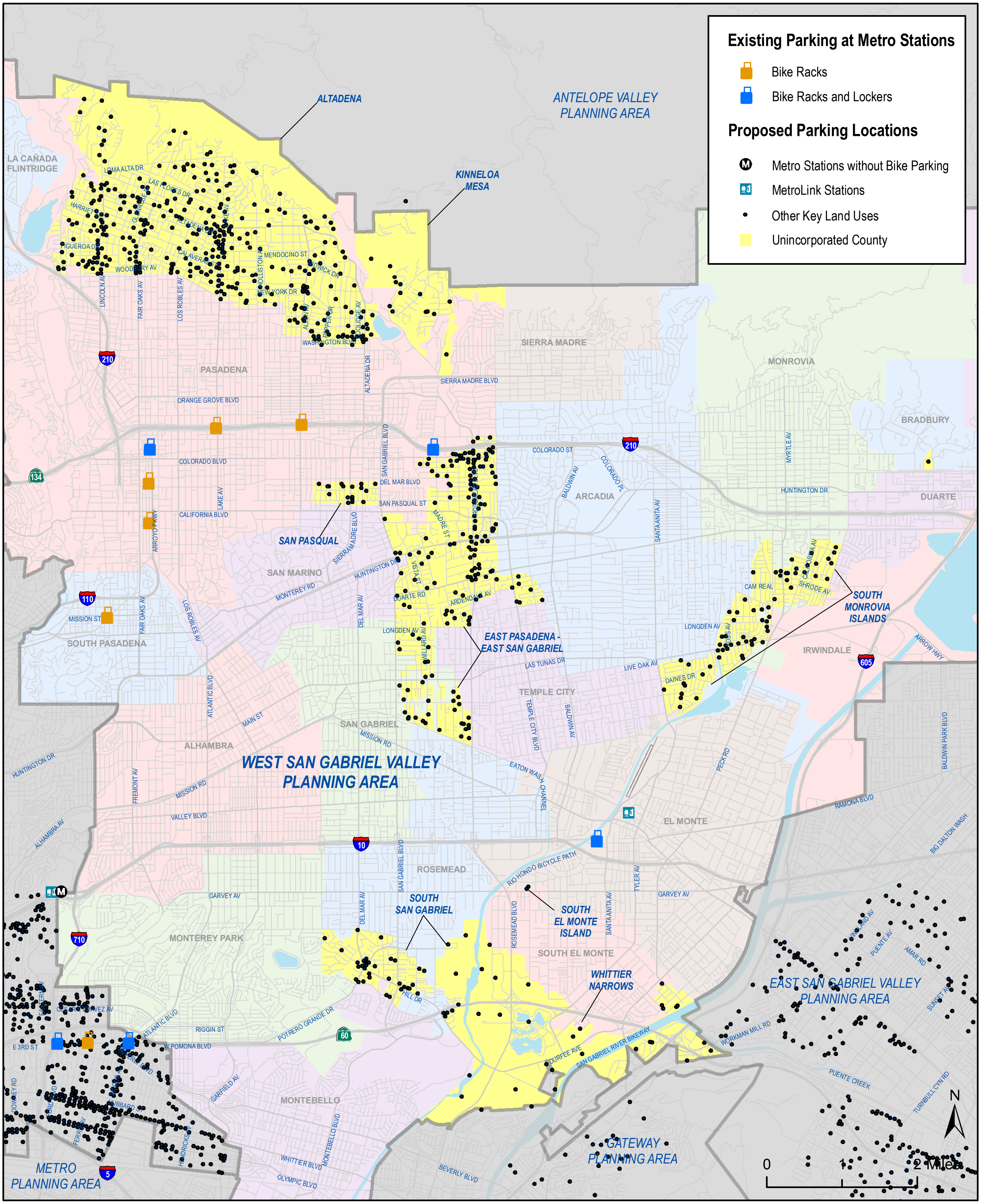

Figure E-9: West San Gabriel Valley Planning Proposed Bicycle Parking

Los Angeles County Bicycle Master Plan

Source: Los Angeles Metro (2010); Alta Planning + Design (2010)
Date: 11/2/2010

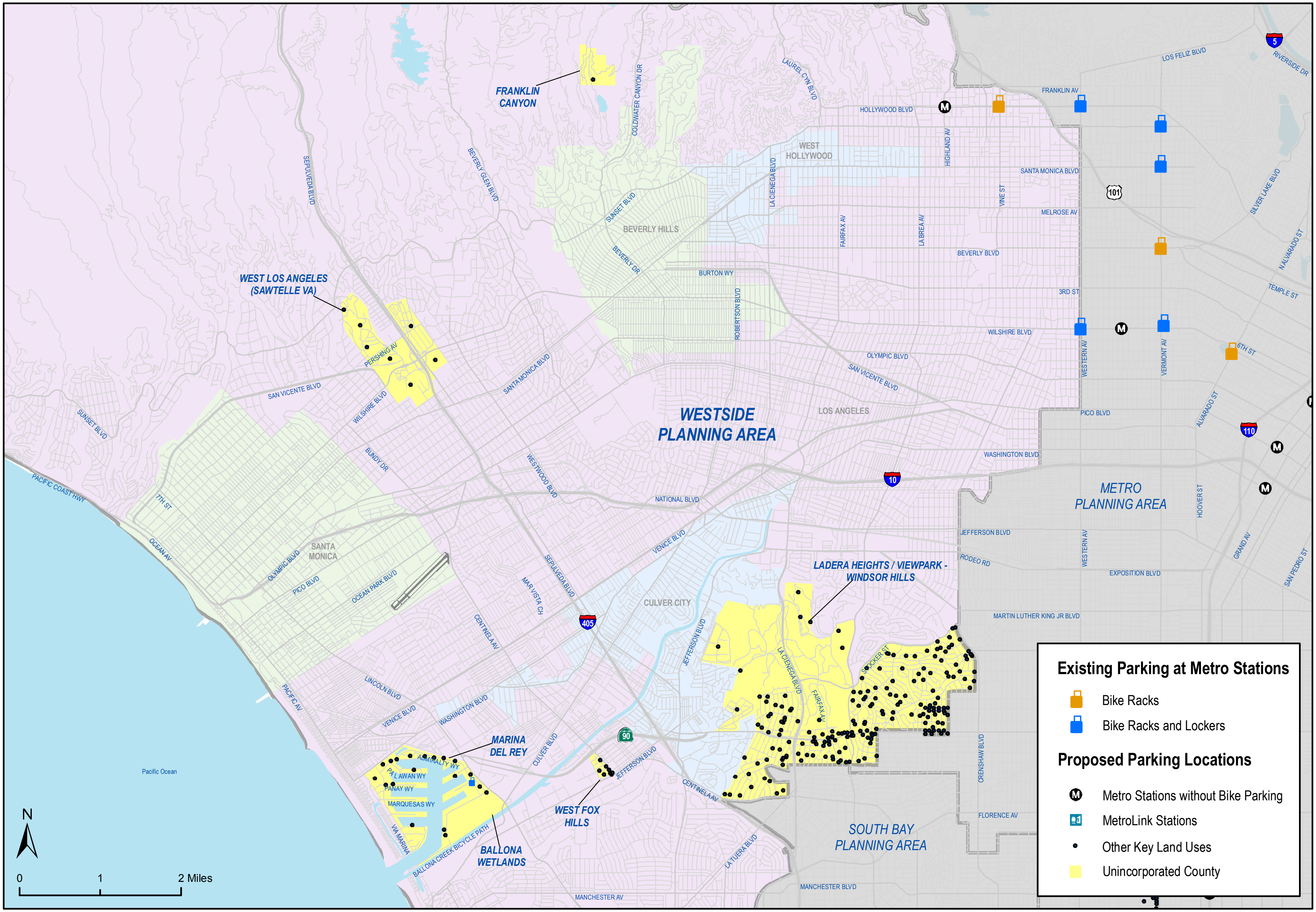

Figure E-10: Westside Planning Area Proposed Bicycle Parking

Los Angeles County Bicycle Master Plan

Source: Los Angeles Metro (2010); Alta Planning + Design (2010)
Date: 11/2/2010

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Appendix F. Design Guidelines

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Bicyclists have legal access to all county streets. While this Plan identifies a specific subset of streets to be designated as bikeways, many bicyclists will need to use other streets to reach their destinations. Therefore, it is important that all roadways be designed to accommodate bicyclists.

The County of Los Angeles works to implement on-and off-street projects to encourage walking and cycling, improve safety and accessibility, and enhance the quality of the walkway and bikeway networks so that these activities become integral parts of daily life. The County of Los Angeles features a mix of urban, suburban, and rural environments, and many future projects will involve retrofitting existing streets and intersections. The County has high demand for on-street parking in commercial corridors, an auto-oriented roadway system reliant on high-capacity arterials, and many other complex situations.

The Design Guidelines are intended to provide a range of design options for bicycle treatments. The Design Guidelines provide a toolbox of ideas that may be implemented by the County of Los Angeles, but is not inclusive of all treatments that may be used and does not identify treatments intended for any specific projects. The following key principles should guide the development of all future County bikeways and bicycle facilities:

- The bicycling environment should be safe. On-and off-road bikeways described in Chapter 3 (Table 3.1) should be designed and built to be free of hazards and to minimize conflicts with external factors such as noise, vehicular traffic and protruding architectural elements.
- The bicycle network should be accessible. Future bikeway design should ensure the mobility of all users by accommodating the needs of people regardless of age or ability. Bicyclists have a range of skill levels, and facilities should be designed for use by experienced cyclists at a minimum, with a goal of providing for inexperienced / recreational bicyclists (especially children and seniors) to the greatest extent possible. In areas where specific needs have been identified (e.g., near schools) the needs of appropriate types of bicyclists should be accommodated.
- The bicycle network should connect to places people want to visit. The bikeway network should provide continuous direct routes and convenient connections between destinations, including homes, schools, offices, commercial districts, shopping areas, recreational opportunities and transit.
- The bikeway network should be clearly designated and easy to use. On-and off-road bikeways should be designed so people can easily find a direct route to a destination and delays are minimized.
- Bicyclists should be able to enjoy a positive environment. Good design should enhance the feel of the bicycling environment. A complete network of on-street bicycling facilities should connect seamlessly to the existing and proposed off-street pathways to complete recreational and commuting routes around the County.
- All roadway projects and improvements *should* accommodate bicyclists.
- Bicycle improvements should be economical. Improvements should be designed to achieve the maximum benefit for their cost, including initial cost and maintenance cost as well as reduced reliance on more expensive modes of transportation. Where possible, improvements in the right-of-way should stimulate, reinforce, and connect with adjacent private improvements.

Design guidelines are intended to be flexible and should be applied with professional judgment by designers. Specific national and state guidelines are identified in this document, as well as design treatments that may exceed these guidelines.

F.1 National, State, and Local Guidelines / Best Practices

The following is a list of references and sources utilized to develop design guidelines for the County of Los Angeles Bicycle Master Plan. Many of these documents are available online.

F.1.1 Federal Guidelines

- American Association of State Highway and Transportation Officials. (2004). *AASHTO Policy on Geometric Design of Streets and Highways*. Washington, DC. www.transportation.org
- American Association of State Highway and Transportation Officials. (1999). *AASHTO Guide for the Development of Bicycle Facilities*. Washington, DC. www.transportation.org
- Federal Highway Administration. (2009). *Manual on Uniform Traffic Control Devices (MUTCD)*.Washington, DC. http://mutcd.fhwa.dot.gov
- United States Access Board. (2007). *Public Rights-of-Way Accessibility Guidelines (PROWAG)*. Washington, D.C. http://www.access-board.gov/PROWAC/alterations/guide.htm

F.1.2 State and Local Guidelines

- California Department of Transportation. (2006). *Highway Design Manual* (HDM), *Chapter 1000: Bikeway Planning and Design.* http://www.dot.ca.gov/hq/oppd/hdm/pdf/chp1000.pdf
- California Department of Transportation. (2010). *California Manual of Uniform Traffic Control Devices for Streets and Highways, Part 9: Traffic Controls for Bicycle Facilities.* http://www.dot.ca.gov/hq/traffops/signtech/mutcdsupp/pdf/camutcd2010/Part9.pdf
- California Department of Transportation. (2005). Pedestrian and Bicycle Facilities in California: A Technical Reference and Technology Transfer Synthesis for Caltrans Planners and Engineers. http://www.dot.ca.gov/hq/traffops/survey/pedestrian/TR_MAY0405.pdf
- County of Los Angeles, Department of Public Works. (2004). *Los Angeles River Master Plan Landscaping Guidelines and Plant Palettes.* http://ladpw.org/wmd/watershed/LA/LAR_planting_guidelines_webversion.pdf

F.1.3 Best Practices Documents

- Alta Planning + Design and the Initiative for Bicycle & Pedestrian Innovation (IBPI). (2009). *Fundamentals of Bicycle Boulevard Planning & Design.* http://www.ibpi.usp.pdx.edu/media/BicycleBoulevardGuidebook.pdf
- Association of Pedestrian and Bicycle Professionals (APBP). (2010). *Bicycle Parking Design Guidelines, 2nd Edition.*
- City of Berkeley. (2000). *Bicycle Boulevard Design Tools and Guidelines*. http://www.ci.berkeley.ca.us/contentdisplay.aspx?id=6652
- City of Chicago and the Pedestrian and Bicycle Information Center (PBIC). (2002). Bik*e Lane Design Guide.*http://www.activelivingresources.org/assets/chicagosbikelanedesignguide.pdf
- City of Portland Bureau of Transportation. (2010). *Portland Bicycle Master Plan for 2030.*http://www.portlandonline.com/transportation/index.cfm?c=44597

- Federal Highway Administration. (2005). *Report HRT-04-100, Safety Effects of Marked Versus Unmarked Crosswalks at Uncontrolled Locations.* http://www.tfhrc.gov/safety/pubs/04100/
- Federal Highway Administration. (2001). *Designing Sidewalks and Trails for Access.*http://www.fhwa.dot.gov/environment/sidewalk2/contents.htm
- Institute of Transportation Engineers Pedestrian and Bicycle Council. (2003). *Innovative Bicycle Treatments.*
- King, Michael, for the Pedestrian and Bicycle Information Center. (2002). *Bicycle Facility Selection: A Comparison of Approaches.* Highway Safety Research Center, University of North Carolina – Chapel Hill. http://www.bicyclinginfo.org/pdf/bikeguide.pdf
- National Association of City Transportation Officials, NACTO Urban Bikeway Design Guide, (2011), http://nacto.org/cities-for-cycling/design-guide/
- Oregon Department of Transportation. (1995). *Oregon Bicycle and Pedestrian Plan.* http://www.oregon.gov/ODOT/HWY/BIKEPED/planproc.shtml
- Rosales, Jennifer. (2006). *Road Diet Handbook: Setting Trends for Livable Streets.* Institute of Transportation Engineers.

F.2 Experimental Projects

Most of the design concepts in **Section F.5** are based on uniform standards outlined in the *California Highway Design Manual, Chapter 1000 – Bikeway Planning and Design*; *Manual of Uniform Traffic Control Devices* (CA MUTCD) 2010, Part 9 Traffic Controls for Bicycle Facilities and the American Association of State Highway and Transportation Officials (AASHTO) *Guide for the Development of Bicycle Facilities*. The toolbox also includes treatments that as yet have not been approved by the State of California Department of Transportation and/or the Federal Highway Administration. California State law requires the State to adopt uniform standards, and for local agencies to conform to these standards. California allows approved experimental projects on a case by case basis as approved by the California Traffic Control Devices Committee (CTCDC) and FHWA. These approved experimental projects are studied by the CTCDC and FHWA as a means to consider changes to these uniform standards.

These Design Guidelines contain several innovative treatments, such as cycle tracks, for which other jurisdictions both in California and in other states are experimenting. The State of California may at some future time approve these treatments, or other treatments not provided in these Design Guidelines, for use by all local agencies. As additional designs and standards are adopted by the State of California, the County will include those innovative treatments in the Plan's toolbox of treatments. The County promotes the use of these innovative treatments and will apply for and implement experimental projects utilizing them where cost effective and where such projects enhance the safety of bicycles, pedestrians, and motorists.

The process and requirements related to requests for approval for an experimental project from FHWA and CTCDC is outlined in the CA MUTCD. Examples of the processes to request and conduct experimental projects from the CTCDC and FHWA are shown in **Chart F-1** and **Chart F-2**, respectively. Per State guidelines, "experimental projects shall terminate at the end of the approved period unless an extension is granted, and all experimental devices and applications shall be removed unless specific permission is given for continued operation."

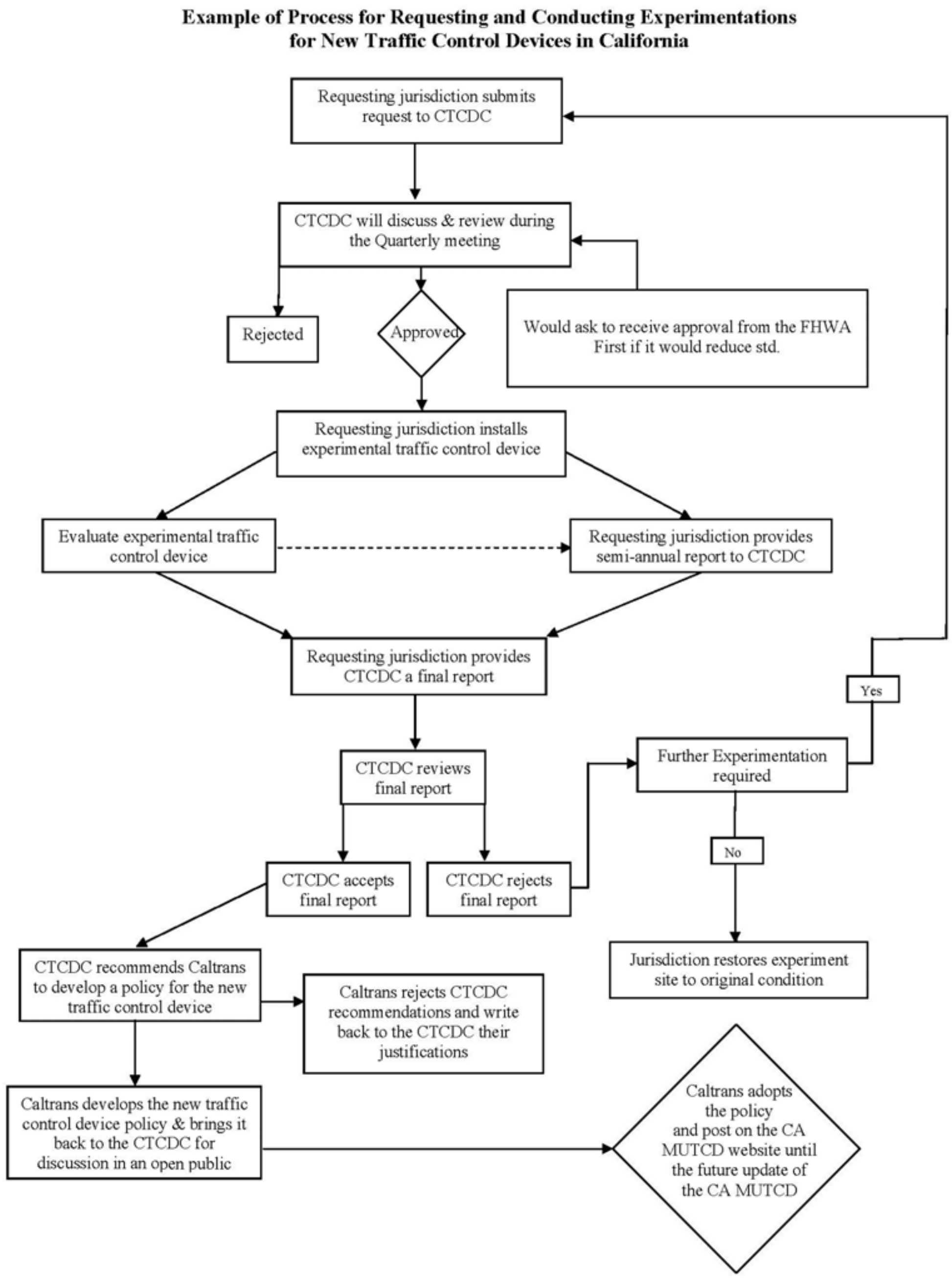


Chart F-1 – CTCDC Experimental Process

Reference: California Department of Transportation website

link: http://www.dot.ca.gov/hq/traffops/signtech/newtech/others/example-implementation.pdf

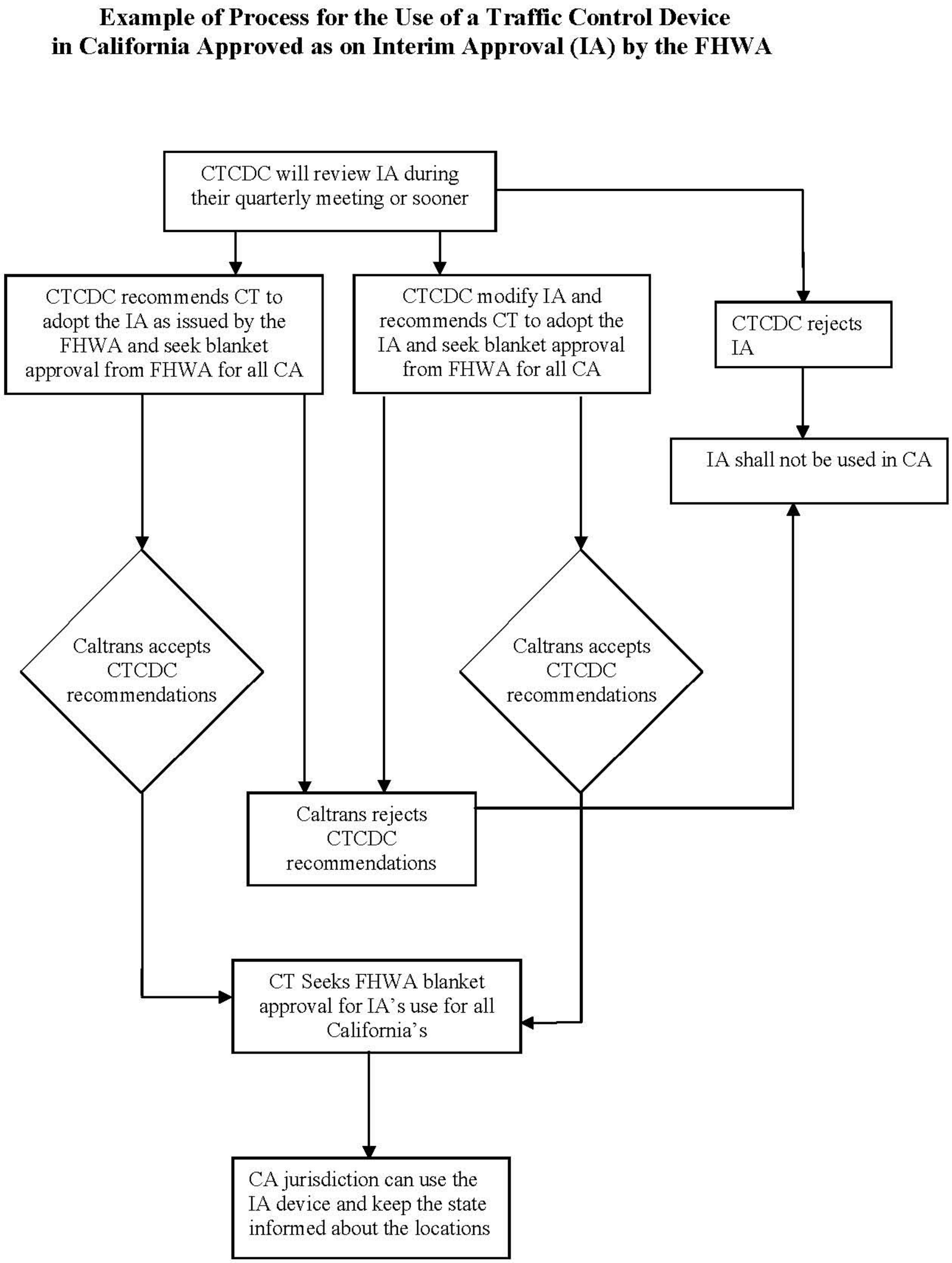


Chart F-2 – FHWA Experimental Process

Reference: California Department of Transportation website

link: http://www.dot.ca.gov/hq/traffops/signtech/newtech/others/example-experimentprocess.pdf

F.3 The Bicycle as a Design Vehicle

Similar to motor vehicles, bicyclists and their bicycles come in a variety of sizes and configurations. This variation can take the form of the variety in types of vehicle (such as a conventional bicycle, a recumbent bicycle, or a tricycle), or the behavioral characteristics and comfort level of the cyclist riding the vehicle. Any bicycle facility undergoing design should consider what types of design vehicles will be using the facility and design with that set of critical dimensions in mind.

F.3.1 Physical Dimensions

The operating space and physical dimensions of a typical adult bicyclist are shown in **Figure F-1**. Clear space is required for the bicyclist to be able to operate within a facility; this is why the minimum operating width is greater than the physical dimensions of the bicyclist. Although four feet is the minimum acceptable operating width, five feet or more is preferred.

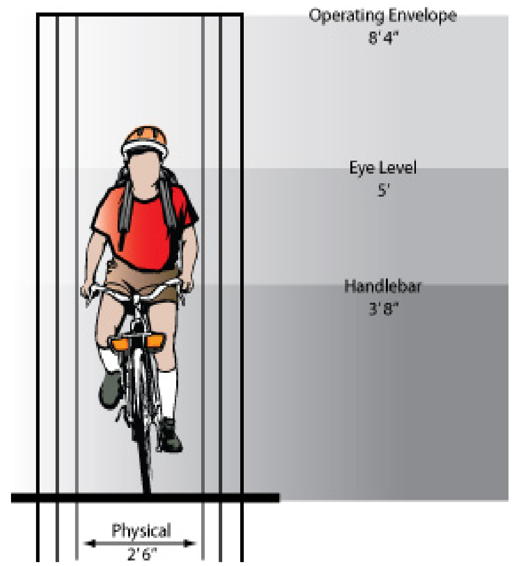


Figure F-1: Standard Bicycle Rider Dimensions

Outside of the design dimensions of a typical bicycle, there are many commonly used pedal driven cycles and accessories that should be considered when planning and designing bicycle facilities. The most common types of bicycles are depicted in **Figure F-2.**

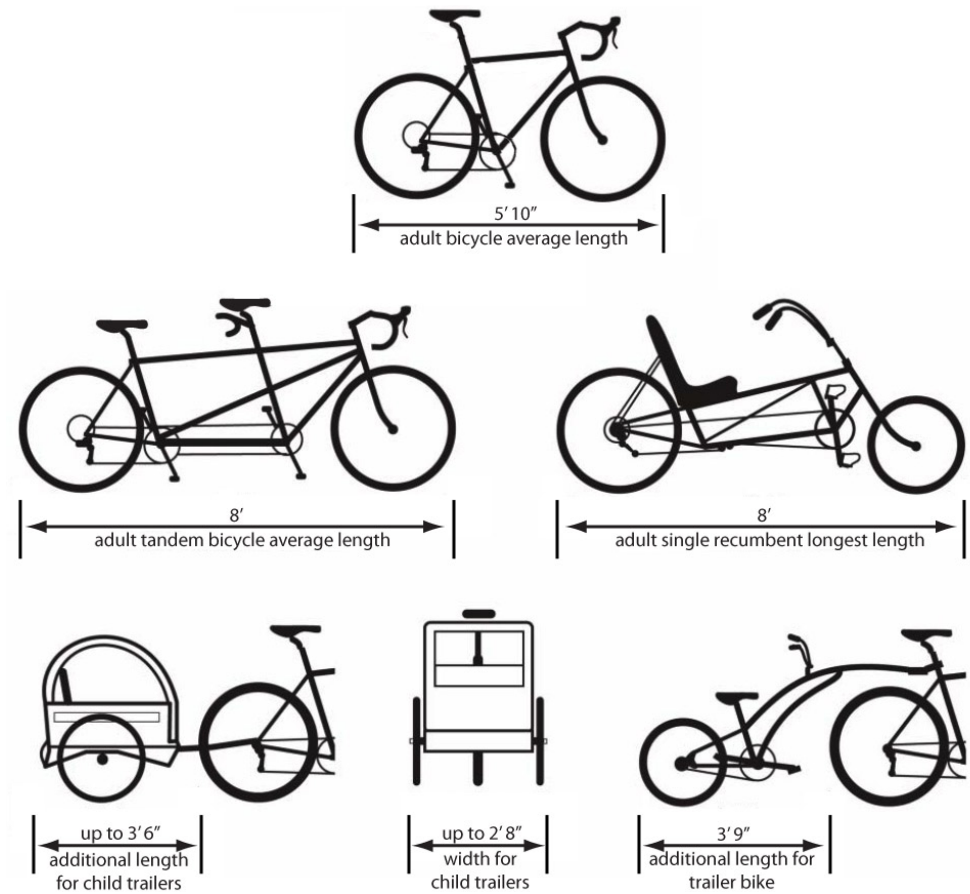


Figure F-2: Various Bicycle Dimensions

Table F-1 summarizes the typical dimensions for most commonly encountered bicycle design vehicles.

Table F-1: Bicycle as Design Vehicle – Typical Dimensions

Bicycle Type	Feature	Typical Dimensions
Upright Adult Bicyclist	Physical width	2 ft 6 in
	Operating width (Minimum)	4 ft
	Operating width (Preferred)	5 ft
	Physical length	5 ft 10 in
	Physical height of handlebars	3 ft 8 in
	Operating height	8 ft 4 in
	Eye height	5 ft
	Vertical clearance to obstructions (tunnel height, lighting, etc.).	10 ft
	Approximate center of gravity	2 ft 9 in to 3 ft 4 in
Recumbent Bicyclist	Physical length	7 ft
	Eye height	3 ft 10 in
Tandem Bicyclist	Physical length	8 ft
Bicyclist with child trailer	Physical length	10 ft
	Physical width	2 ft 6 in
Hand Bicyclist	Eye height	2 ft 10 in
Inline Skater	Operating width (sweep width)	5 ft

F.3.2 Design Speed

The speed that various types of bicyclists can be expected to maintain under various conditions can also have influence over the design of facilities such as shared use paths. **Table F-2** provides typical speeds of various types of bicyclists for a variety of conditions.

Table F-2: Bicycle as Design Vehicle – Design Speed Expectations

Bicycle Type	Feature	Typical Speed
Upright Adult Bicyclist	Level surface	15 mph
	Crossing Intersections	10 mph
	Downhill	30 mph
	Uphill	5-12 mph
Recumbent Bicyclist	Level surface	18 mph

F.3.3 Types of Cyclists

The skill level of the cyclist also provides a dramatic variance on expected speeds and expected behavior. There are several systems of classification currently in use within the bicycle planning and engineering professions. These classifications can be helpful in understanding the characteristics and infrastructure preferences of different cyclists. However, it should be noted that these classifications may change in type or proportion over time as infrastructure and culture evolve. Often times an instructional course can instantly change a less confident cyclist to one that can comfortably and safely share the roadway with vehicular traffic. Bicycle infrastructure should be planned and designed to accommodate as many user types as possible with separate or parallel facilities considered to provide a comfortable experience for the greatest number of cyclists.

A classification system that is currently in use in the Pacific Northwest and also under consideration for the Draft 2009 AASHTO *Guide for the Development of Bicycle Facilities* provides the following bicycle user types:

- **Strong and Fearless** (Very low percentage of population) – Characterized by bicyclists that will typically ride anywhere regardless of roadway conditions or weather. These bicyclists can ride faster than other user types, prefer direct routes and will typically choose roadway connections, even if shared with vehicles, over separate bicycle facilities such as class I pathways.
- **Enthused & Confident** (5-10% of population) – This user group encompasses the 'intermediate' cyclists who are mostly comfortable riding on all types of bicycle facilities but will usually prefer low traffic streets or class I pathways when available. These cyclists may deviate from a more direct route in favor of a preferred facility type. This group includes all kinds of cyclists including commuters, recreationalists, racers, and utilitarian cyclists.
- **Interested But Concerned** (approximately 60% of population) – This user type makes up the bulk of the cycling population and represents cyclists who typically only ride a bicycle on low traffic streets or class I pathways under favorable conditions and weather. These cyclists perceive significant barriers towards increased use of cycling with regards to traffic and safety. These cyclists may become "Enthused & Confident" with encouragement, education and experience.
- **No Way, No How** (approximately 30% of population) – Persons in this category are not cyclists, and perceive severe safety issues with riding in traffic. Some people in this group may eventually give

cycling a second look and may progress to the user types above. A significant portion of these people will never ride a bicycle under any circumstances.

F.4 Routine Accommodation of Bicyclists (Complete Streets)

Bicyclists have legal access to all County streets. While this Plan identifies a specific subset of streets to be designated as bikeways, many bicyclists will need to use other streets to reach their destinations. Therefore, it is important that all roadways be designed to accommodate bicyclists. The California Complete Streets Act of 2008 (AB 1358) mandates that cities and counties plan for all users of roadways.

> *"Commencing January 1, 2011, upon any substantive revision of the circulation element, the legislative body shall modify the circulation element to plan for a balanced, multimodal transportation network that meets the needs of all users of streets, roads, and highways for safe and convenient travel in a manner that is suitable to the rural, suburban, or urban context of the general plan....*
>
> *For purposes of this paragraph, "users of streets, roads, and highways" means bicyclists, children, persons with disabilities, motorists, movers of commercial goods, pedestrians, users of public transportation, and seniors."*

An engineering study, accounting for various site-specific factors including traffic speeds, parking turnover, bus and truck volumes, will determine whether it is safe to use "absolute minimum" travel and turn lane widths in order to accommodate bike lanes.

Figure F-3 through **Figure F-8** illustrate potential ways to configure roadways in order to enhance bicycle access. For roads without curb and gutter, the minimum bike lane width allowed in the Caltrans Highway Design Manual is four feet. The cross-sections shown below are not intended to be standards; they are merely illustrations how bikeways may be included on County roadways.

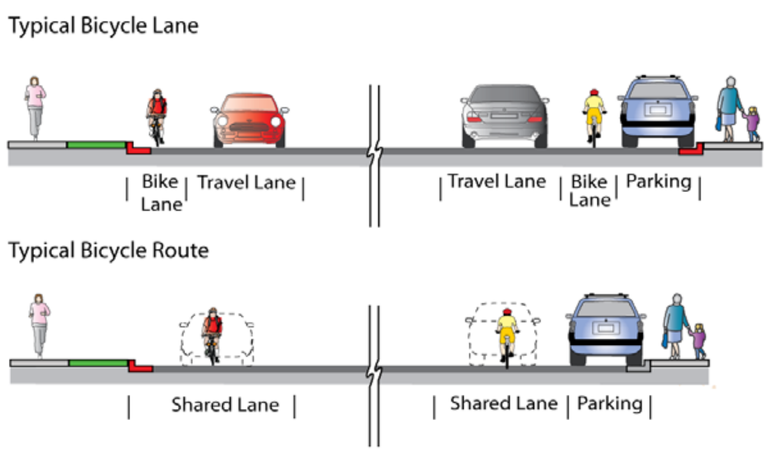


Figure F-3: Typical bicycle lane and bicycle route accommodation with and without on street parking

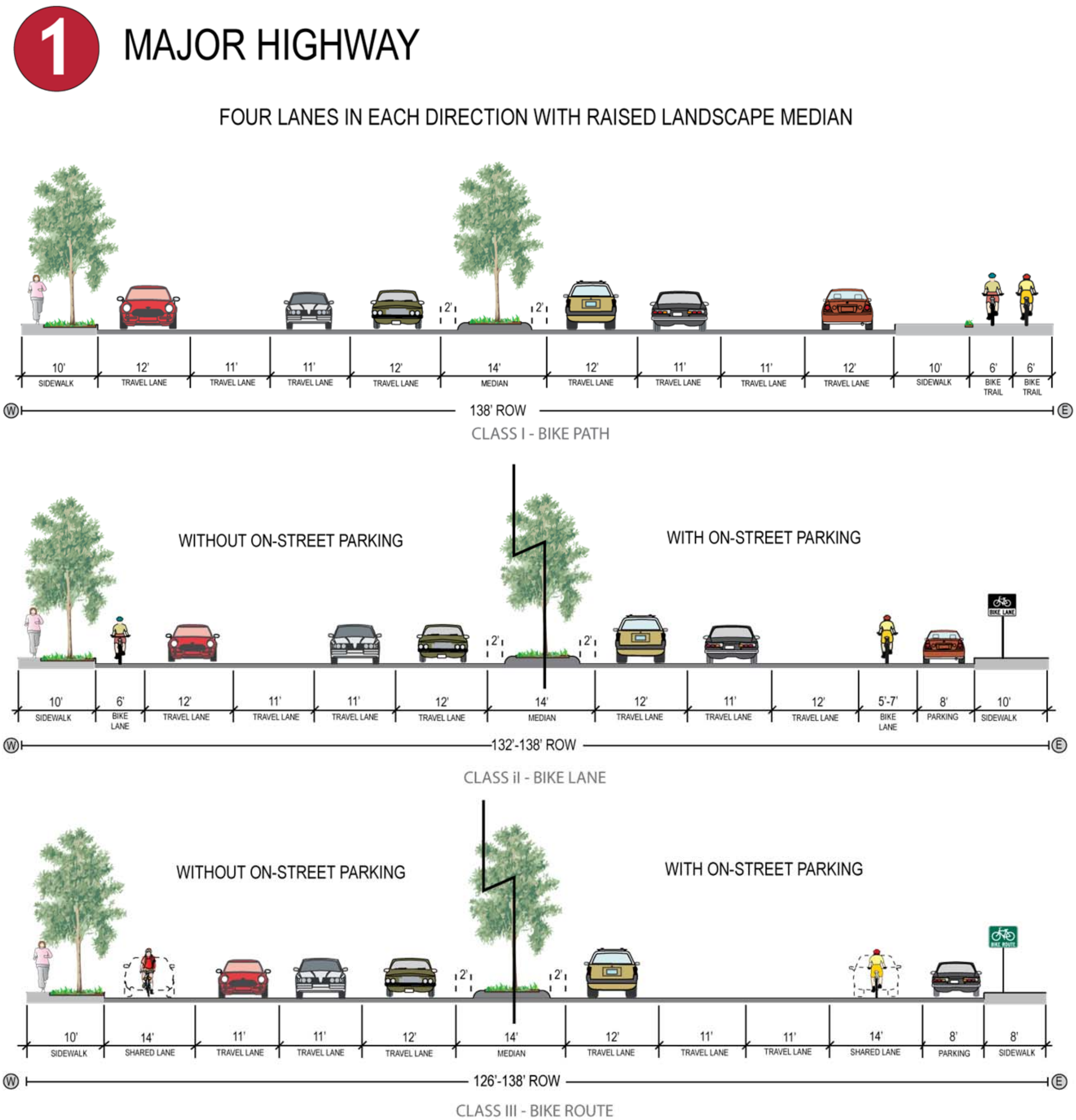


Figure F-4: Major Highway with four traffic lanes, ROW ≥100'

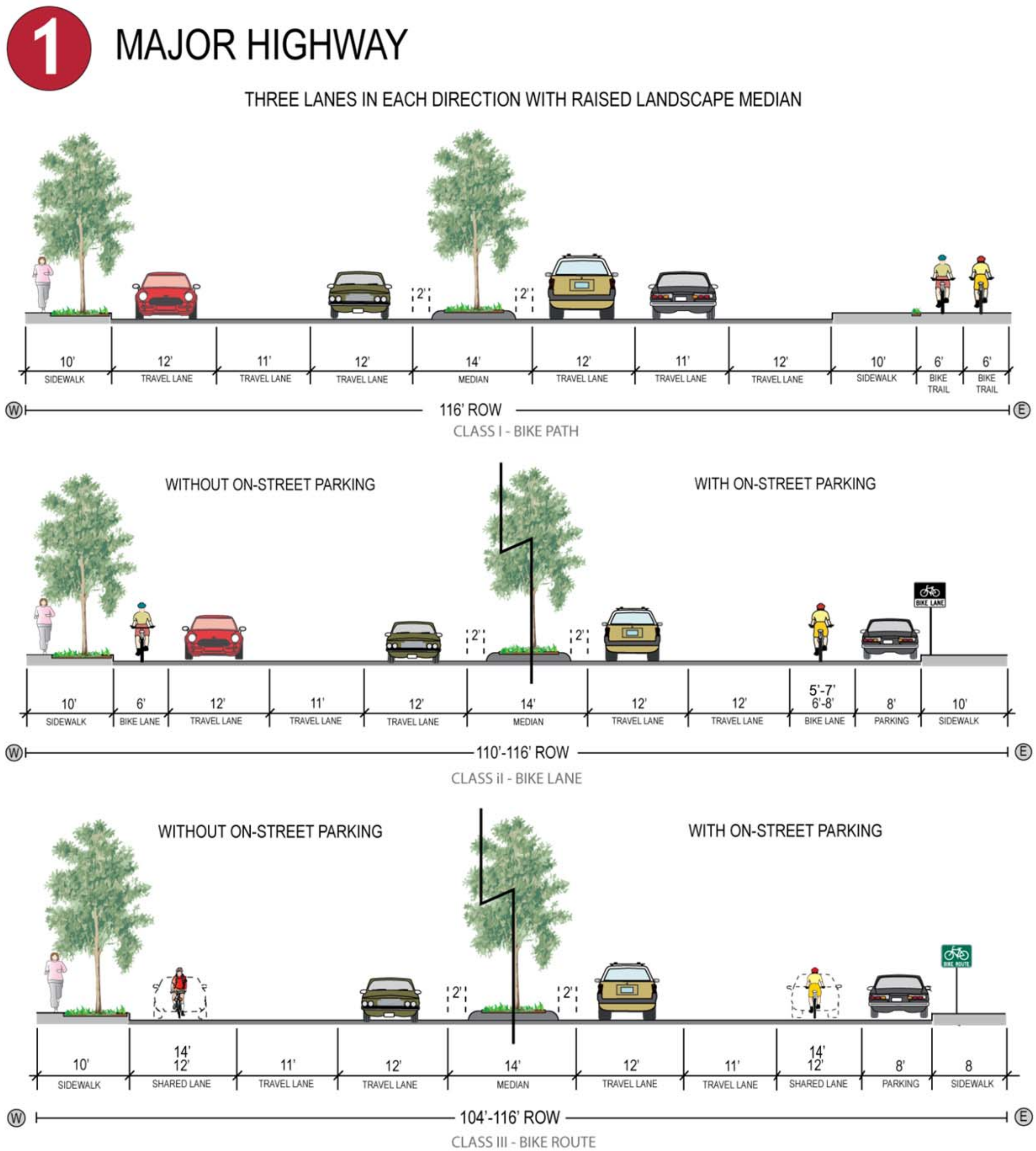
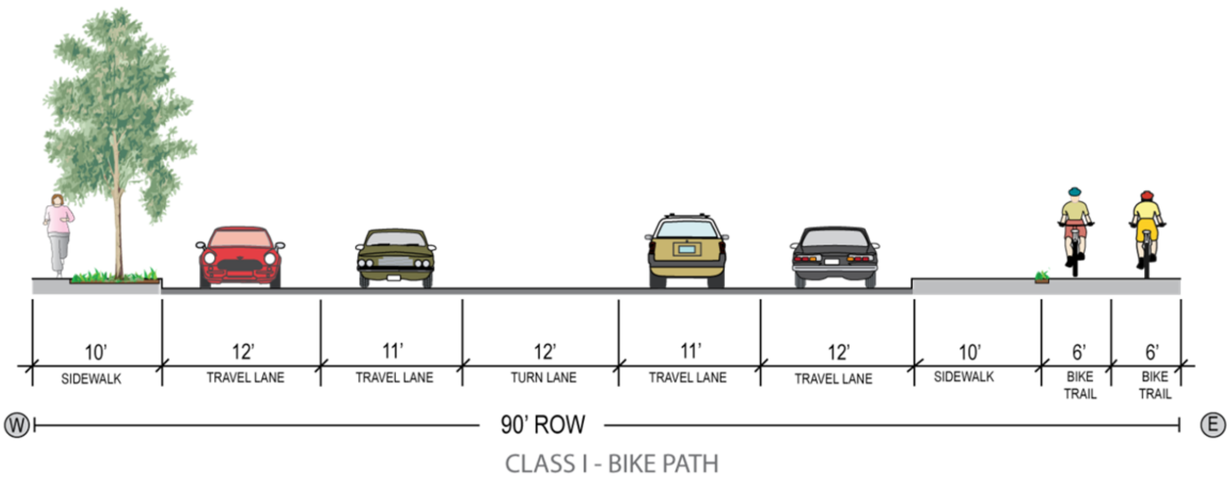
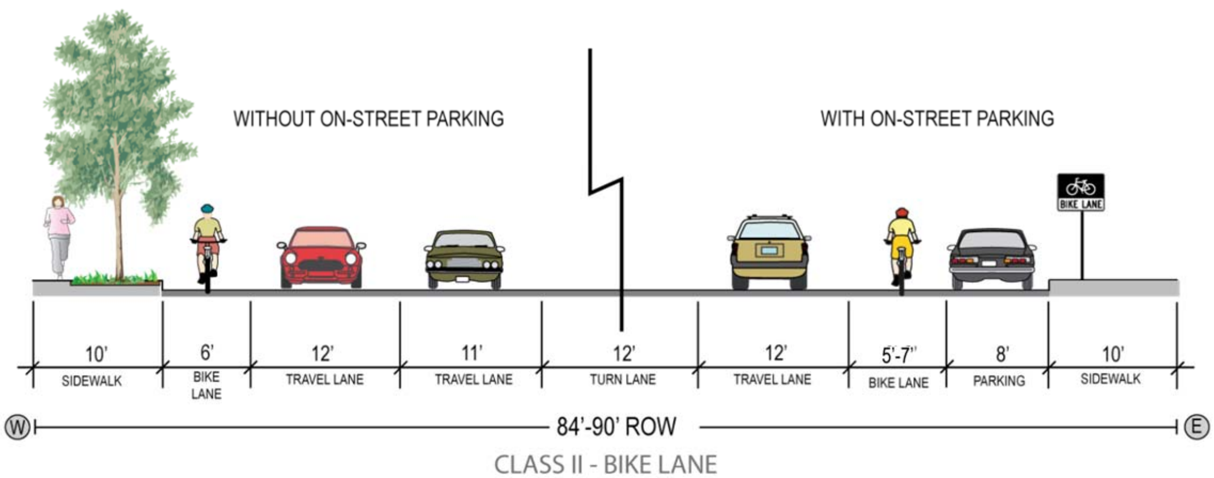


Figure F-5: Major Highway with three traffic lanes, ROW ≥100'

2 SECONDARY HIGHWAYS





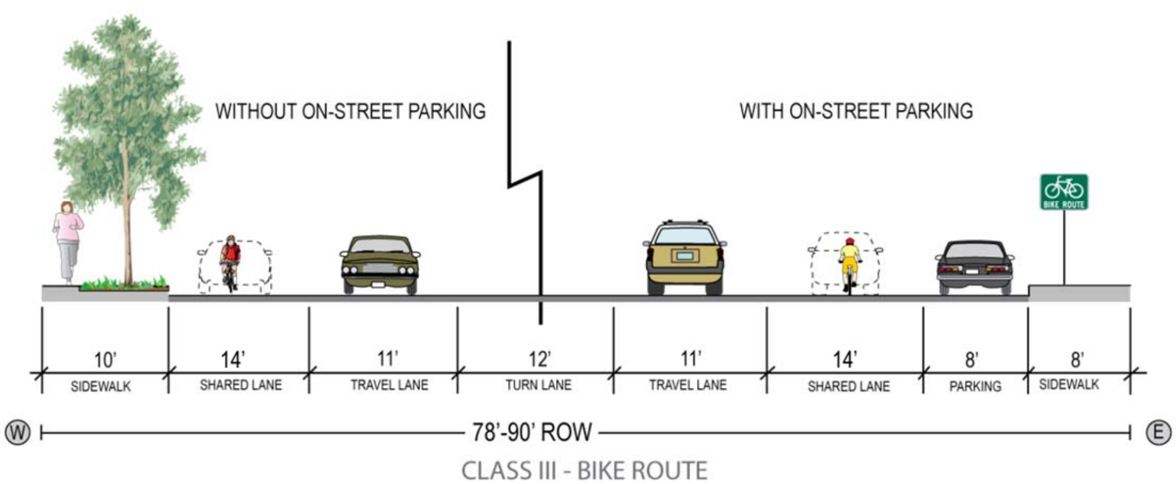


Figure F-6: Secondary Highway ROW 80'-90'

3 LIMITED SECONDARY HIGHWAY

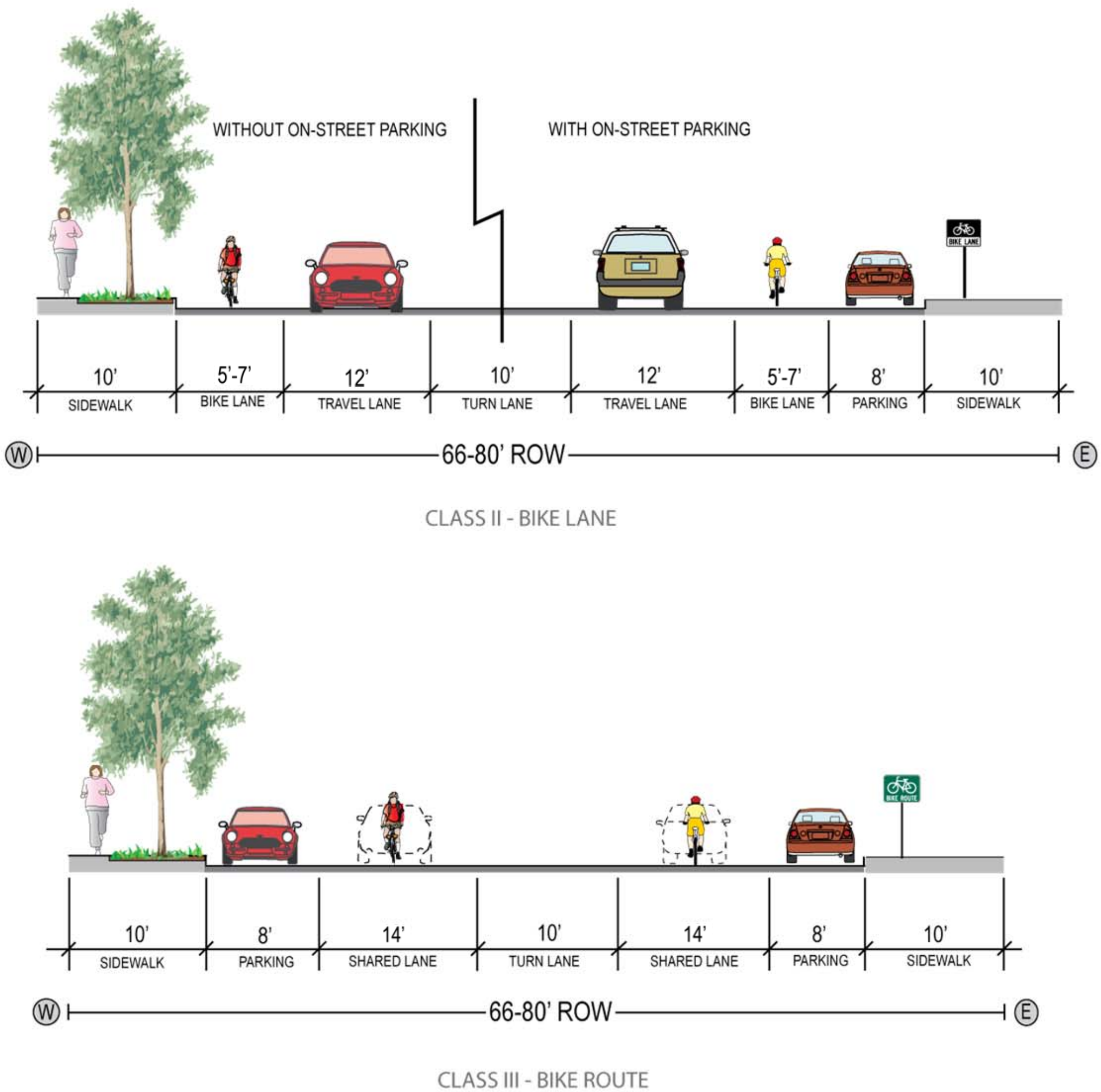


Figure F-7: Limited Secondary Highway ROW 66'-79'

4 LOCAL STREET

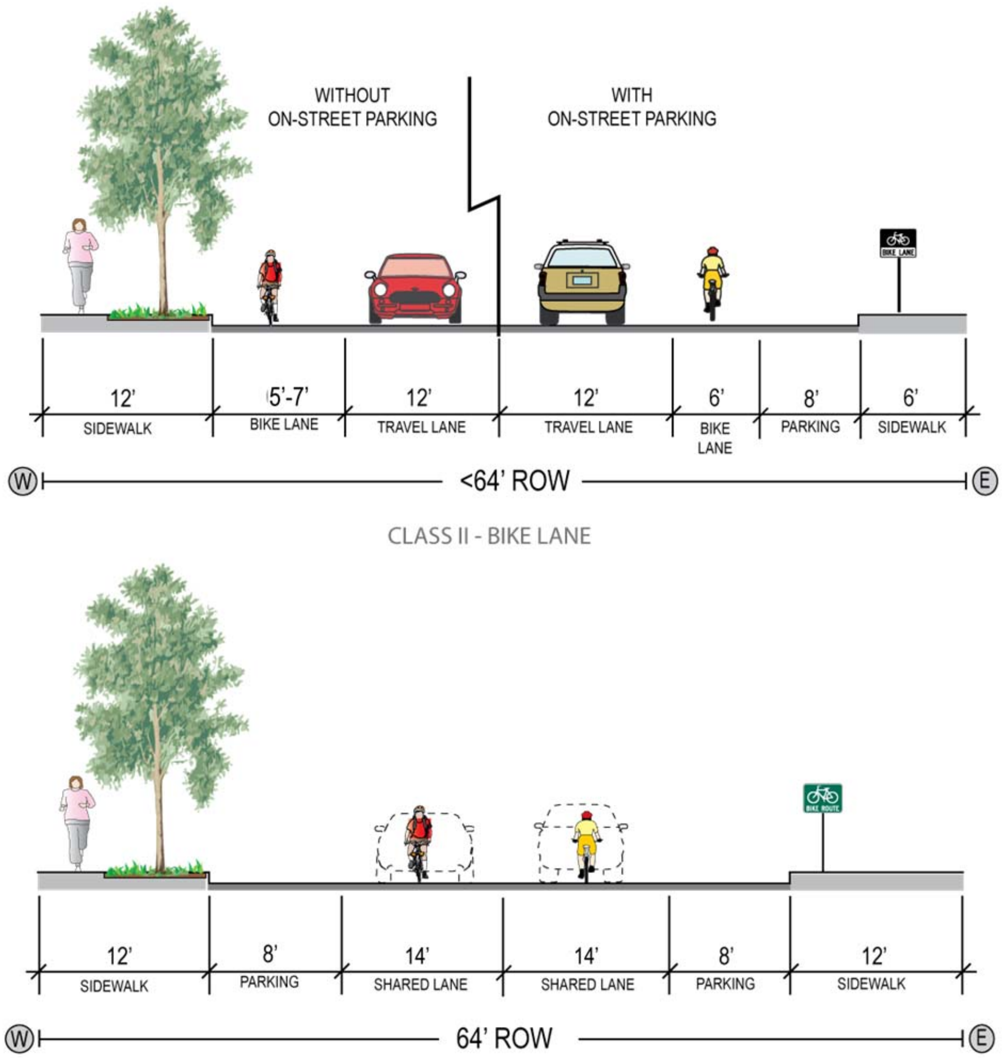


Figure F-8: Local street ROW <64'

F.5 Design Toolbox

F.5.1 Class I Bikeway

Bike Path (Class I Bikeway) Design Guidelines

A Class I facility allows for two-way, off-street bicycle and pedestrian traffic and also may be used by pedestrians, skaters, wheelchair users, and other non-motorized users. These facilities are frequently found in parks, along rivers, and in greenbelts or utility corridors where there are few conflicts with motorized vehicles. Class I facilities can also include amenities such as lighting, signage, and fencing (where appropriate). In California, design of Class I facilities is dictated by Chapter 1000 of the Highway Design Manual. Class I facilities can provide a desirable facility particularly for novice riders, recreational trips, and cyclists of all skill levels preferring separation from traffic. Class I bikeways should generally provide new travel opportunities.

Class I facilities serve bicyclists and pedestrians and provide additional width over a standard sidewalk. Facilities may be constructed adjacent to roads, through parks, or along linear corridors such as active or abandoned railroad lines or waterways. Regardless of the type, paths constructed next to the road must have some type of vertical (e.g., curb or barrier) or horizontal (e.g., landscaped strip) buffer separating the path area from adjacent vehicle travel lanes.

Class I Bikeways (also referred to as "bike trails" or "paths") are often viewed as recreational facilities, but they are also important corridors for utilitarian trips.

Elements that enhance Class I bikeway design include:

- Providing frequent access points from the local road network; if access points are spaced too far apart, users will have to travel out of direction to enter or exit the path, which will discourage use
- Placing directional signs to direct users to and from the path
- Building to a standard high enough to allow heavy maintenance equipment to use the path without damage
- Terminating the path where it is easily accessible to and from the street system, preferably at a controlled intersection or at the beginning of a dead-end street. If poorly designed, the point where the path joins the street system can put pedestrians and cyclists in a position where motor vehicle drivers do not expect them
- Identifying and addressing potential safety and security issues up front
- Whenever possible, and especially where heavy use can be expected, separate bicycle paths and pedestrian walkways should be provided to reduce conflicts
- Providing accessible parking space(s) at trailheads and access points
- Limiting the number of at-grade crossings with streets or driveways

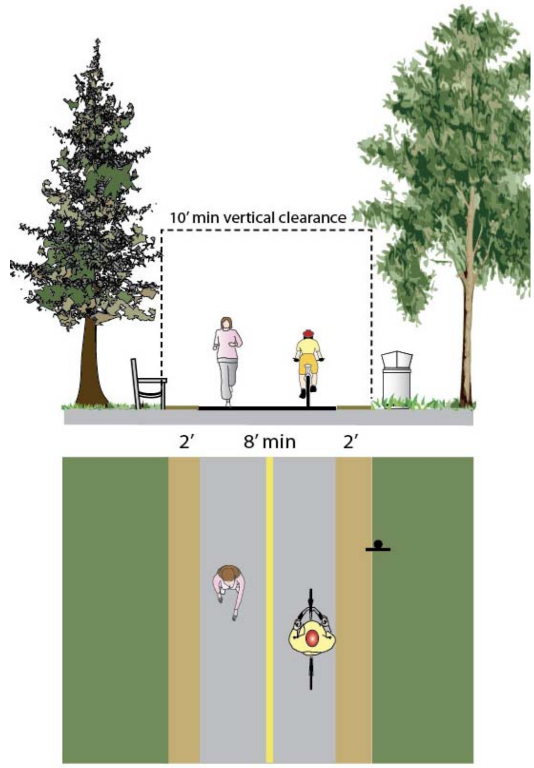
Bike Path (Class I Bikeway) Design Guidelines (continued)

A hard surface should be used for Class I bikeways. Concrete, while more expensive than asphalt, is the hardest of all surfaces and lasts the longest. Dyes, such as reddish pigments, can be added to concrete to increase the aesthetic value of the facility itself. When concrete is used the Class I bikeway should be designed and installed using the narrowest possible expansion joints to minimize the amount of 'bumping' cyclists experience on the facility.

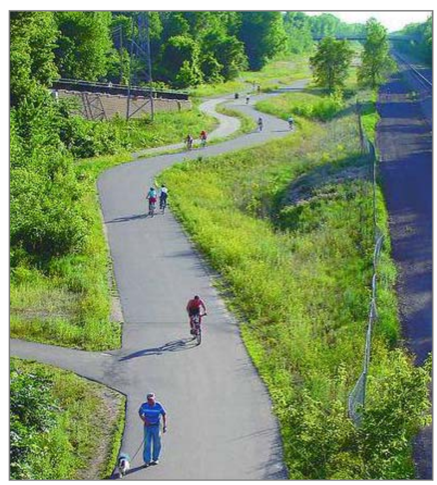
Where possible, Class I bikeways should be designed according to ADA standards. Topographic, environmental, or space constraints may make meeting ADA standards difficult and sometimes prohibitive. Prohibitive impacts include harm to significant cultural or natural resources, a significant change in the intended purpose of the trail, requirements of construction methods that are against federal, state or local regulations, or presence of terrain characteristics that prevent compliance.

Design Considerations

- Width standards:
    - 8' is the minimum allowed for a two-way bikeway and is only recommended for low traffic situations
    - 10' is recommended in most situations and will be adequate for moderate to heavy use
    - 12' is recommended for heavy use situations with high concentrations of multiple users such as joggers, bicyclists, rollerbladers, and pedestrians
- Lateral Clearance: 2' minimum or 3' preferred shoulder on both sides (required by Caltrans' HDM, Chapter 1000)
- Overhead Clearance: 8' minimum, 10' recommended to accommodate first responders such as fire trucks or ambulance
- Minimum design speed: 25 mph. Speed bumps or other surface irregularities should never be used to slow bicycles
- Recommended maximum grade: 5%. Steeper grades can be tolerated for short distances (see guidelines following)
- Loading: AASHTO H-20. Heavy duty traffic load requirement



Recommended Class I Bikeway design.



The Cedar Lake Regional Trail in Minneapolis, MN has sufficient width to accommodate a variety of users.

Reference

California Highway Design Manual Chapter 1000
AASHTO Guide for the Development of Bicycle Facilities
U.S. Access Board, Public Rights-of-Way Accessibility Guidelines (PROWAG).
FHWA. Designing Sidewalks and Trails for Access.

Class I Bikeway: Along Utility Corridors/Waterway Corridors

Several utility and waterway corridors in Los Angeles offer excellent Class I bikeway and bikeway gap closure opportunities. Utility corridors typically include power line and sewer corridors, while waterway corridors include canals, drainage ditches, rivers, and beaches. Class I bikeway development along these corridors already exists in the Los Angeles area (e.g., along the Los Angeles and San Gabriel rivers). The LARMP Landscape Guidelines (2004) require service road access on both sides of the river and wash, which is compatible with bicycle path use.

Access Points

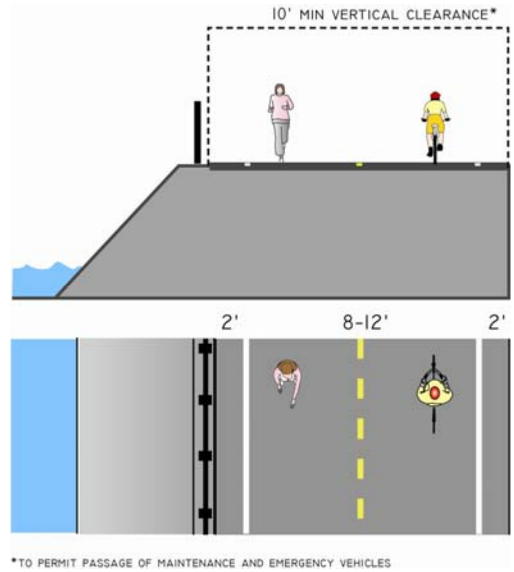
Any access point to the bikeway should be well-defined with appropriate signage designating the pathway as a bicycle facility and prohibiting motor vehicles. Removable bollards can prevent motorized access while preserving maintenance access to authorized vehicles (see bollards section for additional guidance). A gate that can prevent any access to the facility should also be present in case of path closure, to prevent public access to the bike path during maintenance activities or flooding. Advanced warning signs with detour information for path closures should be posted 14 days prior to planned closure. Signs should be posted at the closed access point and at the two adjacent access points in either direction.

Fencing

Public access to flood control channels or canals is undesirable for public safety. Hazardous materials, deep water or swift current, steep, slippery slopes, and debris are all potential hazards. Fencing can help keep path users within the designated travel way. The County of Los Angeles requires a 5' minimum height fences or railings to retain bicyclists. Fencing on the channel side should be constructed out of metal such as chain link or wrought iron, and allow a view down to the channel. Fencing on the non-channel side can take several forms. Bike path owners should consider constructing a masonry wall if the path is adjacent to high-security land-uses. Visually permeable fencing is acceptable for non-sensitive areas, with fence types including chain link or wrought iron in urban areas, to picket, split rail, or post and cable fencing in rural areas.

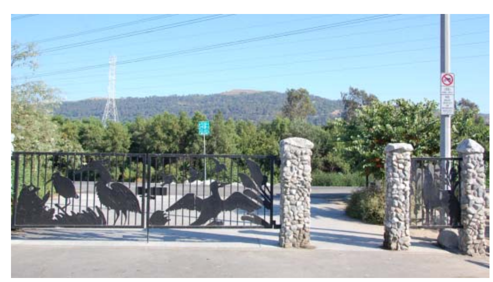
Landscaping

The Los Angeles and San Gabriel River Watershed Councils provide guidelines for sustainable re-vegetation of public right-of-way. Landscaping along bikeways within river corridors will conform to the Los Angeles River Master Plan Landscaping Guidelines and Plant Palettes and standards established by relevant Los Angeles County River Master Plans.



Recommended design for bikeways in flood control channels.

Flood control channels are a good opportunity to develop a continuous off-street pathway.



Gate at access point to San Gabriel River Bikeway.

Class I Bikeway: Along Utility Corridors/Waterway Corridors (continued)

Ownership and Liability

Owners of Bike Paths shall fund landscaping and landscaping maintenance at their cost. Bike paths and landscaping shall be non-invasive and compatible with existing and future flood control and maintenance uses. Operators of bike paths shall indemnify the Los Angeles County Flood Control District (LACFCD) for liability associated with bike paths within LACFCD right-of-way. Operators of bike paths shall assume all responsibility for opening and closing access points.

Design Considerations

- Meet or exceed Caltrans standards
- Use permeable surfacing where possible; where asphalt is required, grade towards infiltration strips
- Meet ADA standards to the maximum extent feasible
- 12' minimum vertical clearance to permit passage of maintenance and emergency vehicles
- Operators of bike paths shall indemnify the Los Angeles County Flood Control District (LACFCD) for liability associated with Bike Paths usage within LACFCD right-of-way
- Operators of bike paths are to fund landscaping and landscaping maintenance at their cost.
- Bike path landscaping is to be non-invasive. The plant palette in the LA River Master Plan is a good source for selecting low maintenance California Native Plants that are well suited to the environment
- Bike paths and landscaping along rivers and channels are to be compatible with existing and future flood control and maintenance uses
- Operators of Bike paths are to assume all responsibility for opening and closing access points

Reference

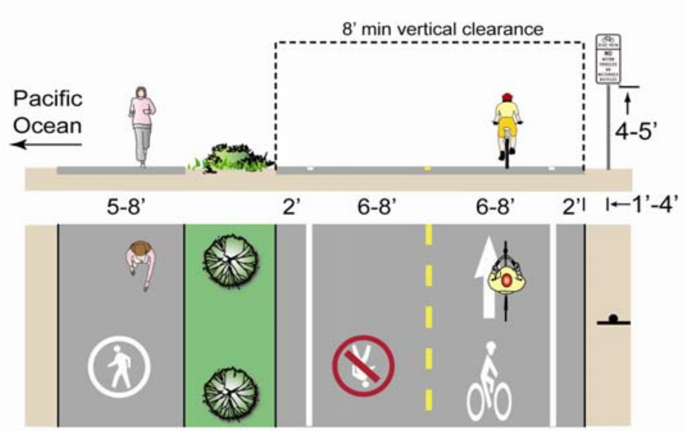
- AASHTO Guide for the Development of Bicycle Facilities
- California Highway Design Manual Chapter 1000
- LARMP Landscape Guidelines (2004)

Class I Bikeway: Coastal Paths

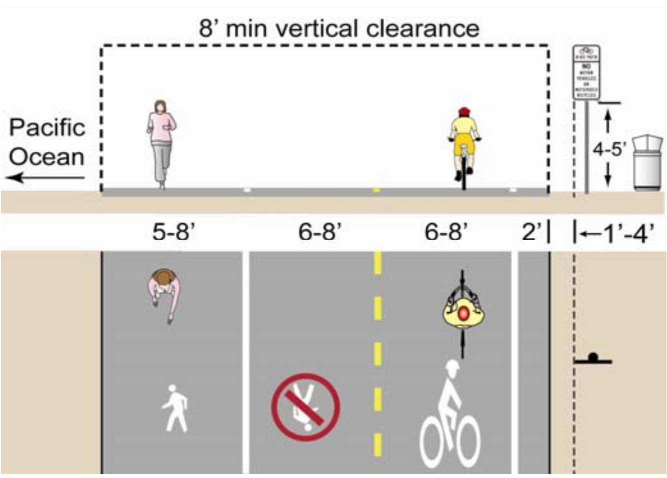
Coastal Paths attract many types of pathway users and conveyances. Bicyclists, pedestrians, rollerbladers, strollers, and pedal cabs typically compete for space. To provide an adequate and pleasant facility, adequate widths and separation are needed to maintain a good pathway environment.

Offsetting of the pedestrian path should be provided if possible. Otherwise, physical separation should be provided in the form of striping or landscaping.

The multi-use path should be located on whichever side of the path will result in the fewest number of anticipated pedestrian crossings. For example, the multi-use path should not be placed adjacent to large numbers of destinations. Site analysis of each project is required to determine expected pedestrian behavior.



Preferred design, with separation.



Preferred design, no separation.

Design Considerations

- Preferred Width: 17 feet
- Multi-use path: 12 feet minimum; 17 feet with parallel 5 foot pedestrian path, with 1 foot clearance for signage
- Pavement Markings: Facility should have graphic markings for non-English speakers
- Striping: Dashed centerline and shoulder striping should be used
- Surfacing: Paved surface adequate to support maintenance vehicles. Required thickness dependent upon paving material and subgrade

Reference

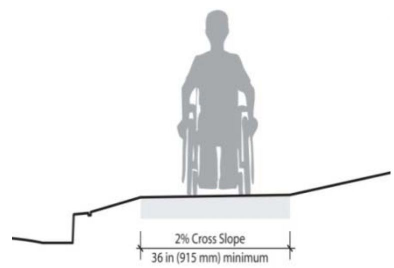
- California MUTCD
- Caltrans Highway Design Manual (Chapter 1000)
- AASHTO Guide for the Development of Bicycle Facilities

Class I Bikeway: Accessibility

Slopes typically should not exceed 5%. However certain conditions may require the use of steeper slope. For conditions exceeding a 5% slope, the recommendations are as follows:

- Up to an 8.33% slope for a 200-feet maximum run, with landings or resting intervals at minimum of 200 feet must be provided
- Up to a 10% slope for a 30-foot maximum run, with resting intervals spaced at a 30 feet minimum
- Up to 12.5 % slope for a 10-foot maximum run, with resting intervals spaced at a 10 feet minimum

The surface shall be firm and stable. The Forest Service Accessibility Guidelines defines a firm surface as one that is not noticeably distorted or compressed by the passage of a device that simulates a person who uses a wheelchair. Where rights-of-way are available, Class I bikeways can be made more accessible by creating side paths that meander away from a roadway that exceeds a 5% slope.



ADA clearance requirement.

Class I bikeways surfacing materials affects which types of users can benefit from the facility.

Design Considerations

3 foot minimum clear width where clear width of facility is less than 5 feet; passing space (5 foot section or wider) should be provided at least every 100 feet

Cross slope should not exceed 5%

Signs shall be provided indicating the length of the accessible trail segment

Ramps should be provided at roadway crossings. Tactile warning strips and auditory crossing signals are recommended.

FHWA recommends that when trails intersect roads, the design of trail curb ramps should, as a minimum, follow the recommendations provided in Chapter 7: Curb Ramps (FHWA *Designing Sidewalks and Trails for Access;*
www.fhwa.dot.gov/environment/sidewalk2/sidewalks207.htm

Reference

- American with Disabilities Act (ADA) for accessible trails
- See also FHWA. (2001).Designing Sidewalks and Trails for Access, Chapter 14: Shared Use Path Design, Section 14.5.1: Gradewww.fhwa.dot.gov/environment/sidewalk2/sidewalks212.htm#tra2

Class I Bikeway: Managing Multiple Users

On Class I bikeways that have high bicycle and pedestrian use, conflicts can arise between faster-moving bicyclists and slower bicyclists, as well as pedestrians and other users. As this is a common problem in more urban areas, a variety of treatments have been designed to alleviate congestion and minimize conflicts.

Centerline Striping

On trails of standards widths, striping the centerline identifies which side of the trail users should be on.

Trail Etiquette Signage

Informing trail users of acceptable trail etiquette is a common issue when multiple user types are anticipated. Yielding the right-of-way is a courtesy and yet a necessary part of a safe trail experience involving multiple trail users. Trail right-of-way information should be posted at trail access points and along the trail. The message must be clear and easy to understand. Where appropriate, trail etiquette systems should instruct trail users to the yielding of cyclists to pedestrians and equestrians and the yielding of pedestrians to equestrians.

Centerline striping and directional arrows encourage trail users to provide space for other users to pass.

Design Considerations

- Barrier separation – vegetated buffers or barriers, elevation changes, walls, fences, railings and bollards
- Distance separation – differing surfaces
- User behavior guidance signage

Reference

- The 2009 CA-MUTCD Section 9C.03 contains additional information about centerline striping on a trail

Class I Bikeway: Roadway Crossings

While at-grade crossings create a potentially high level of conflict between Class I bikeway users and motorists, well-designed crossings have not historically posed a safety problem for path users. This is evidenced by the thousands of successful paths around the United States with at-grade crossings. In most cases, at-grade path crossings can be properly designed to a reasonable degree of safety and can meet existing traffic and safety standards.
Evaluation of crossings involves analysis of vehicular and anticipated path user traffic patterns, including

- Vehicle speeds
- Street width
- Sight distance
- Traffic volumes (average daily traffic and peak hour traffic)
- Path user profile (age distribution, destinations served)

Consideration must be given for adequate warning distance based on vehicle speeds and line of sight. Visibility of any signing used to mark the crossing is absolutely critical. Catching the attention of motorists jaded to roadway signs may require additional alerting devices such as a flashing light, roadway striping or changes in pavement texture. Signing for Class I bikeway users must include a standard "STOP" sign and pavement marking, sometimes combined with other features such as a kink in the pathway to slow bicyclists.

Design Considerations

At-grade Class I bikeway/roadway crossings that provide assistance for cyclists and pedestrians crossing the roadway generally will fit into one of four basic categories:

- Type 1: Marked/Unsignalized - Uncontrolled crossings include trail crossings of residential, collector, and sometimes major arterial streets or railroad tracks.
- Type 1+: Marked/Enhanced – Unsignalized intersections can provide additional visibility with flashing beacons and other treatments.
- Type 2: Route Users to Existing Signalized Intersection - Trails that emerge near existing intersections may be routed to these locations, provided that sufficient protection is provided at the existing intersection.
- Type 3: Signalized/Controlled - Trail crossings that require signals or other control measures due to traffic volumes, speeds, and trail usage.
- Type 4: Grade-separated crossings - Bridges or under-crossings provide the maximum level of safety but also generally are the most expensive and have right-of-way, maintenance, and other public safety considerations.

An offset crossing forces pedestrians to turn and face the traffic they are about to cross.

Reference

- California Highway Design Manual Chapter 1000
- AASHTO Guide for the Development of Bicycle Facilities
- Federal Highway Administration (FHWA) Report, Safety Effects of Marked vs. Unmarked Crosswalks at Uncontrolled Locations

Class I Bikeway: Roadway Crossings (continued)

Summary of Path/Roadway At-Grade Crossing Recommendations[iv]

Roadway Type	Vehicle ADT ≤ 9,00			Vehicle ADT > 9,000 to 12,000			Vehicle ADT >12,000 to 15,000			Vehicle ADT > 15,000		
	Speed Limit (mph)**											
	30	35	40	30	35	40	30	35	40	30	35	40
2 Lanes	1	1	1/1+	1	1	1/1+		1	1+/3		1/1+	1+/3
3 Lanes		1	1/1+		1/1+	1/1	1/1+	1/1+	1+/3	1	1+	1+/3
Multi-Lane (4 +) w/ raised median***	1	1	1/1+	1	1/1+	1+/3	1/1+	1/1+	1+/3	1+/3	1+/3	1+/3
Multi-Lane (4 +) w/o raised median	1	1/1+	1+/3	1/1+	1/1+	1+/3	1+/3	1+/3	1+/3	1+/3	1+/3	1+/3

**General Notes: Crosswalks should not be installed at locations that could present an increased risk to pedestrians, such as where there is poor sight distance, complex or confusing designs, a substantial volume of heavy trucks, or other dangers, without first providing adequate design features and/or traffic control devices. Adding crosswalks alone will not make crossings safer, nor will they necessarily result in more vehicles stopping for pedestrians. Whether or not marked crosswalks are installed, it is important to consider other pedestrian facility enhancements (e.g., raised median, traffic signal, roadway narrowing, enhanced overhead lighting, traffic-calming measures, curb extensions), as needed, to improve the safety of the crossing. These are general recommendations; good engineering judgment should be used in individual cases for deciding which treatment to use.*

For each pathway-roadway crossing, an engineering study is needed to determine the proper location. For each engineering study, a site review may be sufficient at some locations, while a more in-depth study of pedestrian volume, vehicle speed, sight distance, vehicle mix, etc. may be needed at other sites.

*** Where the speed limit exceeds 40 mph marked crosswalks alone should not be used at unsignalized locations.*

**** The raised median or crossing island must be at least 4 ft (1.2 m) wide and 6 ft (1.8 m) long to adequately serve as a refuge area for pedestrians in accordance with MUTCD and AASHTO guidelines. A two-way center turn lane is not considered a median. Los Angeles County prefers a 14 ft wide raised median, although a 12 ft wide median without a median nose could be used.*

1= Type 1 Crossings. Ladder-style crosswalks with appropriate signage should be used.

1/1+ = With the higher volumes and speeds, enhanced treatments should be used, including marked ladder style crosswalks, median refuge, flashing beacons, and/or in-pavement flashers. Ensure there are sufficient gaps through signal timing, as well as sight distance.

1+/3 = Carefully analyze signal warrants using a combination of Warrant 2 or 5 (depending on school presence) and EAU factoring. Make sure to project pathway usage based on future potential demand. Consider Pelican, Puffin, or Hawk signals in lieu of full signals. For those intersections not meeting warrants or where engineering judgment or cost recommends against signalization, implement Type 1 enhanced crosswalk markings with marked ladder style crosswalks, median refuge, flashing beacons, and/or in-pavement flashers. Ensure there are sufficient gaps through signal timing, as well as sight distance.

[iv] *This table is based on information contained in the U.S. Department of Transportation Federal Highway Administration Study, "Safety Effects of Marked vs. Unmarked Crosswalks at Uncontrolled Locations," February 2002.*

Class I Bikeway: Marked/Unsignalized Crossings

If well-designed, multi-lane crossings of higher-volume arterials of over 15,000 ADT may be unsignalized with features such as a combination of some or all of the following: excellent sight distance, sufficient crossing gaps (more than 60 per hour), median refuges, and/or active warning devices like flashing beacons or in-pavement flashers. These are referred to as "Type 1 Enhanced" (Type 1+). Such crossings would not be appropriate; however, if a significant number of schoolchildren used the path. Furthermore, both existing and potential future path usage volume should be taken into consideration.

On two-lane residential and collector roads below 15,000 ADT with average vehicle speeds of 35 MPH or less, crosswalks and warning signs ("Path Xing") should be provided to warn motorists, and stop signs and slowing techniques (bollards/geometry) should be used on the path approach. Curves in paths that orient the path user toward oncoming traffic are helpful in slowing path users and making them aware of oncoming vehicles. Care should be taken to keep vegetation and other obstacles out of the sight line for motorists and path users. Engineering judgment should be used to determine the appropriate level of traffic control and design.

On roadways with low to moderate traffic volumes (<12,000 ADT) and a need to control traffic speeds, a raised crosswalk may be the most appropriate crossing design to improve pedestrian visibility and safety. These crosswalks are raised 75 millimeters above the roadway pavement (similar to speed humps) to an elevation that matches the adjacent sidewalk. The top of the crosswalk is flat and typically made of asphalt, patterned concrete, or brick pavers. Brick or unit pavers should be discouraged because of potential problems related to pedestrians, bicycles, and ADA requirements for a continuous, smooth, vibration-free surface. Detectable warning strips are needed at the sidewalk/street boundary so that visually impaired pedestrians can identify the edge of the street.

Design Considerations

A marked/unsignalized crossing (Type 1) consists of a crosswalk, signage, and often no other devices to slow or stop traffic. The approach to designing crossings at mid-block locations depends on an evaluation of vehicular traffic, line of sight, path traffic, use patterns, vehicle speed, road type and width, and other safety issues such as proximity to schools.

Maximum traffic volumes:

- Up to 15,000 ADT on two-lane roads, preferably with a median
- Up to 12,000 ADT on four-lane roads with median

Maximum travel speed:

- 35 MPH

Minimum line of sight:

- 25 MPH zone: 155 feet
- 35 MPH zone: 250 feet
- 45 MPH zone: 360 feet

Type 1 crossings include signage and pavement markings.

Reference

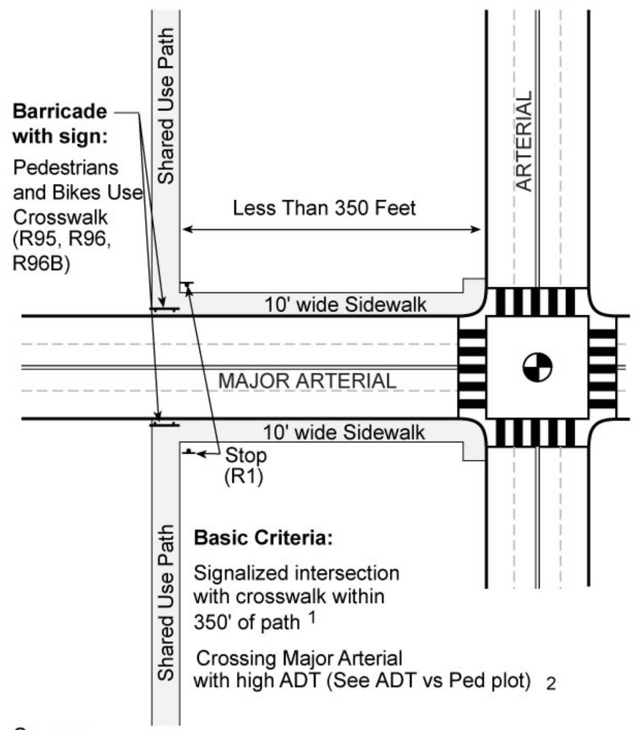
- California *Highway Design Manual* Chapter 1000
- AASHTO Guide for the Development of Bicycle Facilities
- Federal Highway Administration (FHWA) Report, Safety Effects of Marked vs. Unmarked Crosswalks at Uncontrolled Locations

Class I Bikeway: Route Users to Existing Signalized Intersection

Crossings within 350 feet of an existing signalized intersection with pedestrian crosswalks are typically diverted to the signalized intersection for safety purposes. For this option to be effective, barriers and signing may be needed to direct shared-use path users to the signalized crossings. In most cases, signal modifications would be made to add pedestrian detection and to comply with ADA.

Design Considerations

- A Class I bikeway should cross at a signalized intersection if there is a signalized intersection within 350 feet of the path and the crossroad is crossing a major arterial with a high ADT.
- Intersection Warning (W2-1 through W2-5) signs may be used on a path in advance of the intersection to indicate the presence of the crossing and the possibility of turning or entering traffic. A trail-sized stop sign (R1-1) should be placed about 5 feet before the intersection.



Sources:
1. California MUTCD, 2006
2. Investigation of Exposure Based Accident Areas: Crosswalks, Local Street, and Arterials, Knoblauch, 1987

Recommended at-grade crossing of a major arterial at an intersection where trail is within 350′ of a roadway intersection

Reference

- Caltrans *Highway Design Manual* (Chapter 1000)
- *California MUTCD*, Part 9
- AASHTO *Guide for the Development of Bicycle Facilities*
- AASHTO *Policy on the Geometric Design of Highways and Streets*
- FHWA-RD-87-038 *Investigation of Exposure-Based Pedestrian Accident Areas: Crosswalks, Sidewalks, Local Streets, and Major Arterials*

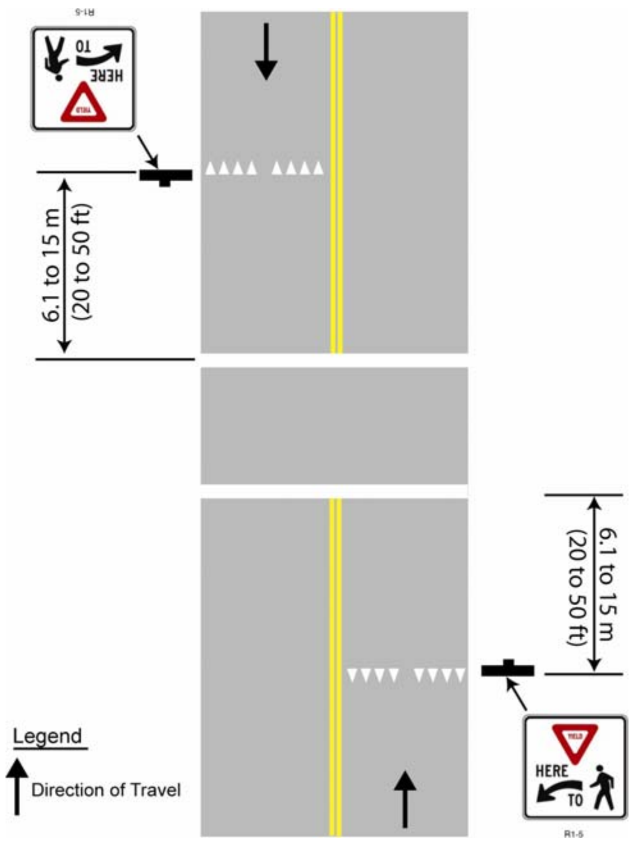
Class I Bikeway: Uncontrolled Mid-Block Crossing

The National MUTCD requires yield lines and "Yield Here to Pedestrians" signs at all uncontrolled crossings of a multi-lane roadway. Yield lines are not required by the CA MUTCD. The National MUTCD includes a trail crossing sign, shown to the right on the next page (W11-15 and W11-15P), which may be used where both bicyclists and pedestrians might be crossing the roadway, such as at an intersection with a shared-use path.

Design Considerations

- Installed where there is a significant demand for crossing and no nearby existing crosswalks
- If yield lines are used for vehicles, they shall be placed 20–50 feet in advance of the nearest crosswalk line to indicate the point at which the yield is intended or required to be made and "Yield Here to Pedestrians" signs shall be placed adjacent to the yield line. Where traffic is not heavy, stop or yield signs for pedestrians and bicyclists may suffice.
- The Bicycle Warning (W11-1) sign alerts the road user to unexpected entries into the roadway by bicyclists, and other crossing activities that might cause conflicts

A ladder crosswalk should be used. Warning markings on the path and roadway should be installed.



Recommended design from CA-MUTCD, Figure 3B-15.

Reference

- California MUTCD, Part 9
- AASHTO Guide for the Development of Bicycle Facilities

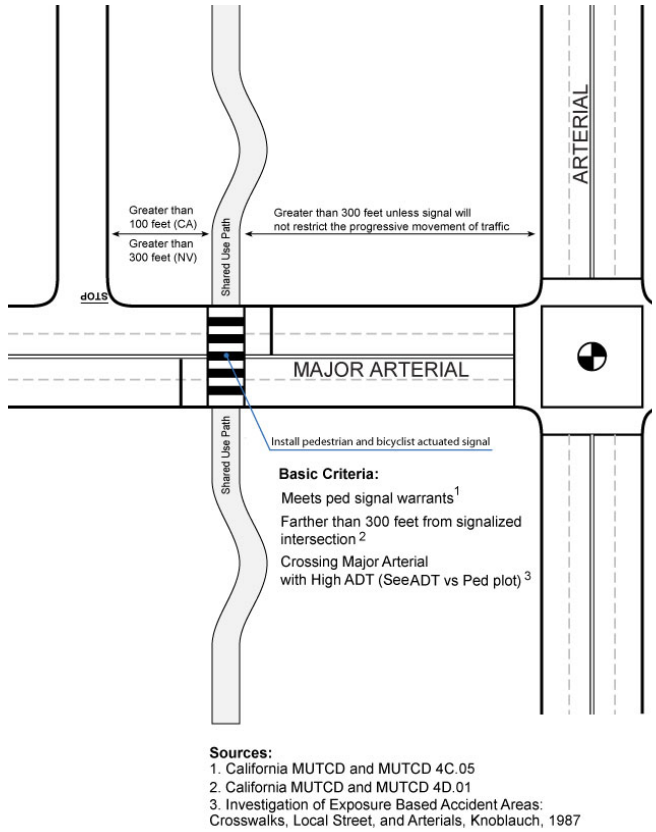
Recommended signage.

Class I Bikeway: Signalized Mid-Block Crossing

Warrants from the MUTCD combined with sound engineering judgment should be considered when determining the type of traffic control device to be installed at path-roadway intersections. Traffic signals for path-roadway intersections are appropriate under certain circumstances. The MUTCD lists 11 warrants for traffic signals, and although path crossings are not addressed, bicycle traffic on the path may be functionally classified as vehicular traffic and the warrants applied accordingly. Pedestrian volumes can also be used for warrants.

Design Considerations

- Section 4C.05 in the CAMUTCD describes pedestrian volume minimum requirements (referred to as warrants) for a mid-block pedestrian-actuated signal
- Stop lines at midblock signalized locations should be placed at least 40 feet in advance of the nearest signal indication



CA-MUTCD guidance for a signalized mid-block crossing.

Reference

- MUTCD, Sections 4C.05 and 4D
- California MUTCD, Chapters 3 and 9 and Section 4C.05 and 4D
- AASHTO Guide for the Development of Bicycle Facilities, Chapter 2

Class I Bikeway: Grade Separated Undercrossing

Undercrossings should be considered when high volumes of bicycles and pedestrians are expected along a corridor and:

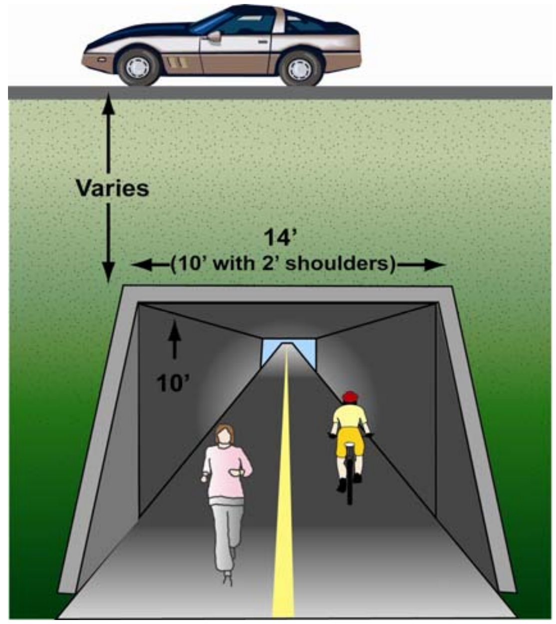
- Vehicle volumes/speeds are high
- The roadway is wide
- A signal is not feasible
- Crossing is needed under another grade-separated facility such as a freeway or rail line

Advantages of grade separated undercrossings include:

- Improves bicycle and pedestrian safety while reducing delay for all users
- Eliminates barriers to bicyclists and pedestrians
- Undercrossings require 10 feet of overhead clearance from the path surface. Undercrossings often require less ramping and elevation change for the user versus an overcrossing, particularly for railroad crossings.

Disadvantages or potential hazards include:

- If crossing is not convenient or does not serve a direct connection it may not be well utilized
- Potential issues with vandalism and maintenance
- Security may be an issue if sight lines through undercrossing and approaches are inadequate. Lighting or openings for sunlight may be desirable for longer crossings to enhance users' sense of security, especially at tunnels and underpasses under freeways and major highways. Lighting should follow Caltrans-accepted lighting design guidelines.
- High cost



Recommended undercrossing design.

Undercrossings provide key connections and allow path users to avoid a potentially dangerous at-grade crossing of a major street.

Design Considerations

- 14' minimum width to allow for access by maintenance vehicles if necessary
- 10' minimum overhead height (AASHTO)
- The undercrossing should have a centerline stripe even if the rest of the path does not have one

Reference

- Caltrans *Highway Design Manual* (Chapter 1000)
- ASHTO *Guide for the Development of Bicycle Facilities*

Class I Bikeway: Grade Separated Overcrossing

Overcrossings require a minimum of 17' of vertical clearance to the roadway below versus a minimum elevation differential of around 12' for an undercrossing. This results in potentially greater elevation differences and much longer ramps for bicycles and pedestrians to negotiate.

Overcrossings should be considered when high volumes of bicycles and pedestrians are expected along a corridor and:

- Vehicle volumes/speeds are high
- The roadway is wide
- A signal is not feasible
- Crossing is needed over a grade-separated facility such as a freeway or rail line

Advantages of grade separated overcrossings include:

- Improves bicycle and pedestrian safety while reducing delay for all users
- Eliminates barriers to bicyclists and pedestrians

Disadvantages and potential hazards include:

- If crossing is not convenient or does not serve a direct connection it may not be well utilized
- Overcrossings require at least 17 feet of clearance to the roadway below involving up to 400 feet or greater of approach ramps at each end. Long ramps can sometimes be difficult for the disabled
- Potential issues with vandalism, maintenance
- High cost

Design Considerations

- 12 foot minimum width
- If overcrossing has any scenic vistas additional width should be provided to allow for stopped path users
- A separate 6 foot pedestrian area may be provided in locations with high bicycle and pedestrian use
- Minimum of 17 feet of vertical clearance to the roadway below
- 10 foot headroom on overcrossing
- Clearance below will vary depending on feature being crossed
- The overcrossing should have a centerline stripe even if the rest of the path does not have one.
- Ramp slopes should be ADA-accessible: 5% (1:20) grade with landings at 400-foot intervals, or 8.33% (1:12) with landings every 30 feet

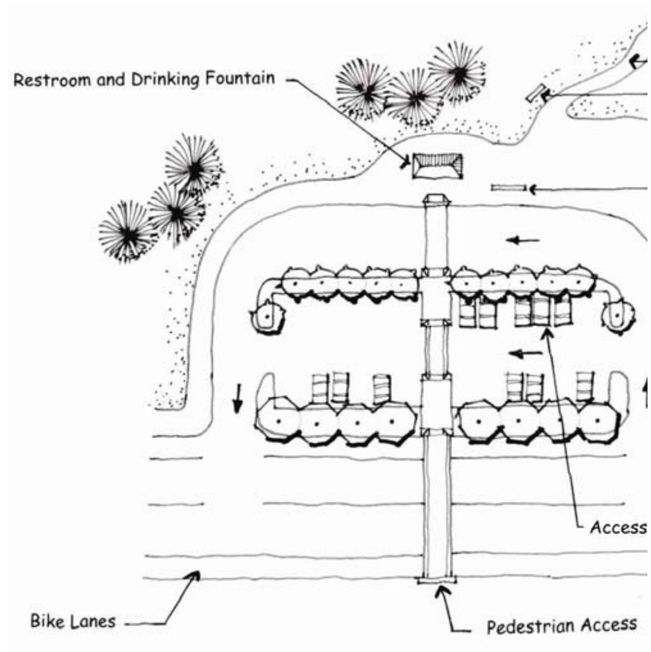
Overcrossings are frequently used over a major roadway.

Reference

- Caltrans *Highway Design Manual* (Chapter 1000)
- AASHTO *Guide for the Development of Bicycle Facilities*

Class I Bike Paths: Trailheads

Good access to a path system is a key element for its success. Trailheads (formalized parking areas) serve the local and regional population arriving to the path system by car, transit, bicycle or other modes. Trailheads provide essential access to the shared-use path system and include amenities like parking for vehicles and bicycles, restrooms (at major trailheads), and posted maps. Trailheads with a small parking area should additionally include bicycle parking and accessible parking. Neighborhood access should be achieved from all local streets crossing the trail. In some situations "No Parking" signs on the adjacent streets are desirable to minimize impact on the neighborhood.



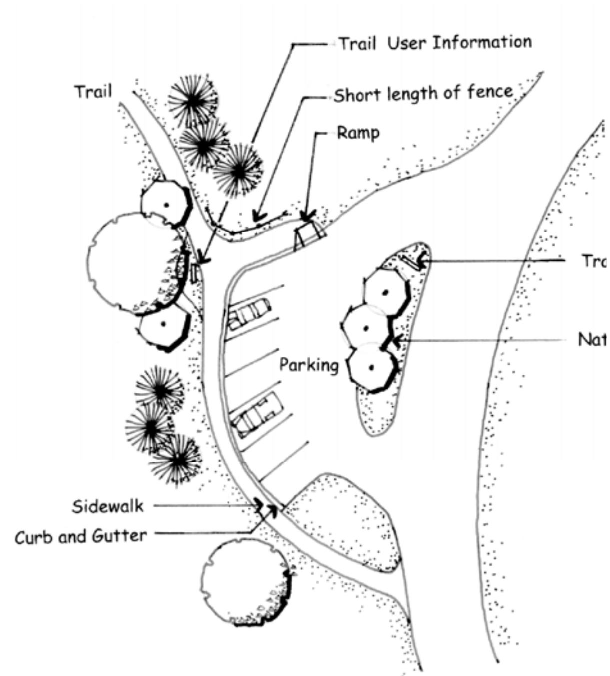
Example major trailhead.

Design Considerations

- Major trailheads should include automobile and bicycle parking, trail information (maps, user guidelines, wildlife information, etc.), garbage receptacles and restrooms
- Minor trailheads can provide a subset of these amenities
- Any trailhead improvements installed within Los Angeles County Flood Control District (LACFCD) right-of-way needs to be operated and maintained by the project sponsor

Reference

- AASHTO Guide for the Development of Bicycle Facilities



Example minor trailhead.

F.5.2 Class II Bikeway

On-Street Facility Design Guidelines

There are a range of different types of bicycle facilities that can be applied in various contexts, which provide varying levels of protection or separation from automobile traffic. This section summarizes best practice on-street bicycle facility design from North America and elsewhere.

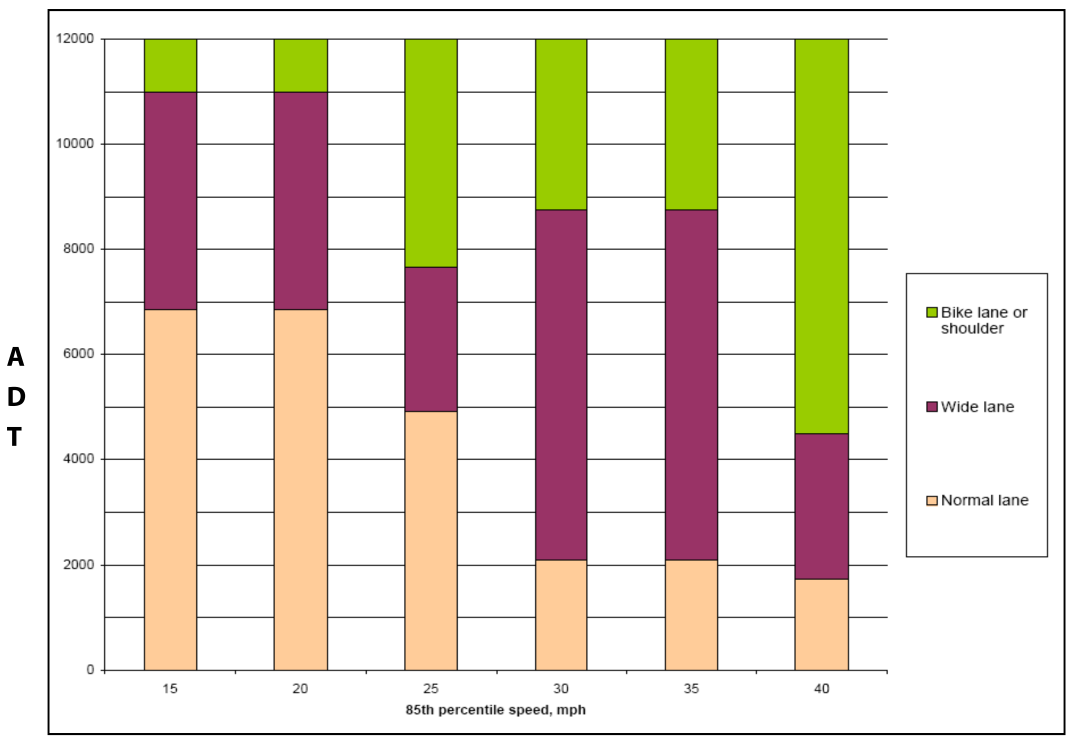
Facility Selection

There are a wide variety of techniques for selecting the type of facility for a given context. Roadway characteristics that are often used include:

- Motor vehicle speed and volume
- Presence of heavy vehicles/trucks
- Roadway width
- Demand for bicycle facilities
- User preference
- Land use/urban or rural context

There are no 'hard and fast' rules for determining the most appropriate type of facility for a particular location; engineering judgment and planning skills are critical elements of this decision.

A 2002 study combined bikeway dimension standards for ten different communities in North America. The goal of the study was to survey the varying requirements available and provide a best practices approach for providing bicycle facilities. The study included a comparison with European standards, and found that "North Americans rely much more on wide lanes for bicycle accommodation than their counterparts overseas." The table below shows the results of this analysis, which recommends use of bike lanes or shoulders, wide lanes, or normal lanes.



North American bicycle facility selection chart.

(King, Michael. (2002). Bicycle Facility Selection: A Comparison of Approaches. Pedestrian and Bicycle Information Center and Highway Safety Research Center, University of North Carolina – Chapel Hill.)

Class II Bikeway

Bike lanes or Class II bicycle facilities (Caltrans designation) are defined as a portion of the roadway that has been designated by striping, signage, and pavement markings for the preferential or exclusive use of bicyclists. Bike lanes are generally found on major arterial and collector roadways and are 5-8 feet wide. Bike lanes can be found in a large variety of configurations, and can have special characteristics including coloring and placement if beneficial.
Bike lanes enable bicyclists to ride at their preferred speed without interference from prevailing traffic conditions and facilitate predictable behavior and movements between bicyclists and motorists. Bicyclists may leave the bike lane to pass other cyclists, make left turns, avoid obstacles or debris, and to avoid other conflicts with other roadway users.

Design Considerations

Width varies depending on roadway configuration, see following pages for design examples. 4-8 feet is standard, measured from edge of gutter pan, although a maximum of 7 feet is recommended to prevent parking or driving in the bike lane.

Striping

- Separating vehicle lane from bike lane (typically left sideline): 6 inches
- Delineate conflict area in intersections (optional): Length of conflict area
- Separating bike lane from parking lane (if applicable): 4 inches
- Dashed white stripe when:
    - Vehicle merging area (optional): Varies
    - Approach to intersections: 100-200 feet
    - Delineate conflict area in intersections (optional): Length of conflict area

Signing: use R81 Bike Lane Sign at:

- Beginning of bike lane
- Far side of all bike path (class I) crossings
- At approaches and at far side of all arterial crossings
- At major changes in direction
- At intervals not to exceed ½ mile

Pavement markings: the preferred pavement marking for bike lanes is the bike lane stencil with directional arrow to be used at:

- Beginning of bike lane
- Far side of all bike path (class I) crossings
- At approaches and at far side of all arterial crossings
- At major changes in direction
- At intervals not to exceed ½ mile
- At beginning and end of bike lane pockets at approach to intersection

Approved R-81 Sign.

Approved California bike lane stencils (either is optional, as is arrow).

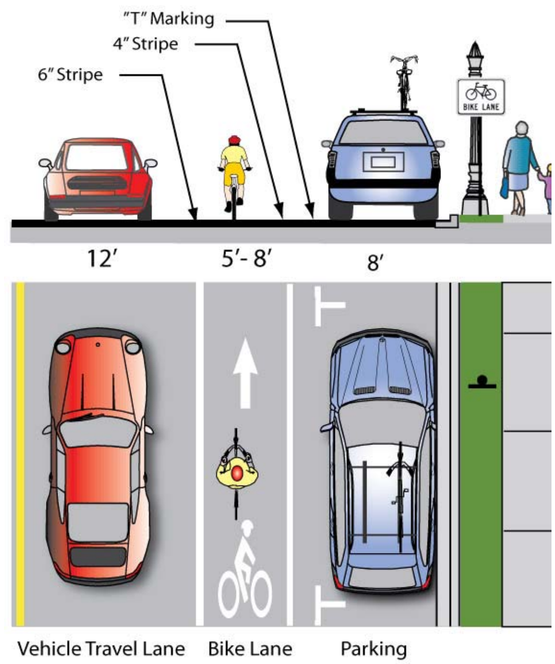
Reference

- Caltrans *Highway Design Manual* (Chapter 1000)
- *California MUTCD*
- AASHTO *Guide for the Development of Bicycle Facilities*
- Additional standards and treatments for bike lanes are provided in the following pages

Class II Bikeway: Bike Lane Adjacent to On-Street Parallel Parking

Bike lanes adjacent to on-street parallel parking are common in the U.S. and can be dangerous for bicyclists if they do not provide adequate separation from parked cars. Crashes caused by a suddenly-opened vehicle door are a common hazard for bicyclists using this type of facility. On the other hand, wide bike lanes may encourage the cyclist to ride farther to the right (door zone) to maximize distance from passing traffic. Wide bike lanes may also cause confusion with unloading vehicles in busy areas where parking is typically full. Treatments to encourage bicyclists to ride away from the 'door zone' include:

- Provide a buffer zone (preferred design). Bicyclists traveling in the center of the bike lane will be less likely to encounter open car doors. Motorists have space to stand outside the bike lane when loading and unloading.
- Installing parking "T's" and smaller bike lane stencils placed to the left.



Parking 'T' bike lane design.

Design Considerations

Bike Lane Width:

- 6 feet recommended when parking stalls are marked
- 5 feet minimum in constrained locations
- 8 feet maximum (greater widths may encourage vehicle loading in bike lane)

Shared bike and parking lane width:

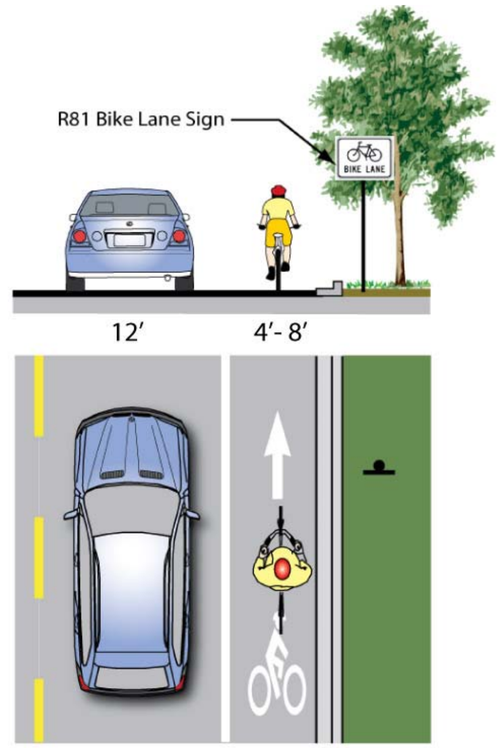
- 13-14 feet for a shared bike/parking lane where parking is permitted but not marked on streets without curbs
- If the parking volume is substantial or turnover is high, an additional 1-2 feet of width is desirable

Reference

- Caltrans *Highway Design Manual* (Chapter 1000)
- California *MUTCD*
- AASHTO *Guide for the Development of Bicycle Facilities*

Class II Bikeway: Bike Lanes on Streets Without Parking

Wider bike lanes are desirable in certain circumstances such as on higher speed arterials (45 mph+) where a wider bike lane can increase separation between passing vehicles and cyclists. Wide bike lanes are also appropriate in areas with high bicycle use. A bike lane width of 6-7 feet makes it possible for bicyclists to ride side-by-side or pass each other without leaving the bike lane, increasing the capacity of the lane. Appropriate signing and stenciling is important with wide bike lanes to ensure motorists do not mistake the lane for a vehicle lane or parking lane.



Where on-street parking is not allowed adjacent to a bike lane, bicyclists do not require additional space to avoid opened car doors.

Design Considerations

Bike lane width:

- 4 foot minimum when no curb & gutter is present, 6 foot preferred (rural road sections). Parking may be allowed on the adjacent shoulder.
- 7 feet preferred when adjacent to curb and gutter (5′ more than the gutter pan width if the gutter pan is wider than 2′).
- 6 feet recommended where right-of-way allows.

Maximum width:

- 7 feet Adjacent to arterials with high travel speeds (45 mph+) and widen curb lanes by 2 feet.

Reference

- Caltrans *Highway Design Manual* (Chapter 1000)
- *California MUTCD*
- *AASHTO Guide for the Development of Bicycle Facilities*

Class II Bikeway: Retrofitting Existing Streets, Roadway Widening

Bike lanes could be accommodated on several streets with excess right-of-way through shoulder widening. Although street widening incurs higher expenses compared with re-striping projects, bike lanes could be added to streets currently lacking curbs, gutters and sidewalks without the high costs of major infrastructure reconstruction.

Roadway widening is preferred on roads lacking curbs, gutters and sidewalks

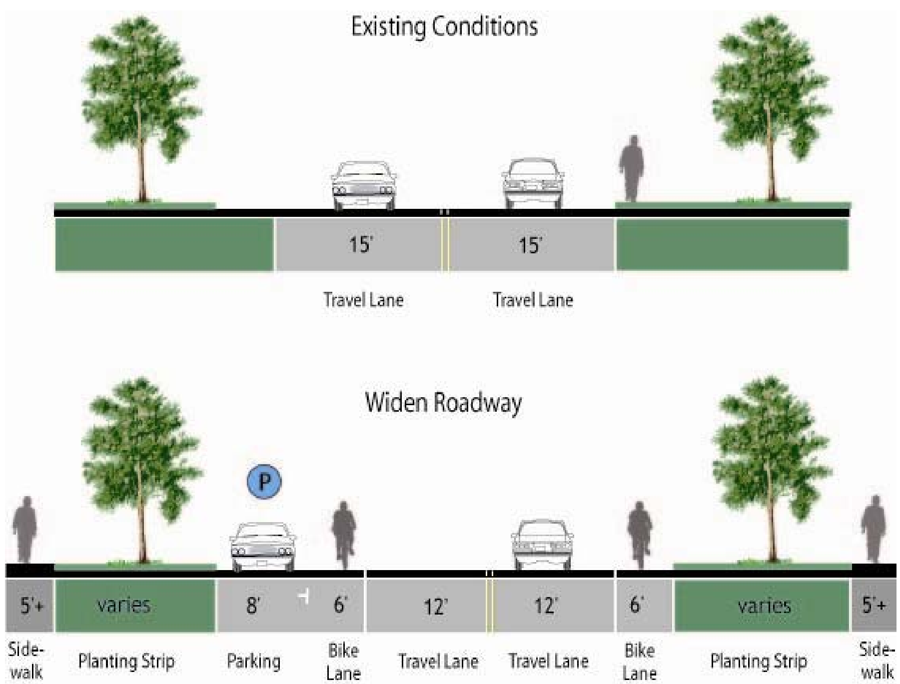
Design Considerations

Bike lane width:

- 6 feet preferred
- 4 feet minimum (see bike lane guidance)

Reference

- Caltrans *Highway Design Manual* (Chapter 1000)
- AASHTO *Guide for the Development of Bicycle Facilities*
- Rosales, Jennifer. (2006). *Road Diet Handbook: Setting Trends for Livable Streets*



Example of roadway widening to accommodate bike lanes and sidewalks.

Class II Bikeway: Retrofitting Existing Streets, Lane Narrowing

Lane narrowing utilizes roadway space that exceeds minimum standards to create the needed space to provide bicycle lanes. Many roadways have lanes that are wider than currently established minimums contained in the AASHTO *Policy on the Geometric Design of Highways and Streets* and the Caltrans HCM. Most standards allow for the use of 11’ and sometimes 10’ travel lanes. Lane widths can be narrowed on a case by case basis to connect to bikeways in neighboring jurisdictions.

Special considerations should be given to the amount of heavy vehicle traffic and horizontal curvature before the decision is made to narrow travel lanes. Center turn lanes can also be narrowed in some situations to free up pavement space for bicycle lanes.

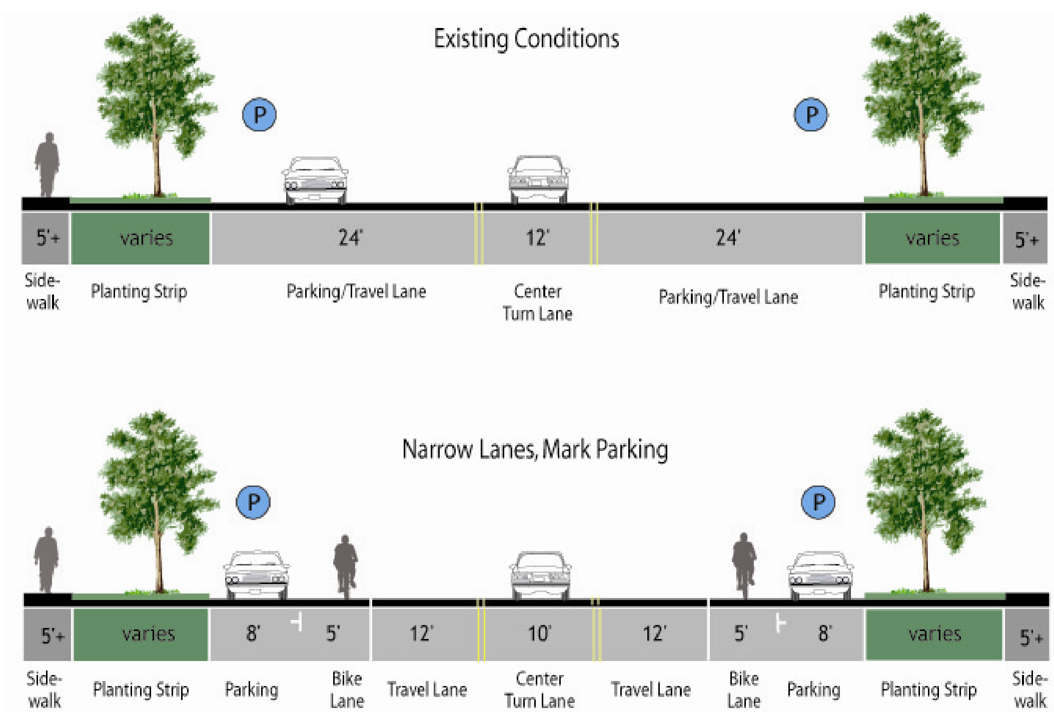
This street in Portland, Oregon previously had 13’ lanes, which were narrowed to accommodate bike lanes without removing a lane.

Design Considerations

- Vehicle lane: before 12 feet to 15 feet; after: 10 feet to 11 feet
- Bike lane width: see bike lane design guidance

Reference

- Caltrans Highway Design Manual (Chapter 1000)
- AASHTO *Guide for the Development of Bicycle Facilities*
- Rosales, Jennifer. (2006). *Road Diet Handbook: Setting Trends for Livable Streets*



Example of vehicle travel lane narrowing to accommodate bike lanes.

Class II Bikeway: Retrofitting Existing Streets, Lane Reconfiguration

The removal of a single travel lane, also called a "Road Diet", will generally provide sufficient space for bike lanes on both sides of a street. Streets with excess vehicle capacity provide opportunities for bike lane retrofit projects. Depending on a street's existing configuration, traffic operations, user needs, and safety concerns, various lane reduction configurations exist. For instance, a four-lane street (with two travel lanes in each direction) could be modified to include one travel lane in each direction, a center turn lane, and bike lanes. Prior to implementing this measure, a traffic analysis should identify impacts.

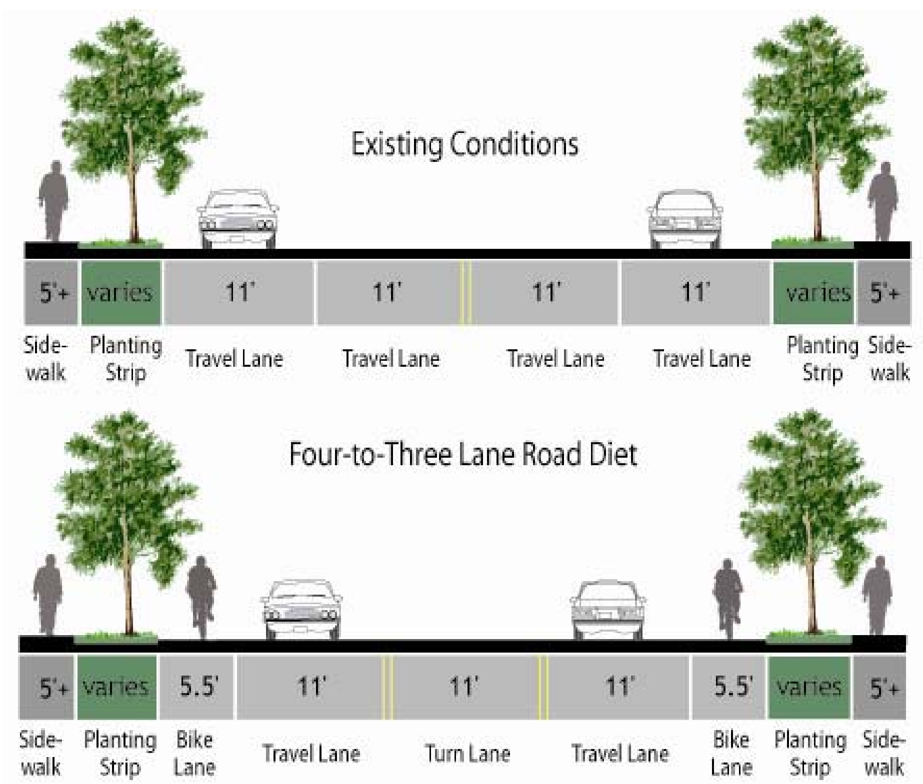
This road was re-striped to convert four vehicle travel lanes into three travel lanes with bike lanes.

Design Considerations

- Vehicle lane width depends on project. No narrowing may be needed if a lane is removed.
- Bike lane width: see bike lane design guidance

Reference

- Slated for inclusion in the update to the AASHTO *Guide for the Development of Bicycle Facilities*
- Rosales, Jennifer. (2006). *Road Diet Handbook: Setting Trends for Livable Streets*



Example of bikeway lane reconfiguration to accommodate bike lanes.

Class II Bikeway: Retrofitting Existing Streets, Parking Reduction

Bike lanes could replace one or more on-street parking lanes on streets where excess parking exists and/or the importance of bike lanes outweighs parking needs. For instance, parking may be needed on only one side of a street (as shown below and at right). Eliminating or reducing on-street parking also improves sight distance for cyclists in bike lanes and for motorists on approaching side streets and driveways. Prior to reallocating on-street parking for other uses, a parking study should be performed to gauge demand and to evaluate impacts to people with disabilities. On streets where parking is at a premium and the roadway width constrains bicycle lane implementation, a Class III Bike Route can be considered.

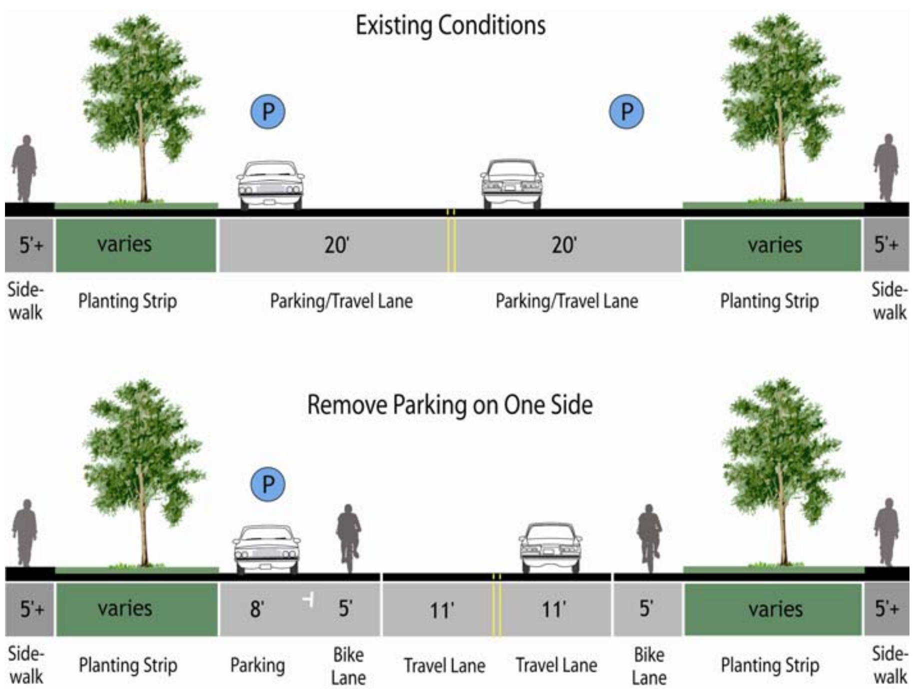
Some streets may not require parking on both sides.

Design Considerations

- Vehicle lane width depends on project. No narrowing may be needed depending on the width of the parking lane to be removed.
- Bike lane width: see bike lane design guidance

Reference

- Rosales, Jennifer. (2006). Road Diet Handbook: Setting Trends for Livable Streets



Example of parking removal to accommodate bike lanes.

Class II Bike Lane: Intersection Treatments, Bicycle Signal Actuation

Loop Detectors

Bicycle-activated loop detectors are installed within the roadway to allow a bicycle to trigger a change in the traffic signal. This allows the cyclist to stay within the lane of travel rather than maneuvering to the side of the road to trigger a push button.

All new loop detectors installed will be capable of detecting bicycles. Identify loops that detect bicycles with the "Bicycle Detector Symbol" shown in Figure 9C-7(CA) in the CA- MUTCD.

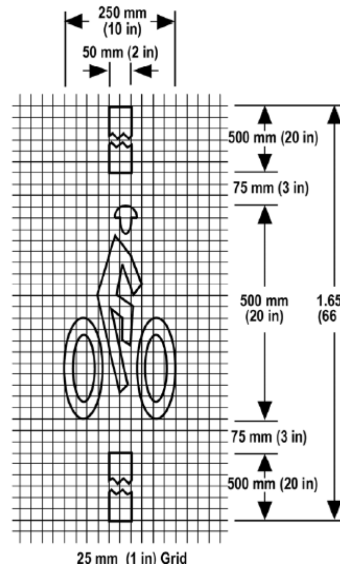
Detection Cameras

Video detection cameras can also be used to determine when a vehicle is waiting for a signal. These systems use digital image processing to detect a change in the image at the location. Cameras can detect bicycles, although cyclists should wait in the center of the lane, where an automobile would usually wait, in order to be detected. Video camera system costs range from $20,000 to $25,000 per intersection.

Detection cameras are currently used for cyclists in the City of San Luis Obispo, CA, where the system has proven to detect pedestrians as well.

Remote Traffic Microwave Sensor Detection (RTMS)

RTMS is a system developed in China, which uses frequency modulated continuous wave radio signals to detect objects in the roadway. This method is marked with a time code which gives information on how far away the object is. The RTMS system is unaffected by temperature and lighting, which can affect standard detection cameras.



Recommended loop detector marking (MUTCD-CA Supplement Figure 9C-7).

Example bicycle actuator marking.

Instructional Sign (MUTCD-CA Supplement Sign R62C).

Design Considerations

At signalized intersections, cyclists should be able to trigger signals when cars are not present. Requiring cyclists to dismount to press a pedestrian button is inconvenient and requires the cyclist to merge in into traffic at an intersection. It is particularly important to provide bicycle actuation in a left-turn only lane where cyclists regularly make left turn movements.

Reference

Additional technical information is available at:

- www.humantransport.org/bicycledriving/library/signals/detection.htm
- ITE Guidance for Bicycle—Sensitive Detection and Counters: http://www.ite.org/councils/Bike-Report-Ch4.pdf

Class II Bikeway: Intersection Treatments, Channelized Right Turn Pocket

The shared bicycle/right turn lane places a standard-width bike lane on the left side of a dedicated right-turn lane. A dashed strip delineates the space for bicyclists and motorists within the shared lane. This treatment includes signage advising motorists and bicyclists of proper positioning within the lane.

According to the CA MUTCD and Chapter 1000, the appropriate treatment for right-turn only lanes is to place a bike lane pocket between the right-turn lane and the right-most through lane or, where right-of-way is insufficient, to drop the bike lane entirely approaching the right-turn lane. Dropping the bike lane is not recommended, and should only be done when a bike lane pocket cannot be accommodated.

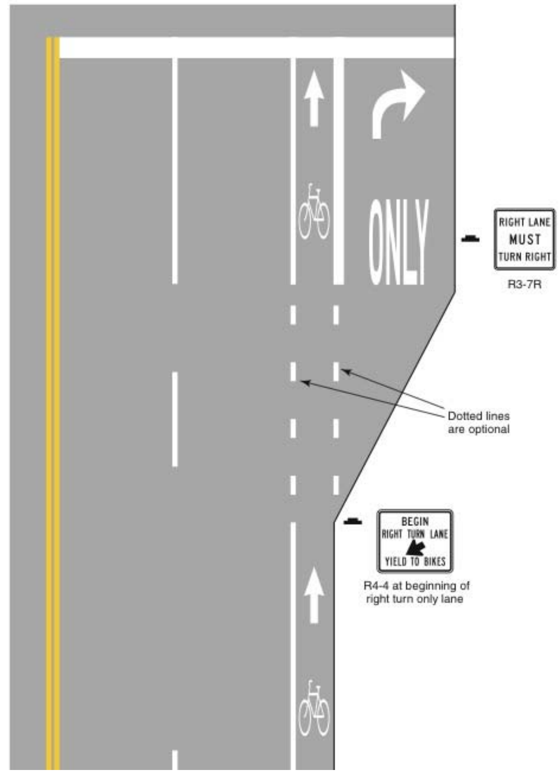
An optional through-right-turn lane next to a right-turn only lane should not be used where there is a through bicycle lane. If a capacity analysis indicates the need for an optional through-right turn lane, the bicycle lane should be discontinued at the intersection approach.

Advantages:

- Aids in correct positioning of cyclists at intersections with a dedicated right-turn lane without adequate space for a dedicated bike lane
- Encourages motorists to yield to bicyclists when using the right-turn lane
- Reduces motor vehicle speed within the right-turn lane

Disadvantages/potential hazards:

- May not be appropriate for high-speed arterials or intersections with long right-turn lanes
- May not be appropriate for intersections with large percentages of right-turning heavy vehicles



Recommended bike/right turn lane design (MUTCD-CA Supplement Figure 9C-3).

Shared bike-right turn lanes require warning signage as well as pavement markings.

Design Considerations

- Right-turn lane width – minimum 12-foot width.
- Bike lane pocket width – minimum 4-5 feet preferred.
- Works best on streets with lower posted speeds (30 MPH or less) and with low traffic volumes (10,000 ADT or less)

Reference

- Caltrans Highway Design Manual (Chapter 1000)
- California MUTCD, Section 9C.04
- AASHTO Guide for the Development of Bicycle Facilities

Class II Bike Lane: Intersection Treatments, Interchanges

At highway interchanges, motor vehicles often make turns at higher speeds than on surface roads. Bike lanes through interchange areas should clearly warn motorists to expect bicyclists, and signage should alert bicyclists that they should not turn to enter the highway.

Figure 9C-104 (right) depicts the current guidance provided by the California MUTCD. On high traffic bicycle corridors, non-standard treatments may be desirable. Dashed bicycle lane lines with or without colored bike lanes may be applied to provide increased visibility for bicycles in the merging area. The use of double-turn lanes should be discouraged because of the difficulties they present for pedestrians and bicyclists (see previous treatment). Existing double-turn lanes should be studied and converted to single-turn lanes, unless found to be absolutely necessary for traffic operations.

Design Considerations

Bike lane width:

- 4-foot minimum when no curb & gutter is present (rural road sections).
- 5-foot minimum when adjacent to curb and gutter (5 feet more than the gutter pan width if the gutter pan is wider than 2 feet).
- 6 feet recommended where right-of-way allows

Maximum Width:

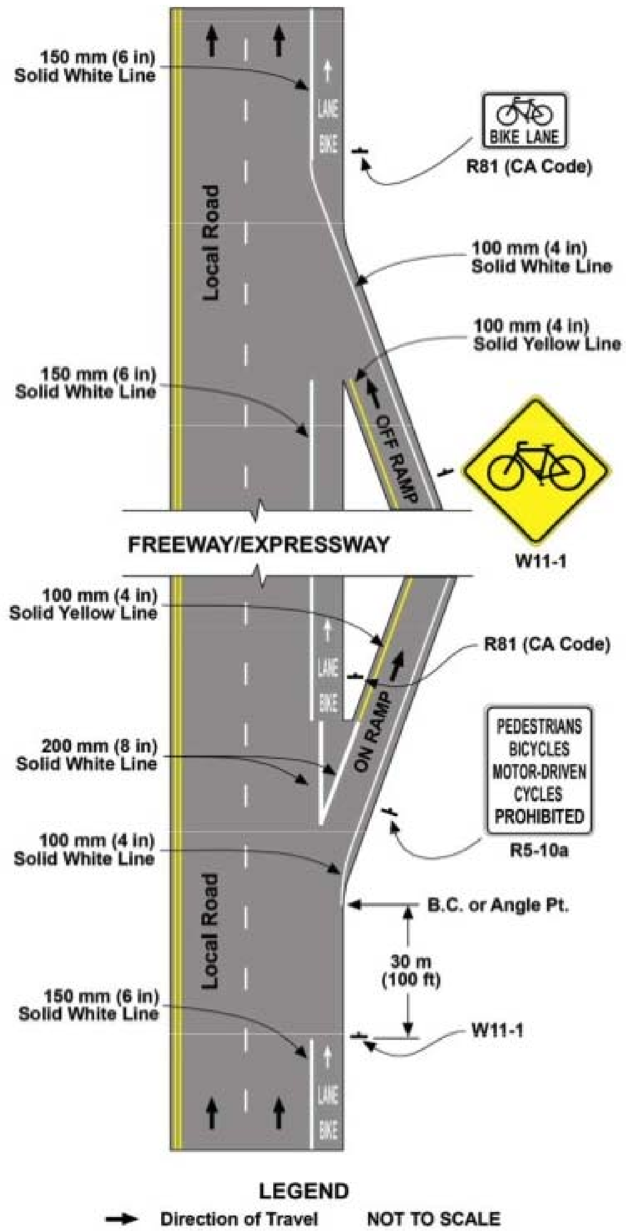
- 8 feet adjacent to arterials with high travel speeds (45 mph+)

Treatment for Interchange Ramp Ingress / Egress:

- Design intersections and ramps to limit the conflict areas or eliminate unnecessary uncontrolled ramp connections to urban roadways
- Follow AASHTO guidance (pp. 62 and 63) on methods for delineating or not delineating a bike lane through an interchange

Reference

- Caltrans *Highway Design Manual* (Chapter 1000)
- *California MUTCD*
- AASHTO *Guide for the Development of Bicycle Facilities*



California MUTCD Figure 9C-104 provides guidance for continuing bike lanes through intersection areas.

F.5.3 Class III Bike Routes

Class III Bikeway: Bike Route

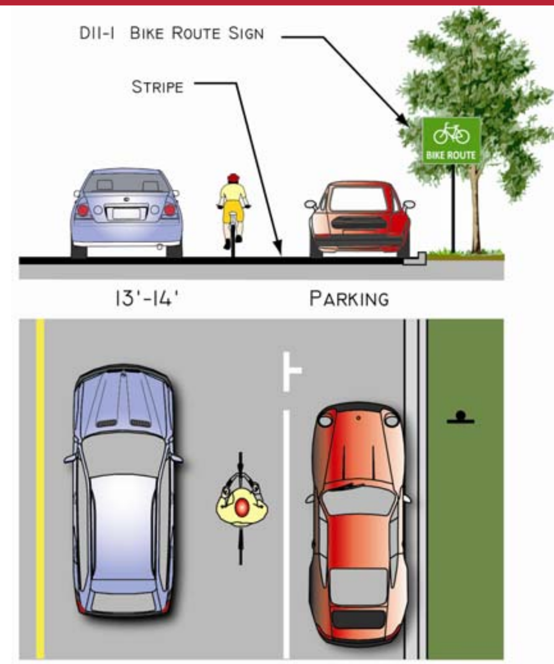
Class III bicycle facilities – (Caltrans designation) are defined as facilities shared with motor vehicles. They are typically used on roads with low speeds and traffic volumes; however, they can be used on higher volume roads with wide outside lanes or with shoulders. Roadways appropriate as shared roadways often have a centerline stripe only, and no designated shoulders.

Bike routes are indicated exclusively by signage, which provide key connections to destinations and trails where providing additional separation is not possible.

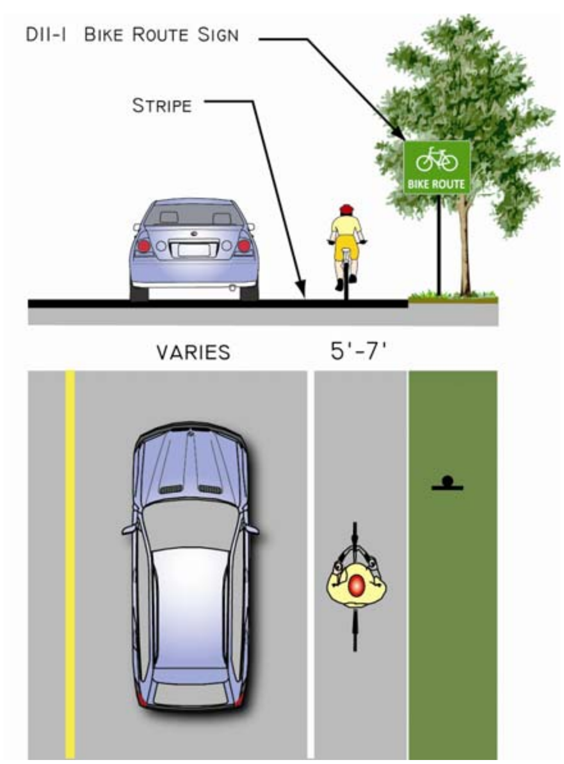
Rural roads with a large shoulder may already accommodate bicycle travel. Reclassifying these large shoulders as "shoulder bikeways" may encourage additional cyclist use. This type of facility can be developed on a rural roadway without curb and gutter. Bike routes along shoulders are appropriate and preferable to bike lanes in rural areas. The separation between the shoulder and the travel lane should be marked with an edge line, and the shoulder should be paved and maintained. A shoulder bikeway could also be used on an urban road where traffic speeds and volumes are low, although shared lane markings in addition to signage may be more appropriate in these locations.

When a roadway with a shoulder bikeway is reconstructed, widened, or overlaid, open drainage grates should be oriented with openings perpendicular to the direction of bicycle travel, so that bicycle wheels are not caught in the openings.

Rumble strips are placed along the sides of high-speed and rural roads, in order to alert drivers when their vehicles have left the roadway. Rumble strips can be dangerous for bicyclists, as a cyclist who runs over a strip could lose control of the bicycle. Conversely, rumble strips can help bicyclists feel more comfortable, knowing that drivers will be alerted if they are near the edge of the roadway. The bike-able area should have sufficient width (5-foot minimum) to accommodate bicycle travel. Rumble strips along shoulder bikeways should also include gaps to allow bicyclists to cross the rumble strip area.



Shared roadway recommended configuration.



Recommended shoulder bikeway configuration.

Class III Bikeway: Bike Route (continued)

Design Considerations

Shared Roadway Considerations:

Use D11-1 Bike Route sign at:

- Beginning or end of bike route (with applicable M4 series sign below)
- Entrance to bike path (class I) – optional
- At major changes in direction or at intersections with other bike routes (with applicable M7 series arrow sign)
- At intervals along bike routes not to exceed ½ mile

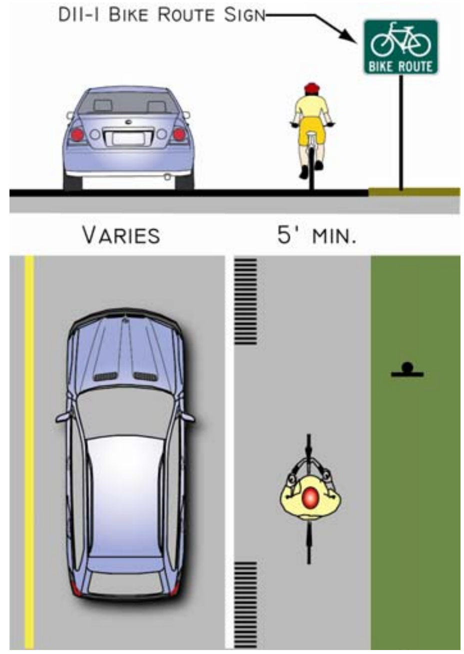
Shoulder Bikeway Considerations:

Widths (measured from painted edge line to edge of pavement or gutter pan):

- The shoulder should be a minimum of 4 feet and preferably, 6 feet wide
- On steep hills, additional width should be provided in the uphill direction, both for cyclists to pass each other and to allow cyclists to 'traverse' the hill by weaving slightly back and forth
- For shoulder bikeways along high-speed roadways, a buffer between the shoulder and vehicle lane using paint or bike-friendly rumble strips (see right) may be considered.

Additional considerations:

- Locate 5 feet from the face of the guardrail, curb, or other roadside barrier
- Use D11-1 "Bike Route" sign as specified for shared roadways



Shoulder bikeway with bike-friendly rumble strip

D11-1 "Bike Route" sign should be used along designated shared roadways.

Reference

- From Caltrans Highway Design Manual (HDM) Chapter 1000: "Class III bikeways (bike routes) are intended to provide continuity to the bikeway system. Bike routes are established along through routes not served by Class I or II bikeways, or to connect discontinuous segments of bikeway (normally bike lanes). Class III facilities are shared facilities, either with motor vehicles on the street, or with pedestrians on sidewalks, and in either case bicycle usage is secondary. Class III facilities are established by placing Bike Route signs along roadways."
- 2010 California MUTCD states," provide a right-of-way designated by signs or permanent markings and shared with pedestrians or motorists. Refer California Streets and Highways Code Section 890.4."
- 2010 California MUTCD Section 9C.04 states, "Class III Bikeways (Bike Route) are shared routes and do not require pavement markings. In some instances, a 100 mm (4 in) white edge stripe separating the traffic lanes from the shoulder can be helpful in providing for safer shared use. This practice is particularly applicable on rural highways and on major arterials in urban areas where there is no vehicle parking."
- AASHTO Guide for the Development of Bicycle Facilities
- Caltrans Standard Plan (2006 Edition).

Class III Bikeway: Shared Roadway Bicycle Marking (Sharrow)

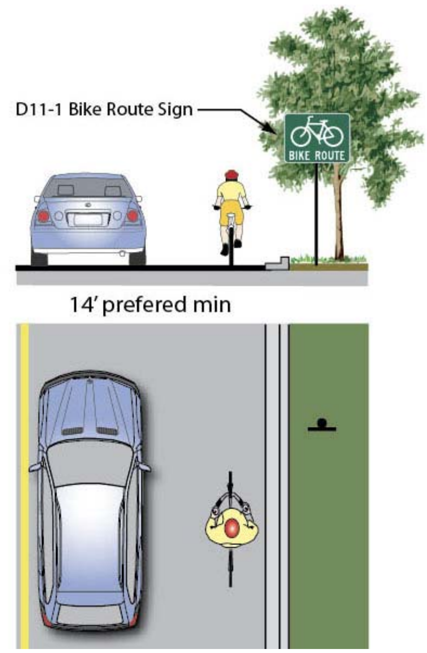
Shared lane marking stencils (also called "sharrows") have been introduced for use in California as an additional treatment for Class III facilities. The California MUTCD states that the shared roadway bicycle marking is intended to:

- Reduce the chance of collisions between open doors of parked vehicles and bicyclists on a roadway with on-street parallel parking
- Alert road users within a narrow traveled way of the lateral location where bicyclists ride
- Be used only on roadways without marked bicycle lanes or shoulders

The stencil can serve a number of purposes, such as making motorists aware of bicycles potentially in their lane, showing bicyclists the direction of travel, and, with proper placement, reminding bicyclists to bike further from parked cars to prevent "dooring" collisions.

A wide outside lane can be used on roadways where bike lanes might otherwise be used, but the existing road width does not allow for restriping. The wide lane allows motor vehicles to pass bicycles while providing the recommended 3 feet of clearance.

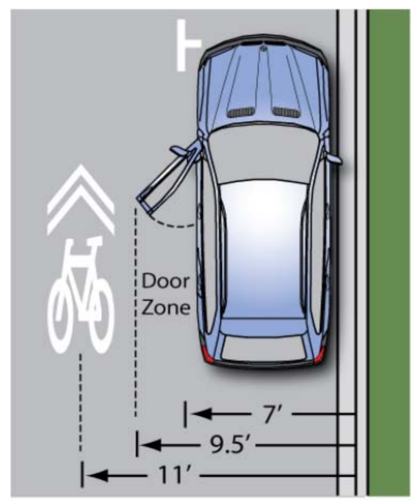
When a roadway with a shoulder bikeway is reconstructed, widened, or overlaid, open drainage grates should be oriented with openings perpendicular to the direction of bicycle travel, so that bicycle wheels are not caught in the openings.



Wide curb lanes can include shared lane pavement markings to increase visibility.

Design Considerations

- Use D11-1 "Bike Route" sign as specified for shared roadways
- Place in a linear pattern along a corridor at least 11' from face of curb (or shoulder edge) on streets with on-street parking. The longitudinal spacing of the markings may be increased or reduced as needed for roadway and traffic conditions.
- Shared lane markings should not be placed on roadways with a speed limit at or above 40 MPH (CA MUTCD)
- Marking should be placed immediately after an intersection and spaced at intervals no greater than 250 feet hereafter
- Use only on a roadway Class III Bikeway (bike route) or shared roadway (no bikeway designation) which has on-street parallel parking



Shared lane marking placement guidance for streets with on-street parking.

Reference

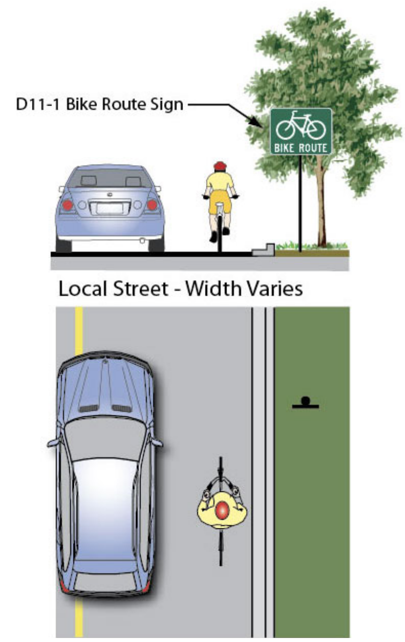
- Caltrans *Highway Design Manual* (Chapter 1000)
- Use of shared lane markings was adopted by Caltrans in 2005 as California MUTCD Section 9C.103 and Figure 9C-107
- AASHTO *Guide for the Development of Bicycle Facilities*

F.5.4 Bicycle Boulevards

Bicycle Routes/Bicycle Boulevards

Design Summary

- Roadway width varies depending on roadway configuration.
- Use D11-1 "Bike Route" sign as specified for shared roadways.
- Intersection treatments, traffic calming, and traffic diversions can be utilized to improve the cycling environment, as recommended in the following pages.



Recommended design for bike routes/ bicycle boulevards.

Bicycle boulevards are low-speed streets that provide a comfortable and pleasant experience for cyclists.

Discussion

Bicycle boulevards are low-volume streets where motorists and bicyclists share the same space. Treatments for bicycle boulevards include five "application levels" based on their level of physical intensity, with Level 1 representing the least physically-intensive treatments that could be implemented at relatively low cost. Identifying appropriate application levels for individual bicycle Traffic calming and other treatments along the corridor reduce vehicle speeds so that motorists and bicyclists generally travel at the same speed, creating a more-comfortable environment for all users. Bicycle boulevards incorporate treatments to facilitate convenient crossings where the route crosses a major street. They work best in well-connected street grids where riders can follow reasonably direct and logical routes and when higher-order parallel streets exist to serve thru vehicle traffic.

Bicycle boulevards/bike routes can be treated with shared lane markings, directional signage, traffic diverters, chicanes, chokers, and /or other traffic calming devices to reduce vehicle speeds or volumes.

Bicycle boulevards can employ a variety of treatments from signage to traffic calming and pavement stencils. The level of treatment provided at a specific location depends on several factors, discussed following.

Guidance

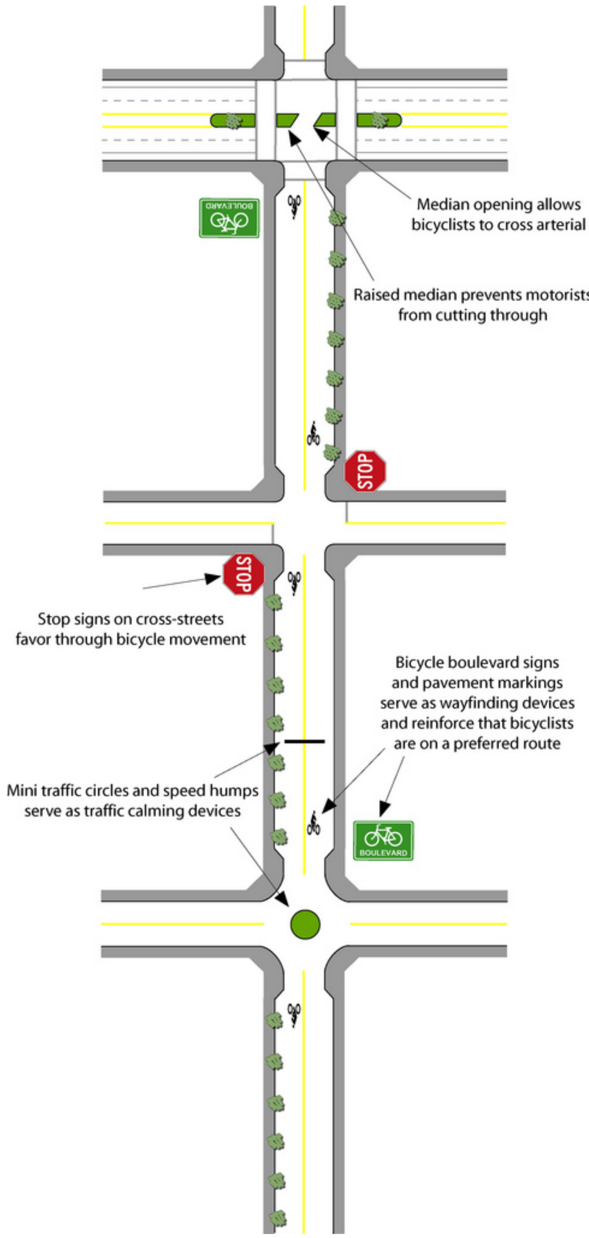
- Bicycle boulevards have been implemented in Berkeley, Emeryville, Palo Alto, San Luis Obispo, and Pasadena, CA; Portland and Eugene, OR; Vancouver, BC; Tucson, AZ; Minneapolis, MN; Ocean City, MD; and Syracuse, NY.
- Alta Planning + Design and IBPI. *Bicycle Boulevard Planning and Design Handbook.* www.ibpi.usp.pdx.edu/guidebook.php
- City of Berkeley. (2000). *Bicycle Boulevard Design Tools and Guidelines.* http://www.ci.berkeley.ca.us/contentdisplay.aspx?id=6652
- AASHTO *Guide for the Development of Bicycle Facilities.*
- *MUTCD* – California Supplement.

Bicycle Routes/Bicycle Boulevards

Discussion (continued)

Bicycle boulevards serve a variety of purposes:

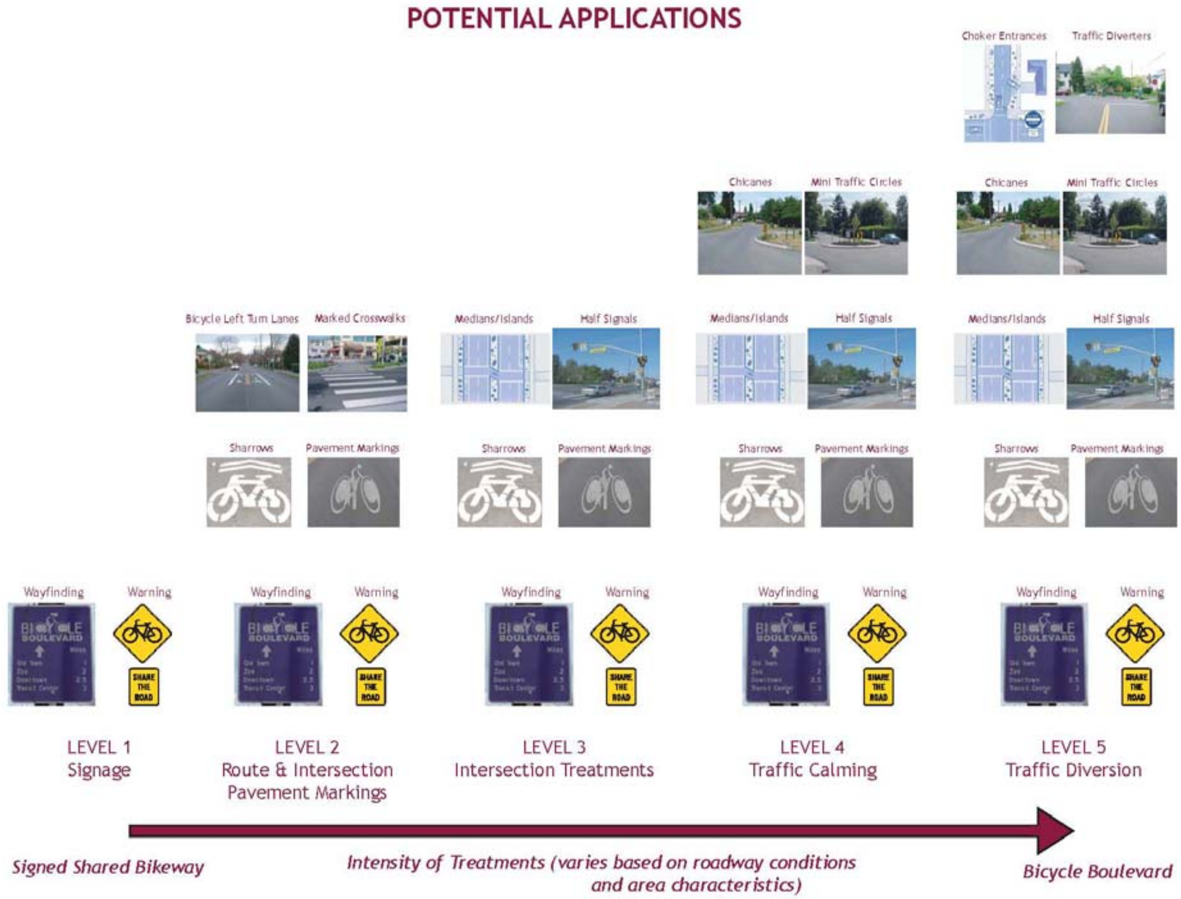
- Parallel major streets lacking dedicated bicycle facilities: Higher-order streets typically include major bicyclist destinations (e.g., commercial and employment areas). However, these corridors often lack bike lanes or other dedicated facilities creating an uncomfortable, unattractive and potentially unsafe riding environment. Bicycle boulevards serve as alternate parallel facilities that allow cyclists to avoid major streets for longer trips.
- Parallel major streets with bicycle facilities that are uncomfortable for some users: Some users may not feel comfortable using bike lanes on major streets due to high traffic volumes and vehicle speeds, conflicts with motorists entering and leaving driveways, and/or conflicts with buses loading and unloading passengers. Children and less-experienced riders might find these environments especially challenging. Utilizing lower-order streets, bicycle boulevards provide alternate route choices for these bicyclists. It should be noted that bike lanes on major streets provide important access to key land uses, and the major street network often provides the most direct routes between major destinations. For these reasons, bicycle boulevards should complement a bike lane network and not serve as a substitute.
- Ease of implementation on most local streets: bicycle boulevards incorporate cost-effective and less physically-intrusive treatments than bike lanes and cycle tracks. Most streets could be provided relatively inexpensive treatments like new signage, pavement markings, striping and signal improvements to facilitate bicyclists' mobility and safety. Other potential treatments include curb extensions, medians, and other features that can be implemented at reasonable cost and are compatible with emergency vehicle accessibility.
- Benefits beyond an improved bicycling environment: Residents living on bicycle boulevards benefit from reduced vehicle speeds and thru traffic, creating a safer and more-attractive environment. Pedestrians and other users can also benefit from boulevard treatments (e.g., by improving the crossing environment where boulevards meet major streets).



Sample bicycle boulevard treatments.

Bicycle Routes/Bicycle Boulevards

Bicycle Boulevard Application Levels



This section describes various treatments commonly used for developing Bicycle Boulevards. The treatments fall within five main "application levels" based on their level of physical intensity, with Level 1 representing the least physically-intensive treatments that could be implemented at relatively low cost. Identifying appropriate application levels for individual Bicycle Boulevard corridors provides a starting point for selecting appropriate site-specific improvements. The five Bicycle Boulevard application levels include the following:

Level 1: Signage	See Section 5.4.1
Level 2: Pavement markings	See Section 5.4.2
Level 3: Intersection treatments	See Sections 5.4.3-5.4.5
Level 4: Traffic calming	See Sections 5.4.6.
Level 5: Traffic diversion	See Sections 5.4.7.

It should be noted that corridors targeted for higher-level applications would also receive relevant lower-level treatments. For instance, a street targeted for Level 3 applications should also include Level 1 and 2 applications as necessary. It should also be noted that some applications may be appropriate on some streets while inappropriate on others. In other words, it may not be appropriate or necessary to implement all "Level 2" applications on a Level 2 street. Furthermore, several treatments could fall within multiple categories as they achieve multiple goals. To identify and develop specific treatments for each bicycle boulevard, Los Angeles County should involve the bicycling community and neighborhood groups. Further analysis and engineering work may also be necessary to determine the feasibility of some applications.

F.5.4.1 Bike Route/Boulevard Signing

Level 1: Bike Route/Boulevard Signing

Design Summary

- Signage is a cost-effective yet highly-visible treatment that can improve the riding environment on a bicycle boulevard.
- The County should adopt consistent signage and paint markings throughout the region.

Discussion

Wayfinding Signs
Wayfinding signs are typically placed at key locations leading to and along bicycle boulevards, including where multiple routes intersect and at key bicyclist "decision points." Wayfinding signs displaying destinations, distances and "riding time" can dispel common misperceptions about time and distance while increasing users' comfort and accessibility to the boulevard network.
Wayfinding signs also visually cue motorists that they are driving along a bicycle route and should correspondingly use caution. Note that too many signs tend to clutter the right-of-way, and it is recommended that these signs be posted at a level most visible to bicyclists and pedestrians, rather than per vehicle signage standards.
Warning signs
Warning signs advising motorists to "share the road" and "watch for bicyclists" may also improve bicycling conditions on shared streets. These signs are especially useful near major bicycle trip generators such as schools, parks and other activity centers. Warning signs should also be placed on major streets approaching bicycle boulevards to alert motorists of bicyclist crossings.

Guidance

- Alta Planning + Design and IBPI. *Bicycle Boulevard Planning and Design Handbook.* www.ibpi.usp.pdx.edu/guidebook.php
- City of Berkeley. (2000). *Bicycle Boulevard Design Tools and Guidelines*.
- AASHTO *Guide for the Development of Bicycle Facilities.*
- *MUTCD* – California Supplement.

F.5.4.2 Bike Route/Boulevard Pavement Markings

Level 2: Bike Route/Boulevard Pavement Markings

Design Summary

- The shared lane marking is the only approved wayfinding/ bicycle boulevard pavement marking by the California MUTCD.

Discussion

Directional Pavement Markings
Directional pavement markings (also known as "bicycle boulevard markings" or "breadcrumbs") lead cyclists along a boulevard and reinforce that they are on a designated route. Markings can take a variety of forms, such as small bicycle symbols placed every 600-800 feet along a linear corridor, as previously used on Portland, Oregon's boulevard network.

Recently, jurisdictions have been using larger, more visible pavement markings. Shared lane markings could be used as bicycle boulevard markings. See shared lane marking guidelines for additional information on this treatment.

In Berkeley, California, non-standard pavement markings include larger-scale lettering and stencils to clearly inform motorists and bicyclists of a street's function as a bicycle boulevard.

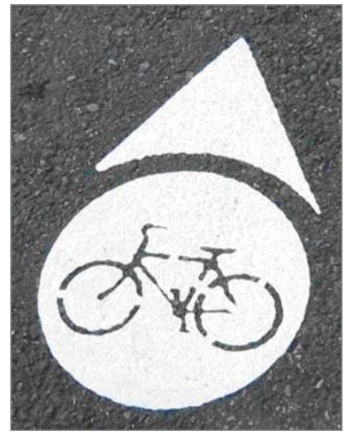
On-Street Parking Delineation
Delineating on-street parking spaces with paint or other materials clearly indicates where a vehicle should be parked, and can discourage motorists from parking their vehicles too far into the adjacent travel lane. This helps cyclists by maintaining a wide enough space to safely share a travel lane with moving vehicles while minimizing the need to swerve farther into the travel lane to maneuver around parked cars.

In addition to benefiting cyclists, delineated parking spaces also promote the efficient use of on-street parking by maximizing the number of spaces in high-demand areas.

Centerline Striping Removal
Automobiles have an easier time passing cyclists on roads without centerline stripes for the majority of the block length. If vehicles cannot easily pass each other using the full width of the street, it is likely that there is too much traffic for the subject street to be a successful bicycle boulevard. In addition, not striping the centerline reduces maintenance costs. Berkeley paints a double yellow centerline from 40-50' at uncontrolled or stop-controlled intersections, as well as pavement reflectors to identify the center of the street.

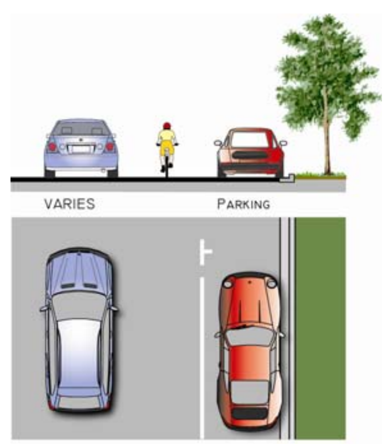
Guidance

- Alta Planning + Design and IBPI. *Bicycle Boulevard Planning and Design Handbook*. www.ibpi.usp.pdx.edu/guidebook.php
- City of Berkeley. (2000). *Bicycle Boulevard Design Tools and Guidelines*.
- AASHTO *Guide for the Development of Bicycle Facilities.*
- *MUTCD* – California Supplement.



Bicycle boulevard directional marker.

Shared lane markings also provide directional support for bicyclists.



Example of on-street parking delineation.

F.5.4.3 Bike Routes/Boulevards at Minor Unsignalized Intersections

Level 3: Bike Routes/Boulevards at Minor Unsignalized Intersections

Design Summary

- To encourage use of the boulevard and improve cyclists' safety, reduce bicycle travel time by eliminating unnecessary stops and improving intersection crossings.

Discussion

Stop Sign on Cross-Street
Unmarked intersections can be dangerous for bicyclists, because cross-traffic may not be watching for cyclists. Stop signs on cross streets require crossing motorists to stop and proceed when safe. Stop signs are a relatively inexpensive treatment that is quite effective at minimizing bicycle and cross-vehicle conflicts. However, stop signs at intersections along bicycle boulevards may be unwarranted as a traffic control device.

Curb Extensions and High-Visibility Crosswalks
This treatment is appropriate near activity centers with large amounts of pedestrian activity, such as schools or commercial areas. Curb extensions should only extend across the parking lane and not obstruct bicyclists' path of travel or the travel lane. Curb extensions and high-visibility crosswalks both calm traffic and also increase the visibility of pedestrians waiting to cross the street, although they may impact on-street parking.

Bicycle Forward Stop Bar
A second stop bar for cyclists placed closer to the centerline of the cross street than the first stop bar increases the visibility of cyclists waiting to cross a street. This treatment is typically used with other crossing treatments (i.e. curb extension) to encourage cyclists to take full advantage of crossing design. They are appropriate at unsignalized crossings where fewer than 25 percent of motorists make a right turn movement.

Guidance

- Alta Planning + Design and IBPI. *Bicycle Boulevard Planning and Design Handbook.* www.ibpi.usp.pdx.edu/guidebook.php
- City of Berkeley. (2000). *Bicycle Boulevard Design Tools and Guidelines.*
- AASHTO *Guide for the Development of Bicycle Facilities.*
- *MUTCD* – California Supplement.

Stop signs effectively minimize conflicts along bicycle boulevards.

Curb extensions can be a good location for pedestrian amenities, including street trees.

Bicycle forward stop bars encourage cyclists to wait where they are more visible.

F.5.4.4 Bike Routes/Boulevards at Major Unsignalized Intersections

Level 3: Bike Routes/Boulevards at Major Unsignalized Intersections

Design Summary

- Increase crossing opportunities with medians and refuge islands.
- Instructional and regulatory signage should be included with installation of a bicycle signal. This signage is not standard and will have to be created for the application. Part 4 of the California MUTCD covers bicycle signals.

Discussion

Medians/Refuge Islands

At uncontrolled intersections at major streets, a crossing island can be provided to allow cyclists to cross one direction of traffic at a time when gaps in traffic allow. The bicycle crossing island should be at least 8' wide to be used as the bike refuge area. Narrower medians can accommodate bikes if the holding area is at an acute angle to the major roadway. Crossing islands can be placed in the middle of the intersection, prohibiting left and thru vehicle movements.

Half-Signals

Bicycle signals are an approved traffic control device in the state of California after the technology was studied and approved after years of service in the City of Davis. A bicycle signal provides an exclusive signal phase for bicyclists traveling through an intersection. This takes the form of a new signal head installed with red, amber, and green bicycle indications. Bicycle signals can be actuated with bicycle sensitive loop detectors, video detection, or push buttons.

Where cyclists have few crossable gaps and where vehicles on the major street do not stop for pedestrians and cyclists waiting to cross, "half signals" could be installed to improve the crossing environment. Half signals include pedestrian and bicycle activation buttons and may also include loop detectors on the bicycle boulevard approach. Many of these models have been used successfully for years overseas, and their use in the U.S. has increased dramatically over the last decade.

Guidance

Note: While bicycle signals are approved for use in California, local municipal code should be checked or modified to clarify that at intersections with bicycle signals, bicycles should only obey the bicycle signal heads.

- Alta Planning + Design and IBPI. *Bicycle Boulevard Planning and Design Handbook.* www.ibpi.usp.pdx.edu/guidebook.php
- City of Berkeley. (2000). *Bicycle Boulevard Design Tools and Guidelines*.
- AASHTO *Guide for the Development of Bicycle Facilities.*
- *MUTCD* – California Supplement.

Medians on bicycle boulevards should provide space for a bicyclist to wait.

Half-signals for bicyclists should be clearly marked to minimize confusion.

F.5.4.5 Bike Routes/Boulevards at Offset Intersections

Bike Routes/Boulevards at Offset Intersections

Design Summary

- Provide turning lanes or pockets at offset intersection , providing cyclists with a refuge to make a two-step turn.
- Bike turn pockets - 5′ wide, with a total of 11′ required for both turn pockets and center striping.

Discussion

Offset intersection can be challenging for cyclists, who need to transition onto the busier cross-street in order to continue along the boulevard.

Bicycle Left-Turn Lane

Similar to medians/refuge islands, bicycle left-turn lanes allow the crossing to be completed in two phases. A bicyclist on the boulevard could execute a right-hand turn onto the cross-street, and then wait in a delineated left-turn lane (if necessary to wait for a gap in oncoming traffic). The bike turn pockets should be at least 5 feet wide, with a total of 11 feet for both turn pockets and center striping.

Bicycle Left Turn Pocket

A bike-only left-turn pocket permits bicyclists to make left turns while restricting vehicle left turns. If the intersection is signal-controlled, a left arrow signal may be appropriate, depending on bicycle and vehicle volumes. Signs should be provided prohibiting motorists from turning. Ideally, the left turn pocket should be protected by a raised curb, but the pocket may also be defined by striping if necessary. Because of the restriction on vehicle left-turning movements, this treatment also acts as traffic diversion.

Example of a bicycle left-turn pocket.

This bike-only left-turn pocket guides cyclists along a popular bike route.

Guidance

- Alta Planning + Design and IBPI. *Bicycle Boulevard Planning and Design Handbook.* www.ibpi.usp.pdx.edu/guidebook.php
- AASHTO *Guide for the Development of Bicycle Facilities.*

F.5.4.6 Bicycle Boulevard Traffic Calming

Level 4: Bicycle Boulevard Traffic Calming

Design Summary

- Traffic calming treatments reduce vehicle speeds to the point where they generally match cyclists' operating speeds, enabling motorists and cyclists to safely co-exist on the same facility.

Discussion

Chicanes: Chicanes are a series of raised or delineated curb extensions on alternating sides of a street forming an S-shaped curb, which reduce vehicle speeds through narrowed travel lanes. Chicanes can also be achieved by establishing on-street parking on alternate sides of the street. These treatments are most effective on streets with narrower cross-sections.

Chicanes require all vehicles to slow down.

Mini Traffic Circles: Mini traffic circles are raised or delineated islands placed at intersections, reducing vehicle speeds through tighter turning radii and narrowed vehicle travel lanes (see right). These devices can effectively slow vehicle traffic while facilitating all turning movements at an intersection. Mini traffic circles can also include a paved apron to accommodate the turning radii of larger vehicles like fire trucks or school buses.

Traffic circles provide an opportunity for landscaping, but visibility should be maintained.

Speed Humps: Shown right, speed humps are rounded raised areas of the pavement requiring approaching motor vehicles to reduce speed. These devices also discourage thru vehicle travel on a street when a parallel route exists.

Speed humps should never be constructed so steep that they may cause a bicyclist to lose control of the bicycle or be distracted from traffic. In some cases, a gap could be provided, whereby a bicyclist could continue on the level roadway surface, while vehicles would slow down to cross the barrier.

Speed humps are a common traffic calming treatment.

Other: The Count also has a Neighborhood Traffic Management Program toolbox, providing information on numerous traffic calming devices that be considered on any bicycle boulevard. The toolbox provides explanations of the pros and cons of these devices, as well as their level of effectiveness. Additional information is available at www.ladpr.org/TNL/NTMP.

Guidance

- Alta Planning + Design and IBPI. *Bicycle Boulevard Planning and Design Handbook.* www.ibpi.usp.pdx.edu/guidebook.php
- City of Berkeley. (2000). *Bicycle Boulevard Design Tools and Guidelines.*
- AASHTO *Guide for the Development of Bicycle Facilities.*

F.5.4.7 Bicycle Boulevard Traffic Diversion

Level 5: Bicycle Boulevard Traffic Diversion

Design Summary

- Traffic diversion treatments maintain thru-bicycle travel on a street while physically restricting thru vehicle traffic.
- Traffic diversion is most effective when higher-order streets can sufficiently accommodate the diverted traffic associated with these treatments.

Discussion

Choker Entrances

Choker entrances are intersection curb extensions or raised islands allowing full bicycle passage while restricting vehicle access to and from a bicycle boulevard. When they approach a choker entrance at a cross-street, motorists on the bicycle boulevard must turn onto the cross-street while cyclists may continue forward. These devices can be designed to permit some vehicle turning movements from a cross-street onto the bicycle boulevard while restricting other movements.

Traffic Diverters

Similar to choker entrances, traffic diverters are raised features directing vehicle traffic off the bicycle boulevard while permitting thru travel.

Advantages:

- Provides safe refuge in the median of the major street so that bicyclists only have to cross one direction of traffic at a time; works well with signal-controlled traffic platoons coming from opposite directions.
- Provides traffic calming and safety benefits by preventing left turns and/or thru traffic from using the intersection.

Disadvantages:

- Potential motor vehicle impacts to major roadways, including lane narrowing, loss of some on-street parking and restricted turning movements.
- Crossing island may be difficult to maintain and may collect debris.

Guidance

- Alta Planning + Design and IBPI. *Bicycle Boulevard Planning and Design Handbook.* www.ibpi.usp.pdx.edu/guidebook.php
- City of Berkeley. (2000). *Bicycle Boulevard Design Tools and Guidelines*.
- AASHTO *Guide for the Development of Bicycle Facilities.*

Choker entrances prevent vehicular traffic from turning from a main street onto a traffic-calmed bicycle boulevard.

Traffic diverters prevent access to both directions of motor vehicle traffic.

F.5.4.8 Bike Signage and Wayfinding

Signing Standards and Guidelines

Bikeways have unique signage requirements and are included in a separate chapter in the Manual of Uniform Traffic Control Devices (MUTCD). In the MUTCD there are three types of signs:

- Regulatory signs indicate to cyclists the traffic regulations which apply at a specific time or place on a bikeway
- Warning signs indicate in advance conditions on or adjacent to a road or bikeway that will normally require caution and may require a reduction in vehicle speed
- Guide and information signs indicate information for route selection, for locating off-road facilities, or for identifying geographical features or points of interest

In addition to MUTCD signs, Los Angeles County uses regulatory signs to alert trail users to the rules and regulations in effect within river path corridors. Under the California Public Resources Code, rules must be posted in order to be enforced by patrolling police officers.

Design Considerations

- Bicycle signs shall be standard in shape, legend, and color
- All signs shall be retroreflective for use on bikeways, including shared-use paths and bicycle lane facilities
- Signs for the exclusive use of bicyclists should be located so that other road users are not confused by them
- Where signs serve bicyclists as well as other road users, vertical mounting height and lateral placement shall be as specified in Part 2 (Signs)

Reference

- Caltrans *Highway Design Manual* (Chapter 1000)
- California MUTCD
- AASHTO *Guide for the Development of Bicycle Facilities*
- Los Angeles River Master Plan Sign Guidelines

MUTCD Sign R5-1b and R9-3c are regulatory sign. The bicycle path exclusion sign (R44A) is specific to the CA MUTCD.

Warning signs are yellow, such as this combination of W11-15 and W11-15P from the MUTCD

Bicycle guide signs are green, and can include destination, direction and distance information. (MUTCD sign D1-3C).

Los Angeles County Department of Public Works regulatory signs post rules and provide contact information.

Wayfinding Guidelines

The ability to navigate through a region is informed by landmarks, natural features, and other visual cues. Wayfinding is a cost-effective and highly visible treatment that can improve the bicycling environment through:

- Helping to familiarize users with the pedestrian and bicycle network
- Helping users identify the best routes to destinations
- Helping to address misperceptions about time and distance
- Helping overcome a "barrier to entry" for infrequent cyclists or pedestrians (e.g., "interested but concerned" cyclists)

A bikeway wayfinding system is composed of three elements:

- Signs: Wayfinding signs throughout Los Angeles County can indicate to pedestrians and bicyclists their direction of travel, location of destinations, and travel time/distance to those destinations.
- Pavement Markings: Pavement markings indicate to cyclists the traffic regulations which apply at a specific time or place on a bikeway. Markings also reinforce to bicyclists that they are on a designated route and remind motorists to drive courteously.
- Maps and Kiosks: Provides users with valuable information regarding bicycle facilities and route options throughout Los Angeles County. Maps and kiosks provide bicyclists with key information such as the rules of the road, tips on safe cycling practices, and other bicycle safety information.

Design Considerations

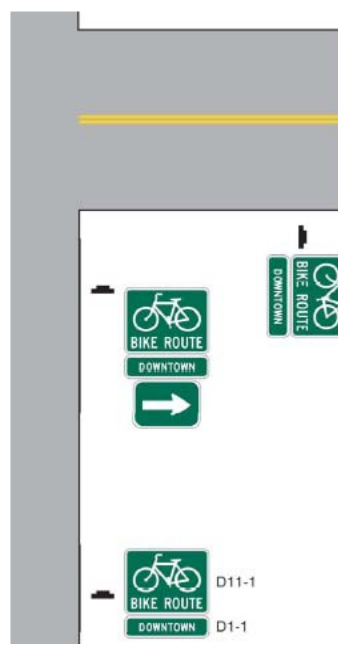
Destinations for on-street signage can include: On-street bikeways, commercial centers, regional parks and trails, public transit sites, civic/community destinations, local parks and trails, hospitals, and schools.

Recommended uses for on-street signage include:

- Confirmation signs confirm that a cyclist is on a designated bikeway. Confirmation signs can include destinations and their associated distances, but not directional arrows.
- Turn signs indicate where a bikeway turns from one street onto another street. Turn signs are located on the near-side of intersections.

Custom bike route guide sign for the Los Angeles River Bikeway.

Pavement markings along the San Gabriel River Bikeway indicate mileage at quarter mile intervals.



Example of signing for an on-roadway bicycle route (MUTCD-CA Figure 9B-6).

Wayfinding Guidelines (continued)

- Decision signs mark the junction of two or more bikeways. Decision signs are located on the near-side of intersections. They can include destinations and their associated directional arrows, but not distances.

Signs are typically placed at key locations leading to and along bicycle routes, including the intersection of multiple routes. Too many road signs tend to clutter the right-of-way, and it is recommended that these signs be posted at a level that is most visible to bicyclists and pedestrians, rather than per vehicle signage standards. Additional recommended guidelines include:

- Place the closest destination to each sign in the top slot. Destinations that are further away can be placed in slots two and three. This allows the nearest destination to 'fall off' the sign and subsequent destinations to move up the sign as the bicyclist approaches.
- Use pavement markings to help reinforce routes and directional signage. Markings, such as bicycle boulevard symbols, may be used in addition to or in place of directional signs along bike routes. Pavement markings can help cyclists navigate difficult turns and provide route reinforcement.

Reference

- Caltrans *Highway Design Manual* (Chapter 1000)
- California MUTCD 9B.19
- AASHTO *Guide for the Development of Bicycle Facilities*
- Los Angeles River Master Plan Sign Guidelines
- City of Oakland. (2009). *Design Guidelines for Bicycle Wayfinding Signage*
- City of Portland (2002). *Bicycle Network Signing Project*

F.5.5 Innovative Bicycle Treatments

Class II - Colored Bike Lanes

Design Summary

<u>Bicycle Lane Width:</u>
5' minimum and 7' maximum.

Colored bike lanes are a common treatment in many European Cities and are starting to garner acceptance in US cities.

Discuss ion

A contrasting color for the paving of bicycle lanes can also be applied to continuous sections of roadways. These situations help to better define road space dedicated to bicyclists and make the roadway appear narrower to drivers resulting in beneficial speed reductions.

Colored bicycle lanes require additional cost to install and maintain. Techniques include:

- Paint – less durable and can be slippery when wet
- Colored asphalt – colored medium in asphalt during construction – most durable.
- Colored and textured sheets of acrylic epoxy coating.
- Thermoplastic – Expensive, durable but slippery when worn.

Guidance

Currently this treatment has been granted interim approval per FHWA.

National Association of City Transportation Officials (NACTO) *Urban Bikeway Design Guide (2011).*

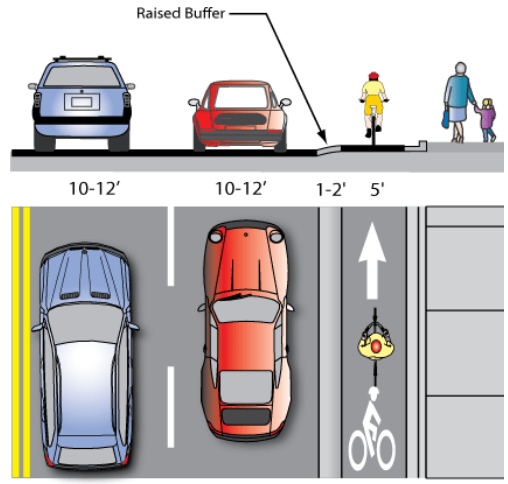
Class II - Raised Bicycle Lanes

Design Summary

Bicycle Lane Width:
5 feet minimum. Bicycle lane should drain to street. Drainage grates should be in travel lane.

Mountable Curb Design:
Mountable curb should have a 4:1 or flatter slope and have no lip that could catch bicycle tires.

Signage & Striping:
Same as traditional Class II bicycle lanes



Discussion

Raised bicycle lanes are bicycle lanes that have a mountable curb separating them from the adjacent travel lanes. Raised bicycle lanes provide an element of physical separation from faster moving vehicle traffic. For drivers, the mountable curb provides a visual and tactile reminder of where the bicycle lane is. For bicyclists the mountable curb makes it easy to leave the bicycle lane if necessary, when passing another bicyclist, or to merge to the left for turning movements. The raised bicycle lane should return to level grade at intersections.

Raised bicycle lanes cost more than traditional bicycle lanes and typically require a separate paving operation. Maintenance costs are lower as the bicycle lane receives no vehicle wear and resists debris accumulation.

Raised bicycle lanes work well adjacent to higher speed roadways with few driveways.

Guidance

Currently this treatment is not present in any State or Federal design standards

National Association of City Transportation Officials (NACTO) *Urban Bikeway Design Guide (2011).*

Crow Design Manual for Bicycle Traffic - Chapter 5

Class II - Buffered Bicycle Lanes

Design Summary

Bicycle Lane Width:
Signage & Striping:
Same as traditional Class II bicycle lanes

Discussion

Provides cushion of space to mitigate friction with motor vehicles on streets with frequent or fast motor vehicle traffic. Buffered Bike lanes allow bicyclists to pass one another or avoid obstacles without encroaching into the travel lane.
These facilities increase motorist shy distance from bicyclist in the bike lane and reduce the risk of "dooring" compared to a conventional bike lane.
Buffered bike lanes require additional roadway space and maintenance.

Guidance

Currently this treatment is not present in any State or Federal design standards
National Association of City Transportation Officials (NACTO) *Urban Bikeway Design Guide (2011).*
Crow Design Manual for Bicycle Traffic - Chapter 5

Class II - Cycletrack

Design Summary

Cycle Track Width:

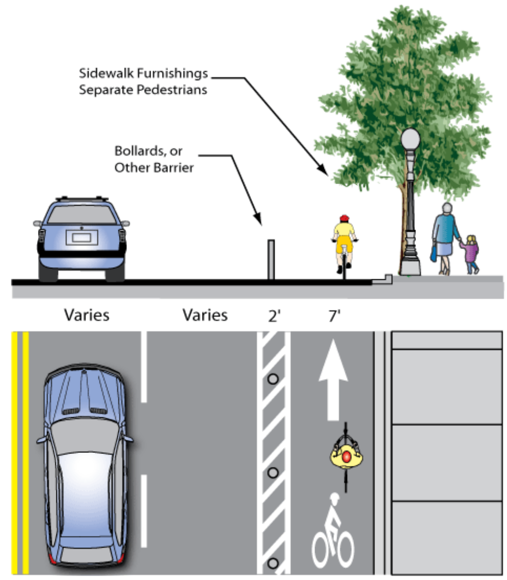
7 feet preferred to allow passing and obstacle avoidance
12 feet minimum for two-way facility

Discussion

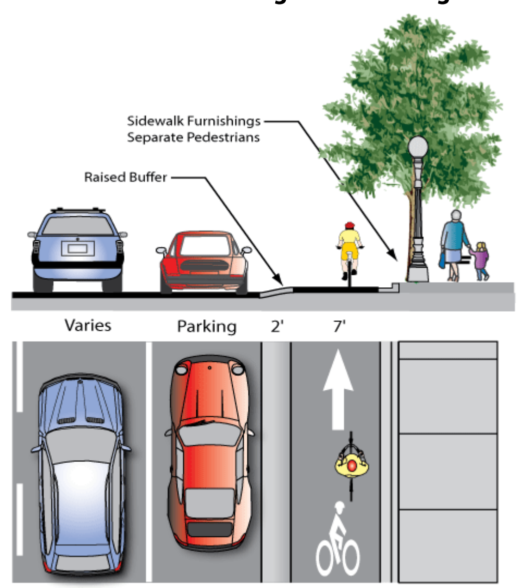
A cycle track is a hybrid type bicycle facility that combines the experience of a separated path with the on-street infrastructure of a conventional bicycle lane. Cycle tracks have different forms, but all share common elements. Cycle tracks provide space that is intended to be exclusively or primarily for bicycles, and is separated from vehicle travel lanes, parking lanes and sidewalks. Cycle tracks can be either one-way or two-way, on one or both sides of a street. They are separated from vehicles and pedestrians by either striping, colored pavement, bollards, curbs/medians or a combination of these elements.

Guidance

Currently this treatment is not present in any State or Federal design standards
National Association of City Transportation Officials (NACTO) *Urban Bikeway Design Guide (2011)*
Crow Design Manual for Bicycle Traffic - Chapter 5



Recommended Design – No Parking

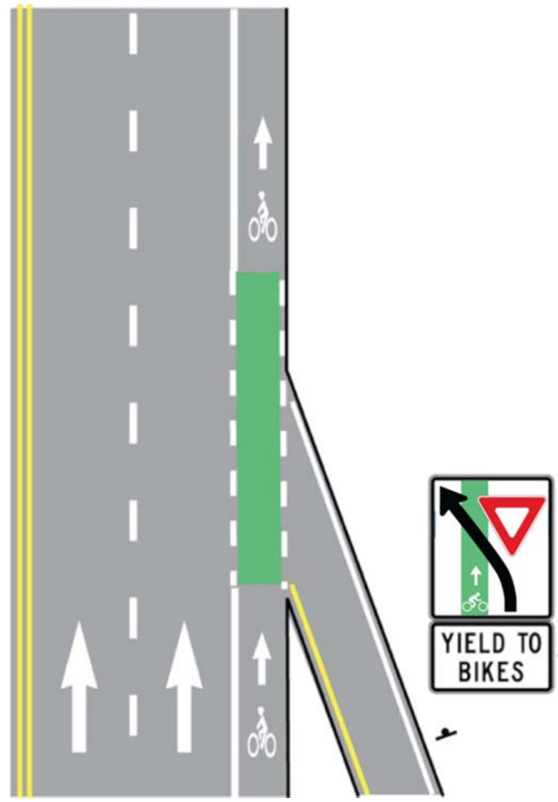


Recommended Design – On-Street Parking

Class II - Colored Bike Lanes at Interchanges

Design Summary

Bicycle Lane Width:
The bicycle lane width through the interchange should be the same width as the approaching bicycle lane (minimum five feet).



Discussion

On high traffic bicycle corridors non-standard treatments may be desirable over current practices outlined in the MUTCD. Dashed bicycle lane lines with or without colored bicycle lanes may be applied to provide increased visibility for bicycles in the merging area.

Guidance

Currently this treatment is not present in any State or Federal design standards
National Association of City Transportation Officials (NACTO) *Urban Bikeway Design Guide (2011).*
City of Chicago - Green Pavement Markings for Bicycle Lanes (Ongoing) - FHWA Experiment No. 9-77(E)
Portland's Blue Bicycle Lanes
http://www.portlandonline.com/shared/cfm/image.cfm?id=58842

Class II - Bicycle Box
Single Lane – No Vehicle Right Turns On Red

Design Summary

Bicycle Box Dimensions:
The Bicycle Box should be 14' deep to allow for bicycle positioning.

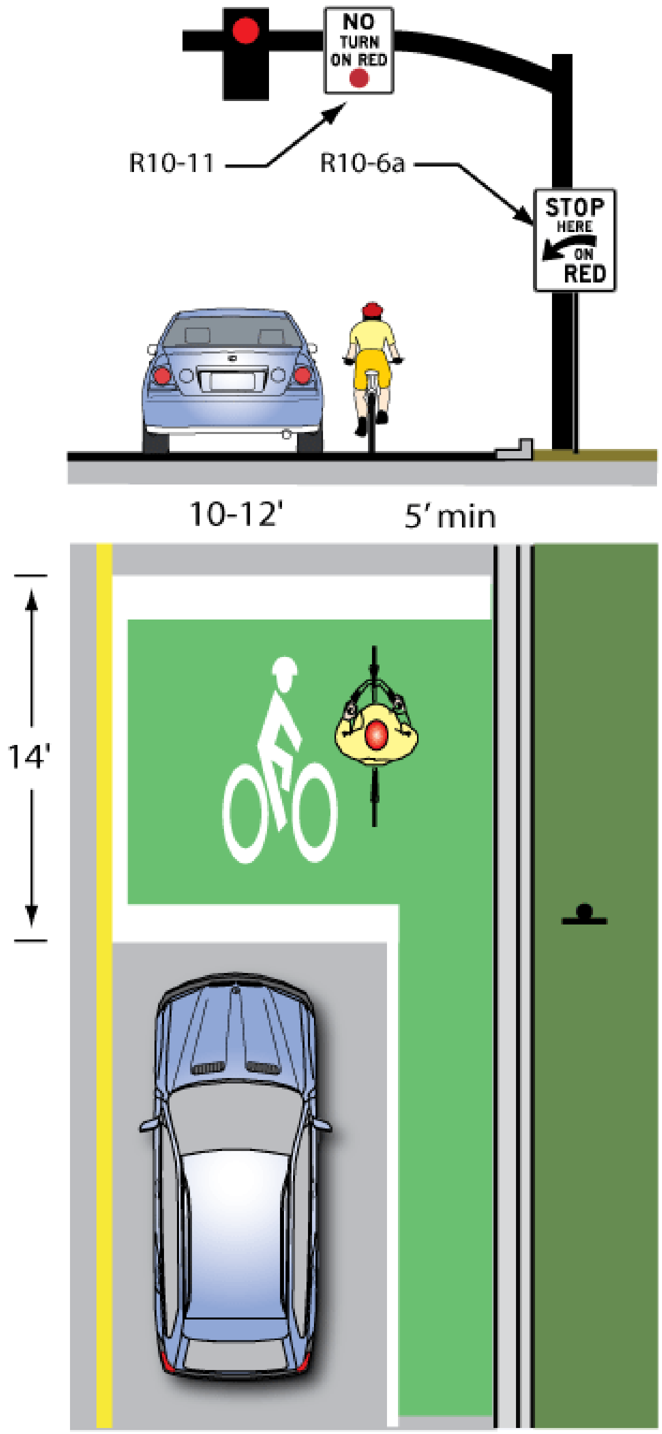
Signage:
Appropriate signage as recommended by the MUTCD applies. Signage should be present to prevent 'right turn on red' and to indicate where the motorist must stop.

Discussion

Bicycle boxes provide additional space for bicyclists to move to the front of the vehicular queue while waiting for a green light. On a two-lane roadway, the bicycle box can also facilitate left turning movements for bicyclists as well as through bicycle traffic. Motor vehicles must stop behind the white stop line at the rear of the bicycle box and may not turn right on red.

Guidance

Currently this treatment is not present in any U.S. State or Federal design manuals.
National Association of City Transportation Officials (NACTO) *Urban Bikeway Design Guide (2011).*
Examples of this treatment can be found in Cambridge, Portland and Vancouver



Class II - Bicycle Box
Multi Lane – No Vehicle Right Turns On Red

Design Summary

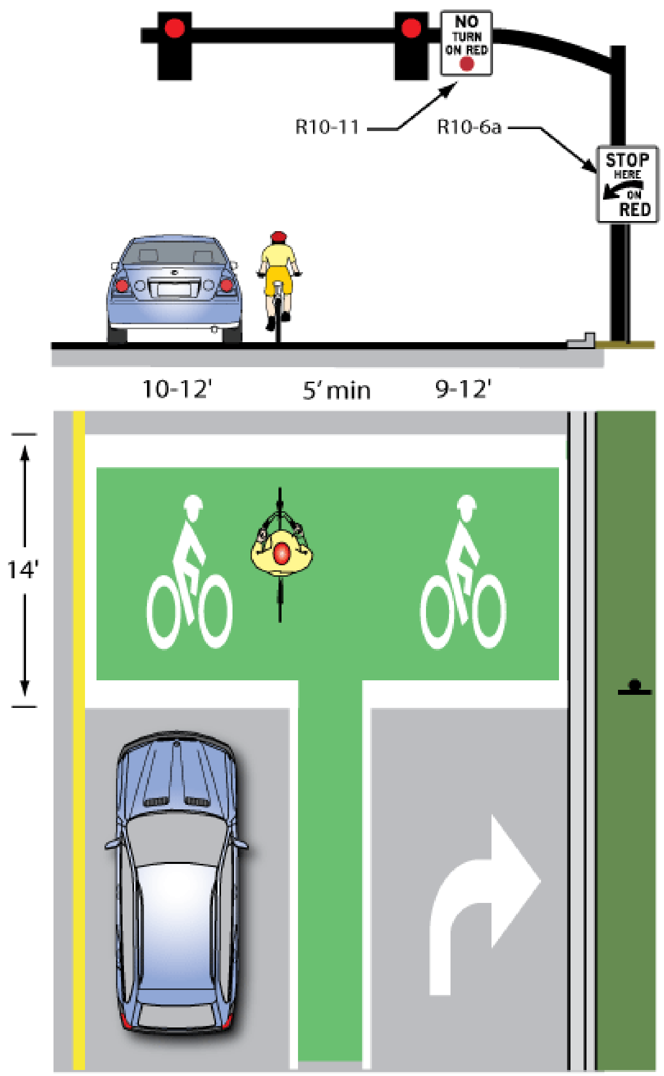
Bicycle Box Dimensions:
The Bicycle Box should be 14' deep to allow for bicycle positioning.
Signage:
Appropriate signage as recommended by the MUTCD applies. Signage should be present to prevent 'right turn on red' and to indicate where the motorist must stop.

Discussion

On wider roadways, the Bicycle Box can allow for movements in all directions for bicyclists providing for right turning, through, and left turning movements ahead of traffic. This treatment can be combined with a bicycle signal or an advanced signal phase to clear queuing bicyclists before vehicles are given a green phase.
At multi-lane bicycle boxes there can be a safety issue if a bicyclist is using the bicycle box to maneuver for a left turn just as the signal turns green. This would put the bicyclist possibly in the path of an approaching vehicle. It is recommended that installations wider than one lane across from the access point to the bicycle box be studied carefully before installation.

Guidance

Currently this treatment is not present in any State or Federal design standards



Class II - Bicycle Box
Multi Lane – Vehicle Right Turns On Red Allowed

Design Summary

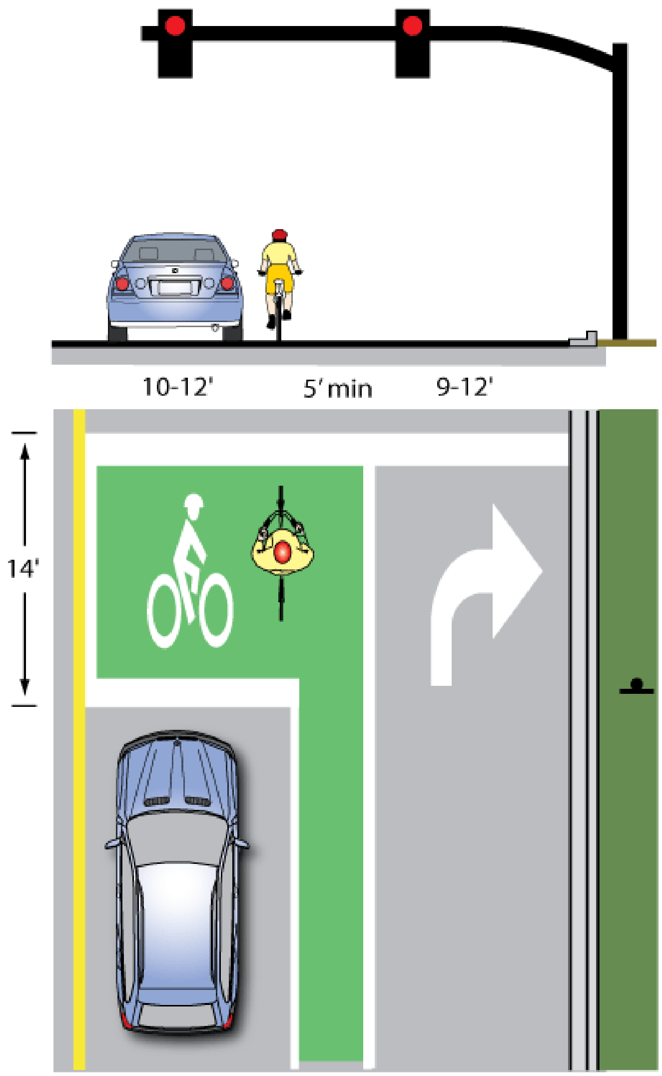
Bicycle Box Dimensions:
The Bicycle Box should be 14' deep to allow for bicycle positioning.
Signage:
Appropriate signage as recommended by the MUTCD applies.

Discussion

In some areas there may be a situation where a freeway ramp exists where bicycles are prohibited or areas where bicycles may not need to access such as parking garages. In these limited cases a vehicle right turn only lane may be provided to the outside of the bicycle box. Right turns on red are permitted in these instances.

Guidance

Currently this treatment is not present in any State or Federal design standards



F.5.6 Bicycle Parking

Bicycle Parking

- Short-term parking accommodates visitors, customers, messengers and others expected to depart within two hours; requires approved standard rack, appropriate location and placement, and weather protection.
- Long-term parking accommodates employees, students, residents, commuters, and others expected to park more than two hours. This parking is to be provided in a secure, weather-protected manner and location.

Design Considerations

Design Issue	Recommended Guidance
Minimum Rack Height	To increase visibility to pedestrians, racks should have a minimum height of 33 inches or be indicated or cordoned off by visible markers.
Signing	Where bicycle parking areas are not clearly visible to approaching cyclists, signs at least 12 inches square should direct them to the facility. The sign should include the name, phone number, and location of the person in charge of the facility, where applicable.
Lighting	A minimum of one foot-candle illumination at ground level should be provided in all high capacity bicycle parking areas.
Frequency of Racks on Streets	In popular retail areas, two or more racks should be installed on each side of each block. This does not eliminate the inclusion of requests from the public which do not fall in these areas. Areas officially designated or used as bicycle routes may warrant the consideration of more racks.
Location and Access	Access to facilities should be convenient; where access is by sidewalk or walkway, ADA-compliant curb ramps should be provided where appropriate. Parking facilities intended for employees should be located near the employee entrance, and those for customers or visitors near main public entrances. (Convenience should be balanced against the need for security if the employee entrance is not in a well traveled area). Bicycle parking should be clustered in lots not to exceed 16 spaces each. Large expanses of bicycle parking make it easier for thieves to be undetected.
Locations within Buildings	Provide bike racks within 50' of the entrance. Where a security guard is present, provide racks behind or within view of a security guard. The location should be outside the normal flow of pedestrian traffic.
Locations near Transit Stops	To prevent bicyclists from locking bikes to bus stop poles - which can create access problems for transit users, particularly those who are disabled - racks should be placed in close proximity to transit stops where there is a demand for short-term bike parking.

Bicycle Parking (continued)

Locations within a Campus-Type Setting	Racks are useful in a campus-type setting at locations where the user is likely to spend less than two hours, such as classroom buildings. Racks should be located near the entrance to each building. Where racks are clustered in a single location, they should be surrounded by a fence and watched by an attendant. The attendant can often share this duty with other duties to reduce or eliminate the cost of labor being applied to bike parking duties; a cheaper alternative to an attendant may be to site the fenced bicycle compound in a highly visible location on the campus. For long-term parking needs of employees and students, attendant parking and/or bike lockers are recommended.
Retrofit Program	In established locations, such as schools, employment centers, and shopping centers, the County should conduct bicycle audits to assess bicycle parking availability and access, and add additional bicycle racks where necessary.

The County could require bicycle parking as part of new developments. Quantities should be linked to land uses; the Association of Pedestrian and Bicycle Professionals (APBP) provides recommended quantities (see APBP reference).

Reference

- Caltrans Highway Design Manual (Chapter 1000)
- California MUTCD
- AASHTO Guide for the Development of Bicycle Facilities
- APBP Bicycle Parking Guidelines (2010.)www.apbp.org/?page=Publications

Short-Term Bicycle Parking

Short-term bicycle parking facilities include racks which permit the locking of the bicycle frame and at least one wheel to the rack and support the bicycle in a stable position without damage to wheels, frame or components. Short-term bicycle parking is currently provided at no charge at various locations in The County of Los Angeles. Such facilities should continue to be free, as they provide minimal security, but encourage cycling and promote proper bicycle parking.

The majority of short-term bicycle parking is provided via a 'staple' on the sidewalk, located within the buffer zone.

Art racks can be an attractive way of providing bicycle parking facilities. Costs can be subsidized by businesses sponsoring racks that are appropriate to their business (e.g., a pair of glasses for an optician).

Bollard-type bicycle racks can also accommodate short-term bicycle parking.

Bike corrals are high capacity bicycle racks installed in areas previously designated for automobile parking. The County shall evaluate requests for bike corrals if property owners and local stakeholders approve removing automobile parking spots.

Design Considerations

- See dimensions below

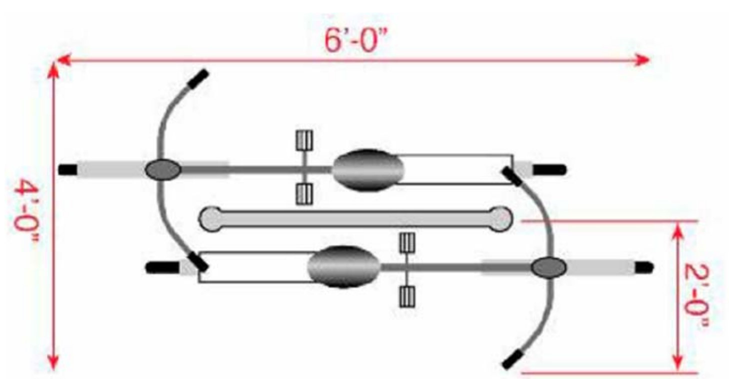
Reference

- Caltrans Highway Design Manual (Chapter 1000)
- California MUTCD
- AASHTO Guide for the Development of Bicycle Facilities

Standard bicycle 'staple' rack.

Art racks can be an attractive way of marketing the bicycle parking.

Bicycle parking can also be on a single post to minimize sidewalk obstructions.



Staple rack parking configuration.

Long-Term Bicycle Parking

Long-term bicycle parking facilities are intended to provide secure long-term bicycle storage. Long-term facilities protect the entire bicycle, its components and accessories against theft and against inclement weather, including snow and wind-driven rain. Examples include lockers, check-in facilities, monitored parking, restricted access parking, and personal storage. Check-in facilities are typically secured facilities that require an access code or key to access. Monitored parking facilities provide some form of supervision, e.g., an attendant.

Long-term parking facilities are more expensive to provide than short-term facilities, but are also significantly more secure. Although many bicycle commuters would be willing to pay a nominal fee to guarantee the safety of their bicycle, long-term bicycle parking should be free wherever automobile parking is free. Potential locations for long-term bicycle parking include transit stations, large employers and institutions where people use their bikes for commuting, and not consistently throughout the day. Coordination between different agencies and property owners would be needed to install parking at many locations.

Bike lockers at a transit station.

Design Considerations

- Dimensions and configuration depends on type of parking

Reference

- Caltrans *Highway Design Manual* (Chapter 1000)
- California MUTCD
- AASHTO *Guide for the Development of Bicycle Facilities*

F.5.7 Bikeway Maintenance

Bikeway Maintenance

Guidelines for regularly maintaining bicycle facilities are provided below.

Sweeping

Bicyclists often avoid shoulders and bike lanes filled with gravel, broken glass and other debris; they will ride in the roadway to avoid these hazards, causing conflicts with motorists. Debris from the roadway should not be swept onto sidewalks (pedestrians need a clean walking surface), nor should debris be swept from the sidewalk onto the roadway. A regularly scheduled inspection and maintenance program helps ensure that roadway debris is regularly picked up or swept.

Action items involving sweeping activities include:

- Establish a seasonal sweeping schedule that prioritizes roadways with major bicycle routes.
- Sweep walkways and bikeways whenever there is an accumulation of debris on the facility.
- In curbed sections, sweepers should pick up debris; on open shoulders, debris can be swept onto gravel shoulders.
- Pave gravel driveway approaches to minimize loose gravel on paved roadway shoulders.
- Provide extra sweeping in the fall where leaves accumulate.

Roadway Surface

Bicycles are more sensitive to subtle changes in roadway surface than motor vehicles. Some paving materials are smoother than others, and compaction/uneven settling can affect the surface after trenches and construction holes are filled. Uneven settlement after trenching can affect the roadway surface nearest the curb where bicycles travel. Sometimes compaction is not achieved to a satisfactory level, and an uneven pavement surface can result due to settling over the course of days or weeks. When resurfacing streets, the county should use the smallest chip size and ensure that the surface is as smooth as possible to improve safety and comfort for bicyclists.

Recommended action items involving maintaining the roadway surface include:

- On all bikeways, use the smallest possible chip for chip sealing bike lanes and shoulders
- Use sealants with the same color as the pavement. This avoids sealing cracks in concrete segments with asphalt
- During chip seal maintenance projects, if the pavement condition of the bike lane is satisfactory, it may be appropriate to chip seal the travel lanes only
- Ensure that on new roadway construction, the finished surface on bikeways does not vary more than ¼ inch
- Maintain a smooth surface on all bikeways that is free of potholes
- Maintain pavement so ridge build-up does not occur at the gutter-to-pavement transition or adjacent to railway crossings
- Inspect the pavement two to four months after trenching construction activities are completed to ensure that excessive settlement has not occurred
- Remove existing markings before reapplying new markings
- When applying thermoplastic stencils for signalizing bikeways, ensure that maximum thickness is 90 millimeters.

Gutter-to-Pavement Transition

On streets with concrete curbs and gutters, 10-20 inches of the curbside area is typically devoted to the gutter pan, where water collects and drains into catch basins. On many streets, the bikeway is situated near the transition between the gutter pan and the pavement edge. It is at this location that water can erode the transition, creating potholes and a rough surface for travel.

The pavement on many streets is not flush with the gutter, creating a vertical transition between these segments. This area can buckle over time, creating a hazardous environment for bicyclists. Since it is the most likely place for bicyclists to ride, this issue is significant for bike travel.

Bikeway Maintenance (continued)

Action items related to maintaining a smooth gutter-to-pavement transition include:

- Ensure that gutter-to-pavement transitions have no more than a ¼ inch vertical transition
- Examine pavement transitions during every roadway project for new construction, maintenance activities, and construction project activities that occur in streets

Drainage Grates

Drainage grates are typically located in the gutter area near the curb of a roadway. Drainage grates typically have slots through which water drains into the municipal wastewater system. Many grates are designed with linear parallel bars spread wide enough for a tire to get caught so that if a bicycle were to ride over them, the front tire would get caught and fall through the slot. This would cause the cyclist to tumble over the handlebars and sustain potentially serious injuries. The County should consider the following:

- Continue to require all new drainage grates be bicycle-friendly, including grates that have horizontal slats on them so that bicycle tires and assistive devices do not fall through the vertical slats
- Create a program to inventory all existing drainage grates and replace hazardous grates as necessary – temporary modifications such as installing rebar horizontally across the grate is no alternative to replacement

Pavement Overlays

Pavement overlays represent good opportunities to improve conditions for cyclists if it is done carefully. A ridge should not be left in the area where cyclists ride (this occurs where an overlay extends part-way into a shoulder bikeway or bike lane). Overlay projects offer opportunities to widen a roadway, or to re-stripe a roadway with bike lanes. Action items related to pavement overlays include:

- Extend the overlay over the entire roadway surface to avoid leaving an abrupt edge
- If there is adequate shoulder or bike lane width, it may be appropriate to stop at the shoulder or bike lane stripe, provided no abrupt ridge remains
- Ensure that inlet grates, manhole, and valve covers are within ¼ inch of the pavement surface and are made or treated with slip resistant materials
- Pave gravel driveways to property line to prevent gravel from spilling onto shoulders or bike lanes

Signage

Signage is crucial for safe and comfortable use of the bicycle and pedestrian network. Such signage is vulnerable to vandalism or wear, and requires regular maintenance and replacement as needed. The County should consider:

- Check regulatory and wayfinding signage along bikeways for signs of vandalism, graffiti, or normal wear
- Replace signage along the bikeway network as-needed
- Perform a regularly-scheduled check on the status of signage with follow-up as necessary
- Create a Maintenance Management Plan (see below)

Landscaping

Bikeways can become inaccessible due to overgrown vegetation. All landscaping needs to be designed and maintained to ensure compatibility with the use of the bikeways. After a flood or major storm, bikeways should be checked along with other roads, and fallen trees or other debris should be removed promptly. Landscaping maintenance action items include:

- Ensure that shoulder plants do not hang into or impede passage along bikeways

After major damage incidents, remove fallen trees or other debris from bikeways as quickly as possible.

Reference

- Caltrans *Highway Design Manual* (Chapter 1000)
- California MUTCD

Appendix G. StreetPlan Analysis

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A critical component of bikeway analysis was the use of Alta Planning + Design's 'StreetPlan' model. The StreetPlan model is a method to determine how an existing roadway cross section can be modified to include bike lanes. Assuming acceptable minimum widths for each roadway element, the model analyzes a number of factors to determine strategies to retrofit bike lanes on each surveyed roadway segment. Factors used in this analysis include:

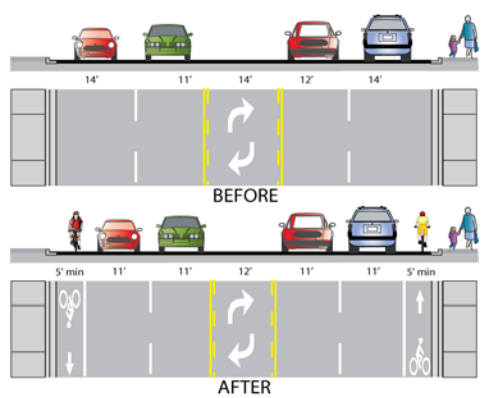
- Current roadway width
- Raised or painted median
- Number and width of travel lanes
- Presence and number of turn lanes and medians
- Location and utilization of on-street parking
- One-way vs. two-way traffic

In some cases, the retrofit is simple and only requires the addition of a bike lane in readily available roadway space while other circumstances may be more challenging and require the narrowing of a travel lane, the removal of on-street parking or a more detailed engineering study. This model is useful as it clearly illustrates locations where projects can be completed easily and locations where adding bike lanes may be challenging. Retaining a uniform roadway configuration throughout a corridor can simplify travel for motorists and cyclists alike, creating a safer and more comfortable experience for all users.

For the model, acceptable minimum roadway dimensions were set at the following widths provided by the County of Los Angeles:

- Travel lane width:[v] 11 feet
- Right turn lane width: 12 feet
- Left or Center Turn Lane width: 10 feet
- Parking lane width: 8 feet

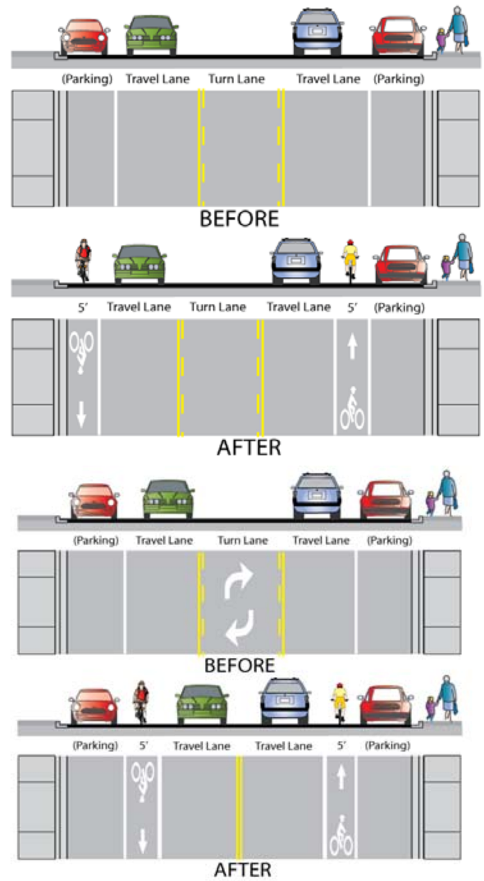
In running the StreetPlan model, multiple strategies for accommodating bike lanes were possible for many segments of roadway. During the first public workshop, approximately 100 members of the public were given the strategies below for retrofitting bike lanes within existing County collectors and arterials. The participants were asked to rate each strategy according to their level of support. The following section lists the options for retrofitting bike lanes given the physical curb-to-curb roadway constraints found in the County. These options were analyzed in this order through the public workshop feedback and project steering committee feedback. Not all of the options below were possible strategies for all segments.



[v] *The County will consider reduced travel lane widths of 10 feet on a case by case basis and as recommended using engineering judgment considering such factors as vehicle speeds, and truck and bus volumes.*

Bike Lanes Fit With Existing Roadway Configuration – In this option, enough surplus road space exists to simply add the bike lane stripes and stencils without impacting the number of lanes or configuration of the roadway. This is by far the most desirable and easily implemented option available.

Narrow Travel Lanes and/or Parking Lanes – In this option bike lanes can be added by simply adjusting wide travel lanes or parking lanes within the established minimums presented above. As before, no modifications to the number of total lanes are required.



Remove Redundant or Unneeded On-Street Parking – In this option, unnecessary on-street parking on one side of the street is removed to create space for bike lanes. Acceptable situations for this scenario include collector or arterial roadways that pass by back fences of homes rather than frontages, or areas that have large surface parking lots adjacent to existing on-street parking.

Remove Center Turn Lane – In this option, the center turn lane is removed to provide road space for the addition of bicycle lanes. This strategy preserves all on-street parking. The turn lane can be restored at intersections if needed. This option will have minor impacts to turning vehicles mid-block, however this situation already exists in several locations within Los Angeles County and is common throughout the country.

Remove On-Street Parking – In this option, on-street parking is removed on one side of the road even if it may currently be utilized in residential or commercial areas. This option is seen as a less desirable option and may only be considered as a last resort in short sections to maintain bike lane continuity. A full parking study should be conducted to determine if excess parking capacity exists before making changes to the roadway configuration.

Bike Lanes Will Not Fit – In this last case, the existing roadway geometry will not allow for the addition of bike lanes. Either a bike route or major reconstruction of the roadway may be necessary for bikeway continuity.

Appendix H. Engineering Unit Cost Estimates

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Table H-1: Class II Bike Lane Striping Unit Cost Estimate

Installations	Unit Price	Unit	Quantity	Item Total
Signs (2 minimum per block * 8 blocks per mile)	$300	Each	16	$4,800
Striping	$4	Linear Foot	5,280	$21,120
Total Contract Cost				$25,920
Contingency (20% of contract)				$5,184
Total P.E. (20% of contract)				$5,184
Construction Engineering (20% of contract)				$5,184
Project Total				$41,472
Rounded Total				**$40,000 per mile**

Table H-2: Class II Bike Lane with Median/Curb Reconstruction Unit Cost Estimate

Removals	Unit Price	Unit	Quantity	Item Total
Concrete Pavement	$75	Cubic Yard	8,580	$643,500
Striping	$6	Linear Foot	5,280	$31,680
Installations	**Unit Price**	**Unit**	**Quantity**	**Item Total**
AC Pavement	$25	Linear Foot	5,280	$132,000
Aggregate Base	$10	Linear Foot	5,280	$52,800
PCC Curb and Gutter over 6" CMB	$22	Linear Foot	5,280	$116,160
Signs (2 minimum per block * 8 blocks per mile)	$300	Each	16	$4,800
Striping	$8	Linear Foot	5,280	$42,240
Total Contract Cost				$1,023,180
Contingency (20% of contract)				$204,636
Total P.E. (15% of contract)				$255,795
Construction Engineering (20% of contract)				$204,636
Project Total				$1,688,247
Rounded Total				**$1,700,000 per mile**

Table H-3: Class II or III – Bike Lane / Route (Road Widening /Added Paved Shoulder) Unit Cost Estimate

Removals	Unit Price	Unit	Quantity	Item Total
Striping	$6	Linear Foot	5,280	$31,680
Installations	**Unit Price**	**Unit**	**Quantity**	**Item Total**
AC Pavement	$25	Linear Foot	5,280	$132,000
Aggregate Base	$10	Linear Foot	5,280	$52,800
Signs (2 minimum per block * 8 blocks per mile)	$300	Each	16	$4,800
Striping	$4	Linear Foot	5,280	$21,120
Total Contract Cost				$242,400
Contingency (20% of contract)				$48,480
Total P.E. (15% of contract)				$60,600
Construction Engineering (20% of contract)				$48,480
Project Total				$399,960
Rounded Total				**$400,000 per mile**

Table H-4: Class III – Bike Routes (Signing Only) Unit Cost Estimate

Installations	Unit Price	Unit	Quantity	Item Total
Signs (4 minimum per block * 8 blocks per mile)	$300	Each	32	$9,600
Total Contract Cost				$9,600
Contingency (20% of contract)				$1,920
Total P.E. (20% of contract)				$1,920
Construction Engineering (20% of contract)				$1,920
Project Total				$15,360
Rounded Total				**$15,000 per mile**

Table H-5: Class III – Bike Routes (Signing and Sharrows) Unit Cost Estimate

Installations	Unit Price	Unit	Quantity	Item Total
Signs (4 minimum per block * 8 blocks per mile)	$300	Each	32	$9,600
Sharrow Pavement Marking (4 minimum per block * 8 blocks per mile)	$155	Each	32	$4,960
Total Contract Cost				$14,560
Contingency (20% of contract)				$2,912
Total P.E. (20% of contract)				$2,912
Construction Engineering (20% of contract)				$2,912
Project Total				$23,296
Rounded Total				**$25,000 per mile**

Table H-6: Class II – Bike Lane (Road Diet, 4 to 3 lanes) Unit Cost Estimate

Removals	Unit Price	Unit	Quantity	Item Total
Striping	$6	Linear Foot	5,280	$31,680
Installations	Unit Price	Unit	Quantity	Item Total
Signs (2 minimum per block * 8 blocks per mile)	$300	Each	16	$4,800
Striping	$8	Linear Foot	5,280	$42,240
Signal Modification/Loop Restoration	$20,000	Lump Sum	1	$20,000
Total Contract Cost				$98,720
Contingency (20% of contract)				$19,744
Total P.E. (15% of contract)				$24,680
Construction Engineering (20% of contract)				$19,744
Project Total				$162,888
Rounded Total				**$165,000 per mile**

Table H-7: Bicycle Boulevard Unit Cost Estimates

Installations	Unit Price	Unit	Quantity	Item Total
Signs (2 minimum per block * 8 blocks per mile)	$300	Each	16	$4,800
Sharrow Pavement Marking (4 minimum per block * 8 blocks per mile)	$155	Each	32	$4,960
Striping (200 LF x 8 intersections)	$2	Linear Foot	1,600	$3,200
Total Contract Cost				$17,760
Contingency (20% of contract)				$3,552
Total P.E. (20% of contract)				$3,552
Construction Engineering (20% of contract)				$3,552
Project Total				$28,416
Rounded Total[vi]				**$30,000 per mile**

[vi] *An additional $250,000 was added to the cost estimate of Bicycle Boulevard project for each instance it intersects an arterial roadway at an uncontrolled location. This additional cost is for the installation of a signalized crossing.*

Appendix I. Prioritization and Phasing Plan

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Sixteen different criteria were used to assign prioritization scoring. The criteria fall under two main category themes: Utility and Implementation. Next to the full prioritization scores listed in **Table I-2** through **Table I-4** are two sub-scores which display the breakdown between Utility score and Implementation score.

The first category, Utility Criteria – for which there are 10 inputs for a maximum of 145 points – considers a project's usefulness toward enhancing the current bicycle network and providing service to key land uses. The second category, Implementation Criteria – for which there are 6 inputs for a maximum of 50 points – considers prioritizing projects with fewer implementation obstacles.

I.1 Utility Criteria

Connects to Existing Bikeway Facility (0, 15, or 20 points)

Points were awarded if a project makes a connection to an existing bicycle facility. For projects connecting to an existing Class I facility, the full 20 points were awarded. For projects connecting to existing on-street bicycle facilities, 15 points were awarded.

Connects to Proposed Bikeway Facility (0 or 10 points)

Points were awarded to projects connecting with other proposed bicycle facilities.

Alternative Route Availability (0 or 10 points)

Points were awarded if a project did not have a parallel existing facility running along a similar span for the extent of the project within a distance of several blocks. If a bicycle project was proposed over an existing bicycle facility (for instance, if an existing Class III were proposed to become a Class II), points were not awarded.

Connects to University, Community College or Other Institutions of Higher Learning (0 or 20 points)

Points were awarded if a proposed project was adjacent to a college or university. For-profit institutions of higher learning were not included in this criterion.

Connects to Mass Transit Station (0 or 20 points)

Points were awarded if a proposed project was adjacent to a Metro or MetroLink Station or if a proposed project provided an extension of an existing facility adjacent to a Metro or MetroLink Station.

Connects to K-12 School (0, 10 or 20 points)

Points were awarded if a proposed project was adjacent to a K-12 School. If multiple schools were adjacent to a proposed project, then the full 20 points were awarded. If a single K-12 school was adjacent to a proposed project, then 10 points were awarded.

Within an Area of High Employment Density (0 or 10 points)

Proposed bicycle projects were scored for this criterion by obtaining the total number of jobs which fall along the blocks adjacent to the extent of the proposed project. To normalize, the total number of jobs was divided by the length of the project, to obtain a jobs-per-mile figure.

After this data was collected for all proposed projects, the totals were divided into 5 categories separated by percentile, and the projects in the top fifth category received the points.

Employment data was obtained for 2008, the most recent year available, from the Longitudinal-Employer Household Dynamics (LEHD) website. LEHD is a program of the US Census designed to provide high quality and up-to-date local labor market information to decision-makers. LEHD data can be downloaded to GIS as detailed as the city block level (as centroid points to a city block) for geographies as large as counties from this website: http://lehd.did.census.gov/led/index.php

Connects to Park, Library or Recreation Center (0, 10 or 20 points)

Points were awarded if a proposed project was adjacent to a park, library or recreation center. If more than one of these land uses were adjacent to a proposed project, then the full 20 points were awarded. If only one of these uses was adjacent to a proposed project, then 10 points were awarded.

Collision Analysis (0 or 5 points)

Proposed bicycle projects were scored for this criterion by summing together all of the bicycle crashes which fall along the extent of the proposed project to obtain a total number of crashes along the project extent. To normalize, the total number of crashes was divided by the length of the project, to obtain a crash per mile figure.

After this data was collected for all proposed projects, the totals were divided into five categories separated by Natural Breaks, and the projects within the top quantile of the natural breaks categories received the points.

Within part of County with Higher than Average Zero-Vehicle-Ownership Households (0 or 10 points)

If the proposed project is within a census tract whose percentage of zero-vehicle-ownership households was higher than the county average (12.5%), then points were awarded for this criterion.

Community Support (0 to 10 points)

Points were awarded if a proposed project was recognized by at least one community member as a priority. If more than one comment was received supporting the proposed project, then 10 points were awarded. If only one comment was received supporting the proposed project, then 5 points were awarded. Community support input was collected through the public comment process undertaken for the preparation of this Plan.

I.2 Implementation Criteria

Information was obtained from the engineering feasibility analysis.

Project Cost (0-20 points)

Prioritization points were awarded to proposed projects on the basis of project cost. Points and project cost were assigned an inverse relationship—projects received higher points for being lower cost. Points were awarded as shown in **Table I-1**.

Table I-1: Project Cost Prioritization Criteria

Cost of Proposed Project	Points Received
$100,000 or Less	20
$100,001 - $500,000	15
$500,001 - $1,500,000	10
$1,500,001 - $3,000,000	5
Greater than $3,000,000	0

Project Coordination (0 or 10 points)

Projects were awarded with points for this criterion if jurisdictional coordination was not required for implementation of the project.

Requires Travel Lane Removal (0 or 5 points)

Projects were awarded points if travel lane removal was not required.

Requires Reduction in Width of Landscaped Median (0 or 5 points)

Projects were awarded with points if the median width reduction was not required.

Requires Street Widening of Paved Surface (0 or 5 points)

Projects were awarded with points if widening the roadway was not required.

Requires Parking Removal (0 or 5 points)

Projects were awarded with points if parking removal was not required.

Table I-2: Phase I Bikeway Projects

Segment	From	To	Class	Mileage	Priority Score	Utility Score	Implementation Score	Planning Area
N. Sunset Avenue	Amar Road	Temple Avenue	2	0.4	145	100	45	East San Gabriel Valley
Workman Mill Road	San Jose Creek Bicycle Path	Strong Avenue	2	3.6	145	100	45	Gateway
Woods Avenue	1st Avenue	Olympic Boulevard	BB	1.3	145	105	40	Metro
Cesar Chavez	Mednik Avenue	Roscommon	2/3	2.0	145	95	50	Metro
Crocket Boulevard	76th Place	83rd Street	3	0.6	145	95	50	Metro
Hawthorne Boulevard	104th Street.	111 Street	2	0.5	145	95	50	South Bay
Redondo Bch Boulevard	Prairie Avenue	Crenshaw Boulevard	2	1.1	145	100	45	South Bay
Madre Street / Muscatel	San Pasqual	Longden Drive	3	1.7	145	95	50	West San Gabriel Valley
Del Mar Boulevard	Pasadena City Limit	Rosemead Avenue	3	0.5	145	95	50	West San Gabriel Valley
San Jose Creek	7th Avenue	Murchison Avenue	1	15.6	140	120	20	East San Gabriel Valley
Normandie Avenue	98th Street	El Segundo Boulevard	2	2.1	140	105	35	Metro
E. 68th Street	Central Avenue	Compton Avenue	3	0.5	135	85	50	Metro
Maie Avenue / Miramonte Boulevard	Slauson Avenue	92nd Street	BB	2.5	135	85	50	Metro
Redondo Beach Boulevard	S Figueroa Street	Avalon Boulevard	2	1.0	135	95	40	Metro
Florence Avenue	Central Avenue	Mountain View Avenue	2	2.2	135	100	35	Metro
Vermont Avenue	87th Street	El Segundo Boulevard	2	2.9	135	110	25	Metro
Rosemont Avenue	Rockdell Street	Honolulu Avenue	3	1.9	135	85	50	San Fernando Valley
Budlong Avenue	N County Border	El Segundo Boulevard	BB	3.0	130	80	50	Metro
El Segundo Boulevard	Figueroa	Central	2	1.6	130	90	40	Metro
Compton Avenue	Slauson Avenue	92nd Street	2	2.5	130	90	40	Metro
Broadway	E. 121st Street	E. Alondra Boulevard	2	2.5	130	90	40	Metro
Firestone Boulevard	Central Avenue	Alameda Street	2	1.4	130	95	35	Metro
Imperial Hwy	Van Ness Avenue	Vermont Street	2	1.5	130	105	25	Metro

Table I-2: Phase I Bikeway Projects (continued)

Segment	From	To	Class	Mileage	Priority Score	Utility Score	Implementation Score	Planning Area
La Cresenta Avenue	Orange Avenue	Foothill Boulevard	3	0.6	130	80	50	San Fernando Valley
111th Street	Buford Avenue	Prairie Avenue	3	1.1	130	80	50	South Bay
Allen Avenue	Pinecrest Drive.	New York Drive	3	0.9	130	80	50	West San Gabriel Valley
Pathfinder Road	Paso Real Avenue	Alexdale Lane	2	0.4	125	75	50	East San Gabriel Valley
Vineland Avenue	Nelson Avenue	Proposed bike path	3	1.3	125	75	50	East San Gabriel Valley
Killian Avenue	Paso Real Avenue	Otterbien	3	0.4	125	75	50	East San Gabriel Valley
Paso Real Avenue	Colima Road	Pathfinder Road	3	0.9	125	75	50	East San Gabriel Valley
Denker Avenue	Century Boulevard	Imperial Hwy	3	1.0	125	75	50	Metro
Holmes Avenue	Slauson Avenue	Gage Avenue	2	0.5	125	80	45	Metro
Rosecrans Avenue	Figueroa Street	Central Avenue	2	1.7	125	95	30	Metro
Manhattan Beach Boulevard	Prairie	Crenshaw	2	1.0	125	85	40	South Bay
Eaton Wash Channel	New York Drive	Rio Hondo Bikeway	1,3	8.3	125	110	15	West San Gabriel Valley
30th Street West	Avenue M	Avenue 0-12	2	2.7	120	85	35	Antelope Valley
Los Padres Drive/ Jellick Avenue	Greenbay Drive	Aguiro Street	3	1.5	120	70	50	East San Gabriel Valley
Amar Road	Vineland Avenue	N. Puente Avenue	2	0.4	120	75	45	East San Gabriel Valley
W Gladstone Street	Blender Street	Big Dalton Wash	3	0.8	120	80	40	East San Gabriel Valley
Ford Boulevard	Floral Drive	Olympic Boulevard	3	1.8	120	70	50	Metro
Hazard Avenue	City Terrace Drive	Cesar Chavez Avenue	3	1.1	120	70	50	Metro
6th Street	Ford Boulevard	Harding Avenue	3	1.8	120	70	50	Metro
92nd Street E	Central Avenue	Alameda Street	3	0.8	120	70	50	Metro
Nadeau Street / Broadway	Central Avenue	E County Border	2	2.6	120	80	40	Metro
Altura Avenue	La Crescenta Avenue	Rosemount Avenue	3	0.3	120	70	50	San Fernando Valley

Table I-2: Phase I Bikeway Projects (continued)

Segment	From	To	Class	Mileage	Priority Score	Utility Score	Implementation Score	Planning Area
La Crescenta Avenue	Foothill Boulevard	Montrose Avenue	3	0.6	120	75	45	San Fernando Valley
104th Street	Buford Avenue	Prairie Avenue	3	1.1	120	70	50	South Bay
Marine Avenue	Gerkin Avenue	Crenshaw Boulevard	3	0.9	120	70	50	South Bay
Balan Rd / Annandel Avenue	Cul-de-sac s/o Pathfinder Rd	Brea Canyon Cut Off Rd	3	1.0	115	65	50	East San Gabriel Valley
Batson Avenue	Colima Rd	Dragonera Drive	3	1.1	115	65	50	East San Gabriel Valley
Nogales Street	La Puente Road	Hollingworth Street	2	0.4	115	75	40	East San Gabriel Valley
Pathfinder Road	Fullerton Road	Paso Real Avenue	2	1.6	115	75	40	East San Gabriel Valley
Fullerton Road	Colima Road	Pathfinder Road	2	1.6	115	75	40	East San Gabriel Valley
Whiteside Street	Hebert Avenue	Eastern Avenue	3	0.6	115	65	50	Metro
Seville Avenue	E. Florence Avenue	Broadway	2	0.5	115	75	40	Metro
Pico Canyon Rd	The Old Road	Whispering Oaks	2	1.2	115	65	50	Santa Clarita Valley
Normandie Avenue	225th Street	Sepulveda Boulevard	2	0.6	115	70	45	South Bay
Longden Avenue	8th Avenue	Peck Road	3	1.0	115	65	50	West San Gabriel Valley
Holliston Avenue	S County Border	Altadena Drive	3	1.1	115	65	50	West San Gabriel Valley
Fiji Way	0.7 Miles South of Lincoln Boulevard	Lincoln Boulevard	3,2	0.8	115	65	50	Westside
Fiji Way	Lincoln Boulevard	Admiralty Way	3	0.1	115	65	50	Westside
Elizabeth Lake Rd	10th Street	Dianron Rd	2	0.8	110	60	50	Antelope Valley
170th Street E	Avenue M	Palmdale Boulevard	2	0.9	110	60	50	Antelope Valley
Nogales Street	Arenth Avenue	Pathfinder Rd	2	1.8	110	70	40	East San Gabriel Valley
Pathfinder Road	Alexdale Lane	Canyon Ridge Road	2	1.9	110	70	40	East San Gabriel Valley
Mills Avenue	Telegraph Rd	Lambert Rd	2	1.4	110	75	35	Gateway
Mednik Avenue	Floral Drive	Olympic Boulevard	2	1.9	110	85	25	Metro

Table I-2: Phase I Bikeway Projects (continued)

Segment	From	To	Class	Mileage	Priority Score	Utility Score	Implementation Score	Planning Area
124th Street E	Slater Avenue	Alameda Street	3	1.5	110	60	50	Metro
Whittler Boulevard	Indiana Street	Ford Boulevard	3	1.2	110	60	50	Metro
Success Avenue/Slater Avenue	Imperial Hwy	El Segundo Boulevard	3	0.9	110	70	40	Metro
Avalon Boulevard	121st Street	E Alondra Boulevard	2	2.5	110	70	40	Metro
Briggs Avenue	Shields Street	Foothill Boulevard	3	1.3	110	60	50	San Fernando Valley
Las Virgenes Rd / Malibu Canyon Rd	Mureau Rd	Pacific Coast Hwy	3	7.9	110	95	15	Santa Monica Mountains
Lennox Boulevard.	Felton Avenue	Osage Avenue	3	1.1	110	60	50	South Bay
Daines Drive/ Lynd Avenue	Santa Anita Avenue	Mayflower Avenue	3	1.3	110	60	50	West San Gabriel Valley
Lake Avenue	Loma Alta Drive	S County Border	3	1.9	110	60	50	West San Gabriel Valley
Sierra Hwy	915' s/o Avenue s	Pearlblossom Hwy	2	2.7	105	70	35	Antelope Valley
Mauna Loa Avenue	Citrus Avenue	E County Border	3	0.6	105	65	40	East San Gabriel Valley
Colima Rd	Mulberry Drive	Poulter Drive	3	1.2	105	55	50	Gateway
Whitter Boulevard	Ford Boulevard	Via Clemente Street	3	2.4	105	60	45	Metro
Imperial Hwy	Central Avenue	Wilmington	2	0.9	105	70	35	Metro
Alondra Boulevard	Figueroa Street	Avalon Boulevard	2	1.0	105	85	20	Metro
Mureau Rd	Las Virgenes Road	Calabasas Rd	2	1.8	105	55	50	Santa Monica Mountains
S Freeman Avenue	W 104th Street	W 111th Street	3	0.5	105	55	50	South Bay
S. Lemoli Avenue	Marine Avenue	Manhattan Beach Boulevard	3	0.5	105	55	50	South Bay
Doty Avenue	Marine Avenue	Manhattan Beach Boulevard	3	0.5	105	55	50	South Bay

Table I-2: Phase I Bikeway Projects (continued)

Segment	From	To	Class	Mileage	Priority Score	Utility Score	Implementation Score	Planning Area
Aviation Boulevard	Imperial Hwy	154th Street	2	0.7	105	70	35	South Bay
Huntington Drive	San Gabriel Boulevard	Michillinda Avenue	2	1.4	105	60	45	West San Gabriel Valley
Sierra Madre Villa Avenue	I-210	Green Street	3	0.2	105	65	40	West San Gabriel Valley
Avenue L-8	65th Street West	60th Street West	2	0.5	100	60	40	Antelope Valley
Willow Avenue	Amar Rd	Francisquito Avenue	3	0.8	100	50	50	East San Gabriel Valley
Las Lomitas Drive / Newton Street	Vallecito Drive	Hacienda Boulevard	3	1.1	100	50	50	East San Gabriel Valley
Los Robles Avenue	7th Avenue	Kwis Avenue	3	1.3	100	50	50	East San Gabriel Valley
Fairway Drive / Brea Canyon Cut Off Rd	Walnut Rd	Bickford Drive	2	1.0	100	55	45	East San Gabriel Valley
Glendora Avenue	Arrow Hwy	Cienega Avenue	2	0.3	100	60	40	East San Gabriel Valley
Ceres Avenue	Broadway	Telegraph Rd	3	0.7	100	50	50	Gateway
Mulberry Drive	Greenbay Drive	Colima Road	2	2.2	100	50	50	Gateway
Atlantic Avenue	Rosecrans Avenue	Alondra Boulevard	3	1.0	100	60	40	Gateway
E. Victoria Street	S. Santa Fe Avenue	Susana Road	2	0.5	100	60	40	Gateway
Compton Boulevard	Harris Avenue	LA River Bikeway	2	0.8	100	75	25	Gateway
Leffingwell Rd	Imperial Hwy	Scott Avenue	2	3.3	100	75	25	Gateway
Rowan Avenue	Floral	Olympic Boulevard	BB	1.8	100	50	50	Metro
120th Street	Central Avenue	Wilmington	2	0.8	100	60	40	Metro
Willowbrook Avenue	Imperial Hwy	119th street	1	0.3	90	50	40	Metro
The Old Rd	Sloan Canyon Road	Weldon Cyn Rd	2	13.4	90	65	25	Santa Clarita Valley
Emerald Necklace Gateway	San Gabriel River Path	Park Entrance parking lot	1	1.1	90	60	30	West San Gabriel Valley
Duarte Rd	San Gabriel Boulevard	Sultana Avenue	3	1.0	90	40	50	West San Gabriel Valley

Table I-2: Phase I Bikeway Projects (continued)

Segment	From	To	Class	Mileage	Priority Score	Utility Score	Implementation Score	Planning Area
San Gabriel Boulevard/ Hill Drive	Graves Avenue	Lincoln Avenue	2	2.6	85	70	15	West San Gabriel Valley
San Jose Creek	Workman Mill Rd	San Gabriel River Bikeway	1	0.7	80	65	15	East San Gabriel Valley
Bouquet Canyon Road	Hob Ct	Elizabeth Lake Rd	3	19.6	75	50	25	Santa Clarita Valley
Rosemead Boulevard	Colorado	Callita Street	2	1.9	45	20	25	West San Gabriel Valley

Table I-3: Phase II Bikeway Projects

Segment	From	To	Class	Mileage	Priority Score	Utility Score	Implementation Score	Planning Area
LA River Path	Lankershim Boulevard	Barham Boulevard	1	1.0	145	120	25	San Fernando Valley
Compton Creek Bikeway	Del Amo Boulevard	LA River Bikeway	1	0.5	120	90	30	Gateway
Santa Anita Wash	Live Oak Avenue	Longden Avenue	1	0.3	110	70	40	West San Gabriel Valley
Elizabeth Lake Road	Lake Hughes Road	Munz Ranch Road	2	3.4	110	75	35	Antelope Valley
Dominguez Channel	Redondo Beach Boulevard	PCH	1	2.7	105	80	25	South Bay
Sierra Hwy	.3 mi s/o Ryan Ln	Pearblossom Highway	3	24.3	105	80	25	Santa Clarita Valley
Beverly Boulevard	Pomona Boulevard	Gerhart Avenue	3	0.8	100	50	50	Metro
Hubbard Street	Ford Boulevard	Mobile Street	BB	2.2	100	50	50	Metro
Gerhart Avenue	Via San Delarro	Whittier Boulevard	2,3	0.7	100	50	50	Metro
120th Street	Wilmington	Mona Av	3	0.6	100	60	40	Metro

Table I-3: Phase II Bikeway Projects (continued)

Segment	From	To	Class	Mileage	Priority Score	Utility Score	Implementation Score	Planning Area
Eastern Avenue	0.1 miles N of Whiteside St	Olympic Boulevard	2	3.1	100	65	35	Metro
Olympic Boulevard	Indiana Street	Concurse Avenue	2	3.3	100	65	35	Metro
Wilmington Avenue	Imperial Hwy	El Segundo Boulevard	2	0.6	100	65	35	Metro
Western	108th	El Segundo Boulevard	2	1.5	100	70	30	Metro
Stevenson Rch Rd	Poe Parkway	Pico Canyon Rd	2	0.2	100	50	50	Santa Clarita Valley
The Old Road	Weldon Canyon Road	Sierra Hwy	2	1.2	100	60	40	Santa Clarita Valley
Buford Avenue	104th Street	111th Street	3	0.5	100	50	50	South Bay
Isis Avenue	116th Street	El Segundo Boulevard	3	0.9	100	50	50	South Bay
223rd Street	Normandie Avenue	Vermont Avenue	2	0.5	100	55	45	South Bay
Colorado Boulevard	Kinneola Avenue	Michillinda Avenue	2	1.1	100	65	35	West San Gabriel Valley
Palawan Way	Washington Boulevard	(cul-de-sac)	3	0.2	100	50	50	Westside
Bali Way	0.1 miles west of Marvin Braude Bicycle Path	Marvin Braude Bicycle Path	2	0.1	100	55	45	Westside
Mindano Way	0.2 miles west of Marvin Braude Bicycle Path	Marvin Braude Bicycle Path	2	0.2	100	55	45	Westside
50th Street W	Avenue M-2	Avenue N	3	0.9	95	45	50	Antelope Valley
55th Street W	Avenue L	Avenue M-8	2	1.5	95	45	50	Antelope Valley
Kwis Avenue	Gale Avenue	Newton Street	3	0.6	95	45	50	East San Gabriel Valley
Ranlett Avenue/ Echelon Avenue/ Walnut Avenue	Francisquito Avenue	Temple Avenue	3	1.6	95	45	50	East San Gabriel Valley
La Monde Street	Hacienda Boulevard	Stimson Avenue	2	0.2	95	45	50	East San Gabriel Valley
Temple	Azusa Av	Woodgate Drive	2	0.4	95	45	50	East San Gabriel Valley
Azusa Avenue	Colima Road	Glenfold Drive	2'3	0.7	95	45	50	East San Gabriel Valley
Gale Avenue	7th Avenue	Stimson Avenue	2	2.0	95	60	35	East San Gabriel Valley

Table I-3: Phase II Bikeway Projects (continued)

Segment	From	To	Class	Mileage	Priority Score	Utility Score	Implementation Score	Planning Area
Rivera Rd	Cul-de-sac w/o Slauson Avenue	Norwalk Boulevard	3	0.7	95	45	50	Gateway
1st Avenue	Lambert Rd	Imperial Hwy	2	0.8	95	55	40	Gateway
Rosecrans Avenue	Butler Avenue	560' e/o Gibson Avenue	2	0.5	95	60	35	Gateway
S. Susana Road	E. Artesia Boulevard	Dl Amo Boulevard	2	2.0	95	60	35	Gateway
Medford/Hebert	Indiana Street	City Terrace	3,2	0.6	95	45	50	Metro
1st Street	Indiana Street	Eastern Avenue	2	1.8	95	60	35	Metro
Ramsdell Avenue	Markridge Rd	Montrose Avenue	3	1.6	95	45	50	San Fernando Valley
San Francisquito Creek Trail	Copper Hill	San Francisquito Canyon Road	1	0.6	95	55	40	Santa Clarita Valley
Woodbury Avenue	Santa Rosa Avenue	Lake Avenue	3	0.5	95	45	50	West San Gabriel Valley
Foss Avenue / Center Street	Longden Avenue	Daines Drive	3	0.6	95	45	50	West San Gabriel Valley
California Avenue	Hurstview Avenue	Novice Ln	3	0.9	95	45	50	West San Gabriel Valley
Pepper Drive	Washington Boulevard	Glen Canyon Rd	3	0.9	95	45	50	West San Gabriel Valley
Altadena Drive	Allen Avenue	Canyon Close Road	3	1.0	95	45	50	West San Gabriel Valley
Ardendale Avenue/ Naomi Avenue	Muscatel Avenue	Golden West Avenue	3	1.4	95	45	50	West San Gabriel Valley
Glenrose Avenue	Loma Alta Drive	Woodbury Rd	3	1.5	95	45	50	West San Gabriel Valley
New York Drive	Lake Avenue	Creekside Court	3	2.2	95	45	50	West San Gabriel Valley
Altadena Drive	245' w/o Ridgeview	Allen Avenue	3	3.1	95	45	50	West San Gabriel Valley
Lincoln Avenue	Altadena Drive	Woodbury	2	1.1	95	50	45	West San Gabriel Valley
Ventura Street/ N. Fair Oaks	Windsor Avenue	Allen Avenue	BB	3.6	95	55	40	West San Gabriel Valley
Peck Rd	N Community Boundary	Working Mill Rd	2	0.9	95	80	15	West San Gabriel Valley

Table I-3: Phase II Bikeway Projects (continued)

Segment	From	To	Class	Mileage	Priority Score	Utility Score	Implementation Score	Planning Area
Ridge Route Road/Pine Canyon Road/Elizabeth Lake Road	Lancaster Road	0.3 miles east of Cherry Tree Lane	3	30.8	95	70	25	Antelope Valley
40th Street East	Avenue H	Lancaster Boulevard	3	1.5	90	55	35	Antelope Valley
40th Street West	Avenue K-4	Avenue M	2	1.7	90	60	30	Antelope Valley
Avenue O	90th Street E	180th Street E	3,2	6.5	90	60	30	Antelope Valley
Gemini Street	Azusa Avenue	Cul-de-sac e/o Shipman Avenue	3	0.6	90	40	50	East San Gabriel Valley
Aguiro Street	Fullerton Rd	Sierra Leone Rd	3	0.7	90	40	50	East San Gabriel Valley
Amar Road	Willow Avenue	N. Unruh Avenue	2	1.5	90	50	40	East San Gabriel Valley
Broadway	Mills Avenue	Colima Rd	3	0.9	90	40	50	Gateway
Santa Fe Avenue	Artesia Blvd.	0.1 miles s/o Reyes Avenue	2	1.0	90	40	50	Gateway
Colima Rd	Poulter Drive	Leffingwell Rd	2	0.3	90	45	45	Gateway
Saragosa/Pioneer	Norwalk Boulevard	Los Nietos Rd	3	1.1	90	50	40	Gateway
Angeles Forest Hwy	Aliso Canyon Rd.	Sierra Hwy	3	7.1	90	60	30	Antelope Valley
Margaret Avenue	Hubbard Street	Sadler Avenue	3	0.8	90	40	50	Metro
Willowbrook Avenue	El Segundo Boulevard	S County Border	3	1.2	90	40	50	Metro
S La Verne Avenue / Gratian Street / Ferris Avenue	3rd Street	Telegraph Rd	3	1.5	90	40	50	Metro
Floral Drive	Indiana Street	Mednick Avenue	3	1.8	90	40	50	Metro
Lohengrin Street / 110th Street	Imperial Hwy	Budlong Avenue	BB	1.3	90	40	50	Metro
City Terrace Drive	Rowan Avenue	Eastern Avenue	3,2	0.9	90	45	45	Metro
Hooper Avenue	Slauson Avenue	Florence Avenue	2	2.7	90	60	30	Metro
Slauson Av	Central Av	Alameda Street	2	1.1	90	75	15	Metro

Table I-3: Phase II Bikeway Projects (continued)

Segment	From	To	Class	Mileage	Priority Score	Utility Score	Implementation Score	Planning Area
Hillcrest Pkwy	Sloan Cyn Rd	The Old Rd	2	2.0	90	40	50	Santa Clarita Valley
Magic Mountain Pkwy	0.4 miles w/o The Old Rd	The Old Rd	2	0.5	90	50	40	Santa Clarita Valley
Compton Creek Bikeway	Greenleaf Boulevard	91 Fwy	1	0.8	90	60	30	Gateway
Lake Vista Drive	Mulholland Hwy	Mulholland Hwy	3	1.4	90	40	50	Santa Monica Mountains
220th Street	Normandie Av	Vermont Street	3	0.5	90	40	50	South Bay
Del Amo Boulevard	Normandie Avenue	Interstate 110	2	0.8	90	40	50	South Bay
Imperial Hwy	La Cienega Boulevard	Inglewood Av	2	0.5	90	50	40	South Bay
Crenshaw Blvd	Palos Verdes area	Indian Peak	2	1.2	90	50	40	South Bay
Windsor Avenue	Ventura Street	Figueroa Drive	3	0.5	90	40	50	West San Gabriel Valley
Loma Alta Drive	Lincoln Avenue	Lake Avenue	3	1.6	90	40	50	West San Gabriel Valley
Glenview Terrace / Glen Canyon Rd/Roosevelt Avenue	Allen Avenue	Washington Boulevard	BB	1.6	90	40	50	West San Gabriel Valley
Valley Ridge/54th	Stocker Street	Hillcrest Drive	3	1.4	90	40	50	Westside
Arroyo Seco Channel	San Fernando Road	Avenue 26th	1	0.3	85	55	30	Metro
Avenue N-8/Bolz Ranch Rd	Rancho Vista	30th Street	3	1.5	85	35	50	Antelope Valley
45th Street W	Avenue M-8	Avenue N-8	2	1.0	85	35	50	Antelope Valley
Avenue P	160th Street	170th Street	3	1.6	85	50	35	Antelope Valley
W Avenue O	30th Street W	10th Street W (Sierra Hwy)	2	2.0	85	50	35	Antelope Valley
Big Dalton Wash	Irwindale Avenue	Barranca Avenue	1,3	3.8	85	60	25	East San Gabriel Valley
Coyote Creek	Leffingwell Road	Foster Rd	1	0.8	85	60	25	Gateway
Fiji Way Bike Path	Fiji Way	Admiralty Way	1	0.7	85	60	25	Westside
Three Palms/Farmdale	Kwis Avenue	Stimson Avenue	3	1.0	85	35	50	East San Gabriel Valley
Cam Del Sur	Vallecito Drive	Colima Rd	2	0.9	85	35	50	East San Gabriel Valley
Colima Rd	Casino Drive	Allenton Avenue	2	1.2	85	35	50	East San Gabriel Valley

Table I-3: Phase II Bikeway Projects (continued)

Segment	From	To	Class	Mileage	Priority Score	Utility Score	Implementation Score	Planning Area
Halliburton Rd	Hacienda Boulevard	Stimson Avenue	2	0.2	85	40	45	East San Gabriel Valley
Fairgrove Avenue, et al	Vineland Av	Lark Ellen Avenue	BB	3.0	85	45	40	East San Gabriel Valley
Palo Verde Av	Carson Street	Conant Street	3	0.4	85	45	40	Gateway
Central Avenue	121st Street	127th Street	2	0.5	85	35	50	Metro
Mulholland Hwy	PCH	Decker	3	7.5	85	55	30	Santa Monica Mountains
Prairie Avenue	Redondo Beach Boulevard	Street. Marine Avenue	2	1.2	85	50	35	South Bay
Lomita Boulevard	Frampton Avenue	Vermont Avenue	2	0.5	85	55	30	South Bay
El Segundo Boulevard	Isis Av	Inglewood Av	2	0.8	85	60	25	South Bay
Windsor Avenue	Figueroa Drive	S County Border	3,2	0.4	85	35	50	West San Gabriel Valley
San Pasqual Street	Madre Street	Rosemead Avenue	2	0.5	85	35	50	West San Gabriel Valley
Tyler Ave/W. Hondo Pkwy	E. Live Oak Avenue	Temple City limits	3	1.0	85	35	50	West San Gabriel Valley
Altadena Drive	Canyon Close Road	Washington Boulevard	2	1.0	85	50	35	West San Gabriel Valley
Via Dolce	Washington Boulevard	Via Marina	3	0.4	85	45	40	Westside
110th Street	Johnson Rd	Avenue G	3	4.5	80	30	50	Antelope Valley
10th Street	Elizabeth Lake Rd	Auto Center Drive	2	0.3	80	30	50	Antelope Valley
105th	Palmdale Boulevard	Avenue S	2	1.5	80	30	50	Antelope Valley
Lancaster Boulevard	40th Street	55th Street	2	1.5	80	30	50	Antelope Valley
Barrel Springs Rd	Tierra Subida Avenue	Sierra Hwy	2	2.0	80	30	50	Antelope Valley
Tierra Subida Avenue	Avenue S	Barrel Springs Rd	2	0.8	80	40	40	Antelope Valley
Avenue U	87th Street	96th Street	2	1.0	80	40	40	Antelope Valley
Avenue M	30th Street West	State Route 14	2	1.7	80	45	35	Antelope Valley
20th Street West	Avenue O-12	West Avenue M	2	2.8	80	45	35	Antelope Valley
Avenue H	Division Street (30th)	40th Street E	2	4.1	80	50	30	Antelope Valley
Rockvale Avenue	N County Border (cul-de-sac)	Utility Corridor 1	3	0.8	80	30	50	East San Gabriel Valley

Table I-3: Phase II Bikeway Projects (continued)

Segment	From	To	Class	Mileage	Priority Score	Utility Score	Implementation Score	Planning Area
Los Altos Drive	Vallecito Drive	Hacienda Boulevard	3	0.9	80	30	50	East San Gabriel Valley
Colima Rd	450' s/o Calbourne Drive	Fairway Drive/Brea Cyn Cutoff Rd	2	0.7	80	35	45	East San Gabriel Valley
Irwindale Avenue	Cypress Street	Badillo Street	2	0.6	80	45	35	East San Gabriel Valley
Puente Avenue	Nelson Avenue	Barrydale Street	2	3.2	80	65	15	East San Gabriel Valley
Leland Avenue	Mills Avenue	Leffingwell Rd	3	1.2	80	30	50	Gateway
Carmenita Rd	Mulberry Drive	Leffingwell Rd	3	2.5	80	40	40	Gateway
Lambert Rd	Mills Avenue	Scott Avenue	2	1.3	80	50	30	Gateway
Hendricks Avenue	N County Border	Ferguson Drive	3	0.8	80	30	50	Metro
Sadler Avenue	Pomona Boulevard	Whittier Boulevard	3	1.0	80	30	50	Metro
Downey Rd	3rd Street	Noakes Street	3	1.5	80	30	50	Metro
120th Street	Western Avenue	Vermont Avenue	2	1.0	80	40	40	Metro
El Segundo Boulevard	Wilmington Avenue	Alameda Street	2	0.9	80	55	25	Metro
Orange Avenue / Whittier Avenue	Pennsylvania Avenue	Briggs Avenue	3	1.2	80	30	50	San Fernando Valley
Castaic Rd	Lake Hughes Rd	Parker Rd	3	0.5	80	30	50	Santa Clarita Valley
Sloan Canyon Rd	Lake Hughes Rd	Quail Valley Rd	2	0.8	80	30	50	Santa Clarita Valley
Jakes Way	Canyon Park Boulevard	Eleanor Cir	2	1.0	80	30	50	Santa Clarita Valley
Escondido Canyon Road	Agua Dulce Canyon	Red Rover Mine	3	6.9	80	50	30	Santa Clarita Valley
Corral Canyon Road	Mesa Peak Road	Pacific Coast Hwy	3	7.7	80	55	25	Santa Monica Mountains
Latigo Canyon Road	Mulholland Hwy	Pacific Coast Hwy	3	10.6	80	55	25	Santa Monica Mountains
Tuna Canyon Road	Fernwood Pacific Drive	Pacific Coast Hwy	3	5.4	80	60	20	Santa Monica Mountains
Old Topanga Cyn Rd	Valsez Road	Pacific Coast Hwy	3	8.3	80	65	15	Santa Monica Mountains
120th Street	Aviation Boulevard	Inglewood Av	3	0.7	80	40	40	South Bay

Table I-3: Phase II Bikeway Projects (continued)

Segment	From	To	Class	Mileage	Priority Score	Utility Score	Implementation Score	Planning Area
Vermont Avenue	190th Street	Lomita Boulevard	2	3.7	80	40	40	South Bay
Figueroa Drive	Windsor Avenue	Fair Oaks Avenue	3	0.8	80	30	50	West San Gabriel Valley
Las Flores	Glenrose Avenue	Lake Avenue	3	1.0	80	30	50	West San Gabriel Valley
Marengo Avenue	Loma Alta Drive	S County Border	3,2	1.8	80	30	50	West San Gabriel Valley
Via Marina	Marquesas Way	End/Jetty	2	0.9	80	30	50	Westside
Overhill Drive	N Community Boundary	62nd Street	2,3	0.9	80	40	40	Westside
Sepulveda Channel	Washington Boulevard	Ballona Creek	1	0.8	80	50	30	Westside
Avenue T	80th Street	126th Street	2	4.7	75	30	45	Antelope Valley
30th Street East	E. Avenue Q	E, Avenue P	3	1.0	75	35	40	Antelope Valley
Avenue K	52nd Street West	40th Street West	2	1.2	75	35	40	Antelope Valley
W Avenue S	1700' e/o The Groves	Tierra Subida Avenue	2	1.3	75	40	35	Antelope Valley
Crown Valley Road	Sierra Hwy	Soledad Canyon Rd.	3	1.9	75	40	35	Antelope Valley
Avenue R	90th Street	110th Street	2	2.0	75	40	35	Antelope Valley
Division Street	Avenue H	Avenue E	2	3.0	75	40	35	Antelope Valley
Sierra Highway	Avenue P-8	E Avenue Q	2	0.5	75	45	30	Antelope Valley
90th Street West	Avenue G	Avenue G-8	3	0.5	75	45	30	Antelope Valley
W Avenue L-8	60th Street	50th Street	2	0.7	75	45	30	Antelope Valley
Covina Hills Rd	San Joaquin Rd	Via Verde	3	2.0	75	35	40	East San Gabriel Valley
Colima Rd	Larkvane Rd	Brea Cyn Cutoff	2	2.3	75	50	25	East San Gabriel Valley
Laurel Park Road	E. Victoria Street	S. Rancho Way	2	0.6	75	30	45	Gateway
Los Angeles River Proposed Bicycle Path	Washington Boulevard	Atlantic Boulevard	1,3	3.4	75	50	25	Gateway
Telegraph Rd	Carmenita Rd	Huchins Drive	2	2.4	75	50	25	Gateway
Plum Canyon Road	Via Joice Drive	Ashbro Drive	2	1.7	75	35	40	Santa Clarita Valley

Table I-3: Phase II Bikeway Projects (continued)

Segment	From	To	Class	Mileage	Priority Score	Utility Score	Implementation Score	Planning Area
Soledad Canyon Rd	Mammoth Lane	Sierra Highway	3	17.5	75	60	15	Santa Clarita Valley
Decker Canyon Rd	Mulholland Hwy	Pacific Coast Hwy	3	5.9	75	55	20	Santa Monica Mountains
Inglewood Av	Century Boulevard	Imperial Hwy	3	1.0	75	35	40	South Bay
La Cienega Boulevard	Imperial Hwy	El Segundo Boulevard	2	1.0	75	60	15	South Bay
Dominguez Creek	Main Street	Pacific Coast Hwy	1	6.3	75	60	15	South Bay
S. 10th Avenue	Arcadia City Limits	E. Live Oak Avenue	3	0.6	75	25	50	West San Gabriel Valley
Casitas Avenue	Ventura Street	W. Altadena Drive	3	0.5	75	30	45	West San Gabriel Valley
Duarte Rd	Sultana Avenue	Oak Avenue	2	0.4	75	35	40	West San Gabriel Valley
Woodbury Avenue	Windsor Avenue	Santa Rosa Avenue	2	1.7	75	45	30	West San Gabriel Valley
Marvin Braude	Washington Boulevard	0.1 Miles South of Yawl Street	1	1.1	75	40	35	Westside
Mackennas Gold Avenue	connect to 170th Street	Avenue P	3	0.9	70	20	50	Antelope Valley
116th	Avenue S	Avenue T	2	1.0	70	20	50	Antelope Valley
Avenue M-8	60th Street	45th Street	2	1.5	70	20	50	Antelope Valley
45th Street West	Avenue K-4	Avenue L	2	1.0	70	35	35	Antelope Valley
San Francisquito Rd	Johnson Rd	Portal	3	3.5	70	35	35	Antelope Valley
90th Street West	Avenue H-8	Avenue K	3	2.5	70	45	25	Antelope Valley
Angelcrest Drive	Newton Drive	La Subuda Drive	3	0.4	70	20	50	East San Gabriel Valley
La Subida Drive	Vallecito Drive	Hacienda Boulevard	3	0.9	70	20	50	East San Gabriel Valley
Vallecito Drive	Cam del Sur	Los Robles Av	3	1.6	70	20	50	East San Gabriel Valley
Fairway Drive / Brea Canyon Cut Off Rd	Bickford Drive	Pathfinder Rd	3	0.5	70	35	35	East San Gabriel Valley
Arrow Hwy	Glendora Av	Valley Center Boulevard	2	1.5	70	45	25	East San Gabriel Valley
Puente Creek	San Jose Creek	Azusa Avenue	1,3	4.3	70	50	20	East San Gabriel Valley
Valley View Avenue	Broadway	Imperial Hwy	3,2	1.4	70	20	50	Gateway

Table I-3: Phase II Bikeway Projects (continued)

Segment	From	To	Class	Mileage	Priority Score	Utility Score	Implementation Score	Planning Area
S. Rancho Way	Laurel Park Road	Del Amo Boulevard	2	0.7	70	30	40	Gateway
Verdugo Flood Control Channel	New York Avenue	Shirly Jean Street	1	1.2	70	45	25	San Fernando Valley
Parker Rd/Ridge Route Rd	Sloan Cyn Rd	Lake Hughes Rd	2	1.2	70	20	50	Santa Clarita Valley
Lost Canyon Road	Via Princessa Road	Canyon Park Boulevard	2	0.5	70	25	45	Santa Clarita Valley
Agua Dulce Cyn Rd	Sierra Hwy	Soledad Canyon Rd.	3	6.5	70	40	30	Santa Clarita Valley
Vista Street	Huntington Drive	Longden Drive	3	1.1	70	20	50	West San Gabriel Valley
San Pasqual Street	Greenwood Avenue	San Gabriel Boulevard	3	0.9	70	20	50	West San Gabriel Valley
Mayflower Avenue	Longden Avenue	Live Oak Avenue	2	0.3	70	20	50	West San Gabriel Valley
S. Golden West Avenue	W Naomi Avenue	E. Lemon Avenue	3	0.4	70	30	40	West San Gabriel Valley
Cam Real/ Shrode Avenue	W County Border	Mountain Avenue	3,2	1.0	70	30	40	West San Gabriel Valley
Washington Boulevard	Bellford Drive	Altadena Drive	2	0.7	70	35	35	West San Gabriel Valley
60th Street/62nd Street	Fairfax Av	Buckler Av	3	0.7	70	30	40	Westside
Slauson	Buckingham Parkway	Angeles Vista Rd	3	1.6	70	30	40	Westside
106th Street	Sun Village	Pearblossom Hwy	2	2.5	65	20	45	Antelope Valley
Sierra Hwy	Avenue G	Avenue A	2	6.1	65	20	45	Antelope Valley
Escondido Canyon Rd.	SR-14	Crown Valley Rd	3	2.3	65	30	35	Antelope Valley
96th Street E	Avenue R8	Avenue U	2	2.5	65	30	35	Antelope Valley
Pearblossom Hwy	62nd Street E	87th Street E	2	3.0	65	30	35	Antelope Valley
Avenue S	0.5 miles west of 90th Street E	116th Street E	2	3.2	65	30	35	Antelope Valley
Co Hwy N2 / Johnson Rd	Munz Ranch Rd	110th Street	3	3.4	65	30	35	Antelope Valley
E Avenue P	15th Street	50th	2	3.6	65	30	35	Antelope Valley
Avenue K	85th Street West	90th Street West	3	0.5	65	35	30	Antelope Valley
Avenue H	80th Street West	70th Street West	3	1.0	65	35	30	Antelope Valley

Table I-3: Phase II Bikeway Projects (continued)

Segment	From	To	Class	Mileage	Priority Score	Utility Score	Implementation Score	Planning Area
Avenue G	25th Street West	Division Street	2	2.3	65	35	30	Antelope Valley
Godde Hill	Avenue M-8	Elizabeth Lake Rd	3	1.4	65	40	25	Antelope Valley
7th Avenue	Palm Avenue	Beech Hill Drive	3	0.8	65	20	45	East San Gabriel Valley
7th Avenue	Clark Avenue	Palm Avenue	2	0.5	65	20	45	East San Gabriel Valley
Hacienda Boulevard	N Community Boundary	Colima Rd	2	2.4	65	40	25	East San Gabriel Valley
Amar Rd	Allieron Avenue	Azusa Av	2	1.6	65	50	15	East San Gabriel Valley
La Mirada Boulevard	Colima Rd	Leffingwell Rd	2	1.1	65	35	30	Gateway
Oak Springs Cyn Rd	Oak Springs/ Soledada Cyn	Los Cyn Rd	1	0.2	65	35	30	Santa Clarita Valley
Via Princessa Rd	Sierra Hwy	Lost Canyon Rd	2	0.8	65	40	25	Santa Clarita Valley

Table I-4: Phase III Bikeway Projects

Segment	From	To	Class	Mileage	Priority Score	Utility Score	Implementation Score	Planning Area
Thompson Creek	Lockhaven Way	White Avenue	1,3	3.7	100	85	15	East San Gabriel Valley
Santa Clara River	McBean Parkway	Ventura County Line	1	10.2	70	55	15	Santa Clarita Valley
Cornell Road	Kanan Road	Mulholland Hwy	3	2.3	65	40	25	Santa Monica Mountains
223rd Street	Vermont Avenue	Harbor FWY	2	0.2	65	25	40	South Bay
Fairfax Avenue	W 57th Street	W 62nd Street	3	0.4	65	20	45	Westside
Centinela Avenue	Green Valley Cir	La Tijera Boulevard	2	0.9	65	20	45	Westside

Table I-4: Phase III Bikeway Projects (continued)

Segment	From	To	Class	Mileage	Priority Score	Utility Score	Implementation Score	Planning Area
Angeles Vista Road	Slauson Avenue	Vernon Avenue	2	1.7	65	30	35	Westside
Sepulveda Channel	Palms Boulevard	Venice Boulevard	1	0.6	65	35	30	Westside
40th Street	Barrel Springs Road	N County Border	3	0.3	60	20	40	Antelope Valley
50th Street E	M Avenue	Q Avenue	3	4.0	60	30	30	Antelope Valley
Barrel Springs Road	630' w/o 47th Street	Cheesboro Road	3	5.0	60	30	30	Antelope Valley
Aliso Canyon Road	Soledad Cyn	Angeles Forest Hwy	3	7.4	60	30	30	Antelope Valley
90th Street/87th	Avenue M	Avenue Q	3,2	8.2	60	30	30	Antelope Valley
Palmdale Boulevard	60th Street E	170th Street E	2,3	10.7	60	30	30	Antelope Valley
San Francisquito Canyon Road	Calle Siemerino	Santa Clara River Trail	3	14.8	60	35	25	Antelope Valley
Avenue G W	110th Street	70th Street	2	4.1	60	40	20	Antelope Valley
Countrywood Avenue	Wedgeworth Drive	Colima Road	2	0.5	60	10	50	East San Gabriel Valley
Valley Center Avenue	Arrow Hwy	Badillo Street	2	0.6	60	25	35	East San Gabriel Valley
Glendora Mt. Road.	Big Dalton Canyon Road	Park area	3	4.4	60	30	30	East San Gabriel Valley
Milan Creek	Marquardt Avenue	Telegraph avenue	1	1.8	60	40	20	Gateway
Canyon Pk Boulevard	Sierra Highway	Lost Canyon Road	2	0.8	60	20	40	Santa Clarita Valley
Henry Mayo Drive	Commerce Center Drive	The Old Road	2	0.8	60	20	40	Santa Clarita Valley
Vasquez Canyon Road	Sierra Hwy	Bouquet Cyn Road	2	3.6	60	25	35	Santa Clarita Valley
Castaic Creek	Lake Hughes Road	Henry Mayo Drive	1	5.5	60	35	25	Santa Clarita Valley
Kanan Road / Kanan Dume Road	Agoura Road	Pacific Coast Hwy	3	12.1	60	45	15	Santa Monica Mountains
W. 7th Street	S Weymounth Avenue	S. Cabrillo Avenue	BB	0.9	60	20	40	South Bay
Willard Avenue	Longden Avenue	S County Border	3	0.7	60	20	40	West San Gabriel Valley
California Boulevard	Rosemead Boulevard	Michillinda Avenue	2	1.0	60	20	40	West San Gabriel Valley

Table I-4: Phase III Bikeway Projects (continued)

Segment	From	To	Class	Mileage	Priority Score	Utility Score	Implementation Score	Planning Area
Avenue N	50th Street	14 FWY	2	3.6	55	20	35	Antelope Valley
Avenue J	110th Street West	70th Street West	3	4.0	55	35	20	Antelope Valley
70th Street West	Avenue F	Avenue J	3	4.5	55	35	20	Antelope Valley
Lancaster/Fairmont Neenach/120th/Avenue I	160th Street W	70th Street W	3	9.8	55	40	15	Antelope Valley
Davenport Road	Sierra Hwy	Agua Dulce Canyon Road	2	3.7	55	20	35	Santa Clarita Valley
Lake Hughes Road	Sloan Cyn Road	Northern Limit	3	23.0	55	30	25	Santa Clarita Valley
Fernwood Pacific Drive	Topanga Canyon Boulevard	Tuna Canyon Road	3	1.7	55	30	25	Santa Monica Mountains
Longden Avenue	San Gabriel Boulevard	Rosemead Boulevard	3	1.0	55	20	35	West San Gabriel Valley
Temple City Boulevard	Duarte Road	Lemon Avenue	2	0.5	55	20	35	West San Gabriel Valley
Munz Ranch Road	Fairmont Neenach Road	Co Hwy N2	3	4.4	50	20	30	Antelope Valley
Ocean View	Foothill Boulevard	Honolulu Avenue	2	0.9	50	20	30	San Fernando Valley
Sand Canyon Road	Sierra Hwy	Vista Point Lane	3	1.0	50	20	30	Santa Clarita Valley
Hasley Cyn Road	Sloan Cyn Road	Henry Mayo Drive	3	4.0	50	20	30	Santa Clarita Valley
Stocker Street	Fairfax Avenue	Santa Rosa Avenue	2	2.0	50	30	20	Westside
Placerita Canyon Road	Santa Clarita Planning Area	Sand Canyon Road	3	5.0	45	25	20	Santa Clarita Valley
Decker Canyon Road	Lechusa Road	Lyndon Drive	3	22.1	45	30	15	Santa Monica Mountains
Fairfax Avenue	La Cienega Boulevard	W 57th Street	2	0.6	45	10	35	Westside

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Appendix J. Removed Facilities

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The following segments of the proposed network were removed from the final plan based upon public comments on the April 2011 Draft Plan. They are documented in **Table J-1** below for informational purposes only.

Table J-1: Removed Facility Inventory

Planning Area	Project	From	To	Class	Source of Recommendation	Reason for Exclusion
South Bay	Inglewood Avenue	120th Street	Rosecrans Avenue	2	Third round of public comments – Draft Plan April 2011	Community request
West San Gabriel Valley	Harriet Street	El Nido Drive	N. Raymond Avenue	BB	Third round of public comments – Draft Plan April 2011	Relocated to an adjacent street
West San Gabriel Valley	Raymond Avenue	Harriet Street	Calaveras Street	BB	Third round of public comments – Draft Plan April 2011	Relocated to an adjacent street
West San Gabriel Valley	Coolidge Avenue	Glen Canyon Road	Washington Boulevard	BB	Third round of public comments – Draft Plan April 2011	Relocated to an adjacent street
West San Gabriel Valley	Midwick Drive	North Allen Avenue	Glenview Terrace	BB	Third round of public comments – Draft Plan April 2011	Relocated to an adjacent street

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Appendix K. Acronyms

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Table K-1: Acronyms and Definitions

Acronym	Definition
AASHTO	Guide for the Development of Bicycle Facilities, *California Highway Design Manual*, Chapter 1000: Bikeway Planning and Design
AB	Assembly Bill
ADA	American Disabilities Act
ADT	average daily traffic
APBP	Association of Pedestrian and Bicycle Professionals
BAC	Bicycle Advisory Committee
BTA	State of California Bicycle Transportation Account
BTSP	Bicycle Transportation Strategic Plan
Caltrans	California Department of Transportation
CAMUTCD	California Manual Uniform Traffic Control Devices
CBSP	Commuter Bikeways Strategic Plan
CFP/Call	call for projects
CMAQ	Congestion Mitigation and Air Quality
CPTED	Crime Prevention Through Environmental Design
CTC	California Transportation Commission
DPR	County of Los Angeles Department of Parks and Recreation
DPH	County of Los Angeles Department of Public Health
DPW	County of Los Angeles Department of Public Works
DRP	County of Los Angeles Department of Regional Planning
DOT	State Department of Transportation
EEMP	Environmental Enhancement and Mitigation Program
EPOP	Enhanced Public Outreach Project
FHWA	Federal Highway Administration
GHG	greenhouse gases
GIS	Geographical Information Systems
HDM	Highway Design Manual
IBPI	Initiative for Bicycle & Pedestrian Innovation
ISTEA	Intermodal Surface Transportation Efficiency Act
LAB	League of American Bicyclists
LACBC	Los Angeles County Bicycle Coalition
LACFCD	Los Angeles County Flood Control District
LARMP	Los Angeles River Master Plan
LACOE	Los Angeles County Office of Education
LARRMP	Los Angeles River Revitalization Master Plan
LEHD	Longitudinal-Employer Household Dynamics
LRTP	Long Range Transportation Plan
LACMTA	Los Angeles County Metropolitan Transportation Authority
MPH	miles per hour
MUTCD	Manual of Uniform Traffic Control Devices

Table K-1: Acronyms and Definitions (continued)

Acronym	Definition
OCTA	Orange County Transportation Authority
OTS	Office of Traffic Safety
PBIC	Pedestrian and Bicycle Information Center
PROWAG	Public Rights-of-Way Accessibility Guidelines
PROWAG	Public Rights-of-Way Accessibility Guidelines
RMC	San Gabriel and Lower Los Angeles Rivers and Mountains Conservancy
RSTI	Regional Surface Transportation Improvements
RSTP	Regional Surface Transportation Program
RTCA	Rivers, Trails and Conservation Assistance Program
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act
SANBAG	San Bernardino Association of Governments
SB	Senate Bill
SCAG	Southern California Association of Governments
SCRRA	Southern California Regional Rail Authority
SGRCMP	San Gabriel River Corridor Master Plan
SRTS	Safe Routes to School
SWITRS	California Highway Patrol Statewide Integrated Traffic Records System
TAC	Technical Advisory Committee
TCSP	Transportation, Community, and System Preservation Program
TDA	Transportation Development Act
TDM	Transportation Demand Management
TEA	Transportation Enhancements Activation
TEA-21	Transportation Equity Act for the 21st Century
TIP	Transportation Improvement Program
TSM	Transportation Systems Management
VCTC	Ventura County Transportation Commission
VMT	Vehicle Miles Traveled
VPD	Vehicles Per Day