

A | Bicycle Demand Forecasting

THIS APPENDIX EXPLAINS THE METHODOLOGIES used to estimate the following information that appears in chapter 2, “Existing Conditions:”

- Current and projected daily bicycle ridership in Contra Costa and in each of the local jurisdictions
- Current and projected daily bicycle trips countywide
- Current and projected motor-vehicle trips and miles reduced as a result of bicycle trips countywide

The information is order-of-magnitude estimates, based on limited available data. Figures have been rounded to the nearest hundred (except in Table A-1) and some numbers do not add up to totals due to rounding.

CURRENT AND PROJECTED DAILY BICYCLE RIDERSHIP

The same methodology was used to estimate the current and projected daily bicycle ridership countywide and in each of the local jurisdictions. The estimates for the county as a whole and for most local

jurisdictions were based primarily on data from the three-year 2006-2008 American Community Survey (ACS; a project of the U.S. Census Bureau). For a few jurisdictions, estimates were based on figures from the 2000 U.S. census or the one-year 2008 ACS, depending on the availability of data. The explanation below of the methodology uses the countywide estimates as its example. Table A-1 includes the data sources.

Current daily bicycle commuters and overall ridership

The estimated number of current daily bicycle *commuters* in Contra Costa is 13,800. This is the sum of the numbers of bicycle commuters to work, school and college and those who ride their bicycle to access transit. The estimated current daily bicycle *ridership* in Contra Costa is 25,600. This includes bicycle commuters as well as those who ride a bicycle for other purposes, such as shopping and social visits. It does not, however, include recreational riders. Below is a description of how each number was estimated.

Commuters to work

The estimated daily number of bicycle commuters to work county-wide is 2,800. This figure is derived from the number of employed persons in Contra Costa (491,572) and the percentage of them who bicycled to work (0.57 percent).

Commuters to school

The estimated daily number of children who ride their bicycle to school countywide is 6,900. This number is derived from the school enrollment for children ages 6–14 in Contra Costa (138,396) and the percentage of them who bicycled to school (5 percent). The figure of 5 percent is based on results from the Lamorinda School Commute Study (1995) by Fehr & Peers Associates and the San Diego County School Commute Study (1990).

Commuters to college

The estimated daily number of college bicycle commuters county-wide is 3,400. This number is derived from the college and graduate-school enrollment in Contra Costa (68,937) and the percentage of them who bicycled to school (5 percent, using the same percentage of children who bicycle to school, from above).

Riders to transit

The estimated daily number of people who ride their bicycle to access transit countywide is 600. This figure is derived from the average daily number of transit boardings in Contra Costa (41,820) and the percentage of boardings made by people who bicycled to transit (1.4 percent). The number of boardings is from MTC’s 2009 Regional Transportation Plan. The percentage of boardings by bicyclists is based on results from a “Bike-n-Ride Survey” conducted by Denver’s Regional Transportation District in December 1999.

Table A-1 | **Daily bicycle ridership in Contra Costa (excluding recreation)**

	<i>Input</i>	<i>Calc. total</i>
Employed persons (2006-'08 ACS)	491,572	
Share of bicycle commuters (2006-'08 ACS)	0.57%	
Work bicycle commuters (est. 2008)		2,802
School enrollment, ages 6-14 (2006-'08 ACS)	138,396	
Share of bicycle commuters ¹	5.0%	
School children bicycle commuters (est. 2008)		6,920
College population (2006-'08 ACS)	68,937	
Share of bicycle commuters ²	5.0%	
College bicycle commuters (est. 2008)		3,447
Average daily transit/rail boardings ³	41,820	
Share of bicycle commuters ⁴	1.4%	
Transit bicycle commuters (est. 2009)		585
Ratio of bicycle trips for other purposes; ⁵ applied to work, college and transit trips	1.74	
Other riders		11,892
Total		25,646

Numbers do not add up to total due to rounding

¹ Lamorinda School Commute Study (1995; Fehr & Peers) and San Diego County School Commute Study (1990)

² Assumed to be the same as for school children (1)

³ 2009 Regional Transportation Plan (MTC)

⁴ “Bike-n-Ride Survey” (December 1999; Denver RTD)

⁵ National Bicycling and Walking Study (1995; FHWA)

Other riders

The estimated daily number of people countywide who ride their bicycle for purposes other than work, school and transit access—but excluding recreation—is 11,900. This figure is derived from the number of work commuters, college commuters and riders to transit (2,800, 3,400 and 600 respectively, from above) and the number of bicycle trips made for other purposes as a ratio of trips made for work, school and transit-access purposes (1.74, from the FHWA’s National Bicycling and Walking Study [1995]).

Projected daily bicycle ridership

The estimated projected daily bicycle ridership in Contra Costa in the year 2035 is 90,800 (48,700 commuters and 42,100 other riders, using the same ratio of commuters to other riders as currently). This projection represents an increase in daily bicycle ridership of 65,100 (34,900 commuters and 30,200 other riders) from current figures.

The projected ridership is derived from the current ridership (25,600, from above) and a multiplier factor of 3.54 that accounts for forecast population growth and an increase in ridership that is expected to occur if the facilities outlined in the CBPP are completed. The multiplier factor attempts to reflect the relationship between changes in the bicycle network and changes in ridership. Unfortunately, such information is not readily available. The most useful piece of data we have is information from the City of Portland on changes in bikeway miles and increases in bicycle ridership across bridges over the Willamette River. It is only a correlation based on the observations of increases in trips across the bridges at two different points in time may not necessarily reflect area-wide increases in ridership; nonetheless, it is a relatively broad and inclusive measure of the effect of new facilities on ridership.

As shown in the table below, a 247 percent increase in bikeway miles in Portland between 1990 and 2008 was associated with a 486 percent increase in bicycle trips across the several bridges that cross the Willamette. To compensate for the population growth that occurred during the same period, we calculated per capita ridership across the bridges. The per capita increase was 345 percent. This means that for every 100 percent increase in bikeway miles, ridership increased 140 percent (345 percent divided by 247 percent).

Portland, OR

	<i>Bikeway miles</i>	<i>Trips across bridges</i>	<i>Population</i>	<i>Trips per capita</i>
1990	79	2,850	437,319	.0065
2008	274	16,711	575,930	.0290
Increase	195	13,861	138,611	.0225
Percent increase	247%	486%	32%	345%

Assuming that this correlation can be applied in other situations, the proposed 130 percent increase in bikeway miles that would occur in Contra Costa with the construction of the facilities proposed in the CBPP would lead to a 181 percent per capita increase in ridership (130 percent times 140 percent, from above). Taking into account forecast population growth, this would translate to a ridership of 90,800 in 2035 (our horizon year for the completion of the bicycling facilities). The 3.54 multiplier derives from dividing 90,800 (the projected ridership) by 25,600 (the current ridership).

Contra Costa

	<i>Bikeway miles</i>	<i>Daily ridership</i>	<i>Population</i>	<i>Trips per capita</i>
Current	467	25,646	1,051,674	.0244
At completion	1,072	90,781	1,322,900	.0686
Increase	605	65,135	271,226	.0442
Percent increase	130%	254%	26%	181%

CURRENT AND PROJECTED DAILY BICYCLE TRIPS

The estimated number of current daily bicycle trips in Contra Costa is 51,300. This is simply twice the countywide bicycle ridership (25,600, from above) and is based on the assumption that each bicyclist makes two trips per day—one to the destination and one returning. Similarly, the estimated number of projected trips is 181,600 (twice 90,800, from above), while the increase is 130,300.

CURRENT AND PROJECTED REDUCTIONS IN MOTOR-VEHICLE TRIPS AND MILES

Motor-vehicle trips

The estimated number of motor-vehicle trips currently being reduced by bicycle trips countywide is 34,700. This number assumes that, (i) each bicyclist makes two trips per day; (ii) of bicycle trips to school by children (6,900, from above, times 2, or 13,800), 53 percent (7,300) replace vehicle trips; and, (iii) of the bicycle trips made for work, college, transit-access and other purposes (2,800, 3,400, 600 and 11,900 respectively, from above, times 2, or 37,500), 73 percent (27,300) replace vehicle trips. The figures of 53 and 73 percent were the estimates developed by Alta Planning + Design for the same purpose in

the 2003 CBPP, based on survey results (see Appendix C of that document for more detail).

The estimated number of vehicle trips projected to be reduced by bicycle trips is 122,700. This is the number of vehicle trips currently being reduced (34,700, from above) times the multiplier factor of 3.54 (from above) to account for forecast population growth and expected increase in bicycle ridership.

Motor-vehicle miles

The estimated number of motor-vehicle miles currently being reduced by bicycle trips countywide is 113,000. This is derived from the number of vehicle trips replaced by bicycle trips to school by children (7,300, from above) and by bicycle trips made for work, college, transit-access and other purposes (27,300, from above). It assumes that the average travel length of one-way bicycle trips by children is 0.5 mile (1 mile for a two-way trip) and of those by adults is 4 miles (8 miles for a two-way trip). The figures of 1 and 8 miles were the estimates developed by Alta Planning + Design for the same purpose in the 2003 CBPP, based on survey results (see Appendix C of that document for more detail).

The estimated number of vehicle miles projected to be reduced by bicycle trips is 400,100. This is derived from the number of vehicle miles currently being reduced (113,000, from above) times the multiplier factor of 3.54 (from above) to account for forecast population growth and expected increase in bicycle ridership.