

2 | Existing Conditions



THIS CHAPTER LOOKS AT EXISTING CONDITIONS related to walking and bicycling in Contra Costa. The first of the four sections considers land use patterns and topography throughout the county, two factors that help explain why some areas are more favorable for walking and bicycling than others. The second and third sections update commuting statistics and data on collisions involving pedestrians and bicyclists that appeared in the original CBPP. This updated information provides insights into the commuting behavior of residents of Contra Costa, the safety needs of pedestrians and bicyclists and changes in these areas since the 2003 CBPP was adopted. The last section lists pedestrian and bicycle projects, or projects with pedestrian and bicycle components, funded by the Authority in recent years.

PHYSICAL ATTRIBUTES

Landscape and topography

With a land area of 720 square miles, Contra Costa is the sixth largest of the nine Bay Area counties. It has a Mediterranean climate, mild and generally dry. Temperatures rarely fall below freezing and snow falls only on the top of the highest peaks and only during winter. Summers are generally warm, especially as one moves farther east, with comfortable humidity. Rainfall averages around 30 inches per year but varies throughout the county.

Contra Costa's diverse natural landscape both accommodates and presents obstacles to walking and, especially, bicycling. On one hand, the county enjoys many trail segments along the coast and inland, both on flatlands and through the area's many hills. On the other, the East Bay hills and northern Diablo Range divide the county into five generally recognized geographic areas, which can make intra-county bicycle travel challenging. The hills, the San Pablo and Suisun bays to

the north and the Sacramento-San Joaquin River Delta to the north-east also make inter-county travel difficult.

Much of the East Bay hills is protected open space, with several large regional parks and reservoirs. West of the hills is the area known as West County. Hemmed in by the hills, the area stretches along the coast from Alameda County north to the Carquinez Strait. It consists, from south to north, of the cities of El Cerrito, Richmond, San Pablo, Pinole and Hercules, and the unincorporated communities of Kensington, El Sobrante, North Richmond, Rodeo and Crockett, among others (Table 2 lists the local jurisdictions in Contra Costa). West County derives much of its character from its proximity to San Francisco and San Pablo bays, immediately to the west.

On the other side of the East Bay hills, in the foothills, are the cities of Lafayette and Orinda and the town of Moraga. The area, known collectively by locals as “Lamorinda,” is marked by gently rolling hills. Physically, it lies much closer to the Alameda County cities of Berkeley and Oakland, on the other side of the Caldecott Tunnel, than to West County.

East of Lamorinda lie two broad plains, framed by the Diablo Range on the west. To the south is San Ramon Valley, which contains the town of Danville, the city of San Ramon and the unincorporated areas of Alamo and Blackhawk-Camino Tassajara. These areas together with Lamorinda are considered Southwest County. The same areas together with Dublin, Livermore and Pleasanton, in Alameda County, make up the Tri-Valley.

To the north is Diablo Valley, named for Mount Diablo, which looks over the valley from the south and is the most notable natural landmark in Contra Costa. The area consists of the cities of Clayton, Con-

Table 2 | Local jurisdictions in Contra Costa

	<i>Land area (square miles)</i>	<i>Population (est. 2007)</i>	<i>Year of incorporation</i>
Antioch	27.0	99,619	1872
Brentwood	11.6	48,448	1948
Clayton	3.9	11,170	1964
Concord	31.1	120,844	1905
Danville	18.1	40,975	1982
El Cerrito	3.6	22,234	1917
Hercules	6.5	24,504	1900
Lafayette	15.2	24,765	1968
Martinez	12.3	35,093	1876
Moraga	9.3	16,290	1974
Oakley	12.4	30,409	1999
Orinda	12.6	18,271	1985
Pinole	5.2	18,691	1903
Pittsburg	15.6	62,511	1903
Pleasant Hill	7.1	32,689	1961
Richmond	30.4	101,454	1905
San Pablo	2.6	30,693	1948
San Ramon	18.0	48,929	1983
Walnut Creek	19.5	63,286	1914
Unincorporated areas	458.0	168,765	—
Total	720.0	1,019,640	

Sources: U.S. Census Bureau (land area and population); League of California Cities (year of incorporation).

cord, Martinez (the county seat), Pleasant Hill and Walnut Creek. This area is also known as Central County.

Over Willow Pass is East County, separated from the rest of Contra Costa by the steep hills of the Diablo Range. This relatively flat area sits at the western edge of the Sacramento-San Joaquin Delta and the Central Valley. East County consists of the cities of Pittsburg, Antioch, Brentwood and Oakley and the unincorporated communities of Bay Point, Bethel Island, Byron, Discovery Bay and Knightsen.

Development patterns

Contra Costa exhibits a broad range of development patterns. Most of the early European settlements were on the shoreline of San Francisco, San Pablo and Suisun bays, reflecting their origin as ports in the 19th century. These communities include Richmond, Pinole, Hercules, Martinez, Pittsburg and Antioch. The older parts of these cities feature the urban forms of that era: short blocks on a grid, small-footprint buildings and a general pedestrian orientation facilitated by nearly ubiquitous sidewalks.

This section, along with Appendix C, addresses BTA requirement (b): “A map and description of existing and proposed land use and settlement patterns which shall include, but not be limited to, locations of residential neighborhoods, schools, shopping centers, public buildings, and major employment centers.”

The advent of the electric trolley and railroads in the late 1890s ushered in the first wave of suburbanization, as residents moved inland in greater numbers, particularly following the 1906 earthquake that devastated much of San Francisco. This wave lasted roughly until the 1940s and resulted in a set of “inner-ring” or “first-ring” suburbs.

While transit-oriented, these suburbs continued to exhibit a comfortable, pedestrian-sized scale, reflecting the complementarity between walking and transit access. Areas fitting this description include large parts of El Cerrito, Richmond (shown in the image below), San Pablo and a few inland districts such as the neighborhoods around downtown Concord and Antioch.



The population of Contra Costa tripled between 1940 and 1950 and again between 1950 and 1990. Such significant growth, coupled with changing tastes in housing, nearly universal automobile ownership and creation of the national highway system, brought a new kind of suburbanization. Communities developed after World War II in Contra Costa are marked by greater segregation of land uses—with single-family homes set apart from apartments and residential neighborhoods apart from commercial districts and civic buildings—and lower-density, larger-scale development designed for access by car, such as shopping malls and business parks.

In these newer communities, many fewer people walk and bicycle, for a number of interrelated reasons. Until the past 10-15 years, arterial and collector streets were built primarily for car traffic, with little or no accommodation for pedestrians and bicyclists. Residential areas have been designed to reduce cut-through traffic using limited access points, curvilinear streets and cul-de-sacs, all of which make walking and bicycling less direct and more time-consuming. This street pattern necessitates longer blocks and wider arterials, which are less comfortable for pedestrians and bicyclists. Perhaps most importantly, the greater distances inherent in low-density developments often make walking impractical and bicycling inconvenient. Since most of the growth in Contra Costa has occurred since the 1950s, it is not surprising that these land use and development patterns are common throughout the county.



Retrofitting these post-WWII streets and neighborhoods to accommodate pedestrians and bicyclists is a daunting challenge. Some communities have been reviving older, traditional development patterns, recognizing their potential to create more attractive environ-

ments, not only for pedestrians and bicyclists. In 2001, for example, the City of Hercules adopted a development code with the long-term objective of transforming central Hercules into a compact, pedestrian-oriented district. In a built example, Pleasant Hill has, over the past decade and a half, created a new, pedestrian-oriented downtown. The city of Concord's redevelopment vision for the decommissioned Concord Naval Weapons Station includes a transit-oriented district around the North Concord BART station, a series of "clustered villages" of homes and large areas set aside as open space, all connected with a network of trails.

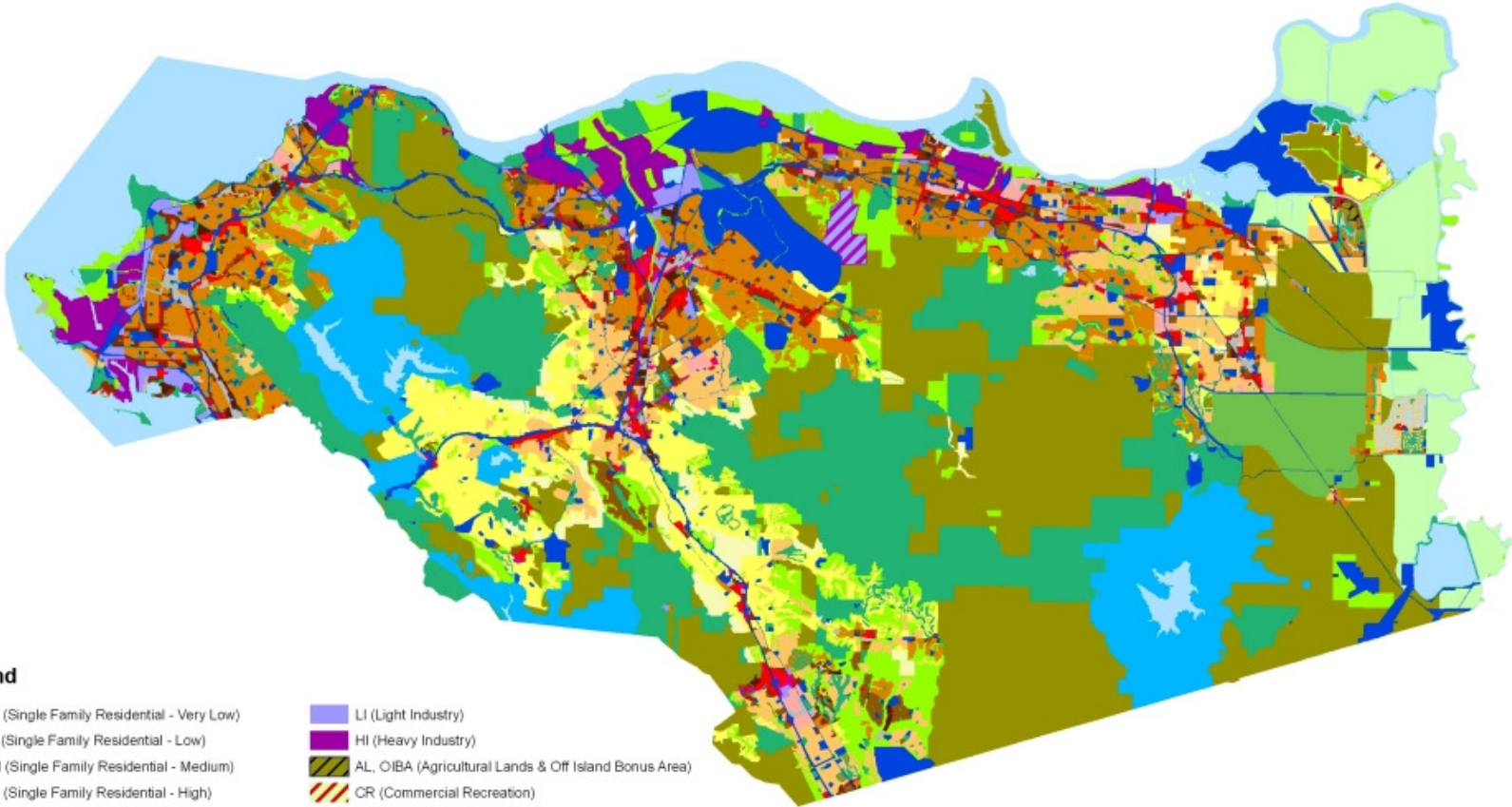
Land use patterns

In terms of specific land uses, the largest concentrations of jobs in Contra Costa occur along Interstate 680, from Concord in the north to San Ramon in the south. Industrial uses are located along the shoreline from Richmond east to Antioch, reflecting current and former dependence on water transport. West County and large parts of Central County and East County are characterized by medium- and high-density housing, while low- and very low-density housing predominate in Southwest County, except in the jurisdictions' downtowns.

Contra Costa also has large areas of undeveloped land. Most of the East Bay hills territory between West County and Lamorinda/Central County is agricultural land, permanently protected parkland owned and managed by the East Bay Regional Park District (EBRPD) or protected watershed land of the East Bay Municipal Utility District. The area within the crescent formed by Southwest, Central and East counties contains large agricultural tracts, several EBRPD parks, Mount Diablo state park and watershed landholdings of the Contra Costa Water District around Los Vaqueros reservoir. Lastly, between Brentwood/Oakley and San Joaquin County are large areas of agriculture and delta marshland. A map of land use designations in Contra Costa appears on the following page.



Consolidated Map of Existing and Proposed Land Uses in Contra Costa County



Legend

- SV (Single Family Residential - Very Low)
- SL (Single Family Residential - Low)
- SM (Single Family Residential - Medium)
- SH (Single Family Residential - High)
- ML (Multiple Family Residential - Low)
- MM (Multiple Family Residential - Medium)
- MH (Multiple Family Residential - High)
- MV (Multiple Family Residential - Very High)
- MS (Multiple Family Residential - Very High Special)
- CC (Congregate Care/Senior Housing)
- MO (Mobile Home)
- MU (Mixed Use)
- CO (Commercial)
- OF (Office)
- BP (Business Park)
- LI (Light Industry)
- HI (Heavy Industry)
- AL, OIBA (Agricultural Lands & Off Island Bonus Area)
- CR (Commercial Recreation)
- ACO (Airport Commercial)
- LF (Landfill)
- PS (Public/Semi-Public)
- PR (Parks and Recreation)
- OS (Open Space)
- AL (Agricultural Lands)
- AC (Agricultural Core)
- DR (Delta Recreation)
- WA (Water)
- WS (Watershed)



Map created by Contra Costa County GIS Department
 All other marks are the property of Contra Costa County
 This map was created by the Contra Costa County
 GIS Department. It is not intended to be used for any other purpose. The information presented in this map is for informational purposes only and does not constitute a guarantee, warranty, or endorsement of any product or service by Contra Costa County. The information presented in this map is for informational purposes only and does not constitute a guarantee, warranty, or endorsement of any product or service by Contra Costa County.



Prepared by Contra Costa County Department of Conservation and Development for the Contra Costa County Transportation Authority for use in the Countywide Bicycle and Pedestrian Plan. This map contains land use information for the cities and unincorporated areas of Contra Costa County. The information presented in this map relies on the County's land use categorization system and makes no assurances for city land use designations.

COMMUTE STATISTICS

Current mode split

Information on how many people walk and bicycle, and for what purposes, can help the Authority and local jurisdictions plan projects and programs and target marketing to potential new users. Table 3 shows estimated commute mode splits in Contra Costa for *home-to-work trips* from the following three sources. It should be noted that the first two sources estimate the percentage of *commuters* using each mode of transportation as their primary mode while BATS 2000 estimates the percentage of *trips* taken by each mode. The sources are:

- 2000 U.S. Census, from the U.S. Census Bureau (as reported in the 2003 CBPP; the 2000 census is the latest).
- 2006-2008 “American Community Survey” (ACS), also from the U.S. Census Bureau. ACS is an ongoing survey that replaces the “long form” of the census and collects demographic, housing and transportation information every year instead of every ten years.
- MTC’s “Bay Area Travel Survey 2000” (BATS 2000; this is the latest BATS available).

According to these sources, walking accounts for 1.6–1.9 percent of work trips or commuters and bicycling represents 0.5–0.6 percent. With a share of approximately 70 percent, drive-alone is by far the predominant mode of transportation in Contra Costa, as in most of the country. Carpooling accounts for approximately 12–16 percent and transit for 9–13 percent.

Table 3 | Home-to-work mode split in Contra Costa (%)¹

	2000 Census	2006-2008 ACS	BATS 2000
Drive alone	73.3	74.4	68.9
Carpool	14.1	12.3	16.1
Transit	9.4	9.5	12.5
Walk	1.6	1.9	1.5
Bicycle	0.5	0.6	0.3
Other ²	1.1	1.2	0.6
Total	100.0	100.0	100.0

¹ Percentage of trips; does not include work-at-home

² Includes motorcycle and taxicab

The census, conducted almost a decade ago, estimated that approximately 7,000 walking trips and 2,000 bicycling trips were made to work each day in Contra Costa. These numbers represented 1.5 percent and 0.5 percent, respectively, of all such trips. To put these figures in a broader context, Table 4 compares the share of home-based work trips made on foot or by bike in the nine Bay Area counties and in the region as a whole, according to the 2000 census. As the table shows, Contra Costa has the lowest share of such trips made by walking among all counties and is tied with Solano for the lowest bicycling share.

Table 4 | Walk and bike mode shares in the Bay Area (%)

	<i>Walk</i>	<i>Bike</i>
Alameda	3.2	1.2
Contra Costa	1.5	0.5
Marin	3.0	1.0
Napa	4.1	0.8
San Francisco	9.4	2.0
San Mateo	2.1	0.8
Santa Clara	1.8	1.2
Solano	1.6	0.5
Sonoma	3.1	0.8
Bay Area	3.2	1.1

Source: 2000 U.S. Census; figures include workers working at home

Since two of the data sources cited above—BATS 2000 and the 2000 U.S. Census—are almost ten years old, it is likely that the commute shares for walking and bicycling have changed. It is also possible that the significant economic downturn that gripped the Bay Area in 2008 and 2009 has also caused a shift in the walking and bicycling rates. Predicting the effect of the recession on such rates, however, is difficult. On the one hand, recessions reduce people’s spending power, which should encourage them to shift to cheaper modes of transportation, namely walking and bicycling; on the other, recessions lead to less driving and, therefore, less congestion, which likely encourages some people to drive alone more often instead of using transportation alternatives. At the same time, it is impossible to say whether the re-

cession will have long-lasting effects on people’s behavior, including their transportation habits.

National studies have shown significantly higher walking and bicycling rates in lower-income households, mainly because they tend to own fewer or no cars and are of a younger average age. This likely translates to higher relative demand for bicycle and walking improvements in lower-income areas. Higher rates of nonmotorized travel are also found in areas characterized by higher-density development, mixed land uses and a small-scale grid street pattern.

Estimated bicycle ridership

The 2003 CBPP included an order-of-magnitude estimate of the daily number of all bicyclists—commuters and others—in Contra Costa. An updated estimate, using more recent data, is shown in Table 5. (See Appendix A for an explanation of the model and estimation methodology.)

Table 5 | Current daily bicycle ridership in Contra Costa

Employees commuting to work	2,800
School children commuting to school	6,900
College students commuting to school	3,400
Bike-to-transit riders	600
Other riders (for shopping, social visits, etc.)	11,900
Total	25,600

Numbers do not add up to total due to rounding

This section, along with Appendix C, addresses BTA requirement (a): “The estimated number of existing bicycle commuters in the plan area and the estimated increase in the number of bicycle commuters resulting from implementation of the plan.”

Similarly, Table 6 shows the updated estimates in the projected numbers of daily bicycle commuters, other riders and bicycle trips in Contra Costa in 2035; the estimates take into account forecast population growth and assume completion of the bicycling facilities outlined in the CBPP. The table also shows the estimated current and projected reductions in vehicle trips and vehicle-miles resulting from trips being taken by bicycle instead.

Table 6 | Daily bicycle ridership in Contra Costa

	<i>Current</i>	<i>Projected (2035)</i>	<i>Increase</i>
Bicycle commuters ¹	13,800	48,700	35,000
Other riders	11,900	42,100	30,200
Bicycle ridership ²	25,600	90,800	65,100
Bicycle trips ²	51,300	181,600	130,300
Reduced motor-vehicle trips	34,700	122,700	88,100
Reduced motor-vehicle miles	113,000	400,100	287,100

¹ To work, school, college and transit; numbers do not add up to total due to rounding

² Includes shopping, social and other non-commute trips but not recreational trips

Lastly, the current and projected number of bicycle commuters has been estimated for each jurisdiction in Contra Costa (Table 7). The totals for all the jurisdictions do not equal the countywide numbers in tables 4 and 5 because countywide estimates were based on data from the three-year 2006-2008 ACS whereas estimates for some jurisdictions were based on data from the 2000 U.S. census or the one-year 2008 ACS, depending on the availability of data.

Again, it is important to emphasize that these are order-of-magnitude estimates and are based on limited data and research. Figures from the U.S. Census Bureau likely underestimate the number of trips to work made by bicycle (and by foot), and estimates of bicycle trips for other purposes are even less well-documented. Counts of actual bicyclists are extremely limited as well.

While research is ongoing into the effect on ridership of improvements in bicycling facilities, no generally accepted method for forecasting bicycle ridership is available. (Travel demand models do forecast bicycle trips but likely underestimate them for two reasons: the starting data itself likely underestimates bicycle trips; and models use a much coarser network, which creates travel-time disadvantages for bicycle trips.) Nonetheless, the bicycle ridership projections appear reasonable if one takes into account forecast population growth and assumes implementation of the bicycle facilities and supportive programs identified in the CBPP.

Table 7 | Daily bicycle commuters by jurisdiction

	<i>Current</i>	<i>Projected</i>	<i>Increase</i>
Antioch	1,200	4,200	3,000
Brentwood	600	2,000	1,400
Clayton	100	400	200
Concord	1,600	5,600	4,000
Danville	600	2,000	1,400
El Cerrito	400	1,300	900
Hercules	300	900	600
Lafayette	300	1,200	900
Martinez	500	1,600	1,200
Moraga	300	1,100	800
Oakley	400	1,400	1,000
Orinda	200	800	600
Pinole	300	1,000	700
Pittsburg	800	2,700	1,900
Pleasant Hill	400	1,500	1,100
Richmond	1,200	4,200	3,000
San Pablo	400	1,500	1,100
San Ramon	1,000	3,500	2,500
Walnut Creek	1,000	3,300	2,300
Unincorporated areas	1,500	5,300	3,800
Total	12,900	45,500	32,700

Some numbers do not add up to totals due to rounding

COLLISION ANALYSIS

Overview

While motor-vehicle collisions can affect anyone in Contra Costa, they have a disproportionate impact on pedestrians and bicyclists, the most vulnerable users of the transportation system. Pedestrians and bicyclists represent a disproportionate number of the transportation-related fatalities in the county, a pattern mirrored throughout the Bay Area and the rest of the country. Data on collisions involving pedestrians and bicyclists can help planners and other decision-makers identify specific areas in which to focus improvement efforts. The data used in this section comes from the California Highway Patrol’s Statewide Integrated Traffic Records System (SWITRS), a database of collisions as reported to and collected by local police departments and other law enforcement agencies in the state. Because SWITRS consists only of reports taken by officers in the field, the incidents in the database represent only a portion of all collisions. This also means that the incidents in SWITRS are more likely to be serious, since minor collisions are less likely to be reported to a police officer.

► **CHP’s Statewide Integrated Traffic Records System (SWITRS):**
www.chp.ca.gov/switrs

Pedestrian collisions

Typically, one-third of collisions involving pedestrians happen while the pedestrian is crossing a street in a crosswalk at an intersection. Another third involves pedestrians crossing a street *not at a crosswalk*. All other types of collisions make up the remainder; of these, the most common involves pedestrians walking along the road, including on the shoulder. This data emphasizes the importance of accommodating pedestrian travel in the design of roadways and intersections to improve pedestrian safety.

In the five years from 2002 to 2006—the latest for which SWITRS data is available—59 pedestrian fatalities and 1,308 pedestrian injuries were reported for Contra Costa (Table 8). The annual number of fatalities ranged from seven to 16 while the number of injuries ranged from 237 to 291. The *average* annual number of fatalities was almost 12 while the average number of injuries was nearly 262. (By comparison, during 1990-2000, there was an average of nearly 300 collisions annually in Contra Costa involving pedestrians.)

Table 8 | Pedestrian and bicycle fatalities and injuries in Contra Costa

	<i>Pedestrian</i>		<i>Bicycle</i>	
	<i>fatalities</i>	<i>injuries</i>	<i>fatalities</i>	<i>injuries</i>
2002	11	291	3	209
2003	14	246	2	223
2004	7	237	4	228
2005	11	274	1	247
2006	16	260	9	213
Total	59	1,308	19	1,120
<i>Annual average</i>	<i>11.8</i>	<i>261.6</i>	<i>3.8</i>	<i>224.0</i>

During that five-year period, four cities (three of which are in West County) had an average of more than one pedestrian fatality per year: Richmond (1.6), Pinole (1.2), Pittsburg (1.2) and San Pablo (1.0); in addition, the unincorporated areas had an annual average of two fatalities (Table 9). On the other hand, Clayton, Lafayette and Orinda saw no pedestrian fatalities during the same period. The jurisdictions with the highest average number of pedestrian injuries annually were

Richmond (45.2), Concord (35.6) and the unincorporated areas (30.8); the lowest injury numbers were in Clayton (0.2) and Moraga (0.6).

When comparing data among local jurisdictions, the numbers of fatalities and injuries tell only part of the story. For a more meaningful comparison, the numbers for each jurisdiction should be adjusted by its population. When calculated per 10,000 population (using the population figures in Table 2), the jurisdictions with the highest annual number of pedestrian injuries are El Cerrito (7.47), San Pablo (5.47) and Richmond (4.46), all of which are in West County (Table 9); the lowest injury rates are in Clayton (0.18) and Moraga (0.37).

El Cerrito Pedestrian Safety Assessment

A pedestrian safety assessment was conducted for the city of El Cerrito in early 2009 by the Institute of Transportation Studies Technology Transfer Program (and sponsored by the California Office of Traffic Safety). The assessment found that during the 2003-08 period, the majority of pedestrian-vehicle collisions in the city were along San Pablo Avenue, which is not only a regional transportation route but also the primary retail and transit corridor in El Cerrito. In general, the top collision locations were those where high-volume roadways traverse the city’s main pedestrian nodes.

While the population-adjusted figures are an improvement over raw numbers, even they do not allow for a truly meaningful comparison of pedestrian safety risk among jurisdictions. Ideally, the figures would be adjusted further, either for the number of pedestrian commuters or of walking trips in each jurisdiction, to account for “pedestrian exposure.” Unfortunately, such information is not available. If it were, it would likely indicate that higher collision rates in places such as Richmond and San Pablo result from higher exposure rates—that

is, more pedestrians and bicyclists per unit of population. A pedestrian safety assessment conducted in Walnut Creek in 2008 and sponsored by the California Office of Traffic Safety found that, between 2006 and 2008, approximately 90 percent of collisions that involved pedestrians took place in the core of the city, where many more pedestrians are present.

Estimating pedestrian exposure

Currently, there is no reliable systematic method for estimating pedestrian exposure. To remedy that, UC Berkeley's Traffic Safety Center has undertaken a research project to develop tools for estimating pedestrian risk for injury. Such tools include definitions of exposure and risk, methods for measurement, and analytic techniques. The primary research product will be a protocol for measuring pedestrian volume at local and state levels that will allow Caltrans to monitor pedestrian safety trends across the state. A long-term goal of the project is to enable the efficient use of limited resources by targeting pedestrian safety interventions at areas with high pedestrian exposure rates.

► www.tsc.berkeley.edu/research/pedexposure.html

The available data supports the observation that pedestrians, along with bicyclists, suffer disproportionately from traffic collisions. In 2002–2006, pedestrians made up almost 16 percent of the traffic fatalities and 4.7 percent of the traffic injuries in the county even though walking accounts for less than 2 percent of work trips and commuters. Lastly, adjusted for population—but, again, not for pedestrian exposure—Contra Costa has a lower rate of pedestrian injuries than the state as a whole. In 2002–2006, Contra Costa had an average of 2.57 injuries annually per 10,000 population. The corresponding figure for California is 3.70.

Table 9 | **Pedestrian fatalities and injuries (annual average, 2002-2006)**

	<i>Fatalities</i>	<i>Injuries</i>	<i>Injuries per 10,000 pop</i>
Antioch	0.6	21.2	2.13
Brentwood	0.4	6.8	1.40
Clayton	0.0	0.2	0.18
Concord	0.8	35.6	2.95
Danville	0.2	7.4	1.81
El Cerrito	0.6	16.6	7.47
Hercules	0.2	1.8	0.73
Lafayette	0.0	2.2	0.89
Martinez	0.4	7.6	2.17
Moraga	0.2	0.6	0.37
Oakley	0.2	2.2	0.72
Orinda	0.0	2.6	1.42
Pinole	1.2	5.2	2.78
Pittsburg	1.2	15.2	2.43
Pleasant Hill	0.6	12.6	3.85
Richmond	1.6	45.2	4.46
San Pablo	1.0	16.8	5.47
San Ramon	0.4	5.2	1.06
Walnut Creek	0.2	25.8	4.08
Unincorporated areas	2.0	30.8	1.83
Total	11.8	261.6	2.57
<i>California</i>			<i>3.70</i>

Bicycle collisions

For the five years from 2002 to 2006, SWITRS reports 19 bicycle fatalities and 1,120 bicycle injuries in Contra Costa (Table 8). The annual number of fatalities ranged from one to nine while the number of injuries ranged from 209 to 247. The *average* annual number of fatalities was almost 4 while the average number of injuries was 224. (By comparison, between 1990 and 2000, an average of 329.1 collisions annually in Contra Costa involved bicyclists.)

Concord and Richmond alone represented more than half of the bicycle fatalities, averaging one fatality each per year (Table 10); twelve cities saw no bicycle fatalities. The jurisdictions with the highest average number of bicycle injuries annually were Concord (40.4), the unincorporated areas (36.6) and Richmond (22.2); the lowest injury numbers were in Hercules (0.6), Moraga (1.0), Orinda (1.8) and Clayton (2.0). Adjusted for population, however, the jurisdictions with the highest annual number of bicycle injuries per 10,000 population (Table 10) were Pleasant Hill (5.38), El Cerrito (4.50), Concord (3.34) and San Pablo (3.19); the lowest injury rates are in Hercules (0.24), Moraga (0.61) and Orinda (0.99).

Table 10 | **Bicycle fatalities and injuries (annual average, 2002-2006)**

	<i>Fatalities</i>	<i>Injuries</i>	<i>Injuries per 10,000 pop</i>
Antioch	0.2	16.8	1.69
Brentwood	0.0	5.0	1.03
Clayton	0.0	2.0	1.79
Concord	1.0	40.4	3.34
Danville	0.2	11.6	2.83
El Cerrito	0.0	10.0	4.50
Hercules	0.0	0.6	0.24
Lafayette	0.0	4.8	1.94
Martinez	0.2	5.8	1.65
Moraga	0.0	1.0	0.61
Oakley	0.0	3.4	1.12
Orinda	0.0	1.8	0.99
Pinole	0.0	2.4	1.28
Pittsburg	0.0	8.0	1.28
Pleasant Hill	0.0	17.6	5.38
Richmond	1.0	22.2	2.19
San Pablo	0.4	9.8	3.19
San Ramon	0.0	6.0	1.23
Walnut Creek	0.6	18.2	2.88
Unincorporated areas	0.2	36.6	2.17
Total (countywide)	3.8	224.0	2.20
<i>California</i>			<i>2.87</i>

As with the pedestrian collision data, even the population-adjusted bicycle injury rates do not allow for a truly meaningful comparison of bicycle safety risk among jurisdictions. Ideally, the figures would be adjusted further, either for the number of bicycle commuters or of bicycling trips in each jurisdiction, to account for bicyclists' exposure. The estimated numbers of bicycle commuters in each jurisdiction (Table 7) and of bicycling trips make are too conjectural to be used for such an adjustment.

Like pedestrians, bicyclists suffer disproportionately from traffic collisions in Contra Costa. Between 2002 and 2006, bicyclists represented 5.1 percent of the traffic fatalities and 4 percent of the traffic injuries in the county even though bicycling accounts for only 0.5 percent of work trips and commuters. Adjusted for population—but, again, not for bicycle exposure—Contra Costa has a lower rate of bicycle injuries than the state as a whole. Between 2002 and 2006, Contra Costa had an average of 2.20 injuries annually per 10,000 population. The corresponding figure for California is 2.87.

Perhaps contrary to popular perception, most bicycle collisions do not involve motor vehicles. Hospitalization data have shown that a majority of bicycle injuries involve falls or collisions with stationary objects, other cyclists or pedestrians. This points to the need to educate bicyclists on safe riding techniques and to implement safer design practices.

FUNDED PROJECTS

This last section highlights the main accomplishments made toward implementing the 2003 CBPP. Below are pedestrian and bicycle projects, or projects with pedestrian and bicycle components, funded by or through the Authority in recent years. This inventory includes projects funded through Measure C (Table 11) and Measure J (Table 12) as well as projects recommended for funding through two MTC fund-

ing programs: the Regional Bicycle and Pedestrian Program and Transportation for Livable Communities (Table 13). Funding amounts are given in 2004 dollars.

This section—along with the “Priorities for Funding” section in Chapter 9 and Appendix C—addresses BTA requirement (k): “A description of past expenditures for bicycle facilities and future financial needs for projects that improve safety and convenience for bicycle commuters in the plan area.”

Table 11 | **Projects funded by Measure C**

<i>Project name or description</i>	<i>Amount</i>
Bancroft Road / Hookston Road Intersection Improvements	\$648,590
Iron Horse Trail Overcrossing at Treat Boulevard	\$1,273,160
Moraga Road Safety Improvements	\$12,170
Bryant Way / Moraga Way Improvements	\$177,180
Moraga Way Rehabilitation & Improvements	\$519,120
Camino Tassajara Circulation Improvements	\$296,490
Martinez Bay Trail	\$199,630
Atlas Road Bridge	\$455,420
Big Break Regional Trail	\$318,630

Table 12 | Projects funded by Measure J

<i>Project name or description</i>	<i>Amount</i>
Interstate 80 / San Pablo Dam Road Interchange Improvements	\$10,070,000
BART Parking, Access and Other Improvements – Central County	\$10,800,000
<ul style="list-style-type: none"> • Access Improvements at Central County BART Stations • Improved Vertical Circulation: Pleasant Hill BART • Comprehensive Wayfinding Signage for Central County BART Stations • Electronic Bike Lockers at Concord, North Concord and Pleasant Hill BART Stations 	
BART Parking, Access and Other Improvements – West County	\$13,500,000
<ul style="list-style-type: none"> • Transit Oriented Development (TOD) and Access Developments at El Cerrito Plaza & del Norte BART Stations • Improved Vertical Circulation at El Cerrito Plaza BART Station • Electronic Bike Lockers at El Cerrito del Norte, El Cerrito Plaza, and Richmond BART Stations • Improved Vertical Circulation at El Cerrito del Norte BART Station • Comprehensive Wayfinding Signage for West Contra Costa BART Stations 	
Marsh Creek Road Upgrade	\$984,000
Pacheco Road Upgrade and Widening: Blum Road to Morello Avenue	\$3,997,000
Court Street Overcrossing — Phase 1	\$7,834,000
Buskirk Avenue Widening — Phase 2	\$6,017,000
Geary Road Widening — Phase 3	\$7,553,000

Table 13 | Projects funded through MTC programs

<i>Project</i>	<i>Regional (R) or County (C)</i>	<i>Amount</i>
REGIONAL BICYCLE AND PEDESTRIAN PLAN		
Concord Boulevard Sidewalk and Bicycle Lane Gap Closure Project, Phase 1	R	\$572,000
Concord Boulevard Sidewalk and Bicycle Lane Gap Closure Project, Phase 2	C	\$820,000
Central Richmond Greenway: East Segment	C	\$1,020,000
Iron Horse Trail Overcrossing at Treat Boulevard	C	\$1,520,000
TRANSPORTATION FOR LIVABLE COMMUNITIES		
Monument Blvd. And Meadow Lane Pedestrian Infrastructure Improvements	R	\$2,200,000
San Pablo Avenue Streetscape, Pedestrian Access and Corridor Revitalization Project – Segment A	R	\$1,800,000
Richmond Downtown Revitalization and Transit Village: Bike and Pedestrian Improvements	R & C	\$2,306,000
Marina Vista Streetscape Project	R	\$1,100,000
Bailey Road Transit Access Improvement Project	R & C	\$1,875,000
San Pablo Avenue Pedestrian Crossing, Transit Stop and Streetscape Improvement Project — Phase II	C	\$989,000
Iron Horse Trail Overcrossing of Treat Boulevard	C	\$4,022,000
Refugio Bridge in Hercules	C	\$775,000
Montalvin Manor Sidewalk and Bus Shelter Project	C	\$365,000