

Chapter 2

Current Conditions/Setting

This chapter presents information on the setting for non-motorized transportation in Santa Clara County. First, the geographic setting is described. This chapter then describes the major attractors and generators to be served by the countywide bicycle plan. It also describes the existing bicycle usage in the county as gleaned from census data, surveys and bicycle counts.

Population

Santa Clara County encompasses 3,367 square kilometers (1,300 square miles) at the southern end of the San Francisco Bay. Since the 1950's, Santa Clara County has been one of the fastest growing metropolitan areas in the United States. The current population of Santa Clara County is 2.3 million. The age distribution for Santa Clara County is typical for California as shown below in Figure 2-1:

Figure 2-1 Santa Clara County Age Distribution

Age range	0-9	10-19	20-44	45-64	65+
% of population	16%	12%	43%	20%	9%

Source: Joint Ventures 1999 Index of Silicon Valley

There are 16 local jurisdictions in the County: 15 incorporated cities/towns, as well as the unincorporated areas which are under the County's administration. The largest of the cities is San Jose, in the middle of the county with almost a million people and 177 square miles.

- Campbell
- Cupertino
- Gilroy
- Los Altos
- Los Altos Hills
- Los Gatos
- Milpitas
- Monte Sereno
- Morgan Hill
- Mountain View
- Palo Alto
- San Jose
- Santa Clara
- Saratoga
- Sunnyvale
- Unincorporated County

Geographic Setting

Santa Clara County is the southernmost of the nine counties that make up the San Francisco Bay Area region. The county is bounded to the south by San Benito County, to the north-east by Alameda County and to the north-west by San Mateo County. The key geographical feature of the County is the Santa Clara Valley bordered on the east by the Diablo Mountain Range and on the west by the Santa Cruz Mountain Range. The valley is

part of a long depression within the central Coastal Ranges of California and is characterized by a relatively flat floor. From the axis of the valley, the terrain gently rises towards the east and west to the toe of the foothills, becoming increasingly steep. Consequently, only the Santa Clara Valley floor, roughly one-third of the county, is the developed or developable land. The remaining two-thirds of the County are the foothills, hills, mountains or preserved space. Santa Clara Valley is home to the “Silicon Valley” with roughly 4,100 high-technology firms and about 30% of the Bay Area’s jobs. The north County, from Milpitas to San Jose to Palo Alto, is extensively urbanized, housing approximately 90% of the County’s residents. The south county is predominantly rural, with the exception of Gilroy, Morgan Hill and the small unincorporated community of San Martin; however development and growth has accelerated in the past decade. Land development patterns vary greatly, from denser mixed-use areas of older city centers to the typical suburban pattern of subdivisions and shopping malls.

Natural Topographic Obstacles

See Figure 2-2 for a map of the natural and man-made barriers to bicycle travel in Santa Clara County.

Mountains/Hills

The terrain affects the ease of bicycling, but for the most part development has occurred in the valley areas of the county. Therefore, most of the non-recreational trips made by bicycle are within areas of relatively flat topography.

Creeks

Santa Clara County is fortunate to have many creeks that are still in their natural state, most of which drain to San Francisco Bay. Creeks in many other areas have been converted to concrete flood control channels. While both provide excellent opportunities for Class 1 trails, they can also be major obstacles to bicycle circulation themselves. Many have bicycle/pedestrian trails developed along parts of them, i.e. Los Gatos Creek, Stevens Creek, Guadalupe River, Coyote Creek, and many of the others could potentially have trails. Many communities have provided bicycle and pedestrian access across creeks such as the three bridges across Adobe Creek, which forms the border between Palo Alto and Los Altos. Many more bridges or undercrossings are needed where creeks form barriers to bicycle circulation. In particular are obstacles posed by creeks where they meet major roadway structures at a perpendicular angle. In such cases, creek trails must be “tunneled” under the roadway structure, often a great cost, in order to provide continuous bicycle/pedestrian access (see Figure 2-3.) Trails, bridges and undercrossings would be subject to approval of the Santa Clara Valley Water District, which is in charge of water supply, flood protection and watershed management.



Figure 2-3 Stevens Creek Trail undercrossing at US-101

Man-made Topographic Obstacles

Freeways

Freeways tend to be the biggest barriers to bicycle connectivity. They are extremely wide, necessitating grade-separated roadways resulting in a limited number of locations where bikes can cross the freeway. Cyclists are often forced to take long detours to find a grade separation to get from one side of the freeway to the other. Building bicycle/pedestrian bridges or undercrossings is expensive but necessary to restore the severed access, as well as mitigate the long detours caused by the freeway. Biking on the shoulders of the roadways going under freeways tends to be an unpleasant experience due to limited width, darkness, lack of landscaping, accumulation of litter and debris, and the proximity of traffic going at high speeds.

Railroads

Railroad tracks pose similar barriers to bicycles as freeways, except that the right of way is not as wide; therefore it is easier and cheaper to construct bicycle crossings. Undercrossings are more viable, because they are less visually obtrusive and usually less expensive.

Expressways

Santa Clara County has 62 miles of expressways which are now all open to cyclists. The history of bicycle access to the expressways reflects different city preferences and changing visions for expressway operations. Bicycles were prohibited from using all the expressways except Page Mill in Palo Alto; Almaden, Montague and Capitol (south of

Capitol Avenue) in San Jose until 1975. The County of Santa Clara County (Roads and Airport Department), which operates and maintains the expressways, cooperated with various cities to repeal the prohibition of bicycles on expressways within their respective jurisdictions. Central within Mountain View, and Foothill within Palo Alto was opened to cyclists in 1975. The remainder of Foothill and Central in Sunnyvale was opened to bicyclists in 1980. In 1991, the bicycle prohibition was repealed for Lawrence and San Tomas within Sunnyvale and Santa Clara, rendering the entire expressway system open to bicycles.

Since the original design standards were not required to take bicycles into account, much of the current roadway geometrics do not meet the *Bicycle Technical Guidelines* standards and requires upgrading. However, for the most part, the expressways have 8-foot shoulders, which make a good bicycle facility for experienced cyclists. As part of the Measure B pavement management effort, the County is reviewing shoulder striping throughout the expressway system for potential improvements to comply with the *Bicycle Technical Guidelines* standards.

Land Use Obstructions

There are also several areas without through access, where bicyclists are forced to take extended detours to get around them, such as airports and other large land-holdings.

Road and Traffic Conditions

Aside from the physical barriers to bicycle travel discussed above, the traffic conditions in the roadway environment intimidates many bicyclists. The perception of unsafe conditions is the dominant factor for many potential cyclists. They may lack the experience and confidence to bicycle on roads with high traffic speeds and volumes. Overall driving behavior and courtesy have deteriorated, which is also a deterrent to bicycling.

Roadway design has traditionally favored cars over bicycles and pedestrians. In situations where motorists are turning right to exit or enter a freeway or expressway, bicyclists proceeding straight through are often forced to stop and wait for cars to clear, before moving forward, since the majority of motorists are not likely to slow down for bicycles.

Ignorance of the status of bicycles as a vehicle on equal footing with motor vehicles within the Vehicle Code has many drivers treating bicycles with less consideration than motor vehicles. Only recently has there been some awareness raised among motorists that the roadways are to be shared with bicyclists with education and signage (Figure 2-4).



Figure 2-4

Countywide Bicycle Trip Attractors/Generators

The regional trip attractors and generators in Santa Clara County were identified by discussions with city staff, from city web sites and the RIDES' Marketing Database. They include all junior colleges, colleges and universities, hospitals, regional shopping centers, central business districts, civic centers, major employment sites, and rail stations and other major transit centers and interface areas. The locations were considered in determining the alignments of the Cross County Bicycle Corridors (see Chapter 4).

Appendix A lists the major employers in each city that have 500 or more employees. In many cases, an employer has more than 500 employees but they are scattered among several sites. (School districts are the best example of this.) The appendix shows the site-specific employee counts since one bicycle planning goal is to serve the high density areas and therefore it is the concentration of employees that is of interest. Each downtown area is assumed to be a major attractor in and of itself.

Existing Bicycle Usage Data

Trip purposes

Bicycles are used for transportation for all types of trip purposes. Figure 2-5 presents trip purpose data from the National Personal Transportation Survey conducted by FHWA in 1995. As indicated, 1 in 8 bicycle trips nationally are for work. As important as work trips are, they only represent a portion of the transportation picture.

Figure 2-5: Bicycle Trips, by trip purpose, nationwide

Trip purpose	Percentage
Work	13%
School	14%
Shopping	14%
Personal /Business	18%
Recreation	31%
Other	10%

Source: FHWA, 1995 National Personal Transportation Survey

Countywide Data

According to the 1990 Census, 1.4 percent of Santa Clara County residents bicycle to work and 2.0 percent walk to work (see Figure 2-6). The 2000 Census data is expected to become available for the next update of the Countywide Bicycle Plan, and will be incorporated into the Plan at that time.

RIDES for Bay Area Commuters has also conducted mode split surveys in the Bay Area periodically since 1992, which provides more recent data.¹ Bicycle mode share has seen dramatic changes recently, dropping to 0.5 percent in 1999, and rising to 2.3% in 2000. The reasons for this are not entirely clear. The rainy season in spring 1999 may have affected the survey results.

Figure 2-6 Santa Clara County Primary Commute Mode, for Residents

	1990	1993	1994	1995	1996	1999	2000
Bicycle	1.4%	1.3%	1.8%	1.8%	1.5%	0.5%	2.3%
Walk	2.0%	1.8%	2.3%	1.0%	0.8%	0.7%	0.3%

Source: 1990 data from 1990 Census-Working Paper No. 5 Journey to Work data, April 1993.

All other years: RIDES for Bay Area Commuters, *Commute Profile 1999: A Survey of San Francisco Bay Area Commute Patterns* (August 1999).

Citywide Data

The bicycle and walk mode splits vary dramatically from city to city. As shown in Figure 2-7, the bicycle mode split varies from 46 percent for trips within Stanford to 0.4 percent for the cities of Milpitas, Morgan Hill and Saratoga, with the majority of cities having about 1 to 2 percent bicycling. The percent of households that are “transit dependent”, i.e. have no car available to them is also shown in Figure 2-7. In most cases, the city with the most number of zero-car households also have the most bike and walk commuters.

¹ RIDES conducts a telephone survey of adults over age 18 who are employed 35 hours or more outside the home. The survey is conducted in the Spring, usually March or April, using random digit dialing, and asks the question “How do you usually get to work?” Thus, the results can be affected by the weather of that particular period when the survey is conducted. The sample size for Santa Clara County has historically been about 400. The data is felt to be valid at the county level, but not at the city level. More details about the study and the methodology is available on the RIDES website: www.rides.org.

Figure 2-7 Existing Bicycle and Walk Mode Share for Commute Trips for Employed Residents

City/Area	Bicycle	Walk	Total Employed Residents	% Zero Auto Households
Campbell	0.9%	1.6%	21,837	6.4%
Cupertino	0.7%	2.0%	23,551	2.8%
Gilroy	1.4%	2.4%	14,748	6.2%
Los Altos	1.5%	1.1%	13,727	1.5%
Los Altos Hills	0.6%	0.6%	3,839	0.2%
Los Gatos	0.7%	1.8%	16,056	4.0%
Milpitas	0.4%	1.3%	26,257	2.9%
Monte Sereno	1.2%	1.3%	1,813	1.4%
Morgan Hill	0.4%	1.0%	12,340	3.8%
Mountain View	2.0%	2.7%	42,888	5.4%
Palo Alto	5.8%	4.0%	32,284	6.0%
San Jose	0.6%	1.6%	408,850	5.9%
Santa Clara	1.3%	3.2%	54,805	6.1%
Saratoga	0.4%	0.9%	14,437	1.4%
Sunnyvale	0.9%	1.6%	70,459	4.3%
<i>Unincorporated Communities</i>				
Burbank	2.0%	1.4%	2,593	9.5%
Cambrian Park	1.7%	2.6%	1,511	2.2%
East Foothills	0.1%	0.7%	7,009	4.4%
Lexington Hills	0.0%	2.6%	1,255	0.0%
Loyola	0.7%	0.7%	1,550	0.4%
Rancho Rinconada	2.1%	0.8%	2,339	1.3%
San Martin	0.0%	6.3%	805	6.8%
Stanford	45.6%	18.3%	8,834	9.9%
Other	0.7%	2.8%	28,558	3.8%

Source: 1990 Census Working Paper No. 2 – Bay Area Travel and Mobility Characteristics, 1992

MTC Travel Survey

As stated previously, census data only covers work trips, but there are other trip purposes. The Metropolitan Transportation Commission (MTC) conducted a survey of regional travel characteristics in 1990. The results of these surveys shows regional and sub-regional travel characteristics with an emphasis on average weekday intra-regional travel made by residents of the nine-county Bay Area. The data includes information on the components of travel (trip purpose, time of day, etc.), household travel rates, personal characteristics of the trip maker, and county-level and county-to-county travel patterns.

Figure 2-8 Weekday Bicycle Trips by Purpose, as compared to Total Weekday Trips by Purpose

	From Home- to				Non-home based
	Work	Shop	Soc/Rec	School	
Santa Clara	1.1%	0.5%	0.9%	1.8%	0.6%
Nine-County Bay Area	1.3%	0.7%	3.0%	4.2%	0.9%

Source: San Francisco Bay Area 1990 Regional Travel Characteristics, Working Paper #4, 1990 MTC Travel Survey

Figure 2-8 displays the 1990 survey results for bicycling or walking trips by purpose for Santa Clara County and the Bay Area as a whole. According to these results, in Santa Clara County, the most common type of a bicycle trip is from home to school (1.8%), and least common type of trip is from home to shopping (0.5%). Compared with the combined nine-county Bay Area results, bicycle and walk trips are less common for all purposes in Santa Clara County.

Figure 2-9 Duration of Bicycle Trips (Minutes)

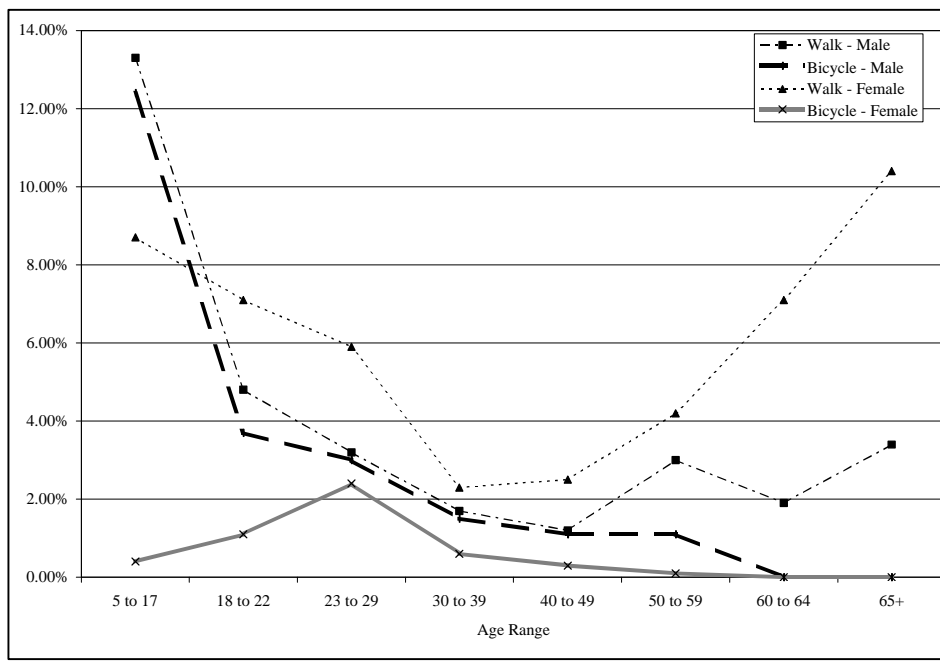
Duration	% of Trips	
	Santa Clara	Bay Area
0-5 minutes	19.90%	19.5%
5.1-10 minutes	15.90%	20.1%
10.1-15 minutes	30.90%	28.0%
15.1-20 minutes	8.40%	7.3%
20.1-25 minutes	7.00%	5.8%
25.1-30 minutes	13.80%	12.1%
30.1-45 minutes	2.40%	2.5%
45.1-60 minutes	1.50%	2.5%
> 60 minutes	0.20%	2.3%
Average	14.2	15.04

Source: San Francisco Bay Area 1990, Regional Travel Characteristics, Working Paper #4, 1990 MTC Travel Survey

Figure 2-9 shows the trip duration of bicycle trips in Santa Clara County and the nine-county Bay Area from the 1990 survey results. Not surprisingly, over two-thirds of bicycle and walk trips are less than 15 minutes. However, about 3 to 5 percent of trips are 45 minutes or longer.

Figure 2-10 shows the 1990 walk and bicycle mode split by age and gender in the nine-county Bay Area. Young males between the ages of 5-17 are the largest group of walkers and bicyclists. Bay Area residents between 30 and 50 years old are least likely to bike or walk. Walking increases sharply for women over 60.

Figure 2-10



Regional Bicycle and Walk Mode Splits by Age and Gender

Existing Bicycle Usage in Conjunction with Transit

Existing Bicycle Usage in Conjunction with VTA

As the operating agency for bus and light rail in Santa Clara County, VTA has collected data related to bicycle usage by transit passengers as part of the On-Board Passenger Surveys conducted in spring 2000. Two percent of all VTA passengers get to and from the bus stops and rail stations by bicycle. The average VTA cyclist-passenger bikes 15 minutes (estimated 3 miles) to get to a VTA stop or station, and then bikes 9 minutes (estimated 2 miles) after getting off VTA to reach their ultimate destination. Most bicycle-transit trips are commute trips.

Most cyclist-passengers on VTA are concentrated in the northern areas of Santa Clara County. Geographic trip origin and trip destination numbers for VTA cyclist-passengers are shown in Figure 2-11

Figure 2-11 Trip Origins and Destinations of Bicycle Riders on VTA

Trip Origin	%	Trip Destination	%
San Jose	55.5	San Jose	46.7
Santa Clara	9.4	Mountain View	10.8
Mountain View	5.6	Palo Alto	9.6
Palo Alto	5.0	Milpitas	6.7
Sunnyvale	4.9	Santa Clara	6.2
Other	19.6	Other	20.0



Figure 2-12 shows the distribution of cities of residence for the surveyed VTA cyclist-passengers.

Figure 2-12 Residence Locations of Bicycle Riders on VTA

Residence Location	%
San Jose	63.8
Mountain View	10.1
Sunnyvale	6.6
Cupertino	3.7
Santa Clara	2.5
Alameda County	1.2
South County	1.0
Other	11.1

Statistics on age, ethnicity and household income of the surveyed cyclist-passengers are shown in Figure 2-13. However, the most extraordinary statistic is that of the gender of cyclist-passengers, 93% were male and 7% were female.

Figure 2-13 Age, Ethnicity and Household Income of Bicycle Riders on VTA

Age	%	Ethnicity	%	Household Income	%
13-17	4.3%	White/Caucasian	42.9%	< \$20,000	26.8%
18-24	7.8%	Hispanic/Latino	36.8%	\$20,000 - \$34,999	27.0%
25-34	35.7%	Black/African American	13.5%	\$35,000 - \$49,999	15.9%
35-44	33.3%	Vietnamese	1.1%	\$50,000 - \$74,999	8.6%
45-64	18.1%	Other Asian/Pacific Islander	5.0%	\$75,000 - \$99,999	13.4%
> 65	0.8%	Other	0.7%	< \$100,000	8.3%

A 24-hour bicycle count on board VTA vehicles was also conducted in May 2000. Figure 2-14 shows the results. 49% of the bicycles are carried during the peak hours (morning and afternoon.)

Figure 2-14 Number of Bicycle Riders Boarding VTA Buses and Light Rail (Peak & Non-Peak for a Full Service Day)

Mode	AM Non-Peak 12 am-6 am	AM Peak 6 am-9 am	Midday 9 am-3 pm	PM Peak 3 pm-6 pm	PM Non-Peak 6 pm-12 am	Total	Average Weekday Ridership	% of Riders with bicycles
Bus	166	707	873	864	556	3,166	151,480	2.1%
Light Rail	103	272	303	273	219	1,170	25,673	4.6%
Subtotals	269	979	1,176	1,137	775	4,336	177,153	
% of Total	6.2%	22.6%	27.1%	26.2%	17.9%	100%		2.4%

Existing Bicycle Usage in Conjunction with Caltrain

A Caltrain survey was conducted in February 2000. The survey results showed that roughly 9% of Caltrain riders ride their bicycle to the station, as well as from the destination station to reach their final destination. The average Caltrain passenger-bicyclist takes 10.4 minutes to bike to the station, and after getting off the train, bikes 12.7 minutes to reach their final destination.

The mode share for bicyclists using Caltrain could be higher, but for the on-board bicycle capacity constraints. Each train has at least one 24-capacity bicycle car; some trains have two bicycle cars. Caltrain has been experiencing increased demand for on-board bicycle storage by passengers who wish to bring their bicycles on board, i.e. to continue their trip by bicycle after getting off the train. There are increasing incidences of bicycles being denied boarding on trains because all the bicycle capacity on board is filled up.

Overall, more bicycles are carried northward in the morning, and southwards in the evening. Santa Clara County accounts for 43.4% of the bicycle boardings systemwide. The ten stations with the most boardings are shown in Figure 2-15. For a more detailed break-down of bicycles boardings and de-boardings on northbound and southbound trains, see Appendix B.

Figure 2-15 Bicycle Boardings at Caltrain Stations

Station	Boardings	% of total boardings	'99 Rank	'98 Rank
San Francisco	263	16.8%	1	1
Palo Alto	108	6.9%	2	2
Redwood City	100	6.4%	3	6
Mountain View	99	6.3%	4	3
California Ave.	95	6.1%	5	5
San Jose Diridon	82	5.3%	6	4
Sunnyvale	72	4.6%	7	7
Menlo Park	72	4.6%	8	9
Lawrence	67	4.3%	9	8
San Carlos	60	3.8%	10	10

Source: Caltrain/Joint Powers Board, February 2000

Existing Bicycle Counts and Surveys

VTA contacted local agencies in Santa Clara County to determine the extent of existing surveys of bicyclists and/or pedestrians and bicycle or pedestrian counts. Three agencies had information: the City of Palo Alto, the City of San Jose and Stanford University. In addition, the City of Santa Clara conducts informal counts with its Bicycle Advisory Committee (BAC). The limited existing data points out the need for more systematic collection of data. The easiest way would be to take advantage of opportunities as they arise, such as piggy-backing onto counts of vehicular turning movements and by including questions on bicycling and walking in transit or other surveys. This should be done on a routine basis, so that the database of existing information on bicycle and pedestrian usage could grow, and local agencies would be able to keep track of trends in bicycle and pedestrian usage, both annually and seasonally.

City and Other Efforts in Bicycle Count and Surveys

The City of Palo Alto periodically collects 12-hour bicycle counts (7 AM to 7 PM) at ten bicycle and pedestrian bridges and tunnels in the city. These counts have taken place in 1978, 1982/3 and 1997. At nearly all count locations, numbers had decreased significantly over the years².

The City of San Jose has an extensive counting system. It uses bike counts to:

1. Determine the success of the City's Bicycling Program
2. Determine ridership figures for grant applications for bike facility improvements

² Palo Alto Bicycle Plan, Working Paper #2: Existing Conditions, pg. 2

3. Calculate ridership figures into the warrants for new bicycle facilities and to calculate the relative accident rates for major bike corridors.

City crews take bike counts every time they conduct a 2-hour manual traffic count at an intersection. They also contract out to obtain 12-hour bike counts for whole corridors to get bicycle volume information on entire streets. The count data is recorded in 30 minute intervals and arranged on a spreadsheet that gives leg and intersection totals. The data shows that most count locations had an increase in bicycle use.

Stanford University conducts biannual bicycle counts at 12 key intersections as part of a Transportation Demand Management (TDM) counting system. Compared with 1998, 1999 counts are higher at all locations.

Accidents and Bicycle Miles Traveled

In 1998, there were 789 reported bicycle injury accidents and 7 bicycle fatalities in Santa Clara County. In order to develop a measure of bicyclists' exposure to traffic, an estimate was prepared of bicycle trips and bicycle miles of travel for Santa Clara County and for comparison, for each Bay Area county. This analysis was based on MTC 1998 model data, as described below.

1998 Daily Bicycle Trips

Daily bicycle trips were based on trip tables by purpose, which was developed for MTC's regional model. These tables provide a matrix of trips from each of 1099 Traffic Analysis Zones (TAZ's) in the Bay Area to each other TAZ, for each trip purpose and transportation mode. Bicycle trips were extracted from each trip purpose table and summed to give a matrix of total daily bicycle trips per Bay Area county.

Daily Bicycle Miles Of Travel

Daily bicycle miles of travel for 1998 were derived based on the MTC regional highway network for 1998. It was assumed, for this analysis, that bicyclists would primarily use city streets, and that they would choose the shortest-path routes to their destinations. The 1998 MTC model generated a matrix of shortest distance paths from each TAZ to each other TAZ in the Bay Area; this zone-to-zone distance matrix was then multiplied by the matrix of bicycle trips from zone to zone, yielding a 1099 by 1099 matrix of bicycle miles of travel. Lastly, the numbers in the matrix were summed to calculate the daily bicycle miles of travel, and sorted by county.

Average Bicycle Trip Length

Once bicycle trips and bicycle miles of travel by county were calculated, average bicycle trip length was calculated by dividing miles of travel by number of trips.

Results

1998 bicycle accidents were obtained from the State-Wide Integrated Traffic Record System (SWITRS) accident records. Figure 2-16 shows the accident rates for each county in terms of bicycle injury accidents per thousand bicycle trips and per thousand bicycle miles. Santa Clara is the second “safest” county in the Bay Area in terms of injuries per million trips and injuries per million bicycle miles traveled (after San Mateo County). The relatively low accident rate may be due to high volume of bicycle trips associated with Stanford.

In comparison, there were 4.3 million vehicle trips per day in Santa Clara County, and 34 injuries to car drivers and passengers per day. The risk of being in an injury vehicle accident is 7.9 per million vehicle trips, which is one-third the risk of being in an injury bicycle accident on a per trip basis.

Figure 2-16 1998 Daily Bicycle Trips, Bicycle Miles and Average Bicycle Trip Length, and Bicycle Accidents
Based on MTC Trip Tables

Area	Total Bicycle Trips	Total Bicycle Miles of Travel	Average Bicycle Trip Length	1998 Bike Accidents		Bike Accident Rates	
				Fatal Accidents	Injury Accidents	Injury Accidents Per Million Trips	Injury Accidents Per Million BMT*
Santa Clara	85,714	242,590	2.8	7	789	25.2	9.04
Bay Area (Total)	247,789	624,185	2.6	18	3011	33.4	13.15

Source: Wilbur Smith Associates, 2000; MTC Travel Demand Model; CHP- SWITRS 1998

*BMT = Bicycle Miles of Travel