City of San Francisco
2009 Bicycle Collision Report

Jan 2012

SFMTA | Municipal Transportation Agency

TABLE OF CONTENTS

List of Tables and Figures

I. Introduction

Report Highlights

- There were 532 bicycle injury collisions in San Francisco in 2009, a 13.7% increase over the previous year and the highest total since 1998.
- San Francisco's estimated collision rate per bicycle commuter has decreased roughly 20% since 2005.
- There was one fatal bicycle collision in 2009.
- In 2009, San Francisco had the one of the lowest number of bicycle collisions per bicycle commuter among California cities of comparable population size, however when reviewing non per cast data, one of the highest number of bicycle collisions per 100,000 residents. .
- The intersection with the most bicycle injury collisions in 2009 was at Market Street and Fifth Street (six collisions).
- Market Street (56 collisions) and Polk Street (22 collisions) were the two corridors with the highest number of bicycle injury collisions in 2009.
- "Dooring" collisions decreased by6% from 2008 to 2009. However between 2005 and 2009 "dooring" collisions increased by 73% from 26 collisions in 2005 to 45 collisions in 2009. "Dooring" was the 2nd most frequently cited California Vehicle Code (CVC) violation in 2009 when motorists were assigned fault.
- 43% of bicycle injury collisions in 2009 involved a bicyclist in the 20 to 29 age cohort, exceeding the eleven-year average of 38%.
- In 2009, nearly 29% of bicyclists involved in bicycle injury collisions were female, almost a 40% increase since 1999.

Summary

This report provides a summary analysis of bicycle injury collisions in San Francisco for the 2009 calendar year. The report also includes collision data from 1999 through 2009 so that the SFMTA can identify and track bicycle injury collision trends that have emerged over the past decade. Analysis of bicycle collisions provides a strong indication of roadway behaviors that negatively impact bicyclists' safety; can help identify which violations should be prioritized for increased education and enforcement; assists with the planning of new bicycle facilities; and, provides safety education opportunities. The information provided in this report will ultimately enable the SFMTA to better address bicycle injury collisions and continue to improve bicyclist, motorist, and pedestrian safety on San Francisco's streets.

It is important to note that this report focuses exclusively on collisions that involve an injury to at least one of the involved parties. While all bicycle collisions are of significant concern, property damage-only, or non-injury collisions involving bicycles, are not consistently reported

to the police. Furthermore, the data produced by such reports is not reliable since it is typically self-reported by one or more of the parties involved without investigation by a neutral third party. Injury and fatal collisions, however, are reported more consistently over time. Therefore, in order to minimize inconsistencies in reporting procedures this report does not include non-injury collisions.

In an effort to identify locations and collision trends that may require special attention, as well as evaluate the efficacy of previous mitigation measures, this report identifies intersections and street segments with the highest annual bicycle injury collisions. However, these intersections and street segments should not be interpreted as the "most dangerous" locations for bicyclists in San Francisco. Motorized traffic, bicycle, and pedestrian activity all play a significant role in determining injury collision totals: the more people that use an intersection, the higher the likelihood of a collision occurring. The high collision intersections and street segments listed in this report include some of the busiest in the city. Any short-term annual increase in collisions could also be simply the result of random yearly fluctuations. Out of the thousands of intersections in San Francisco in any one year, some will have more collisions than usual, while other locations will have lower collisions than the expected annual average. Looking at multi-year trends can help minimize these effects.

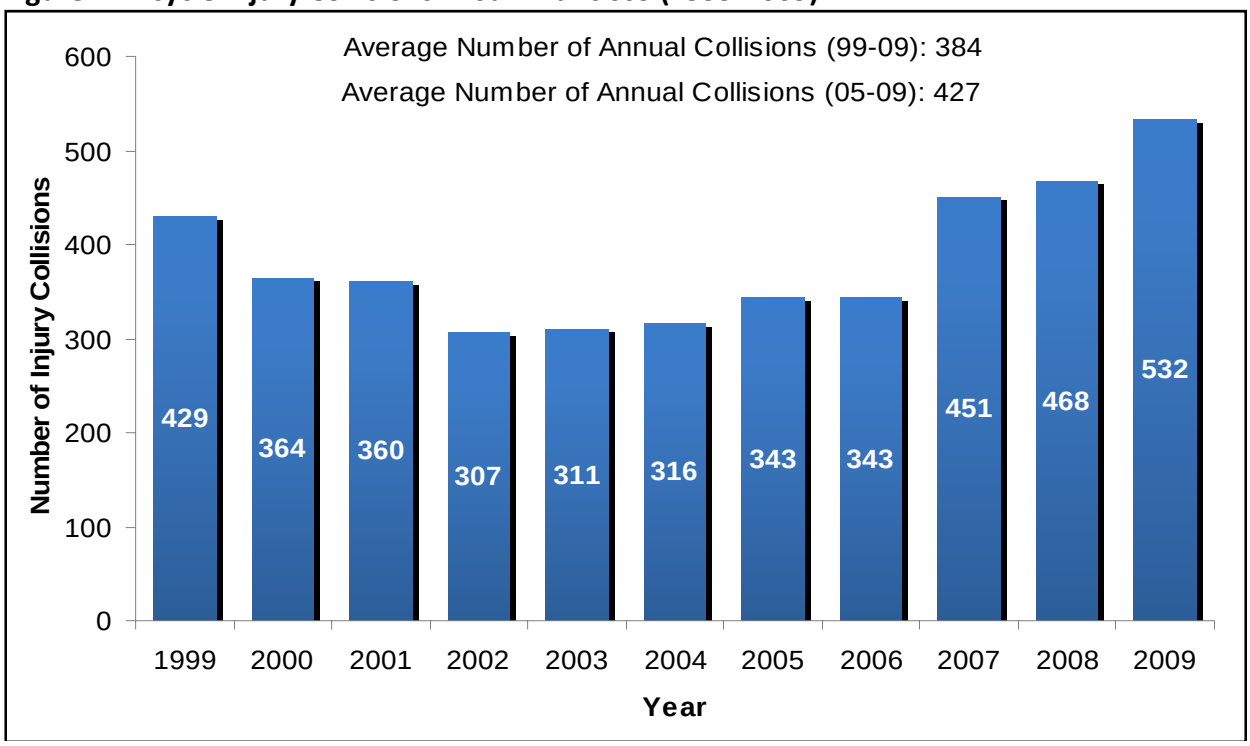
Unless noted otherwise, the source of data in this report is the Statewide Integrated Traffic Records Systems (SWITRS)[1], maintained by the California Highway Patrol (CHP). California Vehicle Code (CVC) Section 20008 requires that local governments send their police collision reports to the State. The CHP provides electronic summaries of these reported collisions, which are then processed by local jurisdictions. The data used in this report exclude collisions that occurred on San Francisco freeways or private property, but do include collisions on city streets that are classified as state highways (such as 19th Avenue or Van Ness Avenue).

[1] SWITRS totals are not made official by the CHP until late in the following calendar year, thereby resulting in the delayed release of this report.

II. Citywide Bicycle Injury Collisions

As shown by Figure 1, there were 532 bicycle injury collisions in San Francisco in 2009, the highest total for bicycle injury collisions since 1999. The 2009 total represents a 13.7% increase in injury collisions over yearly totals in 2008. Furthermore, the 532 collisions in 2009 is a considerable deviation from the more recent five year collision average of 427 for 2005 – 2009 and indicates that further analysis, intervention, and mitigation is needed to ensure the continued safety of bicyclists in San Francisco.

Figure 1: Bicycle Injury Collisions in San Francisco (1999-2009)



From the 2009 San Francisco Collision Report, there were a total of 2907 collisions (2877 injury collisions and 30 fatal collisions). As shown in Table 1, bicycle injury collisions as a percentage of all citywide injury collisions reached 18.3% in 2009, the highest share since 1999, which was 9.9%. Please see Appendices A, B, C, and D for maps showing the location and severity of bicycle injury collisions in 2009.

Table 1: Percentage Change in Annual Bicycle Injury Collisions and Bicycle Injuries Collisions as a Percentage of All Citywide Collisions (1999-2009)

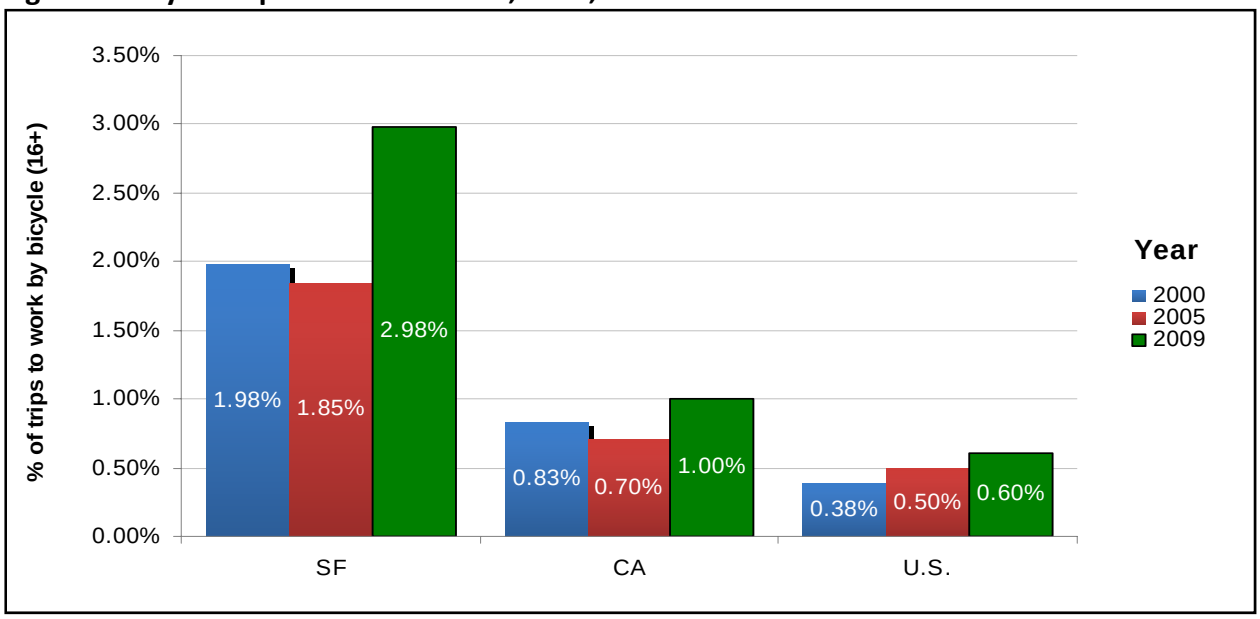
	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
% change from previous year	0.9%	-15.2%	-1.1%	-14.7%	1.3%	1.6%	8.5%	0.0%	31.5%	3.8%	**13.7%**
% of all citywide fatal and injury collisions	9.9%	8.6%	9.1%	8.1%	8.8%	10.3%	10.5%	11.8%	14.7%	15.4%	**18.3%**

III. Bicycle Ridership, Bicycle Collision Rates, and Bike Plan Injunction

Bicycle ridership is on the rise in San Francisco. Numerous measurements have documented the dramatic growth in bicycling in San Francisco in recent years:

- The 2009 American Community Survey found that almost 3% of *work trips* in San Francisco are made by bicycle, a substantial increase from the 2.0 % figure in the 2000 US Census (see Figure 2).
- The 2000 United States Census data also shows (see Figure 3) that bicycling as a means of traveling to work has increased at a much faster rate (58% increase), relative to 2000, than all other travel modes. See Appendix H for more details.
- Finally, starting in 2006, SFMTA staff has conducted annual counts of bicyclists at 33 locations throughout the City over the same three-week period in August. The 2009 data revealed a 53.5% citywide increase in bicyclists since 2006[2].

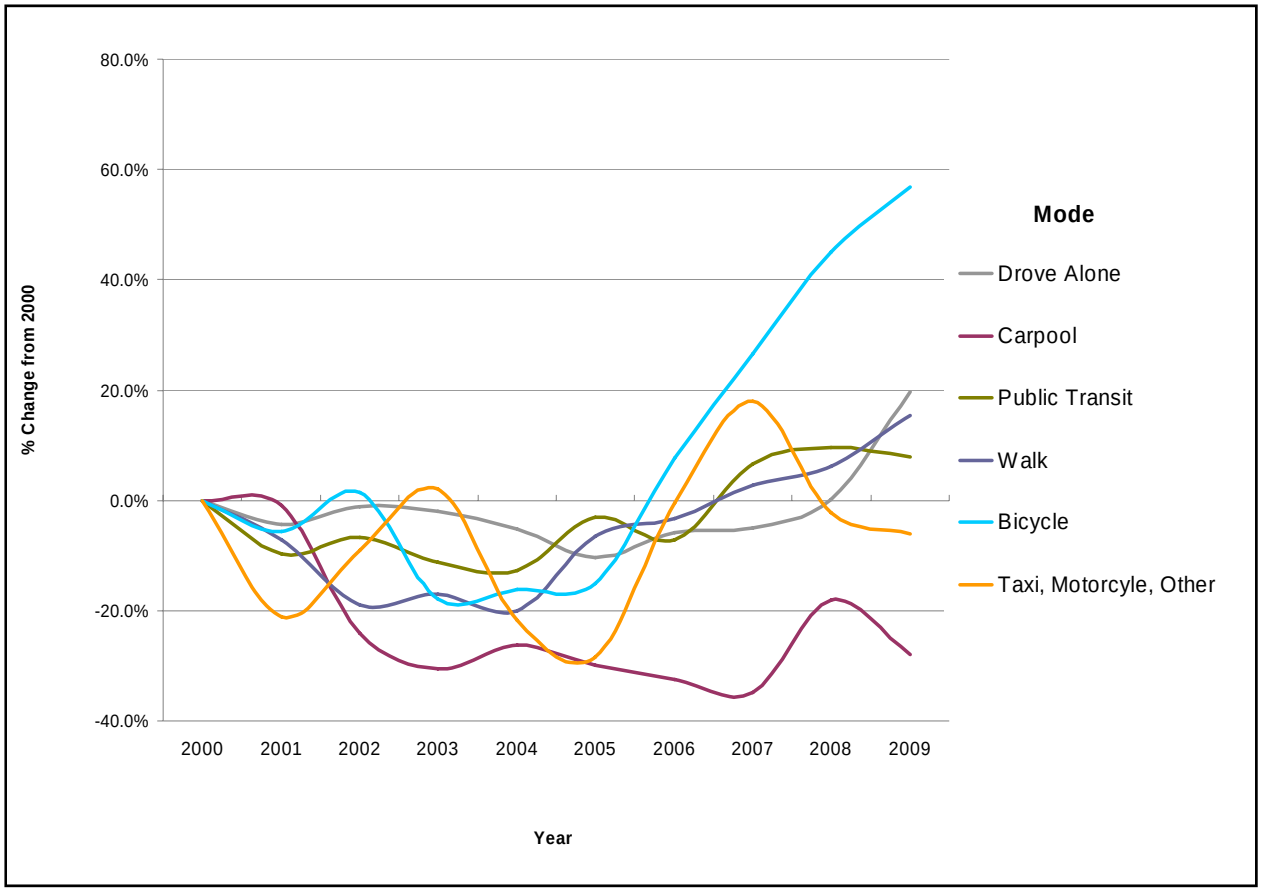
Figure 2: Bicycle Trips to Work in 2000, 2005, and 2009



Source: 2000, 2005, and 2009 American Community Surveys.

[2] Please see the *2009 San Francisco Bicycle Count Report* for more information.

Figure 3: Change in Mode Split Relative to 2000



Source: 2000 United States Census, 2001-2009 American Community Survey

It is important to note that one of the primary challenges when analyzing bicycle collision data is to develop an accurate and definitive *collision rate*. As discussed in this report, there has been an increase in bicycle collisions and in the number of bicyclists in San Francisco in recent years. What may appear as a dramatic increase in collisions may not be an actual increase in the overall *rate* of bicycle collisions. The increase in bicycling has only recently been systematically measured with bicycle counts and cannot yet be linked or compared to injury collision trends in a statistical manner. Additional collision data and longitudinal bicycle count data will facilitate such an analysis.

One method to establish a "collision rate" for bicycles is by reviewing bicycling to work data obtained from the U.S. Census. While this simplified measurement omits the vast numbers and varieties of non-commuting bicyclists; the important differences between street geometries and travel characteristics at the specific intersections; and, road segments in San Francisco where bicycle injury collisions typically occur; it does provide the number of injury collisions per bicycle commuter. Until San Francisco has additional longitudinal exposure data for bicyclists, it can serve as an approximate substitute.

Figure 4: 2009 Bicycle Injury Collisions per 100,000 Residents (CA Cities with 250,000 Residents + Selected Cities)

San Francisco has 61 collisions per 100,000 residents.

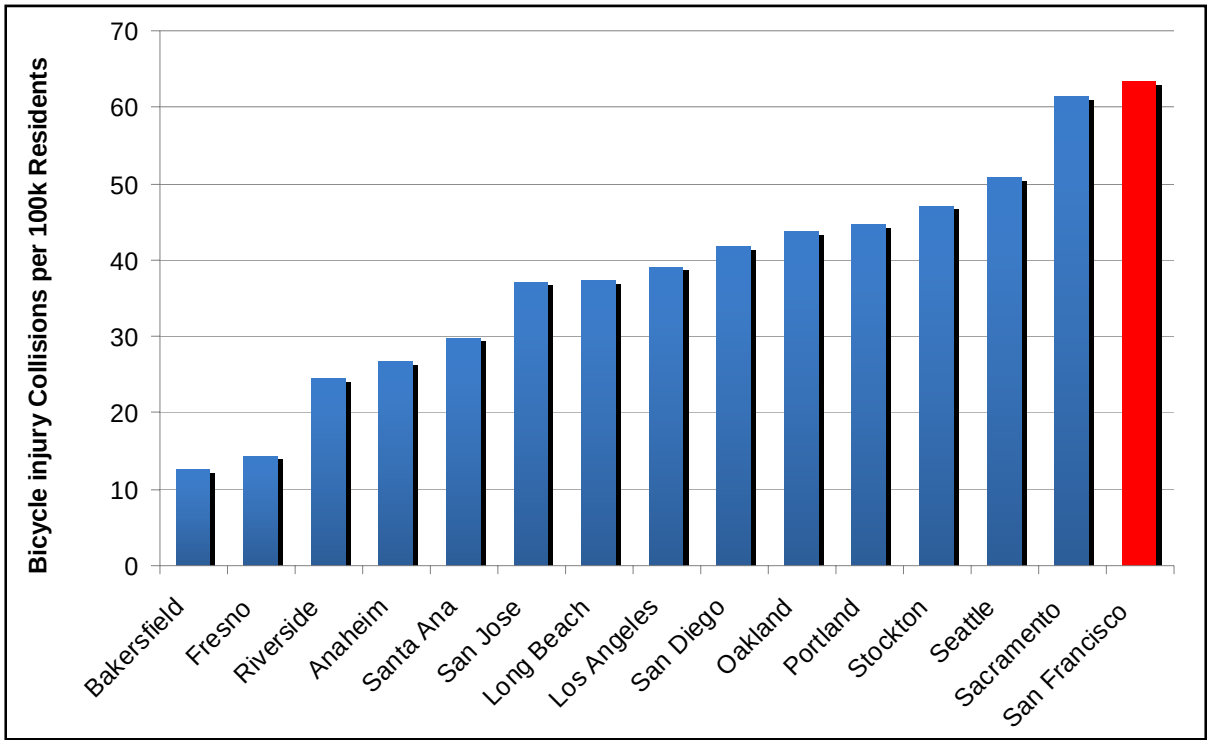
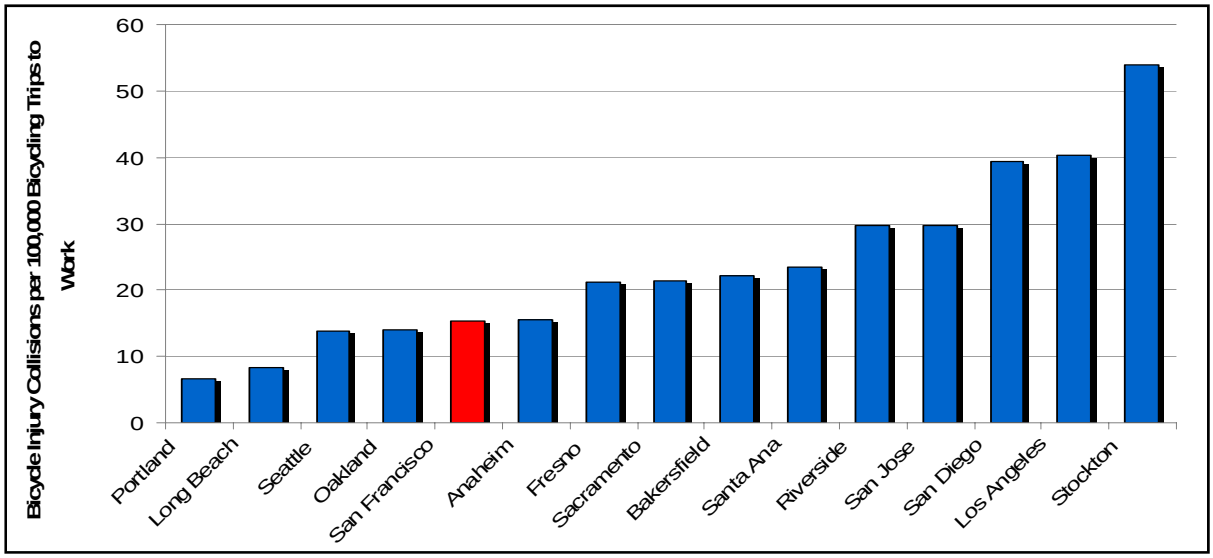


Figure 5: 2009 Estimated Bicycle Injury Collision Rate (CA Cities with 250,000 Residents + Selected Cities)

San Francisco has 15 collisions per 100,000 bicycle trips to work.

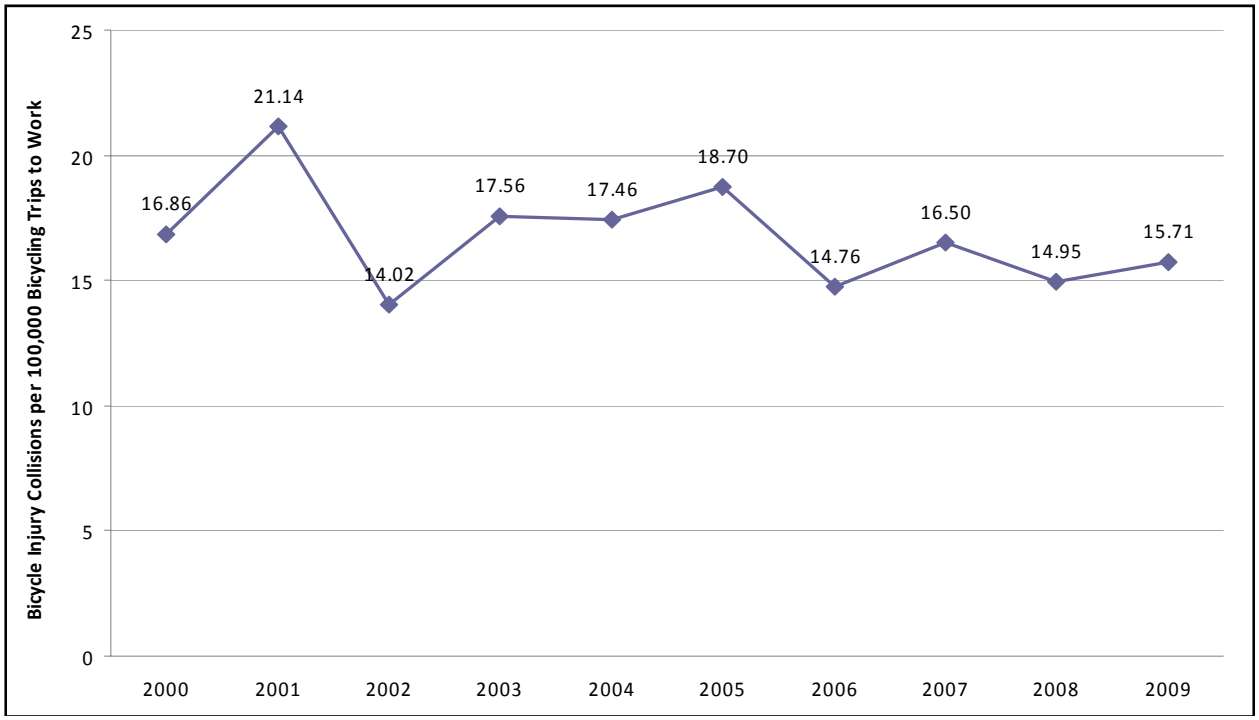


The previous figures[3] show 2009 comparisons between San Francisco and other California cities with more than 250,000 residents. Additionally, Portland and Seattle, two other well-known bicycling cities, were also included for comparison purposes. Figure 4 reflects that in 2009 San Francisco had the highest number of collisions per 100,000 residents, slightly higher than Sacramento and Seattle.

However, Figure 5 shows that in 2009, San Francisco had the lowest number of bicycle injury collisions per 100,000 bicycling trips to work among California cities with similar rates of bicycle commuting and more than 250,000 residents. Of comparable bicycling commuting percentages, only Seattle and Portland had lower collision rates.

[3] See Appendices E, F, and G for complete data.

Figure 6: Estimated San Francisco Bicycle Injury Collision Rate (2000-2009)



Another potential factor in the rise of bicycle injury collisions in San Francisco is that the demand for safe bicycling facilities and bicycle safety education appear to be growing at a faster pace than the City's ability to supply them. From June 20th, 2006, until November 30th, 2009, a legal injunction against the implementation of the City's Bicycle Plan prevented the SFMTA from installing any new physical bicycle infrastructure, including bicycle lanes, sharrows[4], and bicycle racks. On November 30th, 2009, the injunction was partially lifted.

[4] Sharrows are shared roadway markings which are intended to show where cyclists can ride on the street so as to avoid the sudden opening of a car door.

Table 2: Construction of Bicycle Facilities (2002-2009)

Date	Sharrows (miles)	Bicycle Lanes (miles)	Bicycle Racks*
1/1/2002-12/31/2002	0	4.6	350
1/1/2003-12/31/2003	0	4.4	350
1/1/2004-12/31/2004	1.9	1.3	350
1/1/2005-12/31/2005	16.7	3.8	350
1/1/2006-6/19/2006	3.2	2.2	150
6/20/2006-12/31/2006	0	0	0
1/1/2007-12/31/2007	0	0	0
1/1/2008-12/31/2008	0	0	0
1/1/2009-11/30/2009	0	0	0
11/30/2009-12/31/2009	3.8	1.9	80

Source: January 2010 Bicycle Advisory Committee Report.

* Annual numbers are estimates based on grant funding for bicycle racks.

In November 2009, the Superior Court modified the injunction on the San Francisco Bicycle Plan allowing implementation of additional sharrows, bicycle lanes, and bicycle racks. Since then, eight bicycle lane projects have been completed, 80 bicycle racks have been installed, and about 200 sharrows have been painted.

IV. High Collision Intersections and Corridors

In 2009, almost 60% of bicycle injury collisions occurred within an intersection[5]. As shown in Table 3, this figure is consistent with the overall breakdown from the previous eleven years. While bicyclists spend significantly less time riding through intersections than on mid-block street segments, the numerous conflict points and complex dynamics of traffic at intersections can create a particularly challenging environment for roadway users.

Table 3: Bicycle Injury Collisions at Intersections vs. Mid-Block Street Segments (1999-2009)

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	1999-2009
Intersection Collisions	61%	60%	57%	64%	57%	60%	62%	63%	63%	59%	58%	60%
Mid-block Collisions	39%	40%	43%	36%	43%	40%	38%	37%	37%	41%	42%	40%
Total Collisions (100%)	**429**	**364**	**360**	**307**	**311**	**316**	**343**	**343**	**451**	**468**	**532**	**4224**

Intersections

Table 4 shows the intersections[6] with the highest number of bicycle injury collisions in 2009, while Table 5 shows the intersections with the highest number of bicycle injury collisions over the past five years. In 2009, Market and Fifth Streets had the most bicycle injury collisions in 2009 (six collisions), while Masonic Avenue and Fell Street had the most bicycle injury collisions over the five-year period from 2005 to 2009 (twenty-five collisions). In September of 2009, the SFMTA installed the first bicycle- and pedestrian-only traffic signal in San Francisco at Fell Street and Masonic Avenue to better facilitate bicycle and pedestrian crossings and in January 2012 automated photo enforcement will be monitoring prohibited left-turn movements.

Market and Octavia Streets was the intersection with the second most bicycle injury collisions from 2005 to 2009 (twenty-one collisions). The Market and Octavia intersection remains a high priority at the SFMTA and the agency is currently evaluating engineering and enforcement measures to improve safety at this challenging intersection.

[5] Any non-rear end collision within 20 feet of an intersection and within 150 feet of an intersection for rear-end collisions is considered to be "within an intersection."

[6] When analyzing the intersections with the highest number of collisions, the search parameters were expanded from within 20 feet of an intersection to within 150 feet of an intersection. This change was necessary given the unique geometry of the Market Street and Octavia Boulevard intersection, as well as its proximity to the freeway on-ramp.

Table 4: Top 5 Intersections with the Highest Number of Bicycle Injury Collisions (2009)

Intersection	Total Number of Collisions (2009)
Market and 5th Streets	6
Polk Street and Geary Boulevard	5
Market and 3rd Streets	4
Market and New Montgomery Streets	4
Market and Octavia Streets	4

Table 5: Top 10 Intersections with the Highest Number of Bicycle Injury Collisions (2005-2009)

Intersection	Total Number of Collisions (2005-2009)
Masonic Avenue and Fell Street	25
Market and Octavia Streets	21
Valencia and 16th Streets	15
Market and Fifth Streets	15
Market and Valencia Streets	14
Polk Street and Geary Boulevard	14
Valencia and 17th Streets	13
Market and New Montgomery Streets	12
Valencia Street & Duboce Avenue	12
Market and 3rd Streets	11

Corridors

Several travel corridors in San Francisco, seen in Tables 6 and 7, have emerged as the primary corridors for bicycle injury collisions. Market Street has the highest bicycle volumes therefore it is not surprising, Market Street had the most bicycle injury collisions throughout the past five years. With its flat topography and direct access to downtown, Market Street serves as a primary travel corridor for bicyclists. In 2009, there were 56 bicycle injury collisions on Market Street, while from 2005 to 2009, there were at total of 194 bicycle injury collisions on Market Street.

Table 6: Top 5 Corridors with the Highest Number of Bicycle Injury Collisions (2009)

Complete Corridor	In Bicycle Network?	Existing Facilities	Total Number of Collisions in 2009
Market Street	Yes	Sharrows, Bicycle Lanes	56
Polk Street	Yes	Sharrows, Bicycle Lanes	22
Mission Street	No	None	21
Valencia Street	Yes	Bicycle Lanes	19
The Embarcadero	Yes	Bicycle Lanes	10

Table 7: Top 10 Corridors with the Highest Number of Bicycle Injury Collisions (2005-2009)

Complete Corridor	In Bicycle Network?	Existing Facilities	Total Number of Collisions from 2005-2009
Market Street	Yes	Sharrows, Bicycle Lanes	194
Mission Street	No	None	87
Polk Street	Yes	Sharrows, Bicycle Lanes	70
Valencia Street	Yes	Bicycle Lanes	69
16th Street	Yes	Bicycle Lanes (discontinuous)	46
Folsom Street	Yes	Bicycle Lanes (discontinuous)	43
Van Ness Avenue	No	None	35
Haight Street	No	None	30
The Embarcadero	Yes	Bicycle Lanes	29
Mason Street	No	None	28
Harrison Street, Golden Gate Avenue, Ocean Avenue	Yes, Yes, Yes	Sharrows, Bicycle Lanes (discontinuous)	24 (each)

The 2009 bicycle counts[7] showed significant increases in bicycle traffic at count locations along Market Street. For example, in 2006 there were 545 bicyclists observed at 11th and Market Streets. In 2009 the number of observed bicyclists at this intersection jumped to 808, an increase of 48%.

Mission Street, Valencia Street, Polk Street, and the Embarcadero are all corridors with a consistently high number of bicycle injury collisions. All of these corridors had high collision totals for both 2009 and the five-year period from 2005 to 2009.

V. Severity of Bicycle Injury Collisions

Since 1999 there have been 18 fatal bicycle collisions in San Francisco or an average of 1.6 fatal collisions per year. In 2009 there was one fatal collision, a decrease from three fatalities in 2008.

Table 8: Fatal Bicycle Collisions in San Francisco (1999-2009)

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Total
Number of Fatal Collisions	1	2	5	1	1	2	2*	2**	1	3	1	21

* Includes solo fall while riding from sidewalk into crosswalk

** Includes a bicycle/bicycle collision

Table 9 shows the trends in the severity of bicycle injury collisions since 1999. SWITRS divides severity of collisions into a range of four categories, with "fatal" being the most severe and "complaint of pain" being the least severe. The severity of injury is an important characteristic of bicycle collisions, as the extent of injuries is often determined by the speed of both motorists and bicyclists. Please see Appendix C for a map showing the location of 2009 bicycle injury collisions by severity of injury.

Table 9: Severity of Bicycle Injury Collisions (1999-2009)

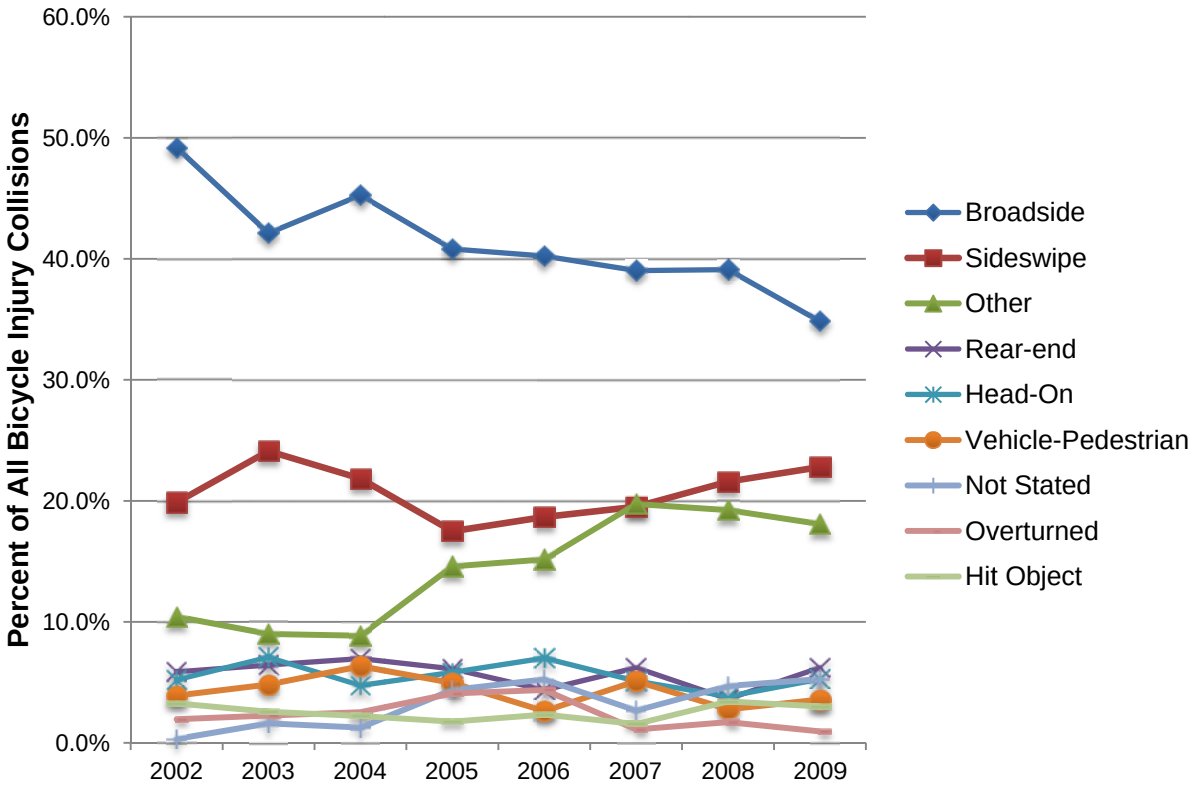
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Fatal	1%	1%	<1%	0.30%	1%	1%	1%	0.20%	1%	0.20%
Severe	5%	6%	5%	6%	8%	7%	7%	8%	5%	7%
Other visible injury	54%	54%	56%	45%	47%	50%	49%	48%	51%	52%
Complaint of pain	40%	38%	39%	48%	45%	43%	43%	43%	43%	41%
Total (100%)	364	360	307	311	316	343	343	451	468	532

[7] Please see the *2009 San Francisco Bicycle Count Report* for more information.

VI. Collision Types

SWITRS data breaks down the types of collisions into nine categories. The data shows that the vast majority of bicycle injury collisions are either "broadside" (collisions at or near 90 degrees) or "sideswipe" (collisions at an oblique angle). In 2009, the highest share of collision types was broadside collisions with 185 collisions constituting 34.8% of overall collisions. The second most common was sideswipe collisions with 121 constituting 22.8% of overall collisions. Similar trends exist from 2002 to 2009[8]: of 3071 total collisions there were with 1247 broadside collisions representing 40.6% and 639 sideswipe collisions representing 20.8% of the total.

Figure 7: Bicycle Injury Collisions by Collision Type (2002-2009)



As shown in Figure 7, broadside collisions have decreased as a share of overall collisions by more than 14% (49.2% to 34.8%) since 2002. At the same time, sideswipe collisions have increased by almost 3 % since 2002 (19.9% to 22.8%). Rear-end and head-on collisions have consistently remained a very small percentage of collision factors.

[8] Data for collision "type" was not available from 1998 to 2001.

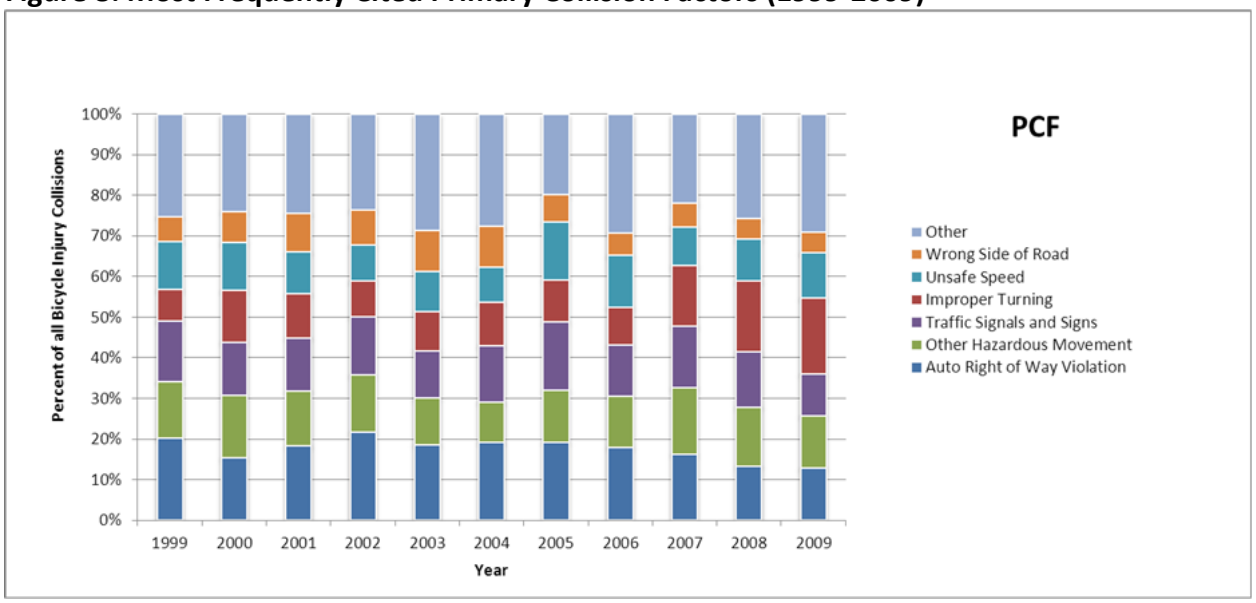
Table 10: Bicycle Injury Collisions by Collision Type (2002-2009)

	2002	2003	2004	2005	2006	2007	2008	2009	2002-2009
Broadside	49.2%	42.1%	45.3%	40.8%	40.2%	39.0%	39.1%	34.8%	40.6%
Sideswipe	19.9%	24.1%	21.8%	17.5%	18.7%	19.5%	21.6%	22.8%	20.8%
Other	10.4%	9.0%	8.9%	14.6%	15.2%	19.7%	19.2%	18.1%	15.1%
Rear-end	5.9%	6.4%	7.0%	6.1%	4.4%	6.2%	3.6%	6.2%	5.7%
Head-On	5.2%	7.1%	4.7%	5.8%	7.0%	5.1%	3.8%	5.3%	5.4%
Vehicle-Pedestrian	3.9%	4.8%	6.3%	5.0%	2.6%	5.1%	2.8%	3.6%	4.2%
Not Stated	0.3%	1.6%	1.3%	4.4%	5.2%	2.7%	4.7%	5.3%	3.4%
Overturned	2.0%	2.3%	2.5%	4.1%	4.4%	1.1%	1.7%	0.9%	2.2%
Hit Object	3.3%	2.6%	2.2%	1.7%	2.3%	1.6%	3.4%	3.0%	2.5%
Total Number (100%)	307	311	316	343	343	451	468	532	3071

VII. Primary Collision Factors

SWITRS data also lists 20 different primary collisions factors (PCF) in its database. Figure 8 and Table 11 identifies the top six PCF over the past 11 years and highlights their long-term trends. From 1999 to 2007, "Auto Right-of-Way Violation" was consistently the top PCF for bicycle injury collisions. In 2009, however, "Improper Turning" was the highest PCF with 99 violations constituting 18.6% of all bicycle injury collisions, while "Auto Right-of-Way Violation" continued its five year decline with 69 violations constituting 13.0%.

Figure 8: Most Frequently Cited Primary Collision Factors (1999-2009)



*Within SWITRS, PCF type "Other" lacks Vehicle Code violation number or other information

Of the top six primary collision factors, "Improper Turning" has shown the greatest increase over both the eleven-year period, as well as the more recent five-year period. In 1999, "Improper Turning" was the primary collision factor in 7.7% of all bicycle injury collisions. In 2009, however, that number had increased to 18.6%.

Table 11: Most Frequently Cited Primary Collision Factors (1999-2009)

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	% of All Bicycle Collisions (1999-2009)
Auto Right of Way Violation	20.3%	15.4%	18.3%	21.8%	18.6%	19.3%	19.2%	18.1%	16.4%	13.5%	13.0%	17.3%
Other Hazardous Movement	14.0%	15.4%	13.6%	14.0%	11.6%	9.8%	12.8%	12.5%	16.4%	14.5%	12.8%	13.5%
Traffic Signals and Signs	14.9%	13.2%	13.1%	14.3%	11.6%	13.9%	16.9%	12.5%	15.1%	13.5%	10.3%	13.5%
Improper Turning	7.7%	12.6%	10.8%	8.8%	9.6%	10.8%	10.2%	9.3%	14.9%	17.5%	18.6%	12.4%
Unsafe Speed	11.9%	11.8%	10.3%	8.8%	10.0%	8.5%	14.3%	12.8%	9.5%	10.3%	11.1%	10.9%
Wrong Side of Road	6.1%	7.7%	9.4%	8.8%	10.0%	10.1%	6.7%	5.5%	5.8%	5.1%	5.1%	7.0%
Other	25.2%	23.9%	24.4%	23.5%	28.6%	27.5%	19.8%	29.2%	22.0%	25.6%	29.1%	25.4%
Year Total (100%)	**429**	**364**	**360**	**307**	**311**	**316**	**343**	**343**	**451**	**468**	**532**	**100.0%**

VIII. California Vehicle Code (CVC) Violations

Table 13 shows the top ten CVC violations in 2009. With 74 instances, CVC 22107 ("Unsafe Turning without Signaling") was the most common CVC violation in 2009. Fault was assigned in all cases with CVC 22107[9] with motorists found to be at fault nearly 75% of the time. The second and third-most common violations in 2009 involved: unsafe speed (CVC 22350) and opening a car door when unsafe, or "dooring" (CVC 22517). The top ten CVC violations, which resulted in 336 collisions, comprised 63.2% of all collisions in 2009. Table 12 shows motorists were assigned fault in around 45% of bicycle injury collisions in 2009, where fault was assigned. Bicyclists, on the other hand, were assigned fault in 48% of fault-determined collisions. Similarly, from 1999 to 2009, bicyclists were assigned fault in a slight majority of bicycle injury collisions (where fault was assigned) at 50.4% (see Appendix J). Please see Appendices I and J for a complete table of all 2009 and 1999-2009 collisions organized by CVC violation.

Table 12: Summary of Assigned Fault in CVC Violations in Bicycle Injury Collisions (2009)

	Number of Collisions	Percentage
TOTAL (All Bicycle Injury Collisions)	**532**	**100%**
Bicyclists at Fault	256	48.1%
Motorists at Fault (including Parked Vehicles)	240	45.1%
Pedestrians at Fault	18	3.4%
# of Fault-Unassigned Collisions	18	3.4%

[9] Analysis of "assigned fault" as part of CVC violations is useful in assessing driver and bicyclist behavior, as well as determining which mitigation measures might be utilized to improve driver and bicyclist safety. At the same time, "assignment of fault" in bicycle injury collisions should be carefully considered when making policy decisions, as it is a measure that is often subject to inconsistency and subjectivity.

Table 13: Top Ten CVC Violations in Bicycle Injury Collisions (2009)

Rank	Description of Violation	CVC Section	# Collisions	# Collisions with Assigned Fault	# Motorists Assigned Fault	% Motorists Assigned Fault	# Bicyclists Assigned Fault	% Bicyclists Assigned Fault
1	**Unsafe Turn Without Signaling**	22107	**74**	74	55	74%	19	26%
2	**Unsafe Speed**	22350	**58**	57	11	19%	46	81%
3	**Unsafe Opening of Car Door**	22517	**45**	43	42	98%	1	2%
4	**Failure to Stop at Red Limit Line**	21453.A 21453.C	**37**	37*	12	32%	24	65%
5	**Failure to Yield when Turning Left**	21801.A	**35**	35	30	86%	5	14%
6	**Wrong Side of Roadway**	21650 21650.1	**22**	22	1	5%	21	95%
7	**Unsafe Lane Change**	21658.A	**21**	21	12	57%	9	43%
8	**Failure to Stop at STOP Sign Limit Line**	22450 22450.A	**19**	19	4	21%	15	79%
9	**Unsafe Pass of Left**	21750	**15**	15	7	47%	8	53%
10	**Failure to Yield to Approaching Traffic**	21804.A 21804.B	**11**	11	3	27%	8	73%
	TOTAL		**336**	**333**	**177**	**53%**	**156**	**47%**

* A pedestrian was at fault.

Motorist-caused collisions

The five most commonly reported behaviors of motorists that resulted in collisions with bicycles in 2009 are shown on the following page in Table 14. Unsafe turning without signaling was the most frequent motorist violation at 55 instances. The second and third-most common motorist violations involve: opening a car door when unsafe and failure to yield when turning left. As discussed above, motorists were responsible for 47% of 2009 bicycle injury collisions where fault was assigned.

Table 14: Top Five CVC Violations in Bicycle Injury Collisions Where Motorists Were Most Frequently Assigned Fault (2009)

Rank	Description of Violation	CVC Section	# Collisions	# Collisions with Assigned Fault	# Motorists Assigned Fault	% Motorists Assigned Fault	# Bicyclists Assigned Fault	% Bicyclists Assigned Fault
1	**Unsafe Turn Without Signaling**	22107	74	74	**55**	**74%**	19	26%
2	**Unsafe Opening of Car Door**	22517	45	43	**42**	**98%**	1	2%
3	**Failure to Yield when Turning Left**	21801.A	35	35	**30**	**86%**	5	14%
4	**Unsafe Lane Change**	21658.A	21	21	**12**	**57%**	9	43%
5	**Failure to Stop at Red Limit Line**	21453.A 21453.C	37	37*	**12**	**32%**	24	65%
	TOTAL		212	210	**151**	**72%**	144	28%

* A pedestrian was at fault.

Bicyclist-caused collisions

In 2009, bicyclists were most frequently assigned fault in collisions for: unsafe speed, failing to stop at the limit line for red lights, riding on the wrong side of the roadway, unsafe turns without signaling, and failing to stop at the limit line for STOP signs as shown in Table 15. There were 46 bicycle injury collisions for which unsafe speed was the CVC violation. Of these

collisions, at least four times as many bicyclists were reported at fault than motorists (46 vs. 11). As shown in Appendix I, there were zero bicyclists cited for biking while under the influence (CVC 21200.5).

Table 15: Top Five CVC Violations in Bicycle Injury Collisions Where Bicyclists Were Most Frequently Assigned Fault (2009)

Rank	Description of Violation	CVC Section	# Collisions	# Collisions with Assigned Fault	# Motorists Assigned Fault	% Motorists Assigned Fault	# Bicyclists Assigned Fault	% Bicyclists Assigned Fault
1	**Unsafe Speed**	22350	58	57	11	19%	**46**	**81%**
2	**Failure to Stop at Limit Line**	21453.A 21453.C	37	37*	12	32%	**24**	**65%**
3	**Wrong Side of Roadway**	21650 21650.1	22	22	1	5%	**21**	**95%**
4	**Unsafe Turn Without Signaling**	22107	74	74	55	74%	**19**	**26%**
5	**Failure to Stop at STOP Sign Limit Line**	22450 22450.A	19	19	4	21%	**15**	**79%**
	TOTAL		209	209	83	40%	**125**	**60%**

Red light running is another major CVC violation for which bicyclists are often assigned fault. The size and geometry of some San Francisco intersections combined with relatively low cycling speeds sometimes contributes to bicyclists not being able to clear an intersection before a traffic signal changes to red. In this situation, the bicyclist has a right to clear the intersection with oncoming traffic legally required to wait. Conversely, before proceeding at a green traffic signal, bicyclists must allow vehicles and pedestrians who have entered the intersection legally to clear the intersection.

IX. Dooring Collisions

In 2009, after five years of increasing numbers, dooring collisions decreased by 6.3% (from 48 to 45 between 2008 and 2009). Table 16 shows that there was a eleven-year low of dooring collisions as a percentage of all collisions in 2004 at 6.3 %, yet that figure peaked to 10.3 % by 2008.

Figure 9: Annual Number of Dooring Collisions (1999-2009)

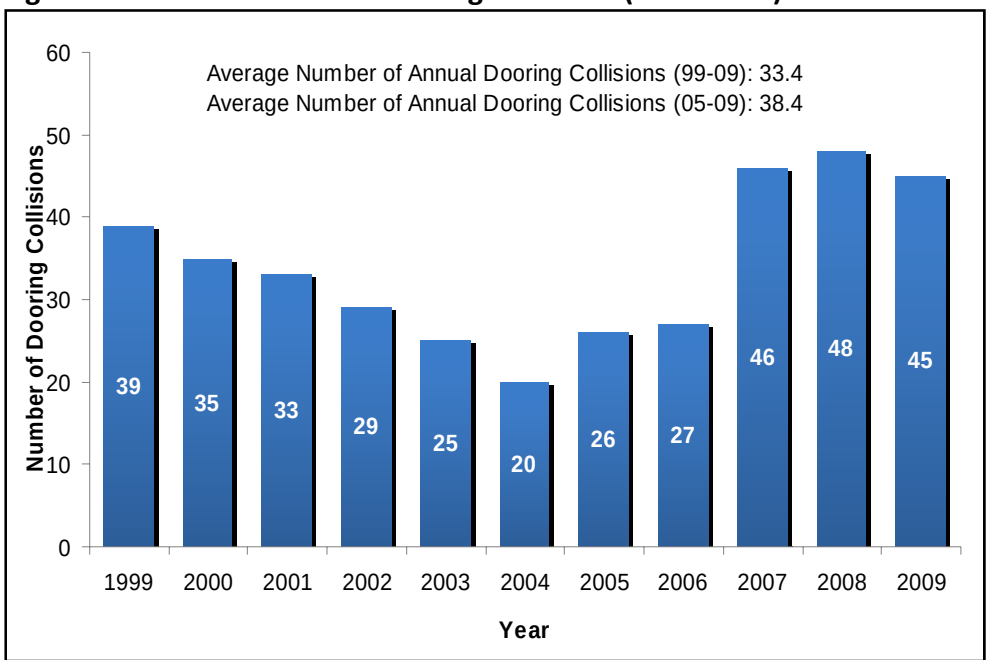


Table 16: Dooring as a Percentage of all Bicycle Injury Collisions (1999-2009)

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	1999-2009
% of all bicycle injury collisions	9.1%	9.6%	9.2%	9.4%	8.0%	6.3%	7.6%	7.9%	10.2%	10.3%	**8.5%**	**8.7%**
Number of bicycle injury collisions	39	35	33	29	25	20	26	27	46	48	**45**	**373**

X. Hit and Run Collisions

Since 1999, there have been almost 400 felony hit-and-run bicycle collisions in San Francisco. Table 17 highlights the general declining trend in felony hit-and-run bicycle injury collisions. With the exception of 2008, when the hit-and-run collisions rose to 9% of all collisions, hit-and-run felonies have declined almost 6 % from its peak of 12.5 % in 2001. Misdemeanor hit-and-run collisions, on the other hand, have hovered around 1 % of all bicycle injury collisions since 1999, with this year's being 0.9 %.[10]

Table 17: Felony and Misdemeanor Hit and Run Bicycle Injury Collisions (1999-2009)

	Felony H&R	% of all collisions	Misdemeanor H&R	% of all collisions
1999	43	10.0%	2	0.5%
2000	42	11.5%	2	0.5%
2001	45	12.5%	0	0.0%
2002	33	10.7%	3	1.0%
2003	31	10.0%	3	1.0%
2004	34	10.8%	5	1.6%
2005	33	9.6%	6	1.7%
2006	29	8.5%	4	1.2%
2007	30	6.7%	4	0.9%
2008	42	9.0%	6	1.3%
2009	**35**	**6.6**%	**5**	**0.9**%
99-09	**397**	**8.5**%	**40**	**0.9**%

[10] According to California Law, a hit and run misdemeanor is defined as, "a failure to immediately stop at the scene of a motor vehicle accident resulting in property damage." According to California Law, a hit and run felony is defined as, "a failure to immediately stop at the scene of a motor vehicle accident involving death or permanent injury to any person(s) associated with the accident."

XI. Parties Involved

The vast majority of bicycle injury collisions occur between a bicyclist and a motorist. In 2009, 423 bicycle injury collisions resulted from the collision between a bicyclist and motorist, representing 79.5% of all bicycle injury collisions and, a drop from an average of 82.5% from 1999 to 2009. This number has declined 7.9% since 1999. At the same time, reported bicyclist collisions with bicyclists have reached 2.1% of collisions, more than three times the amount from 2008. This may be accounted to substantially increased ridership during this span of time as noted in Section III.

Table 18: Parties Involved in Bicycle Injury Collisions (1999-2009)

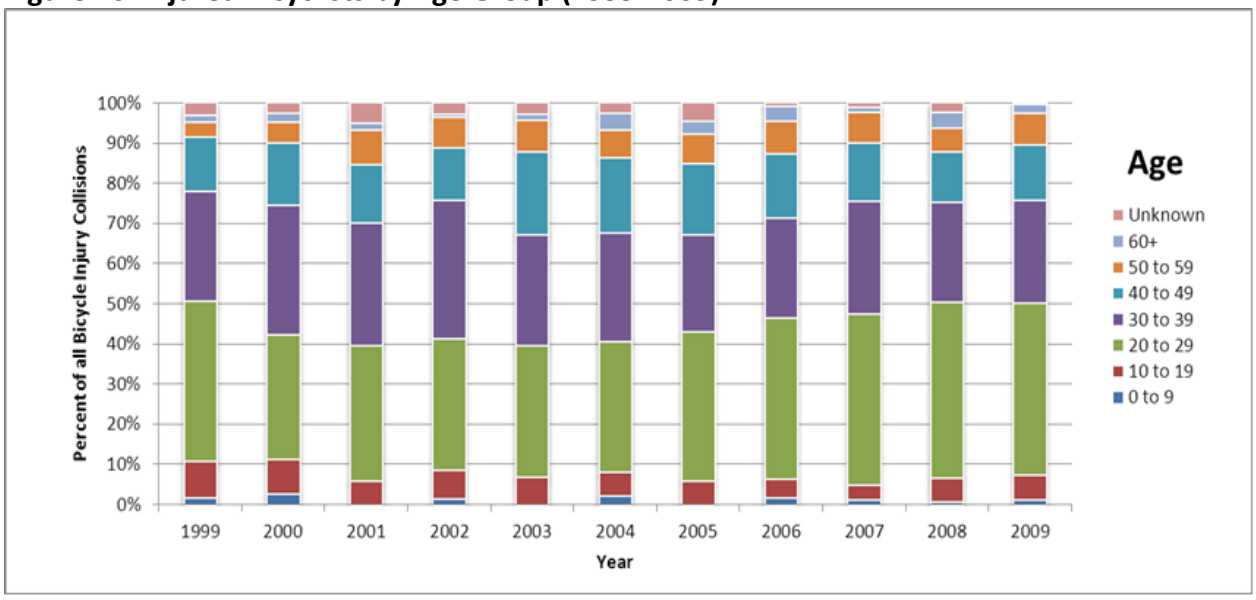
Bicyclist and…	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	99-09	
Motorist	87.4 %	86.8 %	87.8 %	82.7 %	82.6 %	82.0 %	78.4 %	79.6 %	82.3 %	78.8 %	**79.5 %**	**82.5 %**	3485
Bicyclist Only	4.0%	2.2%	4.2%	4.2%	4.5%	5.4%	6.7%	9.0%	5.8%	7.7%	**7.5%**	**5.6%**	237
Pedestrian	4.2%	5.8%	4.2%	3.9%	4.5%	5.4%	5.8%	3.2%	4.9%	4.5%	**4.7%**	**4.6%**	194
Parked Vehicle	3.7%	2.5%	3.9%	6.5%	6.1%	5.4%	6.7%	5.2%	4.2%	7.7%	**4.5%**	**5.1%**	215
Bicyclist	0.0%	1.1%	0.0%	0.3%	1.3%	0.3%	0.6%	0.6%	1.8%	0.6%	**2.1%**	**0.8%**	34
Other	0.0%	0.5%	0.0%	1.3%	0.3%	0.3%	0.9%	0.3%	0.7%	0.2%	**0.8%**	**0.5%**	21
Multiple Parties	0.7%	1.1%	0.0%	0.0%	0.0%	1.3%	0.6%	0.9%	0.2%	0.2%	**0.6%**	**0.5%**	21
Not Stated	0.0%	0.0%	0.0%	1.0%	0.6%	0.0%	0.3%	1.2%	0.2%	0.2%	**0.4%**	**0.4%**	17
Total Number (100%)	429	364	360	307	311	316	343	343	451	468	532	4224	

XII. Profile of Injured Bicyclists

Age of Injured Bicyclists

Figure 10 highlights the trends in the age of bicyclists involved in bicycle injury collisions. The age cohort most involved in bicycle injury collisions for both 2009 (227 collisions or 42.7%) and the eleven-year period from 1999 to 2009 (1600 collisions or 37.9%) was the 20 to 29 age group. Furthermore, this age group's representation in bicycle injury collisions has increased almost six percent since 2005. Meanwhile, the 40 to 49 age group's share of bicycle collisions decreased steadily since 2003, from 20.6% to 13.9%. Finally, the 60+ age group saw a small 1.8% decrease in its share of collisions from 2008 to 2009.

Figure 10: Injured Bicyclists by Age Group (1999-2009)



Tables 19 and 20 show the age distribution of injured bicyclists and San Francisco residents, respectively. For both 2009 and the eleven-year period from 1999 to 2009, the age groups 20 to 29 and 30 to 39 are dramatically overrepresented relative to their share of the overall population of bicyclists involved in injury collisions.

Table 19: Injured Bicyclists by Age Group (1999-2009)

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	1999-2009
0 to 9	1.6%	2.5%	0.0%	1.3%	1.0%	1.9%	0.0%	1.5%	0.9%	0.4%	1.1%	**1.1%**
10 to 19	8.9%	8.5%	5.6%	7.2%	6.4%	6.0%	5.8%	4.7%	3.8%	6.0%	5.8%	**6.2%**
20 to 29	39.9%	31.0%	33.9%	32.6%	32.5%	32.6%	37.0%	40.2%	42.6%	44.0%	42.7%	**37.9%**
30 to 39	27.5%	32.4%	30.6%	34.5%	27.3%	26.9%	24.2%	24.8%	28.2%	24.8%	24.8%	**27.6%**
40 to 49	13.5%	15.4%	14.4%	13.0%	20.6%	18.7%	17.8%	16.0%	14.4%	12.6%	13.7%	**15.2%**
50 to 59	3.7%	5.2%	8.6%	7.8%	7.7%	7.0%	7.3%	8.2%	7.8%	5.8%	7.7%	**6.9%**
60+	1.6%	2.2%	1.7%	0.7%	1.6%	4.1%	3.2%	3.8%	1.1%	4.1%	1.9%	**2.3%**
Unknown	3.3%	2.7%	5.3%	2.9%	2.9%	2.8%	4.7%	0.9%	1.3%	2.4%	2.3%	**2.8%**
Total Number (100%)	429	364	360	307	311	316	343	343	451	468	532	**4224**

Table 20: Age Groups as Percentage of Overall San Francisco Population (2009)

Age Group	%
0 to 9	**8.6%**
10 to 19	**7.4%**
20 to 29	**16.4%**
30 to 39	**20.1%**
40 to 49	**15.4%**
50 to 59	**12.6%**
60 and over	**19.5%**

Source: 2009 American Community Survey

Figure 11 shows the share of both youth (5 to 17) and senior (65+) involvement in bicycle injury collisions. Since 1999, seniors have been involved in 1 to 2 percent of all bicycle injury collisions. Though the percentage of collisions involving youth had steadily decreased since 1999, since 2007 there have been slight increases in youth-related bicycle collisions. Both groups are underrepresented as bicyclists involved in injury collisions relative to their share of the total population.

While it is encouraging that fewer youth are involved in bicycle injury collisions, the roughly 75% decrease from 34 to 21 collisions in youth bicyclists is not consistent with overall bicycle injury collision trends in San Francisco and may reflect a decrease in youth bicyclists on our streets.

Figure 11: Percentage of Bicycle Injury Collisions involving Youth and Seniors (1999-2009)

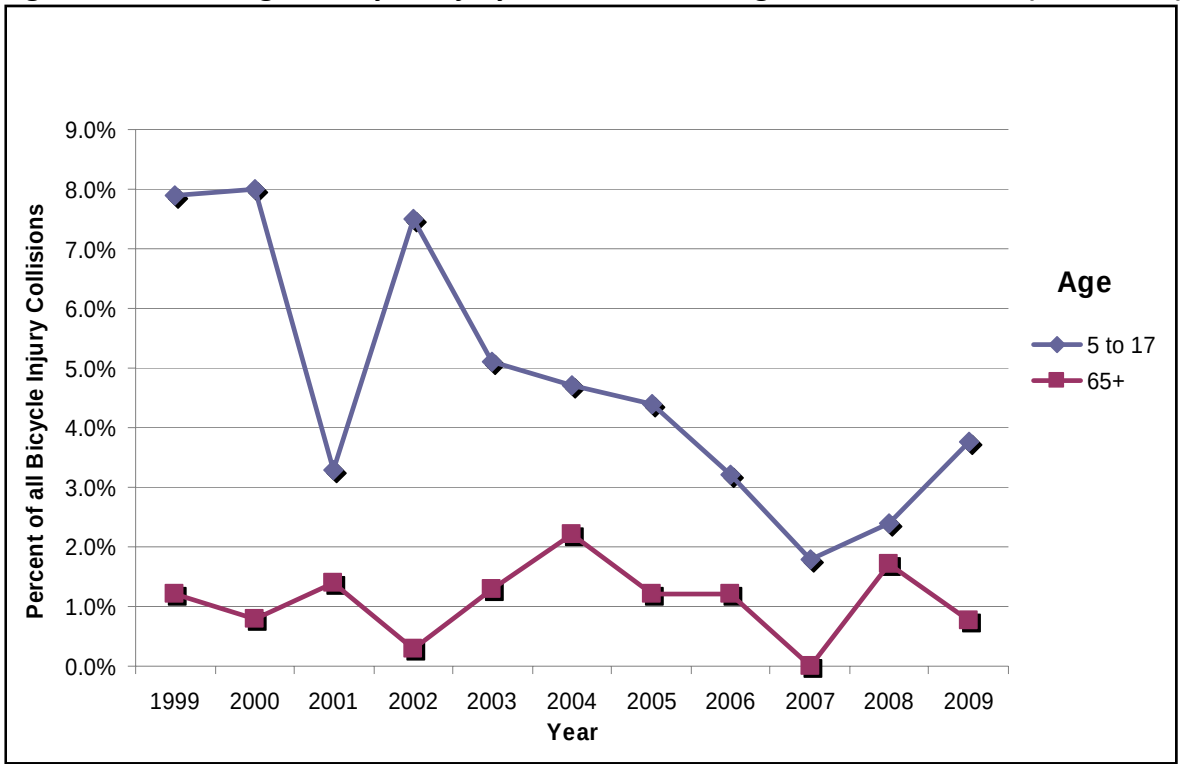


Table 21: Youth and Seniors as a Percentage of Overall San Francisco Population (2009)

Age Group	%
5 to 17	11.9%
65 and over	14.0%

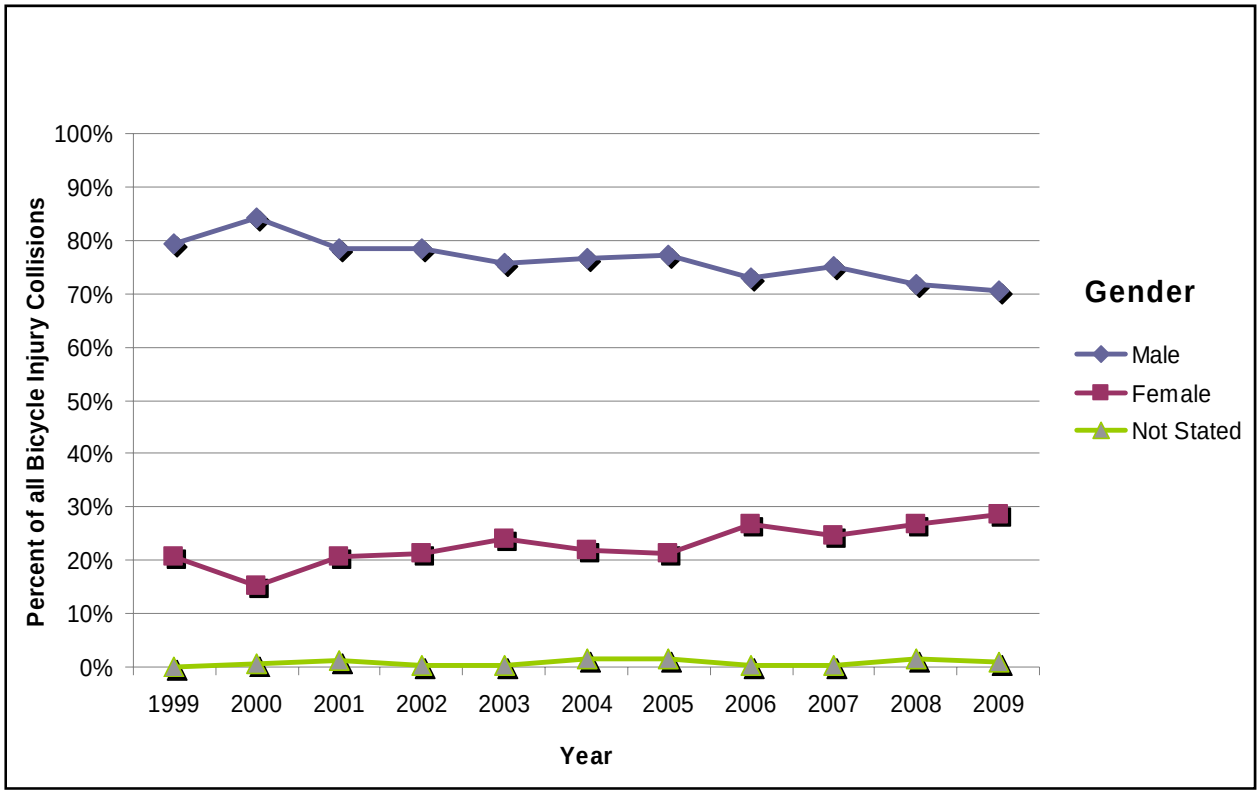
Source: 2009 American Community Survey.

Gender of Injured Bicyclists

Males are far more likely to be involved in bicycle injury collisions than females. From 1999 to 2009, 3222 bicyclists injured in collisions or 76% were male, while 984 or 23.2% were female. This breakdown is generally consistent with the gender split of bicyclists counted in the SFMTA bicycle counts conducted in August of 2009[11]. The 2009 bicycle counts found that 70.5% of observed bicyclists were male, while 29.5% were female.

[11] Please see the *2009 San Francisco Bicycle Count Report* for more information.

Figure 12: Injured Bicyclists by Gender (1999-2009)



Over the past decade, however, it appears that the percentage of females involved in bicycle injury collisions is slowly, but steadily increasing. For example, 15.1% of bicyclists involved in bicycle injury collisions were female in 2000. By 2009, that number had increased to 28.5%, an 88.7% increase.

Table 22: Injured Bicyclists by Gender (1999-2009).

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	1999-2009
Male	79.3%	84.3%	78.3%	78.5%	75.6%	76.6%	77.3%	72.9%	75.2%	71.8%	70.5%	76.0%
Female	20.7%	15.1%	20.6%	21.2%	24.1%	21.8%	21.3%	26.8%	24.6%	26.8%	28.5%	23.2%
Not Stated	0.0%	0.5%	1.1%	0.3%	0.3%	1.6%	1.5%	0.3%	0.2%	1.5%	0.9%	0.8%
Total (100%)	429	364	360	307	311	316	343	343	451	471	543	4238

XIII. Day of Week, Month of Year, and Time of Day

The time of day and day of week when collisions occur generally coincide with peak-hour commute times and days, but are also seasonally impacted by local weather. The months of the year in which collisions occur is also linked to weather and the fluctuating duration of daylight hours associated with the seasons and changes resultant from the change between Standard Time and Daylight Savings Time.

Day of Week

As shown in Figure 13 and Table 23, Wednesdays and Thursdays were the days in 2009 when the most bicycle injury collisions occurred, with 93 collisions each, or 17.5 % of all collisions. Since 1999, Tuesdays (16.8 %) has been the day when most bicycle injury collisions have occurred, slightly more than on Wednesdays (16.5 %). Mondays and Sundays were the days with the fewest bicycle injury collisions in 2009 and since 1999, respectively.

Figure 13: Bicycle Injury Collisions by Day of Week (2009)

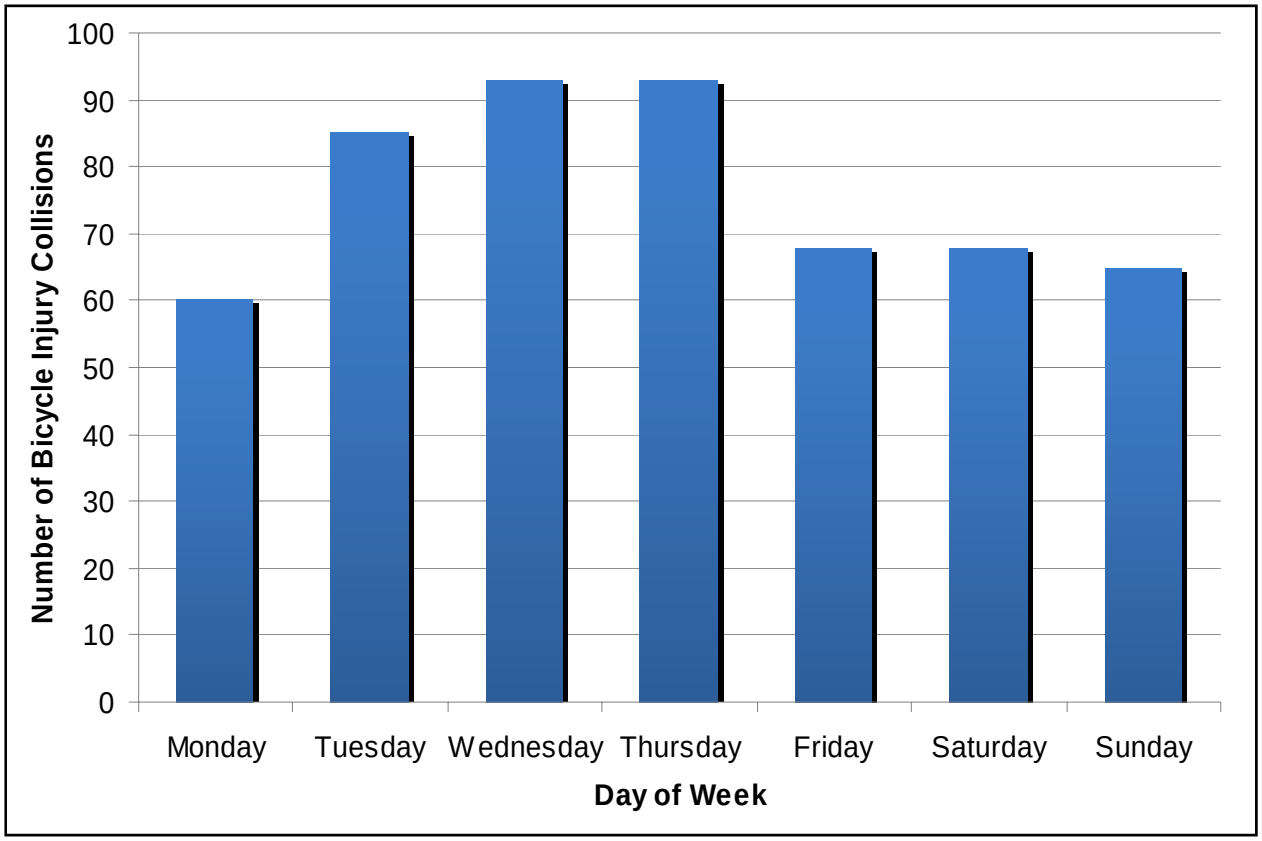


Table 23: Bicycle Injury Collisions by Day of Week (1999-2009)

	2009	%	1999-2009	%
Monday	60	11.3%	599	14.2%
Tuesday	85	16.0%	708	16.8%
Wednesday	93	17.5%	697	16.5%
Thursday	93	17.5%	676	16.0%
Friday	68	12.8%	635	15.0%
Saturday	68	12.8%	472	11.2%
Sunday	65	12.2%	436	10.3%
TOTAL	**532**		**4,223**	

Month of Year

In 2009, October had the most bicycle injury collisions with 64 collisions, or 12.0% of all collisions. Similarly, October was the month with the most collisions from 1999 to 2009 with 462 collisions or 10.9% of all collisions over the past decade. Figure 14 and Table 24 show the breakdown of bicycle injury collisions by month in 2009 and over the past decade.

Figure 14: Bicycle Injury Collisions by Month (2009)

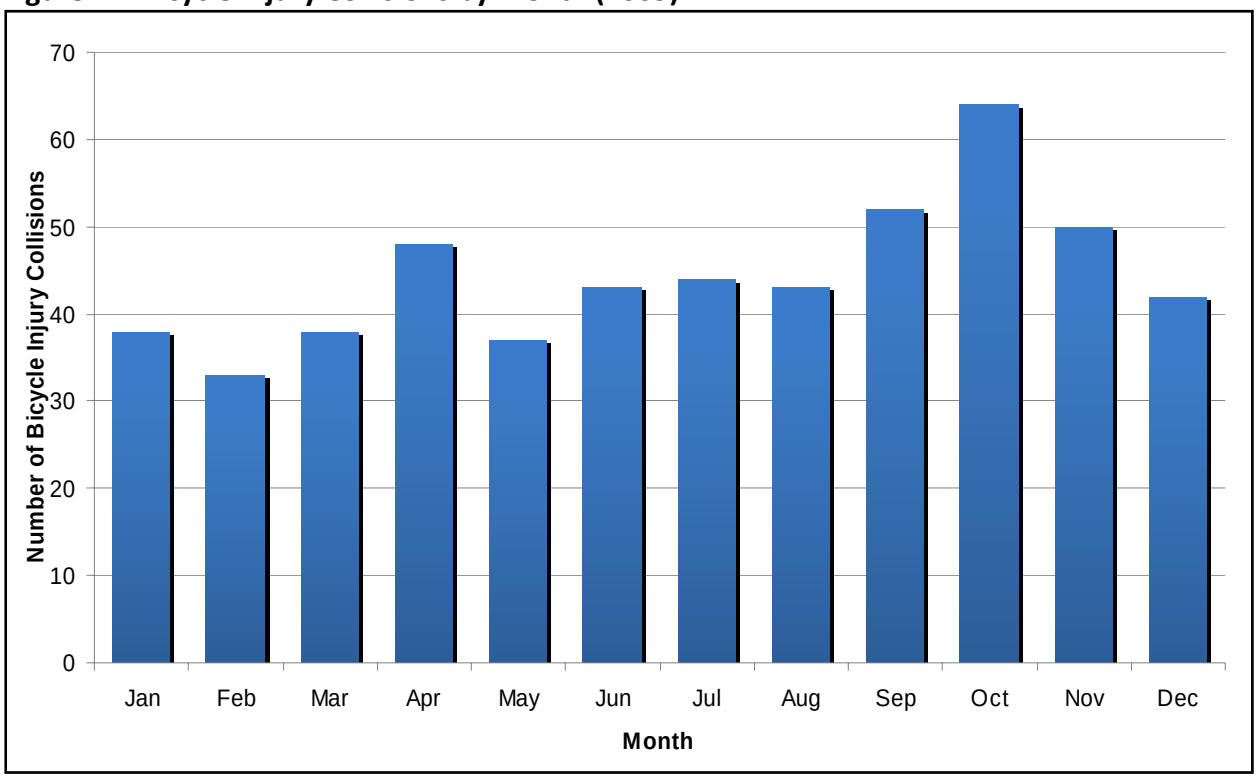


Table 24: Bicycle Injury Collisions by Month (1999-2009)

	2009	%	99-09	%
January	38	7.1	246	5.8
February	33	6.2	280	6.6
March	38	7.1	358	8.5
April	48	9.0	363	8.6
May	37	7.0	368	8.7
June	43	8.1	399	9.4
July	44	8.3	366	8.7
August	43	8.1	350	8.3
September	52	9.8	426	10.1
October	64	12.0	462	10.9
November	50	9.4	325	7.7
December	42	7.9	281	6.7
TOTAL	**532**	**100.0**	**4224**	**100**

Time of Day

In 2009, the hour from 5 to 6 p.m. had the most bicycle injury collisions with 47, or 8.8% of all collisions, matching with historical information. When observing the trends over the past decade it is also worth noting that there were some one-hour periods during the mid-afternoon which had the same or a greater number of bicycle injury collisions than during the morning commute. These trends might be due to the high numbers of bicycle messengers and bicycle tourists within San Francisco, two populations whose trips do not necessarily fall within traditional peak-hour travel times.

Figure 15: Bicycle Injury Collisions by Time of Day (2009)

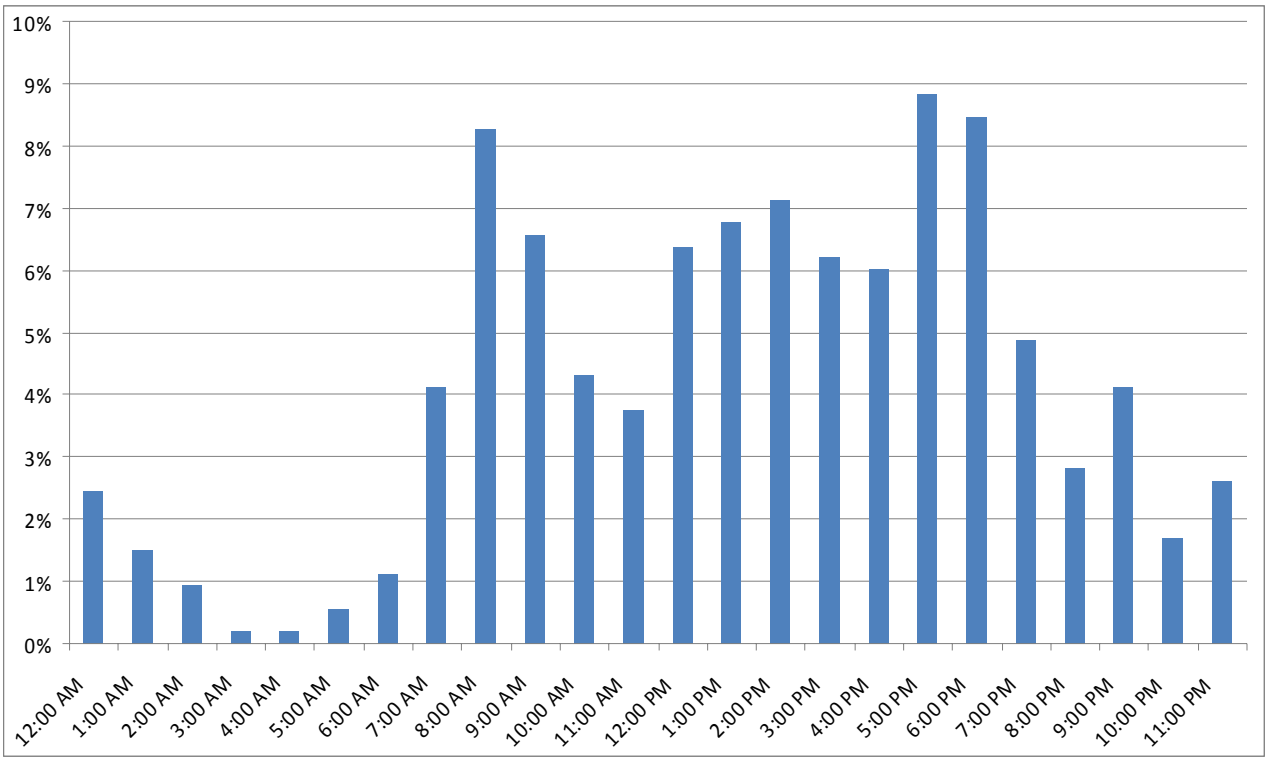
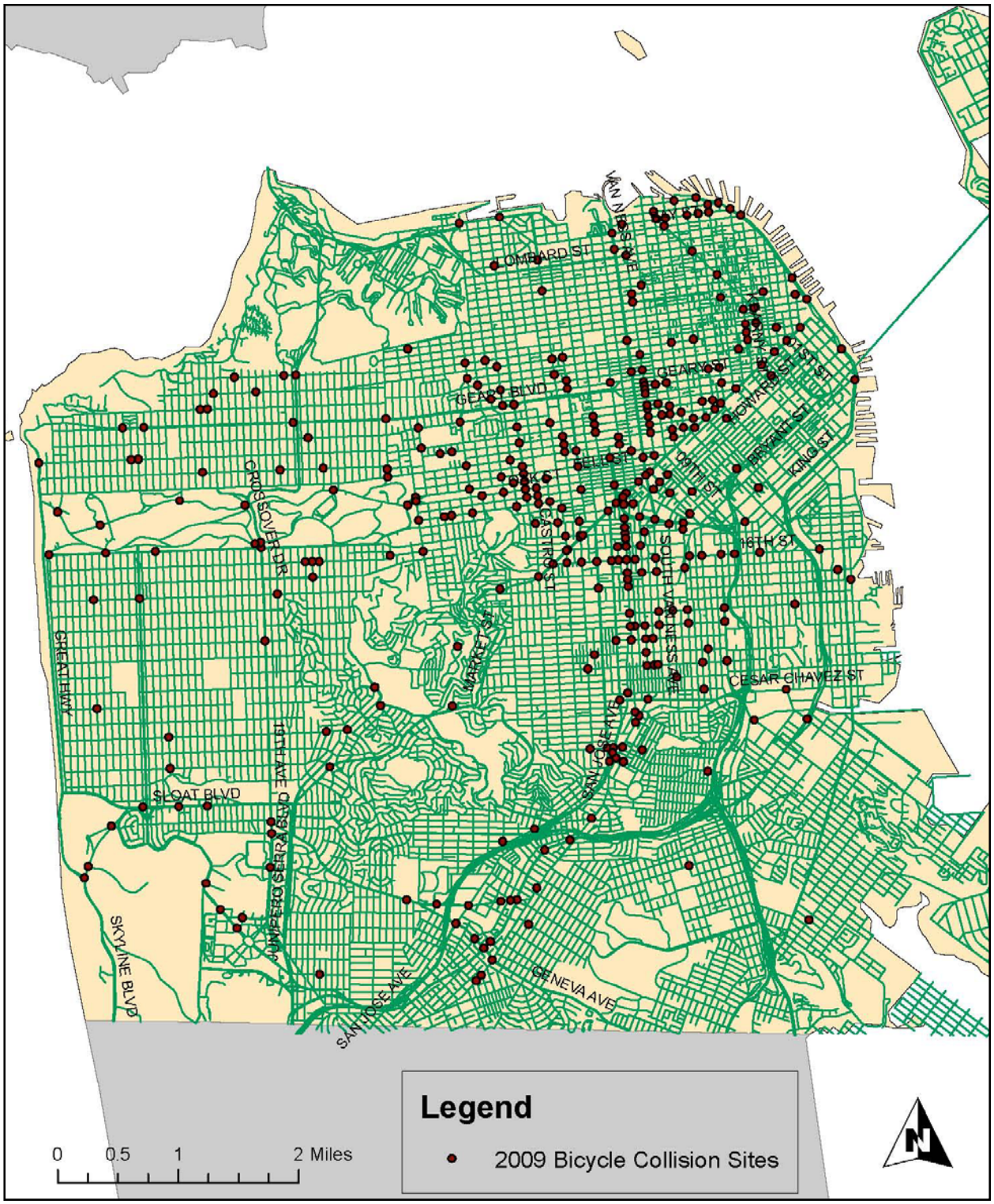


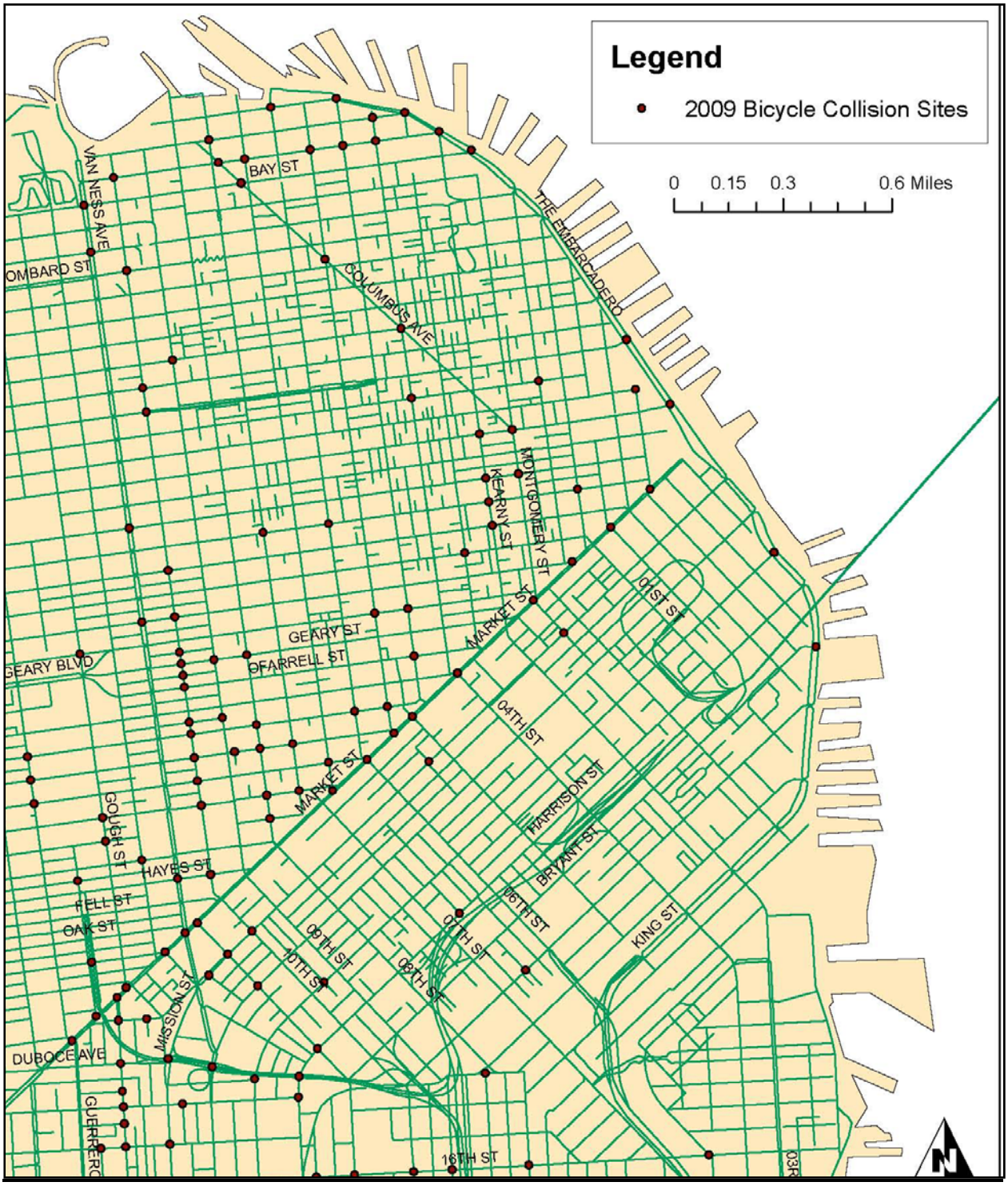
Table 25: Bicycle Injury Collisions by Time of Day (1999-2009)

Hour	Total (in 2009)	% (in 2009)	Total (1999-2009)	% (1999-2009)
12:00-1:00 AM	13	2.44%	65	1.54%
1:00-2:00 AM	8	1.50%	51	1.21%
2:00-3:00 AM	5	0.94%	39	0.92%
3:00-4:00 AM	1	0.19%	16	0.38%
4:00-5:00 AM	1	0.19%	10	0.24%
5:00-6:00 AM	3	0.56%	26	0.62%
6:00-7:00 AM	6	1.13%	67	1.59%
7:00-8:00 AM	22	4.14%	168	3.98%
8:00-9:00 AM	44	8.27%	295	6.98%
9:00-10:00 AM	35	6.58%	267	6.32%
10:0011:00 AM	23	4.32%	193	4.57%
11:00-12:00 PM	20	3.76%	197	4.66%
12:00-1:00 PM	34	6.39%	237	5.61%
1:00-2:00 PM	36	6.77%	272	6.44%
2:00-3:00 PM	38	7.14%	293	6.94%
3:00-4:00 PM	33	6.20%	290	6.87%
4:00-5:00 PM	32	6.02%	358	8.48%
5:00-6:00 PM	47	8.83%	384	9.09%
6:00-7:00 PM	45	8.46%	308	7.29%
7:00-8:00 PM	26	4.89%	211	5.00%
8:00-9:00 PM	15	2.82%	146	3.46%
9:00-10:00 PM	22	4.14%	131	3.10%
10:00-11:00 PM	9	1.69%	106	2.51%
11:00-12:00 AM	14	2.63%	94	2.23%
TOTAL	**532**	**100.00%**	**4224**	**100.00%**

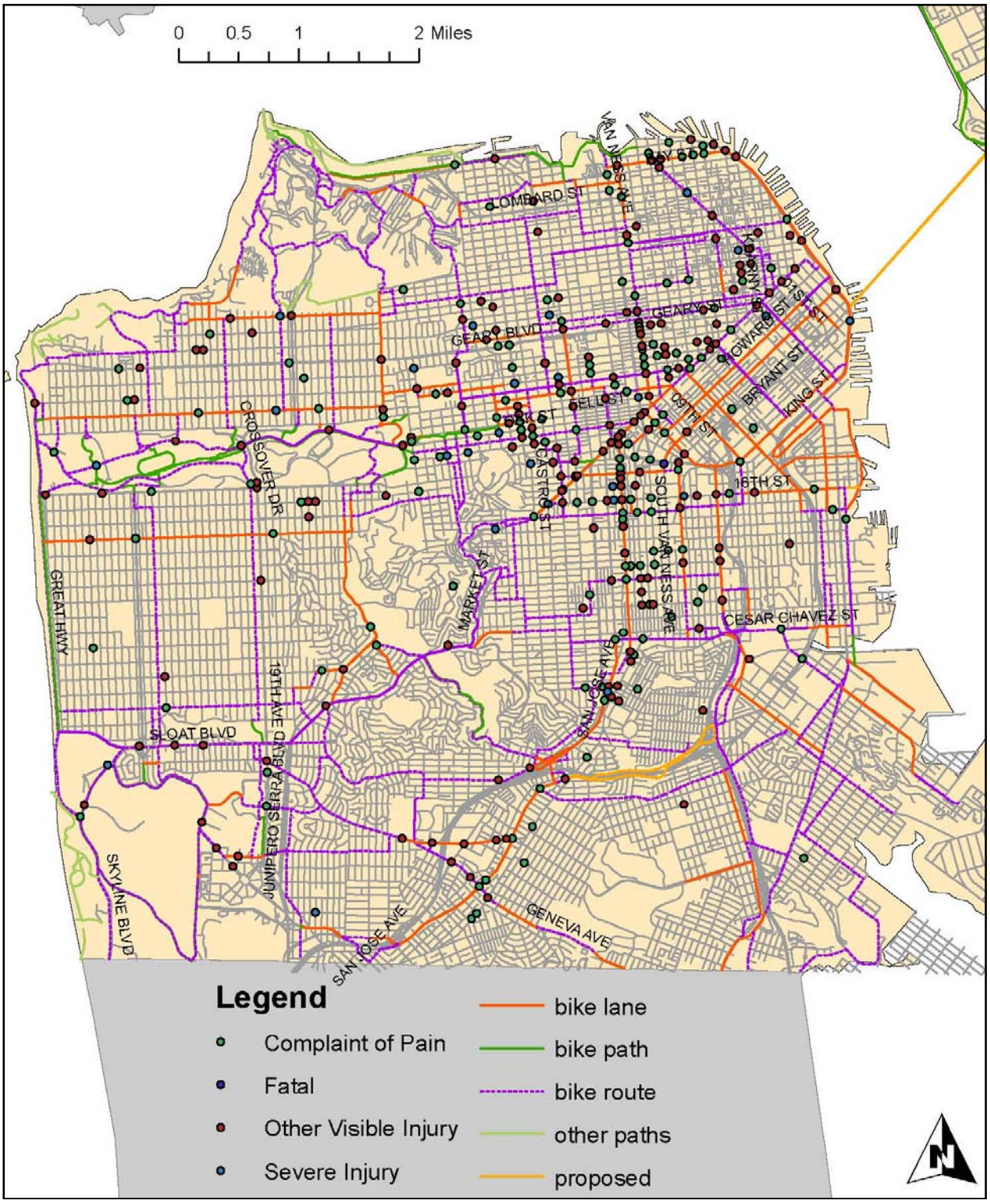
Appendix A: Location of Bicycle Injury Collisions (2009)



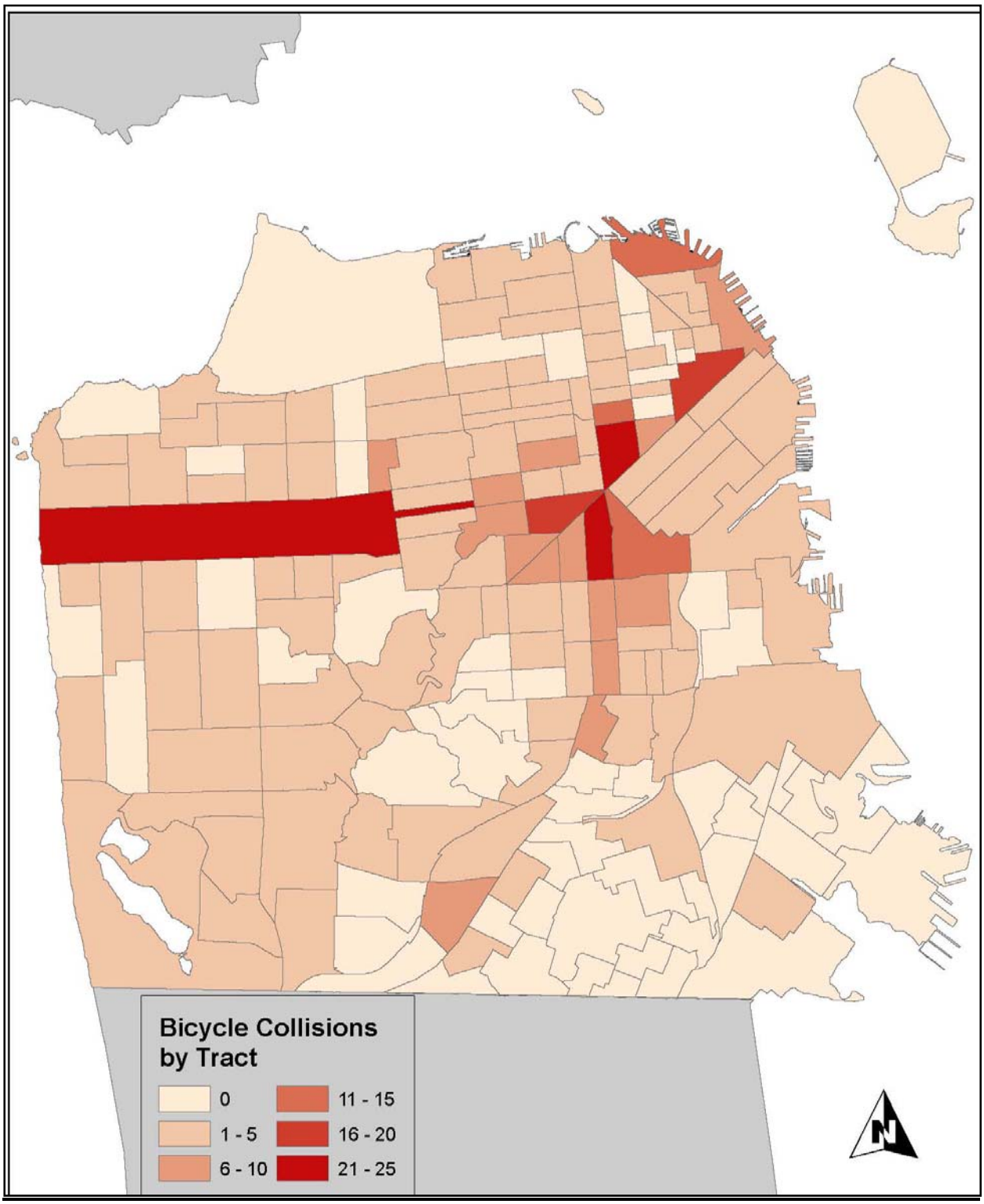
Appendix B: Location of Bicycle Injury Collisions in Downtown Area (2009)



Appendix C: Severity of Injury in Bicycle Injury Collisions (2009)



Appendix D: Number of Bicycle Injury Collisions by Census Tract (1999-2009)



Appendix E: 2009 Bicycle Injury Collisions per 100,000 residents (CA Cities > 250,000 + Selected Cities)

	Bakersfield	Fresno	Riverside	Anaheim	Santa Ana	San Jose	Long Beach	Los Angeles	San Diego	Oakland	Portland	Stockton	Seattle	Sacramento	San Francisco
Total 2009 Population**	336,400	498,767	302,410	350,842	356,489	1,014,965	492,796	4,072,746	1,367,653	428,017	566,143	290,925	602,000	483,773	**851,353**
2009 Bicycle Injury Collisions**	42	72	74	94	133	302	216	1,817	534	179	288	108	382	228	**522**
2009 Bicycle Injury Collisions per Capita	0.0001249	0.0001444	0.0002447	0.0002679	0.0003731	0.0002975	0.0004383	0.0004461	0.0003904	0.0004182	0.0005087	0.0003712	0.0006346	0.0004713	**0.0006131**
2009 Bicycle Injury Collisions per 100,000 residents	**12.49**	**14.44**	**24.47**	**26.79**	**37.31**	**29.75**	**43.83**	**44.61**	**39.04**	**41.82**	**50.87**	**37.12**	**63.46**	**47.13**	**61.31**

Sources: California Office of Traffic Safety, 2009 OTS Collision Rankings; Seattle DOT 2009 Traffic Report; Oregon 2009 Traffic Crash Summary.

Appendix F: 2009 Estimated Bicycle Injury Collision Rate (CA Cities > 250,000 + Selected Cities)

	Portland	Seattle	San Francisco	Oakland	Riverside	Sacramento	Anaheim	San Jose	Fresno	Long Beach	San Diego	Los Angeles	Santa Ana	Bakersfield	Stockton
Total Work Trips (excluding work at home)	272,465	333,761	**407,560**	180,870	119,908	189,517	146,704	427,611	169,435	198,942	584,194	1,650,374	147,241	123,240	100,684
Daily bicycle trips to work*	16,846	10,593	**13,023**	4,884	960	4,090	2,322	3,908	1,309	10,048	5,212	17,345	2,173	732	771
Bicycling mode split	6.2%	3.2%	**3.2%**	2.7%	0.8%	2.2%	1.6%	0.9%	0.8%	5.1%	0.9%	1.1%	1.5%	0.6%	0.8%
2008 Bicycle Injury Collisions**	288	382	**522**	179	74	228	94	302	72	216	534	1,817	133	42	108
Estimated bicycling trips to work per year***	4,379,960	2,754,180	**3,385,980**	1,269,840	249,600	1,063,400	603,720	1,016,080	340,340	2,612,480	1,355,120	4,509,700	564,980	190,320	200,460
Injury Collisions per Estimated Bicycling Trips to Work	0.0000658	0.0001387	**0.0001542**	0.0001410	0.0002965	0.0002144	0.0001557	0.0002972	0.0002116	0.0000827	0.0003941	0.0004029	0.0002354	0.0002207	0.0005388
Injury Collisions per 100,000 Annual Bicycling Trips to Work	**6.58**	**13.87**	**15.42**	**14.10**	**29.65**	**21.44**	**15.57**	**29.72**	**21.16**	**8.27**	**39.41**	**40.29**	**23.54**	**22.07**	**53.88**

Sources: 2009 American Community Survey, California Office of Traffic Safety, 2009 OTS Collision Rankings; etc. Based on 365 days in 2009 and 260 work days

Appendix G: Estimated Bicycle Injury Collision Rate in San Francisco (2000-2009)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Total Work Trips	418,553	399,949	395,542	383,996	380,507	381,922	394,646	416,568	442,831	**437073**
Daily Bicycle Trips to Work	8,302	6,550	8,423	6,811	6,962	7,053	8,938	10,514	12,038	**13023**
Bicycling Mode Split	2.0%	1.6%	2.1%	1.8%	1.8%	1.8%	2.3%	2.5%	2.7%	**3.0%**
Annual Bicycle Injury Collisions	364	360	307	311	316	343	343	451	468	**532**
Estimated Bicycling Trips to Work per Year	2,158,520	1,703,000	2,189,980	1,770,860	1,810,120	1,833,780	2,323,880	2,733,640	3,129,880	**3,385,980**
Injury Collisions per Estimated Bicycling Trips to Work	0.0001686	0.0002114	0.0001402	0.0001756	0.0001746	0.0001870	0.0001476	0.0001650	0.0001495	**0.0001571**
Injury Collisions per 100,000 Estimated Bicycling Trips to Work	**16.86**	**21.14**	**14.02**	**17.56**	**17.46**	**18.70**	**14.76**	**16.50**	**14.95**	**15.71**

Sources: 2000 United States Census, 2009 American Community Survey, California Highway Patrol 2009 SWITRS.

Appendix H: San Francisco Journey to Work, Ages 16+ (2000-2009)

	Total (including worked at home)	Drove Alone	Carpooled	Public Transit	Walk	Bicycle	Taxicab	Motorcycle	Worked at home	Other
2000	418,553	169,508	45,152	128,760	39,192	**8,302**	1,551	3,951	19,376	2,761
%	100.0%	40.5%	10.8%	30.8%	9.4%	**2.0%**	0.4%	0.9%	4.6%	0.7%
2001	399,949	168,055	40,796	119,502	36,985	**6,550**	1,608	3,436	19,709	3,308
%	100.0%	42.0%	10.2%	29.9%	9.2%	**1.6%**	0.4%	0.9%	4.9%	0.8%
2002	395,542	167,510	34,309	120,142	31,742	**8,423**	1,712	3,153	25,908	2,643
%	100.0%	42.3%	8.7%	30.4%	8.0%	**2.1%**	0.4%	0.8%	6.5%	0.7%
2003	383,996	166,250	31,326	114,199	32,533	**6,811**	1,453	4,321	24,440	2,663
%	100.0%	43.3%	8.2%	29.7%	8.5%	**1.8%**	0.4%	1.1%	6.4%	0.7%
2004	380,507	160,795	33,247	112,456	31,339	**6,962**	571	2,955	29,245	2,937
%	100.0%	42.3%	8.7%	29.6%	8.2%	**1.8%**	0.2%	0.8%	7.7%	0.8%
2005	381,922	151,756	31,659	124,738	36,629	**7,053**	925	2,557	24,141	2,434
%	100.0%	39.7%	8.3%	32.7%	9.6%	**1.8%**	0.2%	0.7%	6.3%	0.6%
2006	394,646	159,722	30,459	119,532	37,943	**8,938**	631	5,125	29,832	2,464
%	100.0%	40.5%	7.7%	30.3%	9.6%	**2.3%**	0.2%	1.3%	7.6%	0.6%
2007	416,568	161,142	29,389	137,268	40,241	**10,514**	2,140	4,185	28,262	3,427
%	100.0%	38.7%	7.1%	33.0%	9.7%	**2.5%**	0.5%	1.0%	6.8%	0.8%
2008	442,831	169,868	36,998	141,069	41,621	**12,038**	1,366	3,452	33,150	3,269
%	100.0%	38.4%	8.4%	31.9%	9.4%	**2.7%**	0.3%	0.8%	7.5%	0.7%
2009	**437,073**	**202,683**	**32554**	**138861**	**45227**	**13,023**	**945**	**3,975**	**29,513**	**2,846**
%	**100.0%**	**46.4%**	**7.4%**	**31.8%**	**10.3%**	**3.0%**	**0.2%**	**0.9%**	**6.8%**	**0.7%**

Sources: 2000 United States Census, 2009 American Community Survey.

Appendix I: CVC Violations in Bicycle Injury Collisions (2009)

Description	CVC Section	# of Collision	# of Collisions where Fault was Assigned	# Motorists Assigned Fault	% Motorists Assigned Fault	# Bicyclists Assigned Fault	% Bicyclists Assigned Fault	# "Other" Assigned Fault	% "Other" Assigned Fault
Permissible Action Duty Where Property Damaged	VC 20002.A	1	1	1	100	0	0	0	0
Laws Applicable to Bicycle Use	VC 21200	4	4	0	0	4	100	0	0
	VC 21200.A	3	3	1	33	2	67	0	0
Bicycle Equipment Requirements	VC 21201.A	2	2	0	0	2	100	0	0
	VC 21201.B	1	1	0	0	1	100	0	0
	VC 21201.D	6	6	0	0	6	100	0	0
Permitted Movements from Bicycle Lanes	VC 21208.A	1	1	0	0	1	100	0	0
	VC 21208.B	2	2	0	0	2	100	0	0
Motorized Vehicle Illegally Operated in Bicycle Lane	VC 21209.A	2	2	2	100	0	0	0	0
Obstruction of Bicycle Facilities	VC 21211.A	1	1	1	100	0	0	0	0

Description	CVC Section	# of Collision	# of Collisions where Fault was Assigned	# Motorists Assigned Fault	% Motorists Assigned Fault	# Bicyclists Assigned Fault	% Bicyclists Assigned Fault	# "Other" Assigned Fault	% "Other" Assigned Fault
ROW at Circular Green Signal	VC 21451.A	4	4	4	100	0	0	0	0
	VC 21451.C	1	1	0	0	0	0	1	100
ROW at Circular Red Signal	VC 21453.A	36	36	11	31	24	67	1	3
	VC 21453.B	1	1	0	0	1	100	0	0
	VC 21453.C	1	1	1	100	0	0	0	0
Crossing Double Yellow Lines	VC 21460.A	3	3	3	100	0	0	0	0
Wrong Side of Roadway	VC 21650	5	5	1	20	4	80	0	0
	VC 21650.1	17	17	0	0	17	100	0	0
Divided Highways	VC 21651	1	1	0	0	1	100	0	0
	VC 21651.A	2	2	2	100	0	0	0	0
Designated Traffic Direction	VC 21657	5	5	1	20	4	80	0	0

Description	CVC Section	# of Collision	# of Collisions where Fault was Assigned	# Motorists Assigned Fault	% Motorists Assigned Fault	# Bicyclists Assigned Fault	% Bicyclists Assigned Fault	# "Other" Assigned Fault	% "Other" Assigned Fault
Unsafe Lane Change	VC 21658.A	21	21	12	57	9	43	0	0
Driving on Sidewalk	VC 21663	2	2	0	0	2	100	0	0
Following Too Closely	VC 21703	7	7	3	43	4	57	0	0
Motor Vehicle Turning Unsafely into Bicycle Lane	VC 21717	2	2	2	100	0	0	0	0
Unsafe Pass on Left	VC 21750	15	15	7	47	8	53	0	0
Passing without Sufficient Clearance	VC 21751	2	2	1	50	1	50	0	0
Passing on Right	VC 21754	1	1	0	0	1	100	0	0
	VC 21755	10	10	0	0	10	100	0	0
Yielding at Intersection	VC 21800.A	3	3	2	67	1	33	0	0
Yielding when Turning Left	VC 21801.A	35	35	30	86	5	14	0	0
Yielding to Vehicle Making U-Turn	VC 21801.B	4	4	0	0	4	100	0	0

Description	CVC Section	# of Collision	# of Collisions where Fault was Assigned	# Motorists Assigned Fault	% Motorists Assigned Fault	# Bicyclists Assigned Fault	% Bicyclists Assigned Fault	# "Other" Assigned Fault	% "Other" Assigned Fault
Yielding ROW Entering Highway	VC 21802.A	9	9	6	67	3	33	0	0
	VC 21802.B	2	2	1	50	1	50	0	0
Yield Signs at Intersections	VC 21803.A	3	3	1	33	2	67	0	0
Yielding to Approaching Traffic	VC 21804.A	11	11	3	27	8	73	0	0
Yielding to Pedestrian in Crosswalk	VC 21950.A	4	4	1	25	3	75	0	0
ROW at Crosswalks	VC 21950.B	2	2	0	0	0	0	2	100
Pedestrian Outside Crosswalk	VC 21954.A	6	6	0	0	0	0	6	100
Crossing Between Controlled Intersections	VC 21955	2	2	0	0	0	0	2	100
Pedestrian on Roadway	VC 21956.A	1	1	0	0	0	0	1	100
Pedestrian in Bicycle Lane	VC 21966	1	1	0	0	0	0	1	100
Improper Position for a Turn at Intersection	VC 22100.A	6	6	5	83	1	17	0	0
	VC 22100.B	5	5	1	20	4	80	0	0
Obeying Traffic Signal for Turn at Intersection	VC 22101.D	6	6	4	67	2	33	0	0
U-Turn in Business District	VC 22102	3	3	3	100	0	0	0	0

Description	CVC Section	# of Collision	# of Collisions where Fault was Assigned	# Motorists Assigned Fault	% Motorists Assigned Fault	# Bicyclists Assigned Fault	% Bicyclists Assigned Fault	# "Other" Assigned Fault	% "Other" Assigned Fault
U-Turn in Residential District	VC 22103	2	2	1	50	1	50	0	0
Unobstructed View for U-Turn	VC 22105	1	1	1	100	0	0	0	0
Starting or Backing when Unsafe	VC 22106	9	9	9	100	0	0	0	0
Turning without Signaling	VC 22107	74	74	55	74	19	26	0	0
Excessive Speed and Designated Lane Use	VC 22348.C	1	1	0	0	1	100	0	0
Unsafe Speed	VC 22350	58	57	9	16	48	84	0	0
Minimum Speed Law	VC 22400.A	1	1	1	100	0	0	0	0
Stopping at STOP Sign Limit Line	VC 22450	3	3	0	0	3	100	0	0
	VC 22450.A	16	16	4	25	12	75	0	0
Locked Vehicle	VC 22516	1	1	1	100	0	0	0	0
Opening Car Door when Unsafe	VC 22517	45	45	42	93	1	2	2	4
Not Cited	VC	59	42	7	17	33	79	2	5
TOTAL		**532**	**514**	**240**		**256**		**18**	

Appendix J: CVC Violations in Bicycle Injury Collisions (1999-2009)

Violation Subject	CVC Section	# of Collision	# of Collisions where Fault was Assigned	# Motorists Assigned Fault	% Motorists Assigned Fault	# Bicyclists Assigned Fault	% Bicyclists Assigned Fault	# "Other" Assigned Fault	% "Other" Assigned Fault
Not Cited	VC	365	91	26	29	61	67	4	4
Duty to Stop at Scene of Accident	VC 20001.A	1	1	1	100	0	0	0	0
Duty to Stop Where Property Damaged	VC 20002.A	1	1	1	100	0	0	0	0
Duty to Stop Upon Injury or Death	VC 20003.A	1	1	0	0	1	100	0	0
Disobey Traffic Directions of Local Official	VC 21100.3	1	1	1	100	0	0	0	0
Laws Applicable to Bicycle Use	VC 21200	19	14	0	0	14	100	0	0
Riding Bicycle Under Influence	VC 21200.5	13	12	0	0	12	100	0	0
Laws Applicable to Bicycle Use	VC 21200.A	17	13	0	0	13	100	0	0
Bicycle Equipment Requirements	VC 21201.A	7	7	0	0	7	100	0	0
	VC 21201.B	1	1	0	0	1	100	0	0

Violation Subject	CVC Section	# of Collision	# of Collisions where Fault was Assigned	# Motorists Assigned Fault	% Motorists Assigned Fault	# Bicyclists Assigned Fault	% Bicyclists Assigned Fault	# "Other" Assigned Fault	% "Other" Assigned Fault
	VC 21201.D	17	17	0	0	17	100	0	0
	VC 21202.	2	1	0	0	1	100	0	0
	VC 21202.A	53	51	0	0	51	100	0	0
Hitching Rides	VC 21203.	2	2	0	0	2	100	0	0
Permitted Movements from Bicycle Lanes	VC 21208.A	9	9	0	0	9	100	0	0
	VC 21208.B	6	6	0	0	6	100	0	0
Motorized Bicycles and Vehicles in Bicycle Lane	VC 21209.	1	1	1	100	0	0	0	0
	VC 21209.A	7	7	7	100	0	0	0	0
Obstruction of Bicycle Facilities	VC 21211.A	4	4	4	100	0	0	0	0
	VC 21211.B	1	1	1	100	0	0	0	0

Violation Subject	CVC Section	# of Collision	# of Collisions where Fault was Assigned	# Motorists Assigned Fault	% Motorists Assigned Fault	# Bicyclists Assigned Fault	% Bicyclists Assigned Fault	# "Other" Assigned Fault	% "Other" Assigned Fault
Instructions of Traffic Control Officer	VC 21367.B	1	1	0	0	1	100	0	0
ROW at Circular Green Signal	VC 21451.A	25	25	10	40	15	60	0	0
	VC 21451.B	5	5	3	60	2	40	0	0
	VC 21451.C	3	3	0	0	0	0	3	100
ROW at Circular Yellow Signal	VC 21452.B	1	1	0	0	1	100	0	0
ROW at Circular Red Signal	VC 21453.A	358	345	96	28	247	72	2	1
	VC 21453.B	18	17	14	82	3	18	0	0
	VC 21453.C	3	3	1	33	2	67	0	0
	VC 21453.D	4	4	0	0	0	0	4	100
Pedestrian Signal Violation	VC 21456.A	9	9	0	0	2	22	7	78

Violation Subject	CVC Section	# of Collision	# of Collisions where Fault was Assigned	# Motorists Assigned Fault	% Motorists Assigned Fault	# Bicyclists Assigned Fault	% Bicyclists Assigned Fault	# "Other" Assigned Fault	% "Other" Assigned Fault
	VC 21456.B	2	2	0	0	0	0	2	100
Failure to Yield at Flashing Light	VC 21457.A	5	5	1	20	4	80	0	0
	VC 21457.B	1	1	0	0	1	100	0	0
Crossing Double Yellow Lines	VC 21460.	2	2	1	50	1	50	0	0
	VC 21460.A	12	10	4	40	6	60	0	0
	VC 21460.B	1	1	0	0	1	100	0	0
Obedience by Pedestrian to Official Traffic Control Device	VC 21461.5	1	1	0	0	0	0	1	100
Obey Traffic Signal	VC 21461.A	17	15	6	40	9	60	0	0
Wrong Side of Roadway	VC 21650	38	38	9	24	29	76	0	0
Wrong Side of Roadway	VC 21650.1	180	177	1	1	176	99	0	0

Violation Subject	CVC Section	# of Collision	# of Collisions where Fault was Assigned	# Motorists Assigned Fault	% Motorists Assigned Fault	# Bicyclists Assigned Fault	% Bicyclists Assigned Fault	# "Other" Assigned Fault	% "Other" Assigned Fault
Operation on Divided Highway	VC 21651	2	2	1	50	1	50	0	0
	VC 21651.A	10	10	6	60	4	40	0	0
	VC 21651.B	1	1	0	0	1	100	0	0
Designated Lanes for Certain Vehicles	VC 21655.	1	1	1	100	0	0	0	0
	VC 21655.B	2	2	0	0	2	100	0	0
Failure of Slow Moving Vehicles to Turn Out	VC 21656.	1	1	0	0	1	100	0	0
Designated Traffic Direction	VC 21657	49	49	5	10	44	90	0	0
Unsafe Lane Change	VC 21658.A	129	124	65	52	59	48	0	0
Driving on Sidewalk	VC 21663	26	26	0	0	26	100	0	0
Following Too Closely	VC 21703	46	45	19	42	26	58	0	0

Violation Subject	CVC Section	# of Collision	# of Collisions where Fault was Assigned	# Motorists Assigned Fault	% Motorists Assigned Fault	# Bicyclists Assigned Fault	% Bicyclists Assigned Fault	# "Other" Assigned Fault	% "Other" Assigned Fault
Motor Vehicle Turning Unsafely into Bicycle Lane	VC 21717	20	20	19	95	1	5	0	0
Unsafe Pass on Left	VC 21750	109	108	68	63	40	37	0	0
Passing Without Sufficient Clearance	VC 21751	7	7	4	57	3	43	0	0
Unsafe Pass on Left, Obstructed View	VC 21752.C	1	1	0	0	1	100	0	0
	VC 21752.D	3	3	0	0	3	100	0	0
Unsafe Pass on Right	VC 21754.	18	18	1	6	17	94	0	0
	VC 21755	95	93	5	5	88	95	0	0
Yielding at Intersection	VC 21800.	1	1	0	0	1	100	0	0
	VC 21800.A	32	31	19	61	12	39	0	0
Yielding at Intersection	VC 21800.B	4	4	1	25	3	75	0	0

Violation Subject	CVC Section	# of Collision	# of Collisions where Fault was Assigned	# Motorists Assigned Fault	% Motorists Assigned Fault	# Bicyclists Assigned Fault	% Bicyclists Assigned Fault	# "Other" Assigned Fault	% "Other" Assigned Fault
	VC 21800.C	4	4	2	50	2	50	0	0
Yield ROW at Left or U-Turn	VC 21801.	2	2	2	100	0	0	0	0
Yielding when Turning Left	VC 21801.A	347	335	310	93	23	7	2	1
Yielding to Vehicle Making U-Turn	VC 21801.B	30	29	2	7	27	93	0	0
Yielding ROW Entering Highway	VC 21802.A	78	72	52	72	20	28	0	0
	VC 21802.B	7	7	3	43	4	57	0	0
Yield ROW at Yield Sign	VC 21803.A	6	5	3	60	2	40	0	0
	VC 21803.B	1	1	0	0	1	100	0	0
Entry Onto Highway	VC 21804.	7	7	0	0	7	100	0	0
	VC 21804.A	186	183	31	17	152	83	0	0

Violation Subject	CVC Section	# of Collision	# of Collisions where Fault was Assigned	# Motorists Assigned Fault	% Motorists Assigned Fault	# Bicyclists Assigned Fault	% Bicyclists Assigned Fault	# "Other" Assigned Fault	% "Other" Assigned Fault
	VC 21804.B	1	1	0	0	1	100	0	0
Failure to Yield to Emergency Vehicle	VC 21806.A	2	2	0	0	2	100	0	0
Yielding to Pedestrians in Crosswalk	VC 21950.A	43	42	19	45	23	55	0	0
ROW at Crosswalks	VC 21950.B	31	29	0	0	7	24	22	76
	VC 21950.C	1	1	0	0	1	100	0	0
Overtaking Vehicle Stopped at Crosswalk	VC 21951.	4	4	2	50	2	50	0	0
ROW on Sidewalk	VC 21952.	4	4	1	25	3	75	0	0
Pedestrian Outside Crosswalk	VC 21954.A	23	22	0	0	0	0	22	100
Crossing Between Controlled Intersections	VC 21955	17	17	0	0	0	0	17	100
Pedestrian on Roadway	VC 21956.	1	1	0	0	0	0	1	100

Violation Subject	CVC Section	# of Collision	# of Collisions where Fault was Assigned	# Motorists Assigned Fault	% Motorists Assigned Fault	# Bicyclists Assigned Fault	% Bicyclists Assigned Fault	# "Other" Assigned Fault	% "Other" Assigned Fault
	VC 21956.A	1	1	0	0	0	0	1	100
Pedestrian in Bicycle Lane	VC 21966.	2	2	0	0	0	0	2	100
U-Turn at Controlled Intersection	VC 22100.5	1	1	1	100	0	0	0	0
Improper Position for a Right Turn at Intersection	VC 22100.A	32	32	29	91	3	9	0	0
	VC 22100.B	28	28	7	25	21	75	0	0
Obeying Traffic Signal for Turn at Intersection	VC 22101.	2	2	2	100	0	0	0	0
	VC 22101.D	40	39	29	74	10	26	0	0
U-Turn in Business District	VC 22102	25	25	23	92	2	8	0	0
U-Turn in Residential District	VC 22103	7	7	6	86	1	14	0	0
Unobstructed View for U-Turn	VC 22105	1	1	1	100	0	0	0	0

Violation Subject	CVC Section	# of Collision	# of Collisions where Fault was Assigned	# Motorists Assigned Fault	% Motorists Assigned Fault	# Bicyclists Assigned Fault	% Bicyclists Assigned Fault	# "Other" Assigned Fault	% "Other" Assigned Fault
Starting or Backing when Unsafe	VC 22106	73	73	70	96	3	4	0	0
Turning Without Signaling	VC 22107	365	352	285	81	65	18	2	1
Duration of Signal	VC 22108.	3	3	2	67	1	33	0	0
Signal When Stopping	VC 22109.	2	2	2	100	0	0	0	0
Excessive Speed and Designated Lane Use	VC 22348.C	1	1	0	0	1	100	0	0
Unsafe Speed	VC 22350	458	448	119	27	329	73	0	0
Minimum Speed Law	VC 22400.A	4	4	3	75	1	25	0	0
Stopping at STOP Sign Limit Line	VC 22450	34	34	5	15	29	85	0	0
	VC 22450.A	171	167	26	16	141	84	0	0
Locked Vehicle	VC 22516	1	1	1	100	0	0	0	0

Violation Subject	CVC Section	# of Collision	# of Collisions where Fault was Assigned	# Motorists Assigned Fault	% Motorists Assigned Fault	# Bicyclists Assigned Fault	% Bicyclists Assigned Fault	# "Other" Assigned Fault	% "Other" Assigned Fault
Opening Car Door when Unsafe	VC 22517	373	361	350	97	2	1	9	2
Obstruction of Crosswalk	VC 22526.A	1	1	1	100	0	0	0	0
Reckless Driving	VC 23104.A	2	2	1	50	1	50	0	0
Driving Under Influence	VC 23152.A	23	23	5	22	18	78	0	0
	VC 23153.A	5	5	5	100	0	0	0	0
	VC 23153.B	1	1	1	100	0	0	0	0
Lighting During Darkness	VC 24250	1	1	0	0	1	100	0	0
TOTAL		**4223**	**3838**	**1803**		**1934**		**101**	