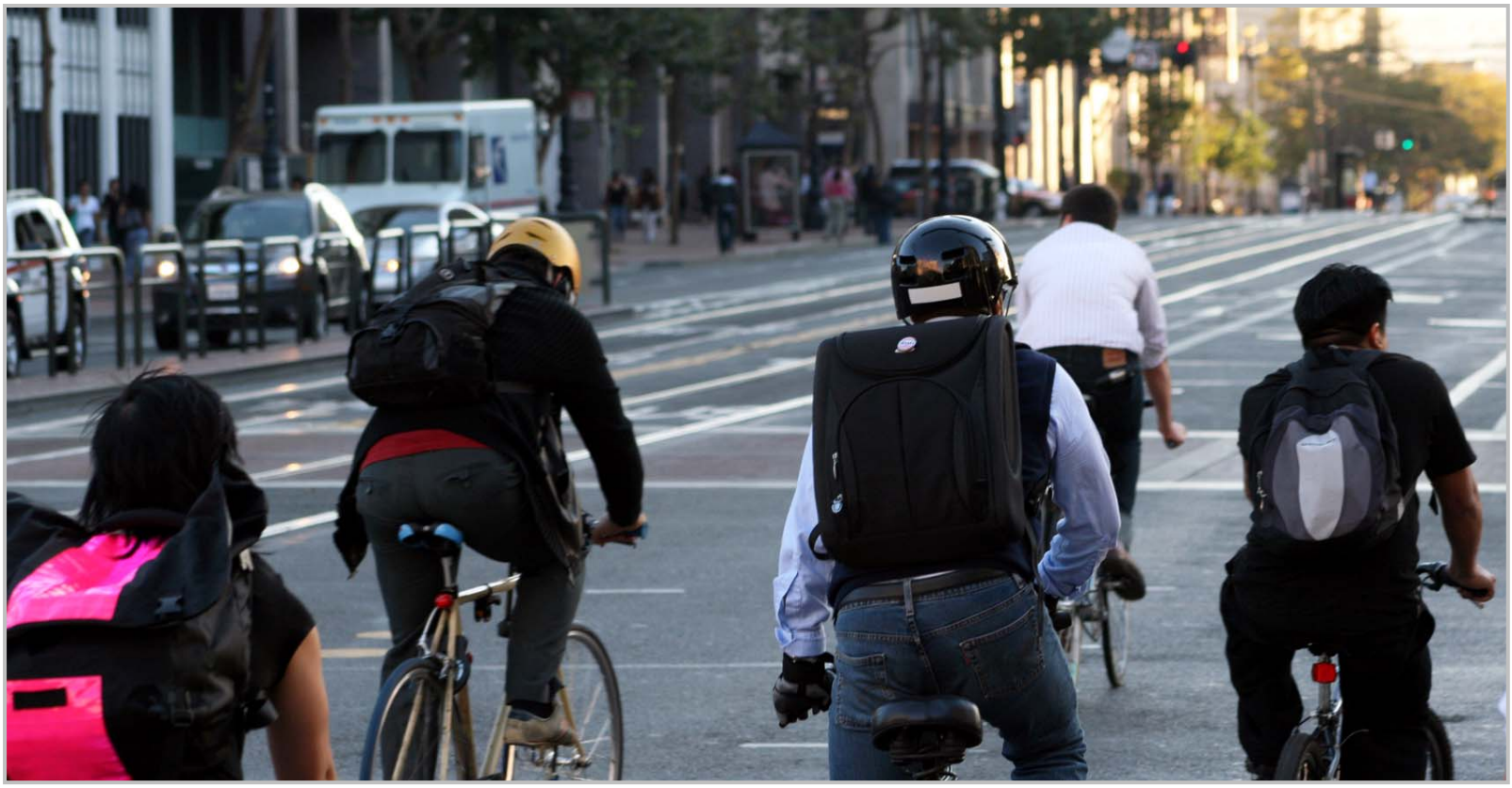

City of San Francisco
2008 Bicycle Collision Report

February 2010

SFMTA | Municipal Transportation Agency

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Report Highlights

- There were **468 bicycle injury collisions** in San Francisco in 2008. This was a **3.8 percent increase** over the previous year and the highest total since 1998.
- There were **three fatal bicycle collisions** in 2008.
- In 2008, San Francisco had the **highest number of bicycle collisions per 100,000 residents**, but the **lowest number of bicycle collisions per bicycle commuter** among California cities of comparable population size.
- San Francisco's estimated collision rate per bicycle commuter has **decreased roughly 20 percent since 2005**.
- The intersection with the most bicycle injury collisions in 2008 was at **Market Street and Valencia Street** (eight collisions).
- **Market Street** (49 collisions) and **Valencia Street** (35 collisions) were the two corridors with the highest number of bicycle injury collisions in 2008.
- **"Dooring" collisions increased by 78 percent** from 2006 to 2008, but only 4 percent from 2007 to 2008. "Dooring" was the **2nd most frequently cited** California Vehicle Code (CVC) violation in 2008.
- **44 percent** of bicycle injury collisions in 2008 involved a bicyclist in the **20 to 29 age cohort**, exceeding the ten-year average of 38 percent.
- In 2008, nearly **27 percent of bicyclists involved in bicycle injury collisions were female**, almost a six percent increase since 1998.

Introduction

This report provides a summary analysis of bicycle injury collisions in San Francisco for the 2008 calendar year. The report also includes collision data from 1998 through 2007 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.

I. Citywide Bicycle Injury Collisions

As shown by Figure 1, there were 468 bicycle injury collisions in San Francisco in 2008, the highest total for bicycle injury collisions since 1998. The 2008 total represents a 3.8 percent increase in injury collisions from 2007. Furthermore, the 468 collisions in 2008 is a considerable deviation from the more recent five year collision average, and indicates that further analysis, intervention, and mitigation is needed to ensure the continued safety of bicyclists in San Francisco. As shown in Table 1, bicycle injury collisions as a percentage of all citywide injury collisions reached 15.4 percent in 2008, the highest share since 1998. Please see Appendices A, B, C, and D for maps which show the location of bicycle injury collisions in 2008, as well as from 1998 to 2008.

Figure 1. Bicycle Injury Collisions in San Francisco (1998-2008)

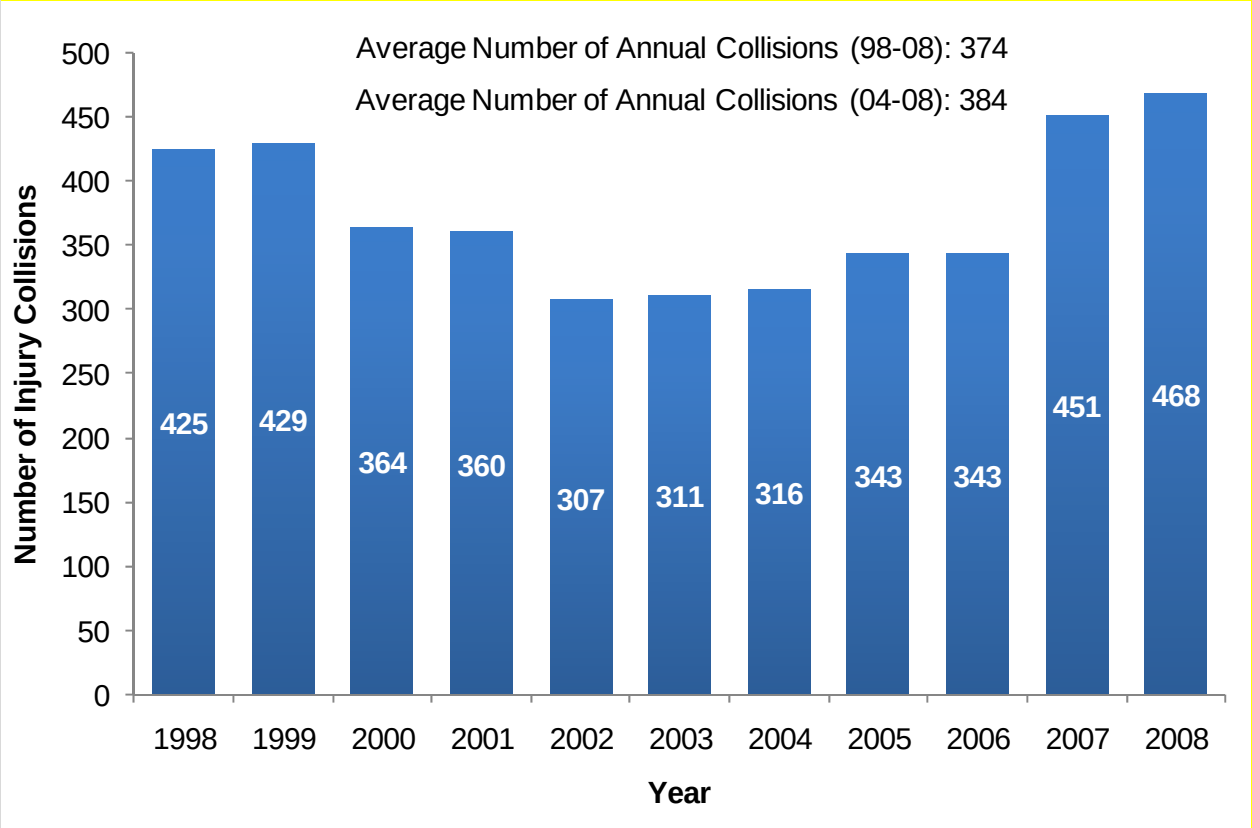


Table 1. Percentage Change in Annual Bicycle Injury Collisions and Bicycle Injuries Collisions as a Percentage of All Citywide Collisions (1998-2008)

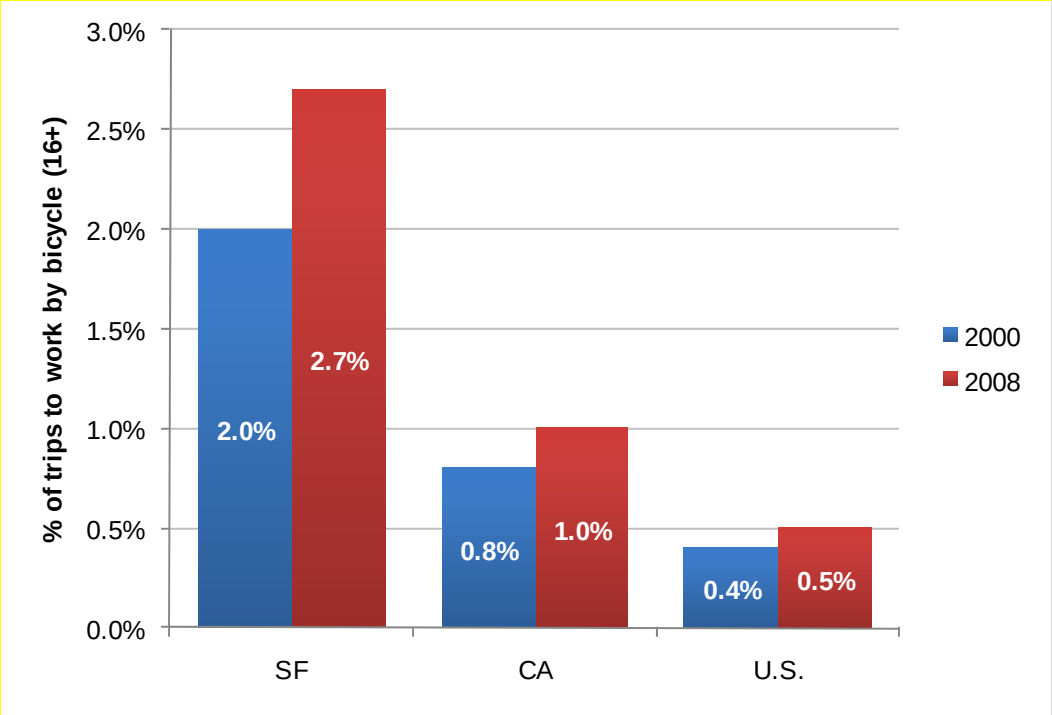
	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
% change from previous year	n/a	0.9%	-15.2%	-1.1%	-14.7%	1.3%	1.6%	8.5%	0.0%	31.5%	3.8%
% of all citywide fatal and injury collisions	9.1%	9.9%	8.6%	9.1%	8.1%	8.8%	10.3%	10.5%	11.8%	14.7%	15.4%

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

At the same time, however, 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 2008 U.S. Census American Community Survey found that 2.7 percent of *work trips* in San Francisco are made by bicycle, a substantial increase from the 2.0 percent figure in the 2000 U.S. Census (see Figure 2). Furthermore, the *2008 San Francisco State of Cycling Report* used phone and intercept surveys of City residents to determine that 6 percent of *all trips* in San Francisco are made by bicycle. This amounts to over 128,000 trips made by bicycle each day[2].

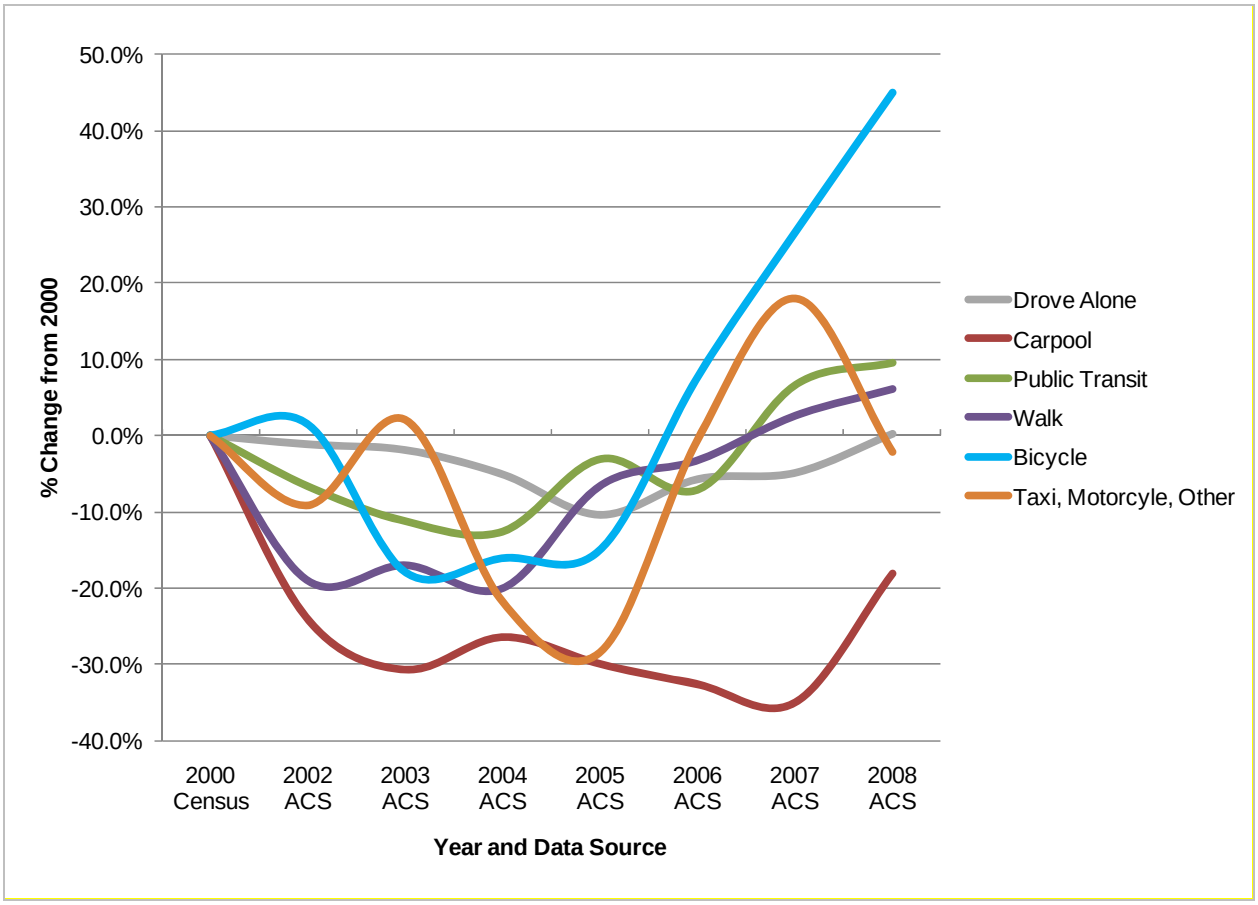
Figure 2. Bicycle Trips to Work (U.S. Census, ACS 2008)



- U.S. Census data also show (see Figure 3) that bicycling as a means of travel to work has increased at a much faster rate (45 percent increase), relative to 2000, than all other travel modes. See Appendix H for more details.

[2] Please see the *2008 San Francisco State of Cycling Report* for more information.

Figure 3. Change in Mode Split Relative to 2000



- 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 percent citywide increase in bicyclists since 2006[3].

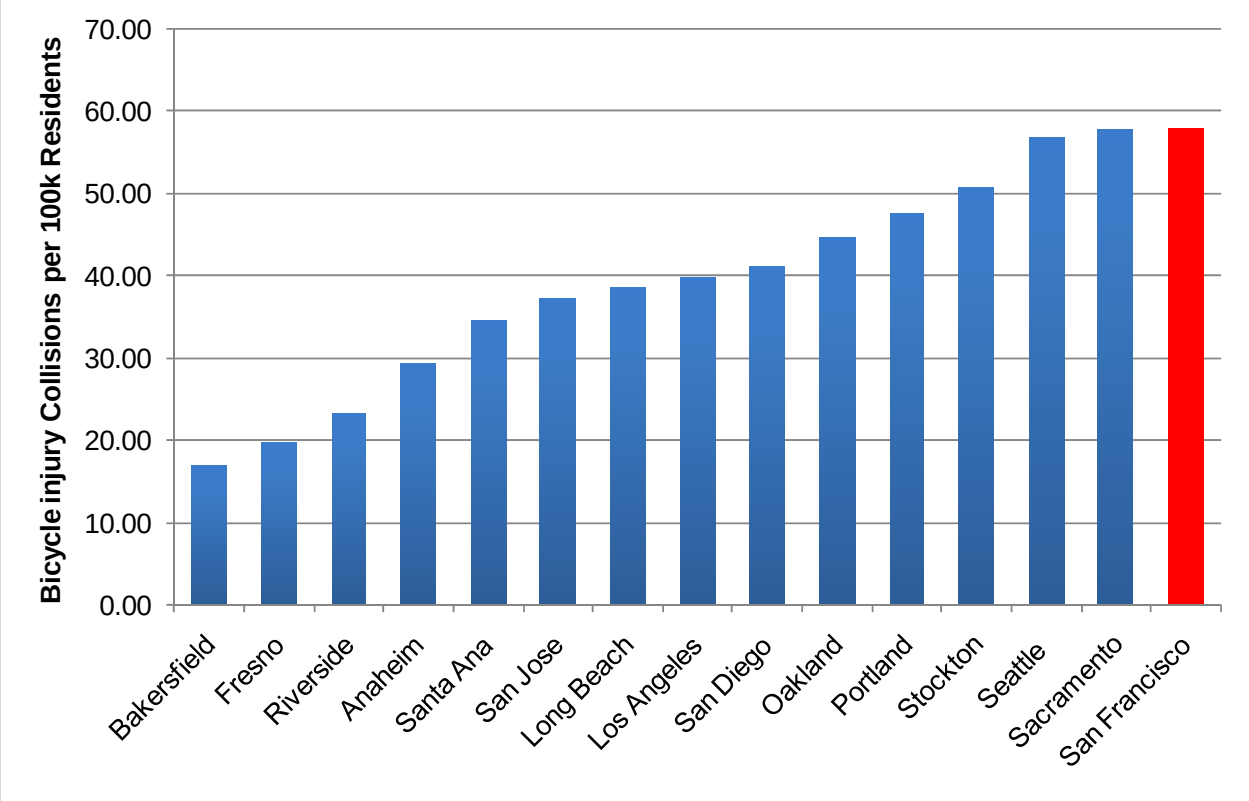
Therefore, it is important to note that one of the primary challenges when analyzing bicycle collision data is developing an accurate and definitive *collision rate*. As discussed above, there has been an increase in bicycle collisions, but also in the number of bicyclists on San Francisco streets in recent years. What might appear as a dramatic increase in collisions, therefore, might not be an actual increase in the overall *rate* of bicycle collisions. Unfortunately, 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.

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

However, one admittedly imperfect way of trying to establish a "collision rate" for bicycles is based on the number of people bicycling to work. This simplified measurement omits the vast numbers and varieties of non-commuting bicyclists, as well as 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. Nevertheless, until the SFMTA has additional longitudinal exposure data for bicyclists, the number of injury collisions per bicycle commuter can serve as an approximate substitute.

The figures[4] below show 2008 comparisons between San Francisco and other California cities with more than 250,000 residents. Portland and Seattle, two other well-known bicycling cities, were also included for comparison purposes. Figure 4 reveals that in 2008 San Francisco had the highest number of collisions per 100,000 residents, slightly higher than Sacramento and Seattle.

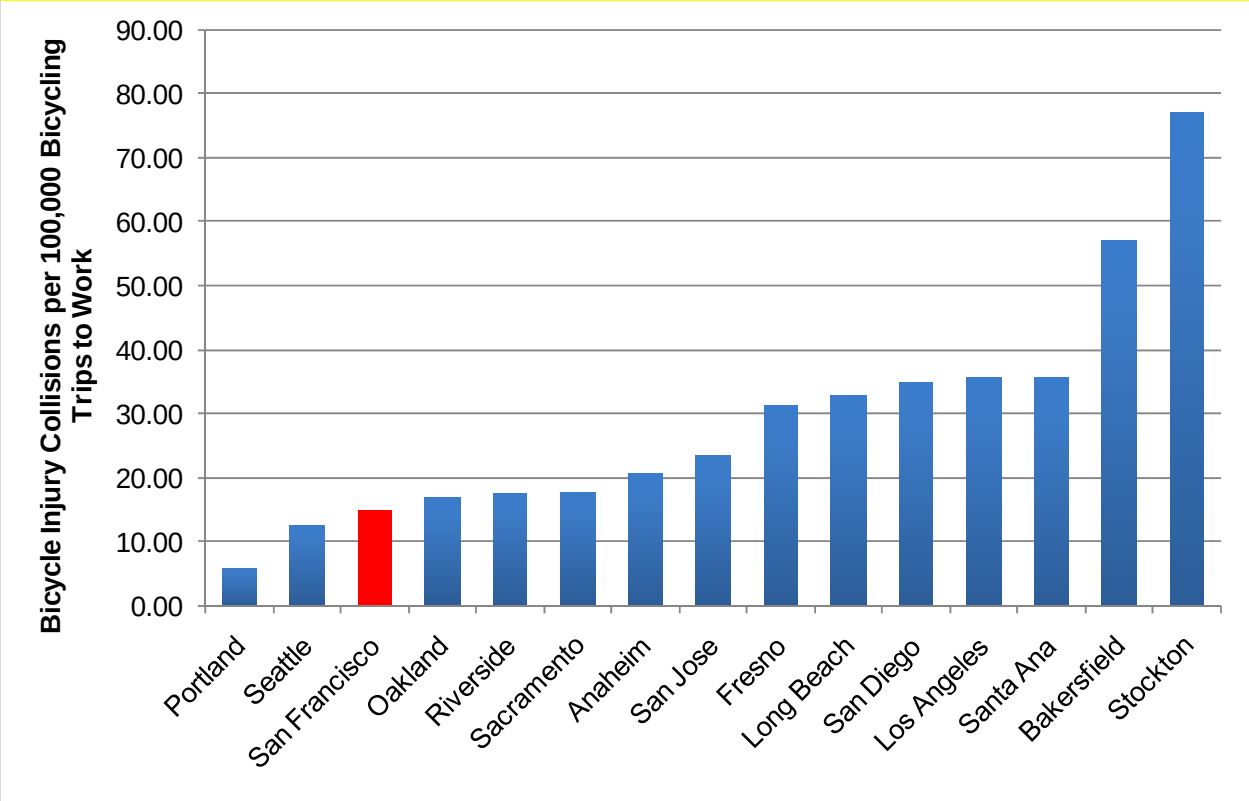
Figure 4. 2008 Bicycle Injury Collisions per 100,000 Residents (CA Cities with 250,000 Residents + Selected Cities)



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

On the other hand, Figure 5 shows that in 2008 San Francisco had the lowest number of bicycle injury collisions per 100,000 bicycling trips to work among California cities with more than 250,000 residents. Only Seattle and Portland had lower collision rates.

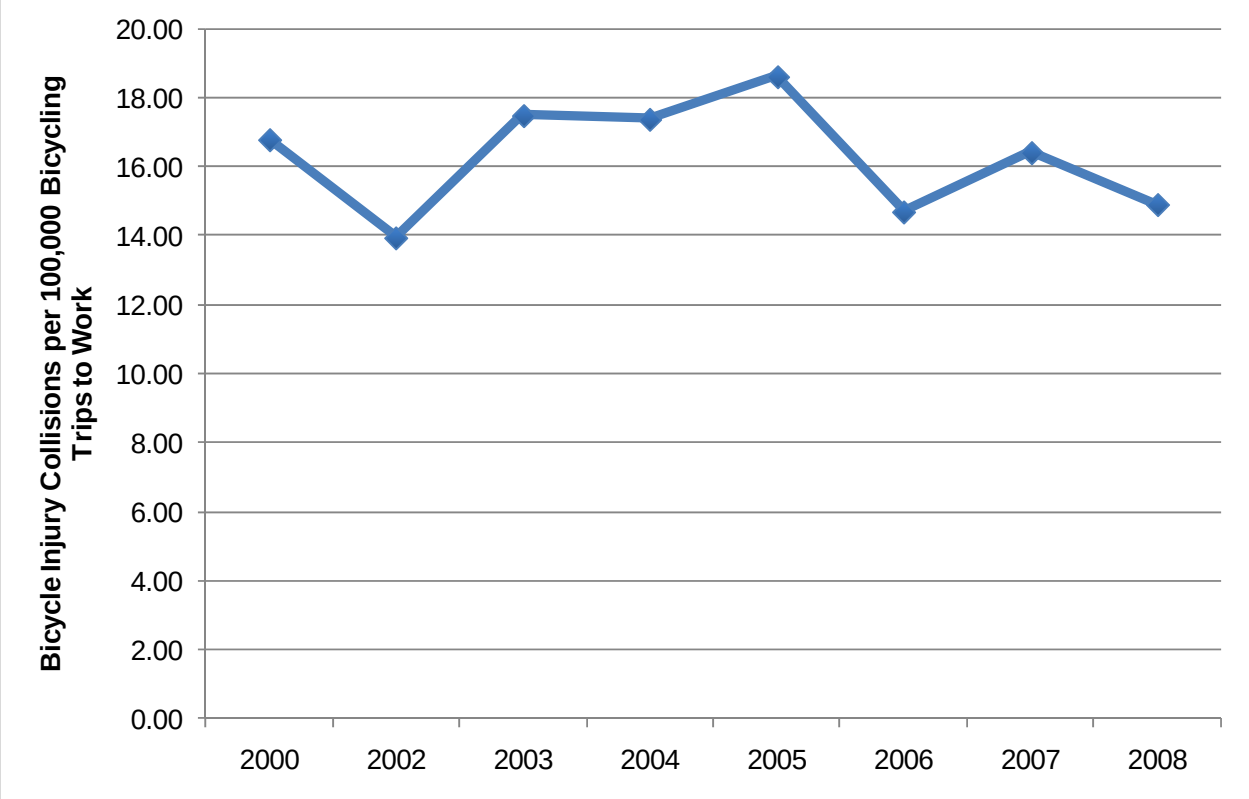
Figure 5. 2008 Estimated Bicycle Injury Collision Rate (CA Cities with 250,000 Residents + Selected Cities)



Finally, Figure 6 shows that despite the despite the recent sharp rise in "raw" injury totals, the bicycle injury collision rate for San Francisco since 2000 has remained relatively stable and even decreased 20.1 percent since 2005 (18.63 in 2005 to 14.90 in 2008). Such collision data and ridership trends might reinforce previous studies which have shown that that there is "safety in numbers" for bicyclists[5].

[5] For example: Jacobsen, P.L. "Safety in Numbers: More Walkers and Bicyclists, Safer Walking and Bicycling," *Injury Prevention*, Volume 9, pp. 205-209, 2003.

Figure 6. Estimated San Francisco Bicycle Injury Collision Rate (2000-08)



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. The legal injunction against the implementation of the City's Bicycle Plan prevented the SFMTA from installing any new physical bicycle infrastructure, such as bicycle lanes, sharrows[6], or bicycle racks since June 20th of 2006.

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

Facility Type	2002	2003	2004	2005	1/1/06 - 6/19/06	6/20/06 - 12/31/06	2007	2008	1/1/09 - 11/30/09	12/1/2009
Sharrows (miles)	0	0	1.9	16.7	3.2	0	0	0	0	Partial revision of injunction allows for limited implementation
Bicycle Lanes (miles)	4.6	4.4	1.3	3.8	2.2	0	0	0	0	
Bicycle Racks*	350	350	350	350	150	0	0	0	0	

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

[6] 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.

In late November of 2009 the San Francisco Superior Court agreed to partially lift the 2006 injunction against the City's Bike Plan. The modification allowed the SFMTA Bike Program to begin implementation of bicycle network improvements, including ten bicycle lane projects, sharrows, and bicycle racks. The City will return to the Court this summer to ask for a complete lifting of the injunction.

III. High Collision Intersections and Corridors

In 2008, 60 percent of bicycle injury collisions occurred within an intersection[7]. 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 creates a particularly challenging environment for roadway users.

Table 3. Bicycle Injury Collisions at Intersections vs. Mid-Block Street Segments (1998-2008)

	1998		1999		2000		2001		2002		2003		2004		2005		2006		2007		2008		98-08	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Intersections	234	55%	235	55%	220	60%	204	57%	196	64%	177	57%	190	60%	213	62%	217	63%	287	64%	281	60%	2454	60%
Mid-block Street Segments	191	45%	194	45%	144	40%	156	43%	111	36%	134	43%	126	40%	130	38%	126	37%	164	36%	187	40%	1663	40%
TOTAL	425		429		364		360		307		311		316		343		343		451		468		4117	

Intersections

Table 4 shows the intersections[8] with the highest number of bicycle injury collisions in 2008, while Table 5 shows the intersections with the highest number of bicycle injury collisions over the past five years. In 2008, Market Street and Valencia Street had the most bicycle injury collisions in 2008 (eight collisions), while Fell Street and Masonic Avenue had the most bicycle injury collisions over the five-year period from 2004 to 2008 (twenty collisions). In September of 2008 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.

Market Street and Octavia Street was the intersection with the second most bicycle injury collisions from 2004 to 2008. 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.

[7] Any collision within 20 feet of an intersection is considered to be "within an intersection."

[8] When analyzing the intersections with the highest number of collisions, the search parameters were expanded from within 20 feet of an intersection to within 100 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. Intersections with the Highest Number of Bicycle Injury Collisions (2008)

Intersection	Number of Collisions
Market Street and Valencia Street	8
Fell Street and Masonic Avenue	6
Market Street and Octavia Blvd	6
16th Street and Guerrero Street	4
Duboce Avenue and Valencia Street	4
Geary Blvd and Polk Street	4
6 intersections	3

Table 5. Intersections with the Highest Number of Bicycle Injury Collisions (2004-2008)

Intersection	Number of Collisions
Fell Street and Masonic Avenue	20
Market Street and Octavia Blvd	18
Duboce Street and Valencia Street	12
Market Street and Valencia Street	11
14th Street and Guerrero Street	9
16th Street and Valencia Street	8
Geary Blvd and Polk Street	8
Market Street and Gough Street	8
14th Street and Folsom Street	7
6th Street and Folsom Street	7
Market Street and South Van Ness Ave	7
McAllister Street and Polk Street	7

Corridors

Several travel corridors in San Francisco, as shown in Tables 6 and 7, have emerged as the primary “hot spots” for bicycle injury collisions. Not surprisingly, Market Street had the most bicycle injury collisions not only in 2008, but also over the past five years. With its flat topography and direct access to downtown, Market Street serves as a primary travel corridor for bicyclists. In 2008, there were 49 bicycle injury collisions on Market Street. From 2004 to 2008, there were 200 bicycle injury collisions on Market Street.

Table 6. Corridors with Highest Number of Bicycle Injury Collisions (2008)

Corridor	In Bicycle Network	Existing Bicycle Facility	2008
Market Street	Y	Sharrows and bicycle lanes	49
Valencia Street	Y	Bicycle lane	35
16th Street	Y	Discontinuous bicycle lanes	26
Polk Street	Y	Sharrows and bicycle lanes	19
Guerrero Street	Y	Bicycle lane	18
Mission Street	N	None	18
17th Street	Y	None	15
Turk Street	Y	Bicycle lane	15
Masonic Avenue	Y	None	14
Van Ness Avenue	N	None	14

Table 7. Corridors with Highest Number of Bicycle Injury Collisions (2004-2008)

Corridor	In Bicycle Network	Existing Bicycle Facility	2004-08
Market Street	Y	Sharrows and bicycle lanes	200
Mission Street	N	None	115
Valencia Street	Y	Bicycle lane	94
Polk Street	Y	Sharrows and bicycle lanes	85
Van Ness Avenue	N	None	79
16th Street	Y	Discontinuous bicycle lanes	71
Folsom Street	Y	Bicycle lane	63
Turk Street	Y	Bicycle lane	47
Divisadero Street	N	None	44
Geary Boulevard	N	None	43

It also appears that bicycle travel along Market Street is increasing. The 2009 bicycle counts[9] 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 percent.

Several other corridors had high collision totals for both 2008 and the five-year period from 2004 to 2008. Mission Street, Valencia Street, Polk Street, Van Ness Avenue, and 16th Street are all corridors with a consistently high number of bicycle injury collisions.

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

IV. Severity of Bicycle Injury Collisions

Since 1998 there have been 20 fatal bicycle collisions in San Francisco or an average of 1.8 fatal collisions per year. In 2008 there were three fatal collisions, the highest number since there were four fatal collisions in 2001.

Table 8. Fatal Bicycle Collisions in San Francisco (1998-2008)

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	Total
Number of Fatal Collisions	2	1	2	4	1	1	1	2*	2**	1	3	20

* 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 1998. Severity of collisions is divided 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 2008 bicycle injury collisions by severity of injury.

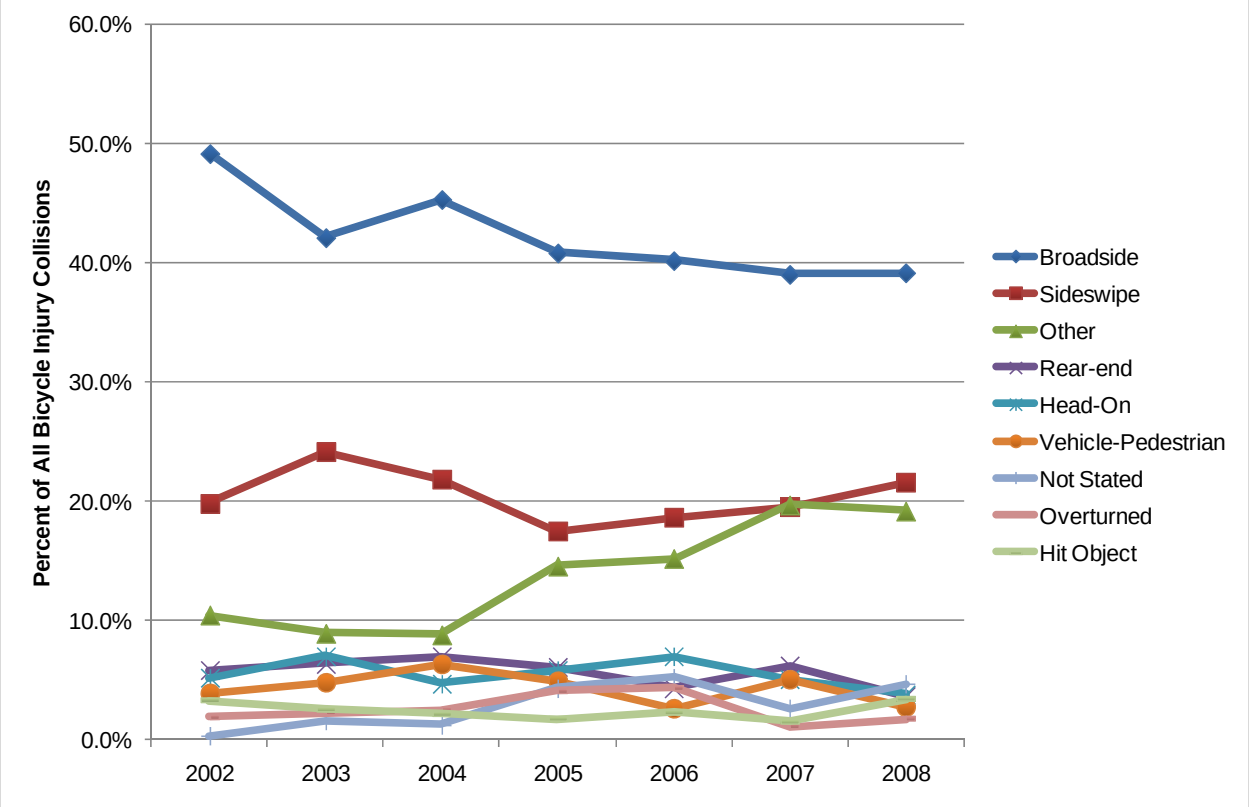
Table 9. Severity of Bicycle Injury Collisions (1998-2008)

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Fatal	<1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%
Severe	4%	5%	4%	5%	4%	6%	8%	7%	7%	8%	5%
Other visible injury	54%	58%	51%	50%	57%	44%	43%	48%	47%	48%	51%
Complaint of pain	41%	37%	41%	36%	39%	44%	44%	41%	47%	43%	43%

V. Collision Types

SWITRS data break down the types of collisions into nine categories. The data show that the vast majority of bicycle injury collisions are either a "broadside" (collisions at or near 90 degrees) or "sideswipe" (collisions at a far more oblique angle, such as in a narrow lane). In 2008 broadside collisions were the highest share of collision types at 39.1 percent. Sideswipe collisions were second at 21.6 percent. Similar trends exist from 2002 to 2008[10], with broadside and sideswipe collisions representing 41.8 percent and 20.4 percent, respectively.

Figure 7. Bicycle Injury Collisions by Collision Type (2002-2008)



As shown in Figure 7, broadside collisions have decreased as a share of overall collisions by more than 10 percent (49.2 percent to 39.1 percent) since 2002. At the same time, sideswipe collisions have increased more than 4 percent since 2004 (17.5 percent to 21.6 percent). Rear-end and head-on collisions have consistently remained a very small percentage of collision factors.

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

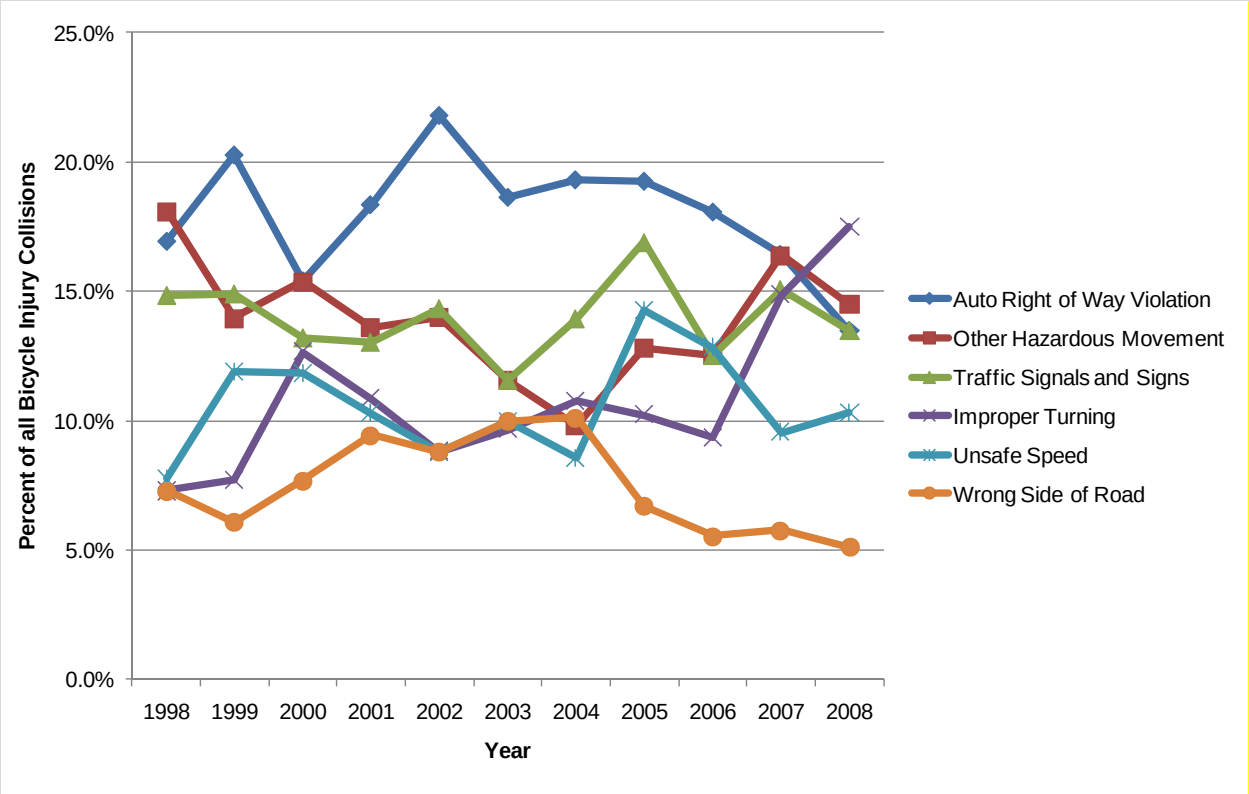
Table 10. Bicycle Injury Collisions by Collision Type (2002-2008)

	2002	2003	2004	2005	2006	2007	2008	2002-08
Broadside	49.2%	42.1%	45.3%	40.8%	40.2%	39.0%	39.1%	41.8%
Sideswipe	19.9%	24.1%	21.8%	17.5%	18.7%	19.5%	21.6%	20.4%
Other	10.4%	9.0%	8.9%	14.6%	15.2%	19.7%	19.2%	14.5%
Rear-end	5.9%	6.4%	7.0%	6.1%	4.4%	6.2%	3.6%	5.6%
Head-On	5.2%	7.1%	4.7%	5.8%	7.0%	5.1%	3.8%	5.4%
Vehicle-Pedestrian	3.9%	4.8%	6.3%	5.0%	2.6%	5.1%	2.8%	4.3%
Not Stated	0.3%	1.6%	1.3%	4.4%	5.2%	2.7%	4.7%	3.0%
Overturned	2.0%	2.3%	2.5%	4.1%	4.4%	1.1%	1.7%	2.5%
Hit Object	3.3%	2.6%	2.2%	1.7%	2.3%	1.6%	3.4%	2.4%

VI. Primary Collision Factors

SWITRS data also list 20 different primary collisions factors (PCFs) in its database. Figure 8 and Table 11 identify the top six PCFs over the past ten years and highlights their long-term trends. From 1998 to 2007, “Auto Right-of-Way Violation” was consistently the top PCF for bicycle injury collisions. In 2008, however, “Improper Turning” was the highest PCF at 17.5 percent, while “Auto Right-of-Way Violation” continued its four year decline to 13.5 percent.

Figure 8. Most Frequently Cited Primary Collision Factors (1998-2008)



Of the top six PCFs, “Improper Turning” has shown the greatest increase over both the eleven-year period, as well as the more recent five-year period. In 1998, “Improper Turning” was the PCF in 7.3 percent of all bicycle injury collisions. In 2008, however, that number had increased to 17.5 percent. Also of note is the recent downward trend in "Wrong Side of Road" as a PCF. In 2004, “Wrong Side of the Road" was the PCF in 10.1 percent of bicycle injury collisions, but in the last four years that figure has declined to 5.1 percent.

Table 11. Most Frequently Cited Primary Collision Factors (1998-2008)

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	98-08
Auto Right of Way Violation	16.9%	20.3%	15.4%	18.3%	21.8%	18.6%	19.3%	19.2%	18.1%	16.4%	13.5%	17.8%
Other Hazardous Movement	18.1%	14.0%	15.4%	13.6%	14.0%	11.6%	9.8%	12.8%	12.5%	16.4%	14.5%	14.1%
Traffic Signals and Signs	14.8%	14.9%	13.2%	13.1%	14.3%	11.6%	13.9%	16.9%	12.5%	15.1%	13.5%	14.0%
Improper Turning	7.3%	7.7%	12.6%	10.8%	8.8%	9.6%	10.8%	10.2%	9.3%	14.9%	17.5%	11.1%
Unsafe Speed	7.8%	11.9%	11.8%	10.3%	8.8%	10.0%	8.5%	14.3%	12.8%	9.5%	10.3%	10.5%
Wrong Side of Road	7.3%	6.1%	7.7%	9.4%	8.8%	10.0%	10.1%	6.7%	5.5%	5.8%	5.1%	7.3%

VII. California Vehicle Code (CVC) Violations

Table 12 shows the top ten CVC violations in 2008. With 61 instances, CVC 22107 ("Unsafe Turning without Signaling") was the most common CVC violation in 2008. In 58 of those instances fault was assigned[11], with 83 percent of the time fault assigned to motorists. The second and third-most common violations in 2008 involve: unsafe speed (CVC 22350) and opening a car door when unsafe, or "dooring" (CVC 22517). As shown in Table 13, the top ten CVC violations comprised 66.7 percent of all collisions in 2008. Table 13 also shows that motorists were assigned fault in 48.7 percent of bicycle injury collisions in 2008, while bicyclists were assigned fault in 49.6 percent of collisions (where fault was assigned). Similarly, from 1998 to 2008, bicyclists were assigned fault in a slight majority of bicycle injury collisions (where fault was assigned) at 51.4 percent (see Appendix J). Please see Appendices I and J for a complete table of all 2008 and 1998-08 collisions organized by CVC violation.

Table 12. Top Ten CVC Violations in Bicycle Injury Collisions (2008)

Rank	Description	CVC Section	# of collisions	# of collisions where fault was assigned	# of Motorists assigned fault	% Motorists assigned fault	# Bicyclists assigned fault	% Bicyclists assigned fault
1	Unsafe Turn without Signaling	22107	61	58	48	83%	10	17%
2	Unsafe Speed	22350	48	47	8	17%	39	83%
3	Opening Car Door when Unsafe	22517	48	44	43	98%	1	2%
4	Failure to Yield when Turning Left	21801.a	41	39	36	92%	3	8%
5	Failure to Stop at Red Light Limit Line	21453.a 21453.c	38	37	5	14%	32	86%
6	Failure to Stop at STOP sign Limit Line	22450 22450.a	23	23	1	4%	22	96%
7	Wrong Side of Roadway	21650 21650.1	16	16	1	6%	15	94%
8	Unsafe Lane Change	21658.a	14	13	6	46%	7	54%
9	Unsafe Pass on Left	21750	12	11	5	45%	6	55%
10	Failure to Yield ROW Entering Highway	21802.a 21802.b	11	8	5	63%	3	38%
	TOTAL		**312**	**296**	**158**	**53.4%**	**138**	**46.6%**

[11] 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. Summary of Assigned Fault in CVC Violations in Bicycle Injury Collisions (2008)

	# of collisions	%
All Bicycle Injury Collisions	468	100%
# of injury collisions where fault was assigned	413	88.2%
10 Most Frequently Cited CVC Violations	312	66.7%
Motorists at Fault in all Bicycle Injury Collisions (where fault assigned)	201	48.7%
Bicyclists at Fault in all Bicycle Injury Collisions (where fault assigned)	205	49.6%

Motorist-caused collisions

The five most commonly reported behaviors of motorists that resulted in collisions with bicycles in 2008 are shown below in Table 14. Unsafe turning without signaling was the most frequent motorist violation at 48 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 48.7 of 2008 bicycle injury collisions where fault was assigned. Only 1 of 201 motorist-caused bicycle collisions (.5 percent) involved drugs or alcohol, as shown in Appendix I.

Table 14. Top Five CVC Violations in Bicycle Injury Collisions Where Motorists Were Most Frequently Assigned Fault (2008)

Rank	Description	CVC Section	# of collisions	# of collisions where fault was assigned	# Motorists assigned fault	% Motorists assigned fault	# Bicyclists assigned fault	% Bicyclists assigned fault
1	Unsafe Turn without Signaling	22107	61	58	48	83%	10	17%
2	Opening Car Door when Unsafe	22517	48	44	43	98%	1	2%
3	Failure to Yield when Turning Left	21801.a	41	39	36	92%	3	8%
4	Unsafe Speed	22350	48	47	8	17%	39	83%
5	Unsafe Lane Change	21658.a	14	13	6	46%	7	54%
	TOTAL		**212**	**201**	**141**	**70%**	**60**	**30%**

Bicyclist-caused collisions

In 2008, bicyclists were most frequently assigned fault in collisions for: unsafe speed; failure to stop at the limit line for red lights; failure to stop at the limit line for STOP signs; riding on the wrong side of the roadway; and unsafe turns without signaling, as shown in Table 15. There were 39 bicycle injury collisions for which unsafe speed was the CVC violation. Of these collisions, nearly five times as many bicyclists were reported at fault than motorists (39 vs. 8). As shown in Appendix I, there were 3 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 (2008)

Rank	Description	CVC Section	# of collisions	# of collisions where fault was assigned	# Motorists assigned fault	% Motorists assigned fault	# Bicyclists assigned fault	% Bicyclists assigned fault
1	Unsafe Speed	22350	48	47	8	17%	39	83%
2	Failure to Stop at Red Light Limit Line	21453.a 21453.c	38	37	5	14%	32	86%
3	Failure to Stop at Stop Sign Limit Line	22450 22450.a	23	23	1	4%	22	96%
4	Wrong Side of Roadway	21650 21650.1	16	16	1	6%	15	94%
5	Unsafe Turn without Signaling	22107	61	58	48	83%	10	17%
	TOTAL		**186**	**181**	**63**	**35%**	**118**	**65%**

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.

VIII. Dooring Collisions

As noted above, dooring was the second most frequent CVC violation in 2008. In 2008, there were 48 dooring collisions, a 4 percent increase over 2007. While dooring collisions as a percentage of all collisions declined steadily from 1998 to 2004, that trend appears to have reversed itself. Table 16 shows that there was a ten-year low of dooring collisions as a percentage of all collisions in 2004 at 6.3 percent, yet that figure increased to 10.3 percent by 2008, slightly lower than 12.0 percent in 1998.

Figure 9. Annual Number of Dooring Collisions (1998-2008)

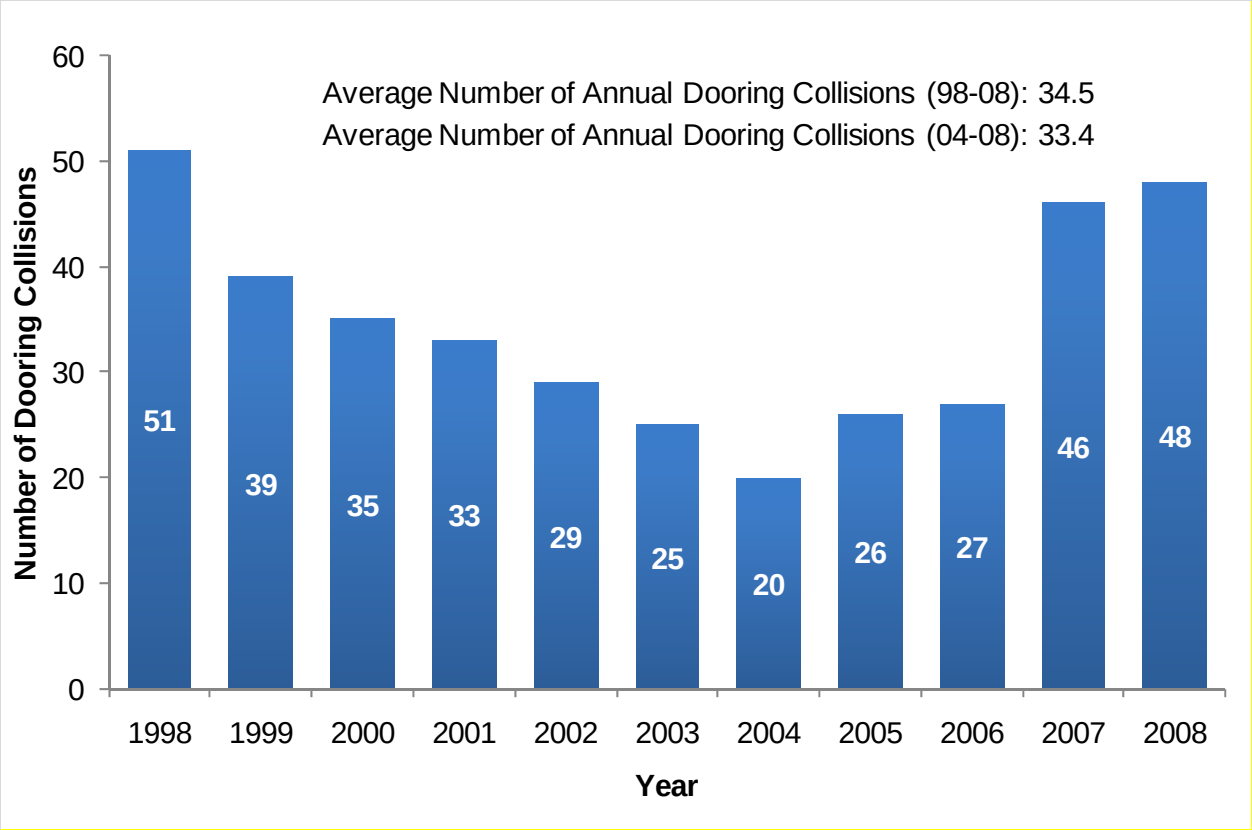


Table 16. Doorings as a Percentage of all Bicycle Injury Collisions (1998-2008)

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	98-08
% of all bicycle injury collisions	12.0%	9.1%	9.6%	9.2%	9.4%	8.0%	6.3%	7.6%	7.9%	10.2%	10.3%	9.2%

IX. Hit & Run Collisions

Since 1998, there have been 417 felony hit-and-run bicycle collisions in San Francisco. Table 17 highlights the decline of felony hit-and-run bicycle injury collisions until 2008, when there was an increase from 30 to 42 (6.7 percent to 9.0 percent of bicycle collisions). In 1998, 12.9 percent of bicycle injury collisions involved felony hit and runs. By 2008 that percentage had declined to 9.0 percent. Misdemeanor hit-and-run collisions have remained at about 1 percent of all bicycle injury collisions since 1998.

Table 17. Felony and Misdemeanor Hit & Run Bicycle Injury Collisions (1998-2008)

	Felony H&R	% of all collisions	Misdemeanor H&R	% of all collisions
1998	55	12.9%	1	0.2%
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%
98-08	417	10.1%	36	0.9%

X. Parties Involved

The vast majority of bicycle injury collisions occur between a bicyclist and a motorist. In 2008, 78.8 percent of all bicycle injury collisions were between a bicyclist and motorist, as compared with 83.3 percent from 1998 to 2008. This number has declined 8.3 percent since 1998. At the same time, bicyclist collisions with pedestrians have decreased from 7.1 percent to 4.5 percent.

Table 18. Parties Involved in Bicycle Injury Collisions (1998-2008)

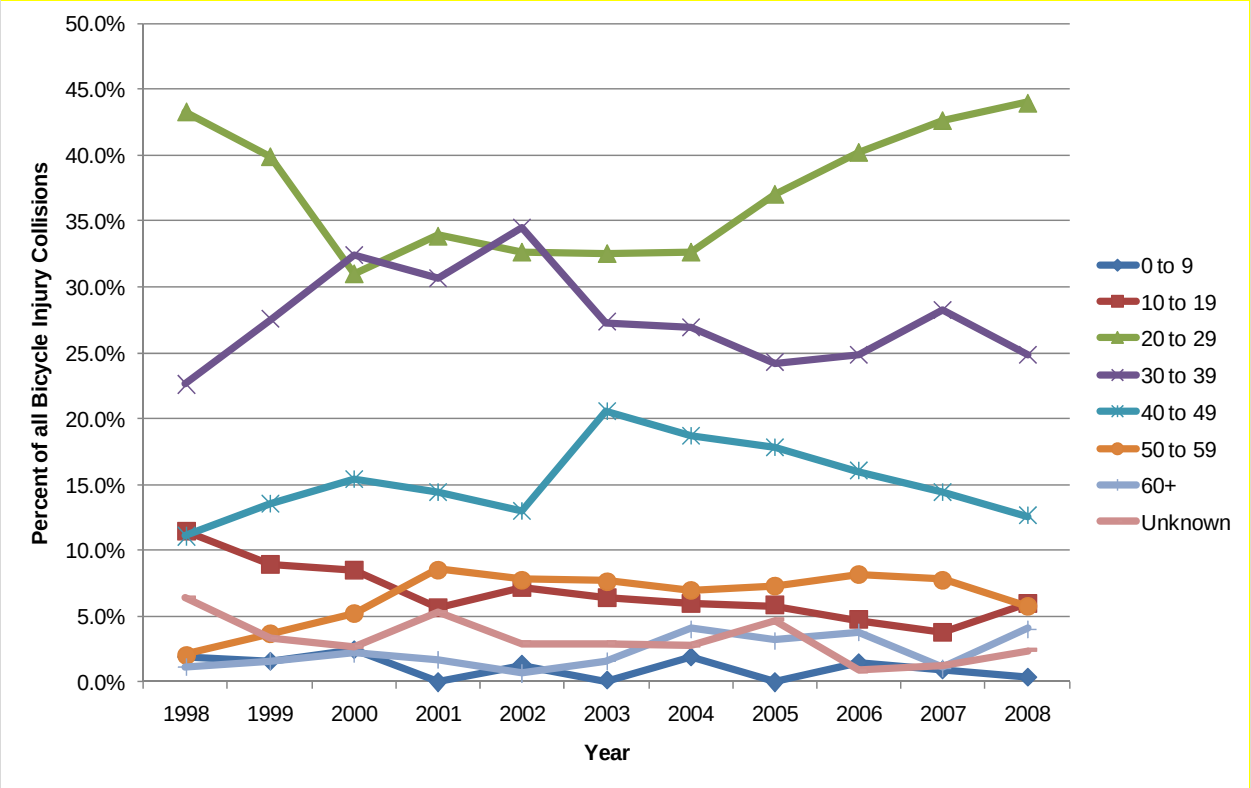
	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	98-08
Bicyclist and Motorist	87.1%	87.4%	86.8%	87.8%	82.7%	82.6%	82.0%	78.4%	79.6%	82.3%	78.8%	83.3%
Bicyclist only	2.1%	4.0%	2.2%	4.2%	4.2%	4.5%	5.4%	6.7%	9.0%	5.8%	7.7%	5.1%
Bicyclist and Parked Vehicle	3.1%	3.7%	2.5%	3.9%	6.5%	6.1%	5.4%	6.7%	5.2%	4.2%	7.7%	5.0%
Bicycle and Pedestrian	7.1%	4.2%	5.8%	4.2%	3.9%	4.5%	5.4%	5.8%	3.2%	4.9%	4.5%	4.9%
Bicyclist and Bicyclist	0.5%	0.0%	1.1%	0.0%	0.3%	1.3%	0.3%	0.6%	0.6%	1.8%	0.6%	0.7%
Bicyclist and Multiple Parties	0.2%	0.7%	1.1%	0.0%	0.0%	0.0%	1.3%	0.6%	0.9%	0.2%	0.2%	0.5%
Bicyclist and Other	0.0%	0.0%	0.5%	0.0%	1.3%	0.3%	0.3%	0.9%	0.3%	0.7%	0.2%	0.4%
Bicyclist and Not Stated	0.0%	0.0%	0.0%	0.0%	1.0%	0.6%	0.0%	0.3%	1.2%	0.2%	0.2%	0.3%

XI. Profile of Injured Bicyclists

Age of Injured Bicyclists

Figure 10 highlights the trends in the age of bicyclists involved in bicycle injury collisions. The 20 to 29 age group was the age cohort most involved in bicycle injury collisions for both 2008 (44 percent) and the eleven-year period from 1998 to 2008 (37.8 percent). Furthermore, this age group's representation in bicycle injury collisions has increased almost 12 percent since 2004. Meanwhile, the 40 to 49 age group's share of bicycle collisions decreased steadily since 2003, from 20.6 percent to 12.6 percent. Finally, the 60+ age group saw a small 3 percent increase in its share of collisions from 2007 to 2008.

Figure 10. Injured Bicyclists by Age Group (1998-2008)



Tables 19 and 20 show the age distribution of injured bicyclists and San Francisco residents, respectively. For both 2008 and the eleven-year period from 1998 to 2008, the age groups 20 to 29 and 30 to 39 are dramatically overrepresented as bicyclists involved in injury collisions relative to their share of the population.

Table 19. Injured Bicyclists by Age Group (1998-2008)

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	98-08
0 to 9	1.9%	1.6%	2.5%	0.0%	1.3%	0.1%	1.9%	0.0%	1.5%	0.9%	0.4%	1.2%
10 to 19	11.5%	8.9%	8.5%	5.6%	7.2%	6.4%	6.0%	5.8%	4.7%	3.8%	6.0%	6.8%
20 to 29	43.3%	39.9%	31.0%	33.9%	32.6%	32.5%	32.6%	37.0%	40.2%	42.6%	44.0%	37.8%
30 to 39	22.6%	27.5%	32.4%	30.6%	34.5%	27.3%	26.9%	24.2%	24.8%	28.2%	24.8%	27.4%
40 to 49	11.1%	13.5%	15.4%	14.4%	13.0%	20.6%	18.7%	17.8%	16.0%	14.4%	12.6%	15.0%
50 to 59	2.1%	3.7%	5.2%	8.6%	7.8%	7.7%	7.0%	7.3%	8.2%	7.8%	5.8%	6.3%
60+	1.2%	1.6%	2.2%	1.7%	0.7%	1.6%	4.1%	3.2%	3.8%	1.1%	4.1%	2.3%
Unknown	6.4%	3.3%	2.7%	5.3%	2.9%	2.9%	2.8%	4.7%	0.9%	1.3%	2.4%	3.2%

Table 20. Age Groups as Percentage of Overall San Francisco Population (2008)

Age Group	% of total population
0 to 9	9.2%
10 to 19	7.4%
20 to 29	12.3%
30 to 39	20.3%
40 to 49	17.5%
50 to 59	13.5%
60+	19.8%

Source: U.S. Census, ACS 2008, Table B01001

Figure 11 shows the share of both youth (5 to 17) and senior (65+) involvement in bicycle injury collisions. Since 1998, seniors have been involved in 1 to 2 percent of all bicycle injury collisions. The percentage of collisions involving youth had steadily decreased since 1998, but from 2007 to 2008 there was a slight increase 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 71.8 percent decrease (39 to 11) in youth bicycle collisions from 1998 to 2008 is not consistent with overall bicycle injury collision trends in San Francisco and may reflect a decrease in youth bicyclists on our streets. For example, in October of 2008 the California Office of Traffic Safety (OTS) conducted a study[12] of bicycle helmet usage at nine middle schools in San Francisco. Unfortunately, no middle school students bicycled to or from school during the observation period.

[12] CA Office of Traffic Safety (OTS) project PS0705, October 2008.

Figure 11. Percentage of Bicycle Injury Collisions involving Youth and Seniors (1998-2008)

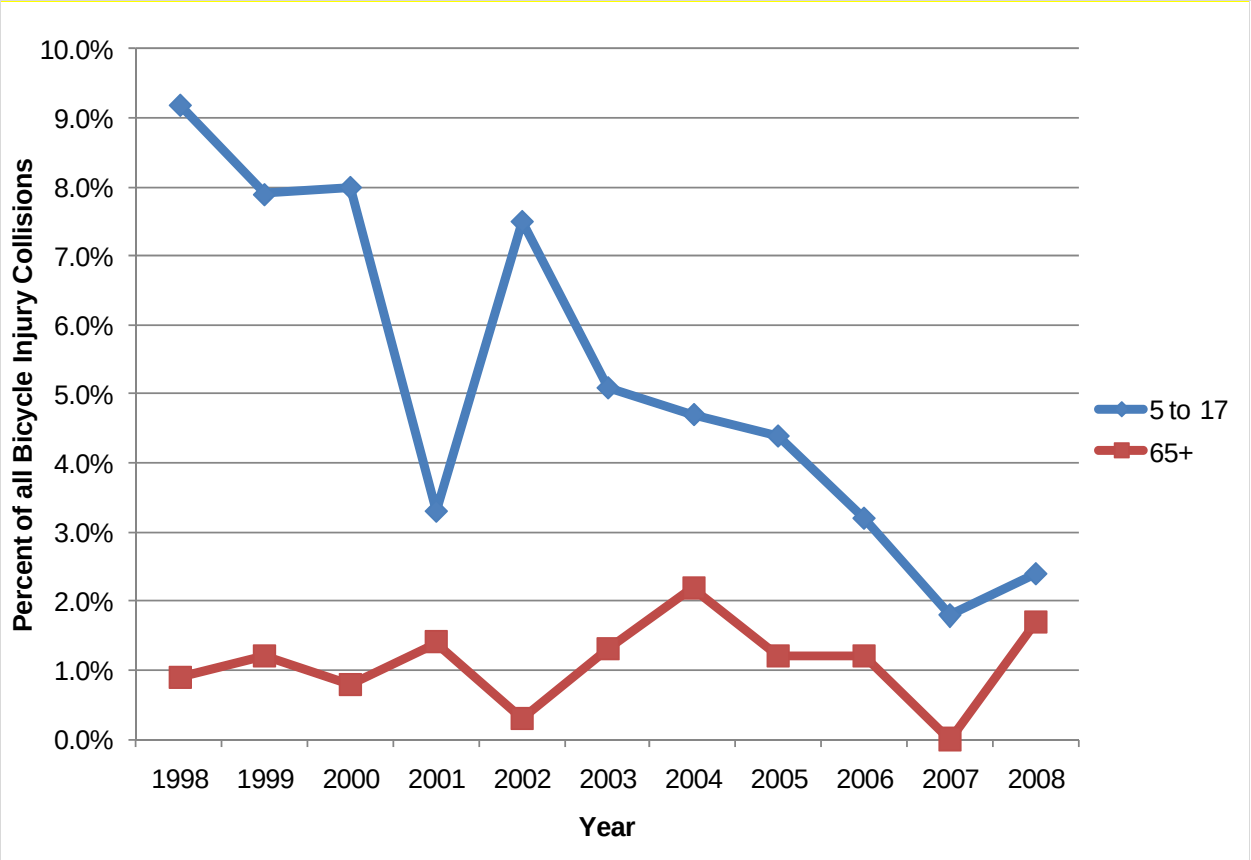


Table 21. Youth and Seniors as a Percentage of Overall San Francisco Population (2008)

Age Group	% of total population
5 to 17	9.4%
65+	14.8%

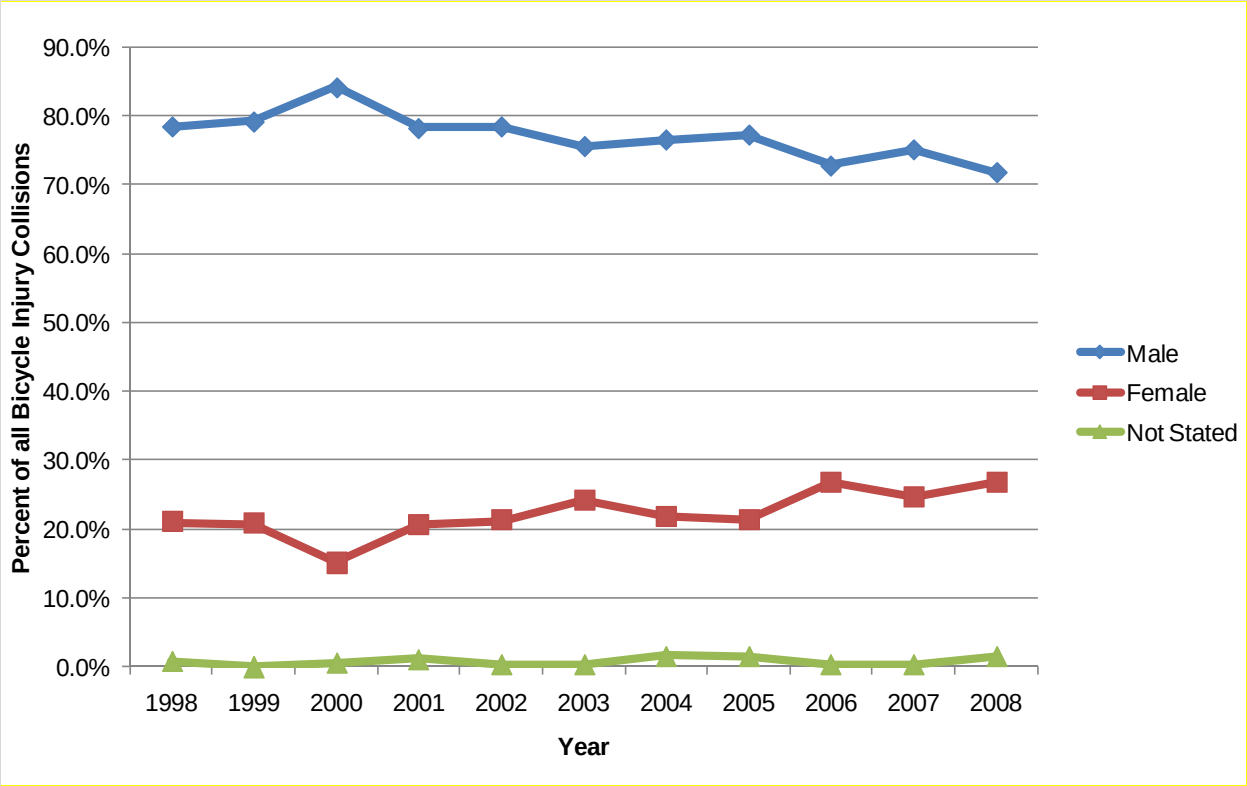
Source: U.S. Census, ACS 2008, Table B01001

Gender of Injured Bicyclists

Males are far more likely to be involved in bicycle injury collisions than females. From 1998 to 2008, 77.0 percent of bicyclists injured in collisions were male, while 22.3 percent were female. This breakdown is generally consistent with the gender split of bicyclists counted in the SFMTA bicycle counts conducted in August of 2009[13]. The 2009 bicycle counts found that 71 percent of observed bicyclists were male, while 29 percent were female.

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

Figure 12. Injured Bicyclists by Gender (1998-2008)



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 percent of bicyclists involved in bicycle injury collisions were female in 2000. By 2008, that number had increased to 26.8 percent, an 11.7 percent increase.

Table 22. Injured Bicyclists by Gender (1998-2008)

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	98-08
Male	78.4%	79.3%	84.3%	78.3%	78.5%	75.6%	76.6%	77.3%	72.9%	75.2%	71.8%	77.0%
Female	20.9%	20.7%	15.1%	20.6%	21.2%	24.1%	21.8%	21.3%	26.8%	24.6%	26.8%	22.3%
Not Stated	0.7%	0.0%	0.5%	1.1%	0.3%	0.3%	1.6%	1.5%	0.3%	0.2%	1.5%	0.7%

XII. 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, Friday was the day of the week in 2008 when the most bicycle injury collisions occurred, with 77 collisions, or 16.5 percent of all collisions. Since 1998, Tuesday (16.6 percent) has been then day when most bicycle injury collisions have occurred, slightly more than on Wednesday (16.3 percent). Saturdays and Sundays were the days with the fewest bicycle injury collisions in both 2008 and since 1998.

Figure 13. Bicycle Injury Collisions by Day of Week (2008)

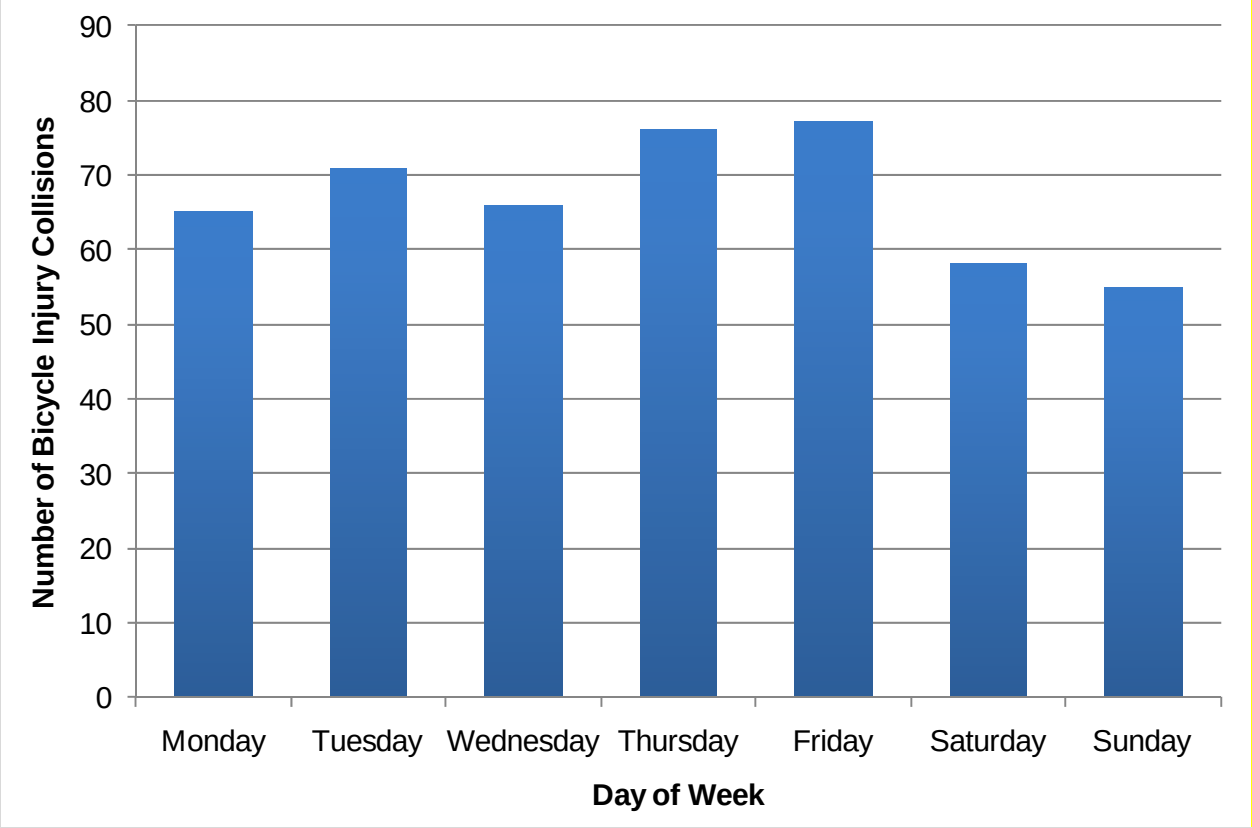


Table 23. Bicycle Injury Collisions by Day of Week (1998-2008)

	2008	%	98-08	%
Monday	65	13.9%	606	14.7%
Tuesday	71	15.2%	685	16.6%
Wednesday	66	14.1%	671	16.3%
Thursday	76	16.2%	653	15.9%
Friday	77	16.5%	640	15.5%
Saturday	58	12.4%	452	11.0%
Sunday	55	11.8%	410	10.0%
TOTAL	468		4,117	

Month of Year

In 2008, October had the most bicycle injury collisions with 57 collisions, or 12.2 percent of all collisions. Similarly, October was the month with the most collisions from 1998 to 2008 with 449 collisions or 10.9 percent of all collisions over the past decade. Figure 14 and Table 24 show the breakdown of bicycle injury collisions by month in 2008 and over the past decade.

Figure 14. Bicycle Injury Collisions by Month (2008)

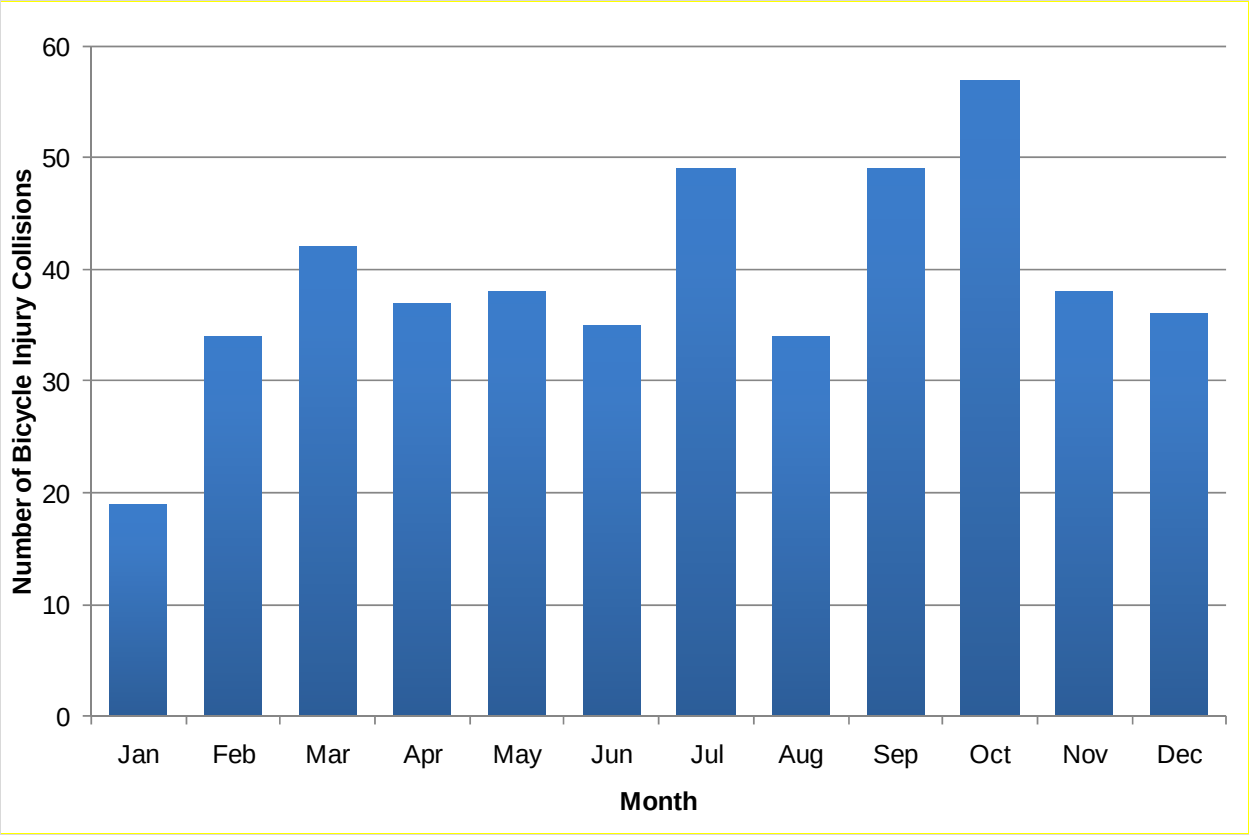


Table 24. Bicycle Injury Collisions by Month (1998-2008)

	2008	%	98-08	%
January	19	4.1%	225	5.5%
Fenruary	34	7.3%	268	6.5%
March	42	9.0%	351	8.5%
April	37	7.9%	352	8.5%
May	38	8.1%	365	8.9%
June	35	7.5%	412	10.0%
July	49	10.5%	366	8.9%
August	34	7.3%	350	8.5%
September	49	10.5%	416	10.1%
October	57	12.2%	449	10.9%
November	38	8.1%	298	7.2%
December	36	7.7%	265	6.4%
TOTAL	468		4117	

Time of Day

In 2008, the hour from 9 a.m. to 10 a.m. had the most bicycle injury collisions with 43, or 9.2 percent of all collisions. Historically, however, the 5 p.m. to 6 p.m. time period was the hour with the most bicycle injury collisions. Nearly 10 percent of all bicycle injury collisions from 1998 to 2008 occurred within this hour. 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 (2008)

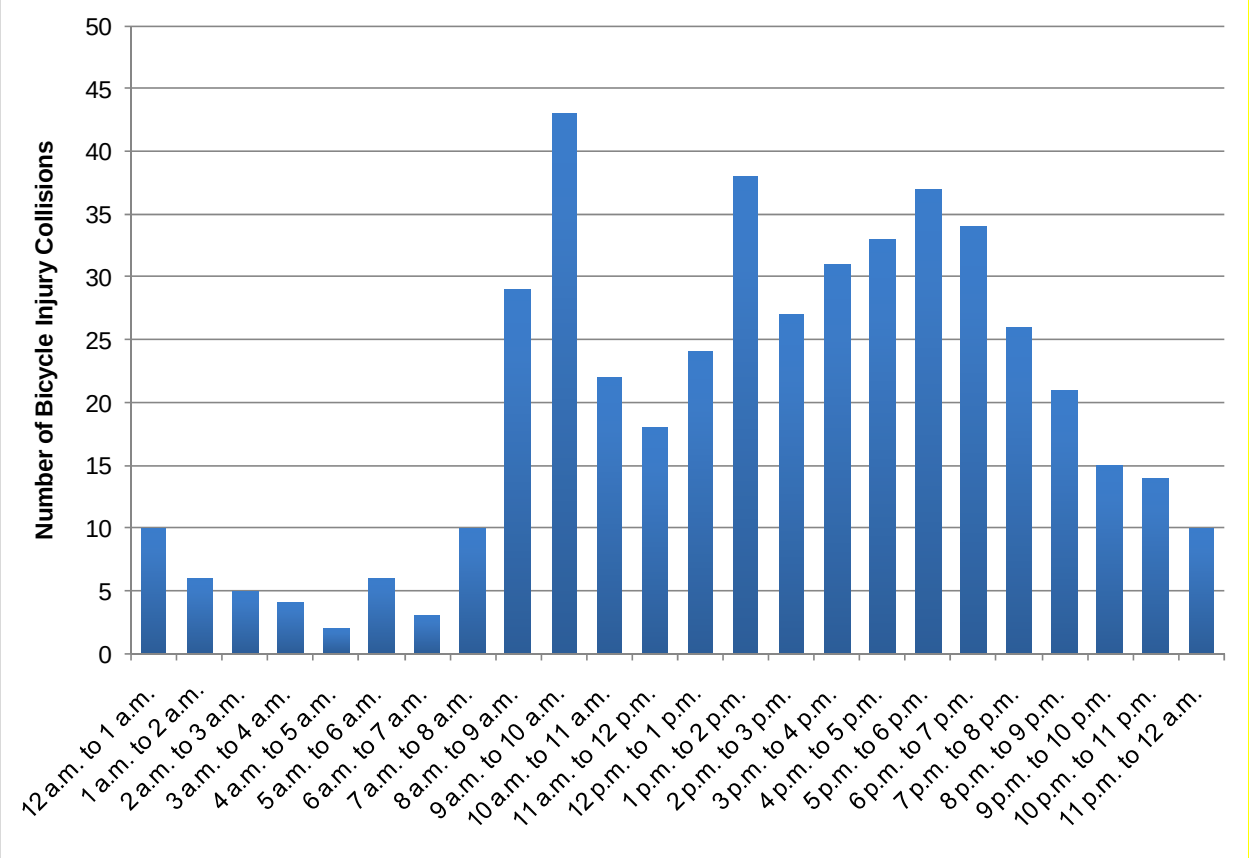
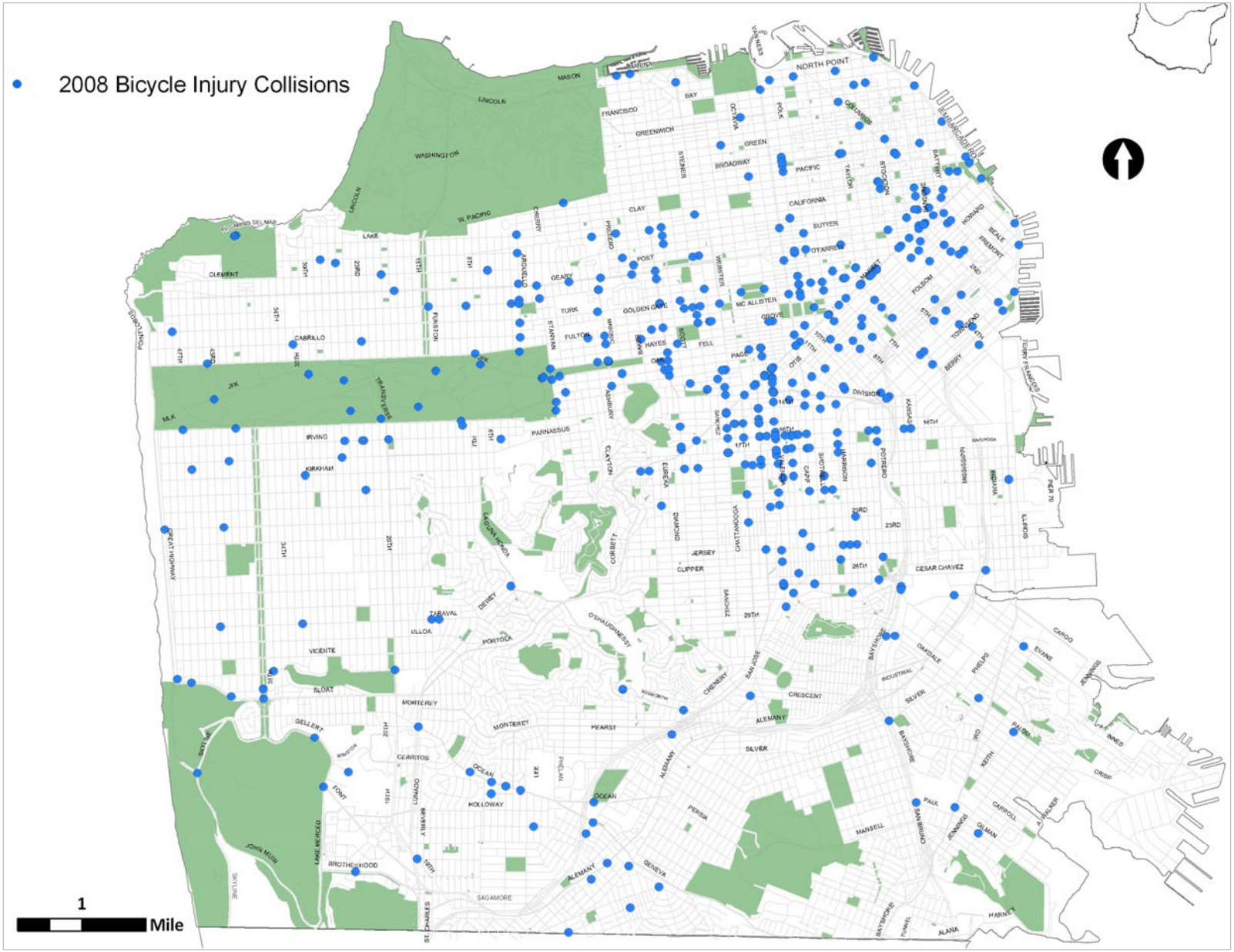


Table 25. Bicycle Injury Collisions by Time of Day (1998-2008)

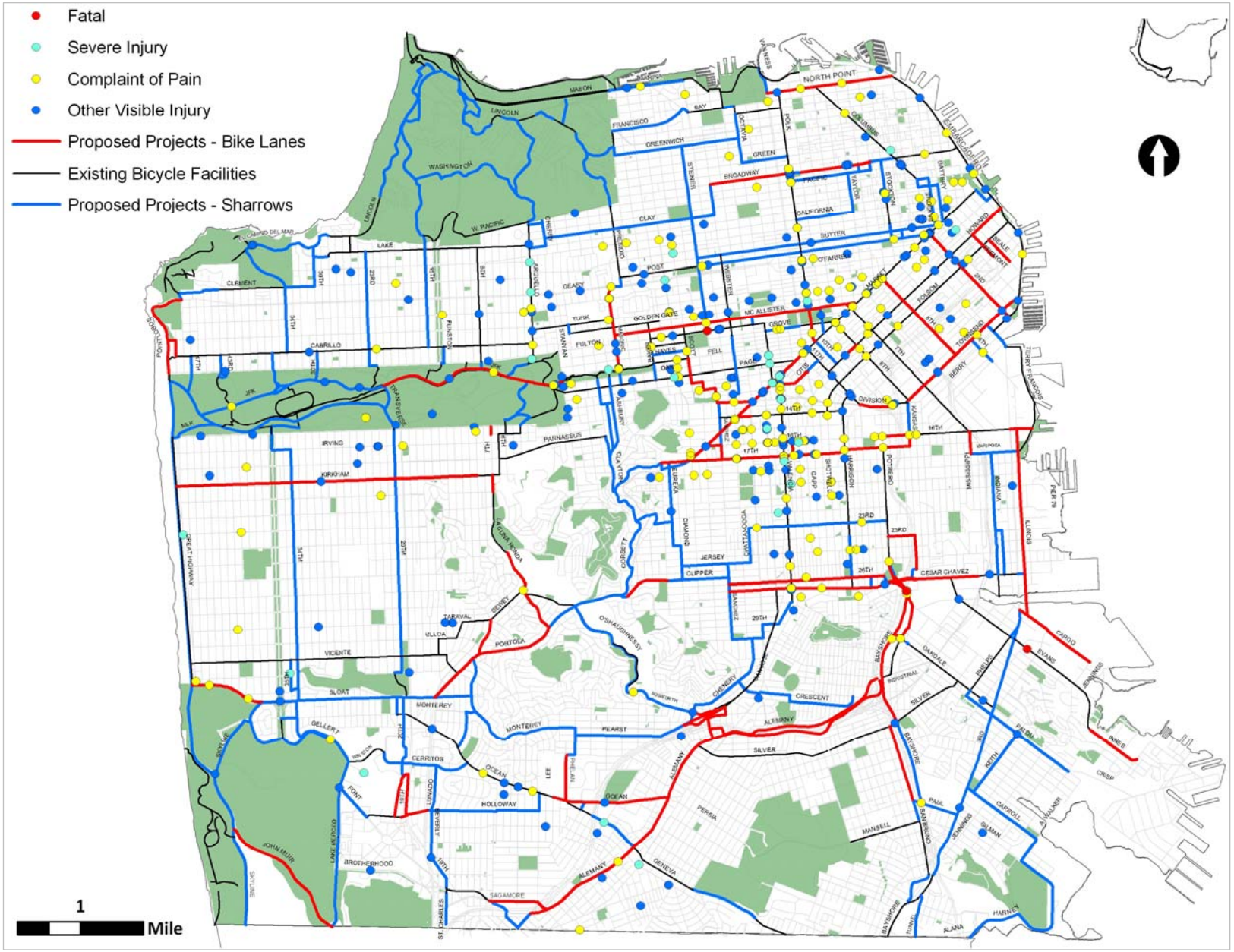
	2008	%	98-08	%
12 a.m. to 1 a.m.	10	2.1%	58	1.4%
1 a.m. to 2 a.m.	6	1.3%	44	1.1%
2 a.m. to 3 a.m.	5	1.1%	38	0.9%
3 a.m. to 4 a.m.	4	0.9%	15	0.4%
4 a.m. to 5 a.m.	2	0.4%	9	0.2%
5 a.m. to 6 a.m.	6	1.3%	27	0.7%
6 a.m. to 7 a.m.	3	0.6%	63	1.5%
7 a.m. to 8 a.m.	10	2.1%	164	4.0%
8 a.m. to 9 a.m.	29	6.2%	283	6.9%
9 a.m. to 10 a.m.	43	9.2%	258	6.3%
10 a.m. to 11 a.m.	22	4.7%	191	4.6%
11 a.m. to 12 p.m.	18	3.8%	198	4.8%
12 p.m. to 1 p.m.	24	5.1%	237	5.8%
1 p.m. to 2 p.m.	38	8.1%	263	6.4%
2 p.m. to 3 p.m.	27	5.8%	284	6.9%
3 p.m. to 4 p.m.	31	6.6%	290	7.0%
4 p.m. to 5 p.m.	33	7.1%	361	8.8%
5 p.m. to 6 p.m.	37	7.9%	390	9.5%
6 p.m. to 7 p.m.	34	7.3%	288	7.0%
7 p.m. to 8 p.m.	26	5.6%	201	4.9%
8 p.m. to 9 p.m.	21	4.5%	141	3.4%
9 p.m. to 10 p.m.	15	3.2%	118	2.9%
10 p.m. to 11 p.m.	14	3.0%	104	2.5%
11 p.m. to 12 a.m.	10	2.1%	92	2.2%
TOTAL	468		4117	

Appendix A. Location of Bicycle Injury Collisions (2008)

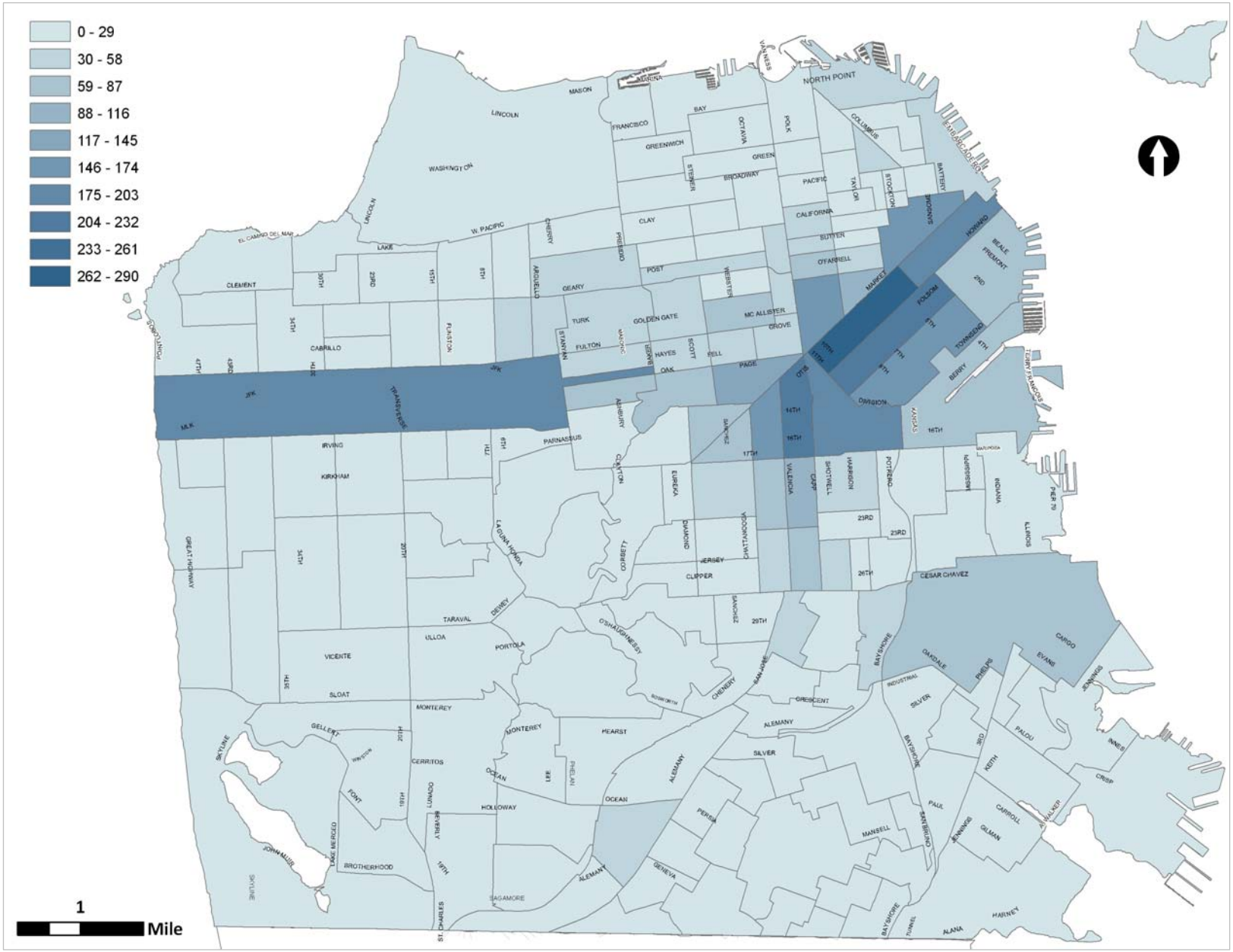


Appendix B. Location of Bicycle Injury Collisions in Downtown Area (2008)

Appendix C. Severity of Injury in Bicycle Injury Collisions (2008)



Appendix D. Number of Bicycle Injury Collisions by Census Tract (1998-2008)



Appendix E. 2008 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 2008 Population*	321,978	474,670	305,428	330,795	324,474	916,715	470,932	3,803,383	1,266,963	365,875	560,194	275,885	582,490	457,849	808,976
2008 Bicycle Injury Collisions**	55	93	71	97	112	341	182	1,512	519	163	266	140	331	264	468
2008 Bicycle Injury Collisions per Capita	0.0001708	0.0001959	0.0002325	0.0002932	0.0003452	0.0003720	0.0003865	0.0003975	0.0004096	0.0004455	0.0004748	0.0005075	0.0005683	0.0005766	0.0005785
2008 Bicycle Injury Collisions per 100,000 residents	**17.08**	**19.59**	**23.25**	**29.32**	**34.52**	**37.20**	**38.65**	**39.75**	**40.96**	**44.55**	**47.48**	**50.75**	**56.83**	**57.66**	**57.85**

*Source: U.S. Census Bureau, 2008 American Community Survey

**Source: California Office of Traffic Safety, 2008 OTS Collision Rankings; 2008 SWITRS; Washington State DOT; Oregon State DOT

Appendix F. 2008 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*	291,579	339,061	442,831	172,887	138,957	207,759	153,905	448,079	192,303	213,370	617,937	1,799,639	148,343	138,827	104,685
Daily bicycle trips to work*	17,365	9,953	12,038	3,711	1,554	5,658	1,787	5,531	1,137	2,124	5,667	16,147	1,193	367	695
Bicycling mode split	6.0%	2.9%	2.7%	2.1%	1.1%	2.7%	1.2%	1.2%	0.6%	1.0%	0.9%	0.9%	0.8%	0.3%	0.7%
2008 Bicycle Injury Collisions**	266	331	468	163	71	264	97	341	93	182	519	1,512	112	55	140
Estimated bicycling trips to work per year***	4,549,630	2,607,686	3,153,956	972,282	407,148	1,482,396	468,194	1,449,122	297,894	556,488	1,484,754	4,230,514	312,566	96,154	182,090
Injury Collisions per Estimated Bicycling Trips to Work	0.0000585	0.0001269	0.0001484	0.0001676	0.0001744	0.0001781	0.0002072	0.0002353	0.0003122	0.0003271	0.0003496	0.0003574	0.0003583	0.0005720	0.0007689
Injury Collisions per 100,000 Annual Bicycling Trips to Work	**5.85**	**12.69**	**14.84**	**16.76**	**17.44**	**17.81**	**20.72**	**23.53**	**31.22**	**32.71**	**34.96**	**35.74**	**35.83**	**57.20**	**76.89**

*Source: U.S. Census Bureau, 2008 American Community Survey

**Source: California Office of Traffic Safety, 2008 OTS Collision Rankings; 2008 SWITRS; Washington State DOT; Oregon State DOT

*** Based on 366 days in 2008 and 262 work days

Appendix G. Estimated Bicycle Injury Collision Rate in San Francisco (2000-08)

	2000	2002	2003	2004	2005	2006	2007	2008
Total Work Trips*	418,553	395,542	383,996	380,507	381,922	394,646	416,568	442,831
Daily bicycle trips to work*	8,302	8,423	6,811	6,962	7,053	8,938	10,514	12,038
Bicycling mode split	2.0%	2.1%	1.8%	1.8%	1.8%	2.3%	2.5%	2.7%
Annual Bicycle Injury Collisions**	364	307	311	316	343	343	451	468
Estimated bicycling trips to work per year***	2,166,822	2,198,403	1,777,671	1,817,082	1,840,833	2,332,818	2,744,154	3,141,918
Injury Collisions per Estimated Bicycling Trips to Work	0.0001680	0.0001396	0.0001749	0.0001739	0.0001863	0.0001470	0.0001643	0.0001490
Injury Collisions per 100,000 Estimated Bicycling Trips to Work	**16.80**	**13.96**	**17.49**	**17.39**	**18.63**	**14.70**	**16.43**	**14.90**

*Source: U.S. Census Bureau, American Community Survey

**Source: California Highway Patrol, SWITRS

***Based on 365 days and 261 working days

Appendix H. San Francisco Journey to Work, Ages 16+ (2000-08)

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

Source: 2000 U.S. Census, SF3, P30; 2002-03 ACS P047; 2004-05 ACS B08006; 2006-08 ACS, B08301

Appendix I. CVC Violations in Bicycle Injury Collisions (2008)

Description	CVC Section	# of collisions	# 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 Turn without Signaling	22107	61	58	48	83%	10	17%	0	0%
Not cited	Not cited	50	13	5	38%	8	62%	0	0%
Unsafe Speed	22350	48	47	8	17%	39	83%	0	0%
Opening Car Door when Unsafe	22517	48	44	43	98%	1	2%	0	0%
Failure to Yield when Turning Left	21801.a	41	39	36	92%	3	8%	0	0%
Failure to Stop at Red Light Limit Line	21453.a 21453.c	38	37	5	14%	32	86%	0	0%
Failure to Stop at Stop Sign Limit Line	22450 22450.a	23	23	1	4%	22	96%	0	0%
Wrong Side of Roadway	21650 21650.1	16	16	1	6%	15	94%	0	0%
Unsafe Lane Change	21658.a	14	13	6	46%	7	54%	0	0%
Unsafe Pass on Left	21750	12	11	5	45%	6	55%	0	0%
Failure to Yield ROW Entering Highway	21802.a 21802.b	11	8	5	63%	3	38%	0	0%
Failure to yield to Approaching Traffic	21804.a	6	6	2	33%	4	67%	0	0%
Laws Applicable to Bicycle Use: Peace officer exemption	21200 21200.a	6	4	0	0%	4	100%	0	0%

Description	CVC Section	# of collisions	# of collisions where fault was assigned	# Motorists assigned fault	% Motorists assigned fault*	# Bicyclists assigned fault	% Bicyclists assigned fault*	"Other" assigned fault	% "Other" assigned fault*
Failure to Yield to Pedestrian in Crosswalk	21950.a 21950.c	6	6	3	50%	3	50%	0	0%
Starting or Backing when Unsafe	22106	6	6	6	100%	0	0%	0	0%
Failure to Obey Traffic Signal for Turn at Intersection	22101 22101.d	6	6	6	100%	0	0%	0	0%
Driving on Sidewalk	21663	5	5	0	0%	5	100%	0	0%
Bicycle Operation on Roadway	21202 21202.a	5	5	0	0%	5	100%	0	0%
Passing on Right When Unsafe	21755	5	5	1	20%	4	80%	0	0%
Right-of-Way at Crosswalks	21950.b	5	5	0	0%	2	40%	3	60%
Motor Vehicle Turning Unsafely Into Bicycle Lane	21717	5	5	4	80%	1	20%	0	0%
Designated Traffic Direction	21657	4	4	0	0%	4	100%	0	0%
Bicycle Equipment Requirements - Lights	21201.d	4	4	0	0%	4	100%	0	0%
Illegal U-Turn in Business District	22102	4	4	4	100%	0	0%	0	0%
Riding bicycle under the influence	21200.5	3	3	0	0%	3	100%	0	0%
Following Too Closely	21703	3	3	0	0%	3	100%	0	0%
Yield ROW to vehicle making U-turn	21801.b	3	3	0	0%	3	100%	0	0%

Description	CVC Section	# of collisions	# of collisions where fault was assigned	# Motorists assigned fault	% Motorists assigned fault*	# Bicyclists assigned fault	% Bicyclists assigned fault*	"Other" assigned fault	% "Other" assigned fault*
Failure to Obey Flashing Signals	21457.a	3	3	1	33%	2	67%	0	0%
Improper Position for a Left-Turn at Intersection	22100.b	3	3	2	67%	1	33%	0	0%
Passing on Right	21754	2	2	0	0%	2	100%	0	0%
Permitted Movements from Bicycle Lanes	21208.a 21208.b	2	2	0	0%	2	100%	0	0%
Right-of-Way at Circular Green or Green Arrow	21451.a	2	2	0	0%	2	100%	0	0%
Divided Highways	21651.a	2	2	1	50%	1	50%	0	0%
Improper Position for a Right-Turn at Intersection	22100.a	2	2	2	100%	0	0%	0	0%
Crossing b/t controlled intersections	21955	2	2	0	0%	0	0%	2	100%
Turning Out of Slow-Moving Vehicles	21656	1	1	0	0%	1	100%	0	0%
Duty Upon Injury or Death	20003.a	1	1	0	0%	1	100%	0	0%
Driving on Left Prohibited	21752.d	1	1	0	0%	1	100%	0	0%
Yield to Emergency Vehicle	21806.a	1	1	0	0%	1	100%	0	0%
Passing Without Sufficient Clearance	21751	1	1	1	100%	0	0%	0	0%

Description	CVC Section	# of collisions	# of collisions where fault was assigned	# Motorists assigned fault	% Motorists assigned fault*	# Bicyclists assigned fault	% Bicyclists assigned fault*	"Other" assigned fault	% "Other" assigned fault*
Overtaking vehicle stopped at x-walk	21951	1	1	1	100%	0	0%	0	0%
Illegal U-Turn in Residence District	22103	1	1	1	100%	0	0%	0	0%
Designated Lanes for Certain Vehicles	21655 21655.b	1	1	1	100%	0	0%	0	0%
Reckless Driving: Bodily Injury	23104.a	1	1	1	100%	0	0%	0	0%
Driving Under the Influence	23152.a 23153.a 23153.b	1	1	1	100%	0	0%	0	0%
Pedestrian on Roadway	21956	1	1	0	0%	0	0%	1	100%
Pedestrians outside a x-walk	21954.a	1	1	0	0%	0	0%	1	100%
TOTAL		**468**	**413**	**201**	**48.7%**	**205**	**49.6%**	**7**	**1.7%**

Appendix J. CVC Violations in Bicycle Injury Collisions (1998-2008)

Description	CVC Section	# of collisions	# 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 Speed	22350	433	425	121	28%	304	72%	0	0%
Opening Car Door when Unsafe	22517	379	360	359	100%	1	0.3%	0	0%
Failure to Stop at Red Light Limit Line	21453.a 21453.c	362	347	96	28%	251	72%	0	0%
Failure to Yield when Turning Left	21801.a	338	324	303	94%	21	6%	0	0%
Not cited	Not cited	328	78	26	33%	52	67%	0	0%
Unsafe Turn without Signaling	22107	312	301	249	83%	52	17%	0	0%
Wrong Side of Roadway	21650 21650.1	226	220	11	5%	209	95%	0	0%
Failure to Stop at STOP sign Limit Line	22450 22450.a	210	205	38	19%	167	81%	0	0%
Yield to Approaching Traffic	21804.a 21804.b	208	205	32	16%	173	84%	0	0%
Unsafe Lane Change	21658.a	127	124	65	52%	59	48%	0	0%
Unsafe Pass on Left	21750	111	110	76	69%	34	31%	0	0%
Passing on Right When Unsafe	21755	88	86	5	6%	81	94%	0	0%
Failure to Yield ROW Entering Highway	21802.a 21802.b	82	76	54	71%	22	29%	0	0%
Starting or Backing when Unsafe	22106	76	76	68	89%	8	11%	0	0%

Description	CVC Section	# of collisions	# of collisions where fault was assigned	# Motorists assigned fault	% Motorists assigned fault	# Bicyclists assigned fault	% Bicyclists assigned fault	"Other" assigned fault	% "Other" assigned fault*
Bicycle Operation on Roadway	21202 21202.a	60	57	0	0%	57	100%	0	0%
Designated Traffic Direction	21657	47	47	4	9%	43	91%	0	0%
Failure to Yield to Pedestrian in Crosswalk	21950.a 21950.c	47	47	20	27%	24	51%	0	0%
Failure to yield ROW at Intersection	21800.a 21800.b 21800.c	46	45	22	49%	23	51%	0	0%
Following Too Closely	21703	43	43	17	40%	26	60%	0	0%
Failure to Obey Traffic Signal for Turn at Intersection	22101 22101.d	39	37	29	78%	8	22%	0	0%
Driving Under the Influence	23152.a 23153.a 23153.b	36	36	15	42%	21	58%	0	0%
Right-of-Way at Crosswalks	21950.b	34	12	0	0%	9	75%	3	25%
Right-of-Way at Circular Green or Green Arrow	21451.a 21451.b 21451.c	33	30	13	43%	17	57%	0	0%
Driving on Sidewalk	21663	32	32	0	0%	32	100%	0	0%
Laws Applicable to Bicycle Use: Peace officer exemption	21200 21200.a	31	23	0	0%	23	100%	0	0%
Yield ROW to vehicle making U-turn	21801.b	29	28	2	7%	26	93%	0	0%
Improper Position for a Right-Turn at Intersection	22100.a	28	28	26	93%	2	7%	0	0%

Description	CVC Section	# of collisions	# of collisions where fault was assigned	# Motorists assigned fault	% Motorists assigned fault	# Bicyclists assigned fault	% Bicyclists assigned fault	"Other" assigned fault	% "Other" assigned fault*
Improper Position for a Left-Turn at Intersection	22100.b	24	24	6	25%	18	75%	0	0%
Illegal U-Turn in Business District	22102	23	23	21	91%	2	9%	0	0%
Pedestrians outside a x-walk	21954.a	23	3	0	0%	2	67%	1	33%
Motor Vehicle Turning Unsafely Into Bicycle Lane	21717	20	20	19	95%	1	5%	0	0%
Passing on Right	21754	19	19	2	11%	17	89%	0	0%
Failure to obey Traffic Signal	21461.a	19	17	6	35%	11	65%	0	0%
Yield ROW on turn at Red Light	21453.b	19	18	16	89%	2	11%	0	0%
Crossing b/t controlled intersections	21955	18	18	0	n/a	0	n/a	18	100%
Riding bicycle under the influence	21200.5	15	14	0	0%	14	100%	0	0%
Pedestrian Signal Violation	21456.a 21456.b	14	2	0	0%	2	100%	0	0%
Permitted Movements from Bicycle Lanes	21208.a 21208.b	12	12	0	0%	12	100%	0	0%
Bicycle Equipment Requirements - Lights	21201.d	12	12	0	0%	12	100%	0	0%
Crossing Double Yellow Line	21460.a 21460.b	12	11	3	27%	8	73%	0	0%
Illegal Operation on Divided Highway	21651.a 21651.b	11	11	5	45%	6	55%	0	0%

Description	CVC Section	# of collisions	# of collisions where fault was assigned	# Motorists assigned fault	% Motorists assigned fault	# Bicyclists assigned fault	% Bicyclists assigned fault	"Other" assigned fault	% "Other" assigned fault*
Failure to Yield at Flashing Light	21457.a 21457.b	7	7	1	14%	6	86%	0	0%
Bicycle Equipment Requirements - Brakes	21201.a	6	6	0	0%	6	100%	0	0%
Passing w/o sufficient clearance	21751	6	6	3	50%	3	50%	0	0%
Illegal U-Turn in Residence District	22103	6	6	5	83%	1	17%	0	0%
Motorized Vehicle Illegally Operated in Bike Lane	21209 21209.a	6	6	6	100%	0	0%	0	0%
Unsafe Passing on Left/ Obstructed View	21752.c 21752.d	5	5	0	0%	5	100%	0	0%
Right-of-Way on sidewalk	21952	4	4	1	25%	3	75%	0	0%
Failure to Yield ROW at Yield Sign	21803.a 21803.b	4	4	2	50%	2	50%	0	0%
Overtaking vehicle stopped at x-walk	21951	4	4	2	50%	2	50%	0	0%
Designated Lanes for Certain Vehicles	21655.b	4	3	1	33%	2	67%	0	0%
Obstruction of bicycle facilities	21211.a 21211.b	4	4	4	100%	0	0%	0	0%
Stop at limit line on Red - Peds	21453.d	4	0	0	n/a	0	n/a	0	n/a
Minimum Speed Law	22400.a	3	3	2	67%	1	33%	0	0%

Description	CVC Section	# of collisions	# of collisions where fault was assigned	# Motorists assigned fault	% Motorists assigned fault	# Bicyclists assigned fault	% Bicyclists assigned fault	"Other" assigned fault	% "Other" assigned fault*
Duration of Signal	22108	3	3	2	67%	1	33%	0	0%
Hitching rides	21203	2	2	0	0%	2	100%	0	0%
Failure of Slow Moving Vehicles to Turn Out	21656	2	2	0	0%	2	100%	0	0%
Failure to Yield to Emergency Vehicle	21806.a	2	2	0	0%	2	100%	0	0%
Obstruction of x-walk	22526.a	2	2	1	50%	1	50%	0	0%
Reckless Driving: Bodily Injury	23104.a	2	2	1	50%	1	50%	0	0%
Failure to Yield ROW at Left or U-Turn	21801	2	2	2	100%	0	0%	0	0%
Signal When Stopping	22109	2	2	2	100%	0	0%	0	0%
Circular Yellow or Yellow Arrow	21452.b	1	1	0	0%	1	100%	0	0%
Lighting during darkness	24250	1	1	0	0%	1	100%	0	0%
Duty Upon Injury or Death	20003.a	1	1	0	0%	1	100%	0	0%
Instructions of traffic control officer	21367.b	1	1	0	0%	1	100%	0	0%
Duty to Stop at Scene of Accident	20001.a	1	1	1	100%	0	0%	0	0%
Disobey traffic directions of local official	21100.3	1	1	1	100%	0	0%	0	0%
U-Turn at Controlled Intersection	22100.5	1	1	1	100%	0	0%	0	0%

Description	CVC Section	# of collisions	# of collisions where fault was assigned	# Motorists assigned fault	% Motorists assigned fault	# Bicyclists assigned fault	% Bicyclists assigned fault	"Other" assigned fault	% "Other" assigned fault*
Tailgating	21704.a	1	0	0	n/a	0	n/a	0	n/a
Pedestrian in bicycle lane	21966	1	1	0	n/a	0	n/a	1	100%
Pedestrian on Roadway	21956	1	1	0	0%	0	0%	1	100%
Obedience by Pedestrian to Official Traffic Control Devices	21461.5	1	1	0	n/a	0	n/a	1	100%
TOTAL		**4,117**	**3,691**	**1,767**	**47.9%**	**1,896**	**51.4%**	**25**	**0.7%**