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The SFMTA's terms of use are at the SFMTA terms webpage.

Focus on Enforcement

Insights from research and analysis in support of San Francisco's Vision Zero plan

Presentation to the Vision Zero Taskforce

Joe Lapka
Corina Monzón

12/13/2016

In support of VISION ZERO SF

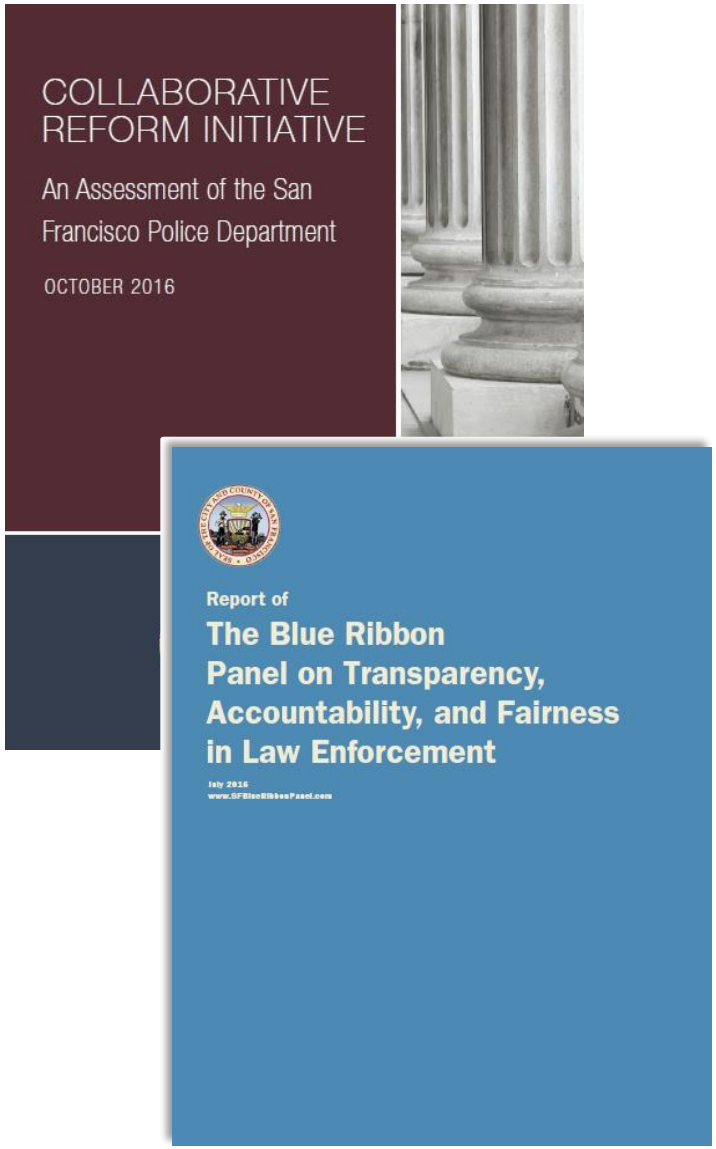
Office of the Controller
City Services Auditor | City Performance

Introduction

- Every year in San Francisco about 30 people lose their lives and over 500 more are seriously injured while traveling on City streets
    - These deaths are unacceptable and preventable, and San Francisco is committed to stopping further loss of life
    - Along with engineering changes to streets, education, outreach, evaluation, and policy changes, enforcement is one component of the Vision Zero framework that the City has adopted
- At the request of the SFPD, SFMTA, and DPH, the Controller's Office has analyzed the most recently available collision data to gain a better view of the relationship between traffic enforcement and collisions, and potentially inform refinements to the SFPD's traffic enforcement strategy

Introduction

- This analysis is also timely in that the SFPD is currently reviewing and implementing 479 recommendations it has received over the last 18 months from the Blue Ribbon Panel, US Department of Justice, Civil Grand Jury, and other sources. Collectively, these recommendations emphasize the importance of:
  - Engaging in **community policing and community outreach**
  - Bringing police and community members together to **foster an improved understanding of police practices and community perceptions**, and
  - Engaging with the community to **develop district-based, co-produced public safety strategies**
- We hope this analysis will be helpful in facilitating conversations among the SFPD and the communities in each District as the SFPD implements these recommendations



Introduction

- Evidence from scientific research shows that:
  - The visible presence of a law enforcement officer has a general deterrence effect on traffic violations, and
  - There is a connection between traffic enforcement and the number of vehicle collisions.
- Drawing upon this research, we have analyzed data from 2013, 2014, and 2015 through the lens of enforcement as a first step in considering how the SFPD can most effectively contribute to achieving the Vision Zero goal
  - Our draft analysis is comprehensive and covers a number of different subjects
    - Deterrence Theory
    - Analysis of the 2013-2015 Collision Data
      - Location
      - Time of day and day of week
      - **Road user behaviors** *focus of today's presentation*
    - Strategies for Maximizing General Deterrence
    - Additional Considerations for Data Collection

Collision Data pertaining to Dangerous Road User Behaviors

Foundational Research

In the book ***Policing and Security in Practice: Challenges and Achievements*** *(2012)*, experts in the field of policing and traffic collisions stress two important points related to the nature of traffic enforcement:

> "…**enforcement operations need to be tailored to the specific driving context and driving environment, such that a 'one-size-fits-all' approach is unlikely to be effective.** " [emphasis added]

> "…there is increasing awareness that **paying attention to causes lends credence to the need for a varied response to crime so that actions taken are fit for their purpose and are more likely to have an effect.**" [emphasis added]

The multitude of factors that contribute to collisions (e.g., road characteristics and conditions, traffic controls, traffic speeds, traffic and pedestrian volumes, and a variety of human-related factors) are not necessarily the same from one police district to another. Thus, a district-based approach to analyzing the collision data appears to be the most appropriate approach.

Methodology for Analyzing Primary Collision Factors in each District (2013-2015)

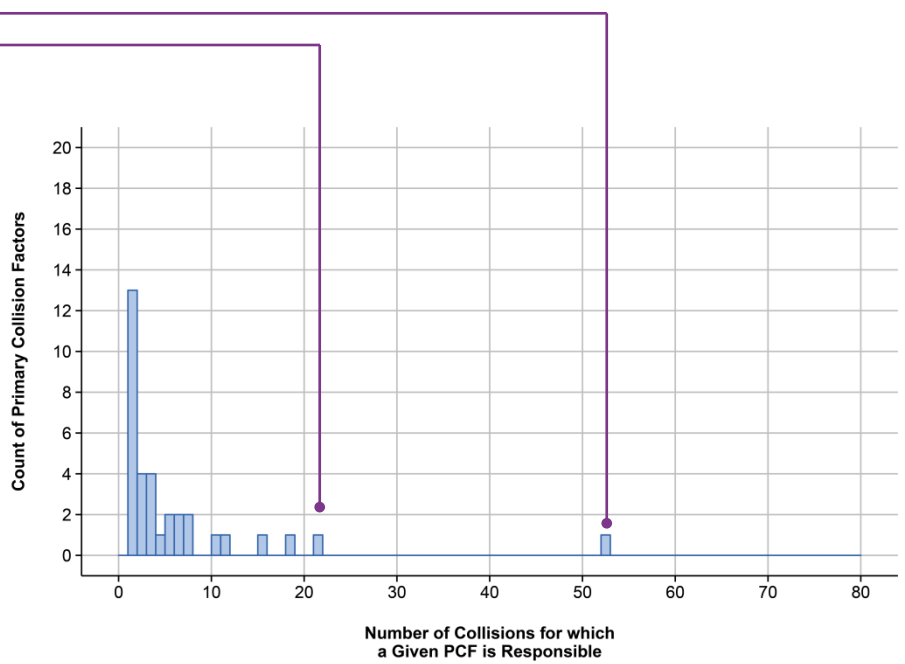
1 **Count the number of fatal and injury collisions (excluding collisions involving only a complaint of pain) for which each PCF is responsible and rank order them**

Example: Bayview Police District

Tabular Format

PCF	Description	Count
22350	Unsafe speed for prevailing conditions	52
22107	Unsafe turn or lane change prohibited	21
21950(a,c)	Driver to yield right-of-way at crosswalks	18
23152	Driving under the influence of alcohol or drug	15
21453(a,c)	"Red" signal - vehicular responsibilities	12
22450(a)	Failure to stop at STOP sign	10
21801(a,b)	Violation of right-of-way - left turn	7
21955	Crossing between controlled intersections (Jaywalking)	7
21658(a,b)	Lane straddling/failure to use specified lanes	6
21802(a,b)	Violation of right-of-way - entering through highway	6
21954(a)	Pedestrians must yield right-of-way outside of crosswalks	5
22106	Unsafe starting or backing on highway	5
21453(d)	"Red" signal - pedestrian responsibilities	4
21456(a,b)	Pedestrian violation of "Walk" or "Wait" signals	3
21650	Failure to keep to right side of road	3

Graphical Format



Methodology for Identifying Priority Behaviors in each District

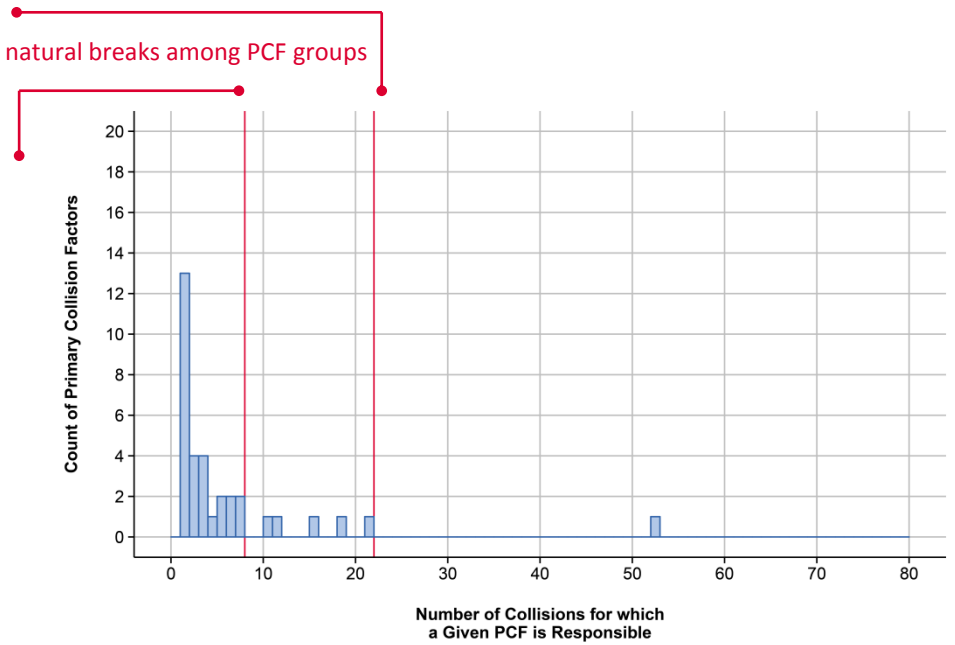
2 **Perform a data clustering analysis to determine the best arrangement of these values into three different groups (high, medium, low impact) using "Jenks natural breaks optimization"**

Example: Bayview Police District

Tabular Format

PCF	Description	Count
22350	Unsafe speed for prevailing conditions	52
22107	Unsafe turn or lane change prohibited	21
21950(a,c)	Driver to yield right-of-way at crosswalks	18
23152	Driving under the influence of alcohol or drug	15
21453(a,c)	"Red" signal - vehicular responsibilities	12
22450(a)	Failure to stop at STOP sign	10
21801(a,b)	Violation of right-of-way - left turn	7
21955	Crossing between controlled intersections (Jaywalking)	7
21658(a,b)	Lane straddling/failure to use specified lanes	6
21802(a,b)	Violation of right-of-way - entering through highway	6
21954(a)	Pedestrians must yield right-of-way outside of crosswalks	5
22106	Unsafe starting or backing on highway	5
21453(d)	"Red" signal - pedestrian responsibilities	4
21456(a,b)	Pedestrian violation of "Walk" or "Wait" signals	3
21650	Failure to keep to right side of road	3

Graphical Format



Results of PCF Clustering Analysis (2013-2015; fatal and injury collisions excluding complaint of pain)

The table below summarizes the results of our district-level PCF analysis. The cells shaded in blue represent the primary collision factors that emerged from the clustering analysis in the top two groups for each district.

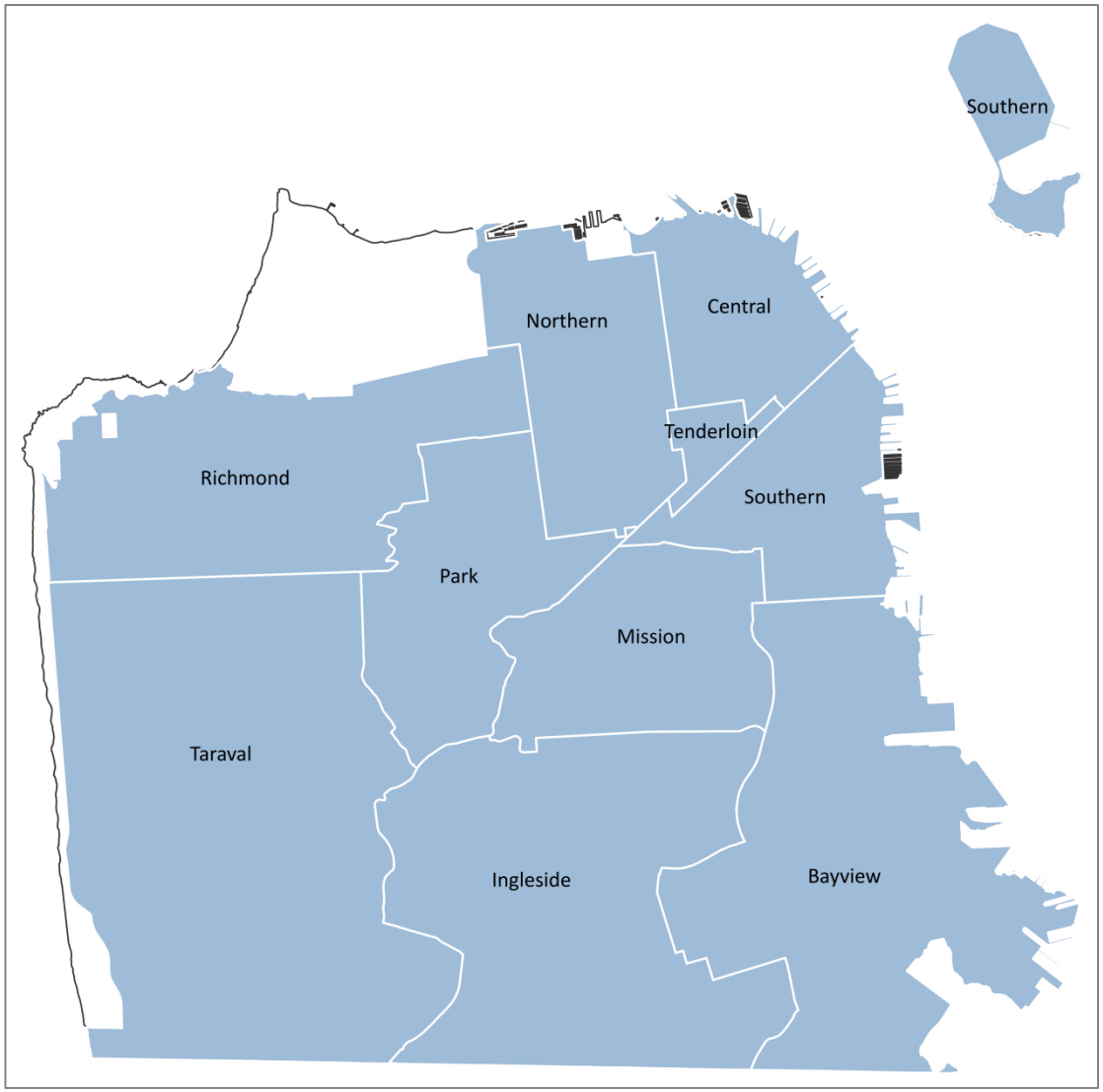
			City-wide	District										District
	PCF	Description		Bayview	Central	Ingleside	Mission	Northern	Park	Richmond	Southern	Taraval	Tenderloin	Count
●	22350	Unsafe speed for prevailing conditions	x	x	x	x	x	x	x	x	x	x	x	10
●	21950(a,c)	Driver to yield right-of-way at crosswalks	x	x	x	x	x	x	x	x	x	x	x	10
●	21453(a,c)	"Red" signal - vehicular responsibilities	x	x	x	x	x	x	x	x	x	x	x	10
	22107	Unsafe turn or lane change prohibited	x	x	x	x	x	x	x	x	x	x	x	10
	23152	Driving under the influence of alcohol or drug	x	x	x	x	x	x		x	x	x		8
●	21801(a,b)	Violation of right-of-way - left turn	x		x	x	x	x		x	x	x		7
	22517	Opening door on traffic side when unsafe	x		x		x	x		x	x		x	6
	21658(a,b)	Lane straddling/failure to use specified lanes	x		x				x	x	x	x	x	6
	21955	Crossing between controlled intersections (Jaywalking)	x		x		x		x		x		x	6
	21954(a)	Pedestrians must yield right-of-way outside of crosswalks	x		x		x				x	x	x	6
●	22450(a)	Failure to stop at STOP sign	x	x		x		x				x		4
	22106	Unsafe starting or backing on highway			x				x				x	3
	21703	Following too closely prohibited							x			x		2
	21802(a,b)	Violation of right-of-way - entering through highway								x		x		2
	21453(d)	"Red" signal - pedestrian responsibilities						x					x	2
	21950(b)	Pedestrian right-of-way at crosswalks regulated			x								x	2
	21456(a,b)	Pedestrian violation of "Walk" or "Wait" signals											x	1
	22101(d)	Violating special traffic control markers									x			1
		Count	11	6	12	7	9	9	8	9	11	11	12	

- ● Current Focus on the Five Factors



Appendices

San Francisco Police Department District Boundaries



Appendix B

PCF Grouping Analysis Results - City-wide

PCF	Description	Count
22350	Unsafe speed for prevailing conditions	526
21950(a,c)	Driver to yield right-of-way at crosswalks	362
21453(a,c)	"Red" signal - vehicular responsibilities	262
22107	Unsafe turn or lane change prohibited	221
21801(a,b)	Violation of right-of-way - left turn	185
21954(a)	Pedestrians must yield right-of-way outside of crosswalks	108
23152	Driving under the influence of alcohol or drug	105
21955	Crossing between controlled intersections (Jaywalking)	104
22517	Opening door on traffic side when unsafe	95
21658(a,b)	Lane straddling/failure to use specified lanes	89
22450(a)	Failure to stop at STOP sign	77
22106	Unsafe starting or backing on highway	65
21802(a,b)	Violation of right-of-way - entering through highway	56
21453(d)	"Red" signal - pedestrian responsibilities	52
21950(b)	Pedestrian right-of-way at crosswalks regulated	47
21703	Following too closely prohibited	46
21456(a,b)	Pedestrian violation of "Walk" or "Wait" signals	38
21755(a)	Unsafe passing on right shoulder	36
21750	Overtaking and passing unsafely	28
21804(a,b)	Entering highway from alley or driveway	28
21650	Failure to keep to right side of road	27
21956(a)	Pedestrian on roadway prohibited	26
22100(a,b)	Turn at intersection from wrong position	25
22101(d)	Violating special traffic control markers	24
21800(a-d)	Violation of right-of-way	19
21650.1	Bicycle to travel in same direction as vehicles	14
21657	Driving against one-way traffic patterns	12
22103	Illegal U-turn in residential district	12
21202(a)	Bicyclist at less than normal speed must keep to the right	11
21460(a,b)	Improper turns over double lines/solid lines to right prohibited	11
22102	Illegal U-turn in business district	11
21663	Driving on sidewalk prohibited	9
21201(a-d)	Equipment requirements for bicycles	8
21451(a,b)	"Green" signal - vehicular responsibilities	8
22515	Leaving vehicle unattended without setting the breaks or stopping the motor	6

Appendix B

PCF Grouping Analysis Results - City-wide (continued)

PCF	Description	Count
21453(b)	"Red" signal - vehicular responsibilities with right turn	5
21717	Turning across bicycle lane	5
22400(a,b)	Minimum speed law - impeding traffic flow	5
21209(a)	Motor vehicle in bicycle lane prohibited	4
21461(a)	Driver failure to obey signs/signals	4
21751	Passing without sufficient clearance	4
21954(b)	Failure of driver to exercise due care for safety of pedestrian on roadway	4
20002(a)	Hit and run - property damage	3
21200.5	Bicyclist riding under the influence	3
21461.5	Pedestrian failure to obey signs/signals	3
21651(a)	Driving across dividing section on freeway prohibited	3
21752(a,b,d)	Driving left of center - limited view/within 100 feet of bridge, viaduct, tunnel/within 100 feet or when traversing intersection - prohibited	3
21754	Improper passing on right prohibited	3
21756(a-c)	Unsafe passing of standing streetcar, trolley coach, or bus safety zones	3
21803(a,b)	Violation of "Yield" sign	3
21806(a,b)	Failure to yield to emergency vehicle	3
21952	Failure to yield right-of-way on sidewalk to pedestrian	3
22105	Illegal U-turn on highway without unobstructed view	3
22109	Sudden stopping without signaling	3
22500	Stopping, standing, parking in prohibited locations	3
23123(a)	Driving while using a wireless telephone not configured for hands-free use	3
7.2.12	Bicycle riding restricted	3
21208(a,b)	Riding outside bicycle lane prohibited	2
21211(a,b)	Illegally impeding bicycle lanes	2
21451(c,d)	"Green" signal - pedestrian responsibilities	2
21712(a)	Allowing riding on portion of vehicle not designed for passenger use prohibited	2
21760(b,c,d)	Improper passing of a bicycle - Three Feet for Safety Act	2
21951	Overtaking vehicles stopped for pedestrians	2
22108	Signal required before turning or changing lanes	2
22348(a)	Driving in excess of the posted speed limit	2

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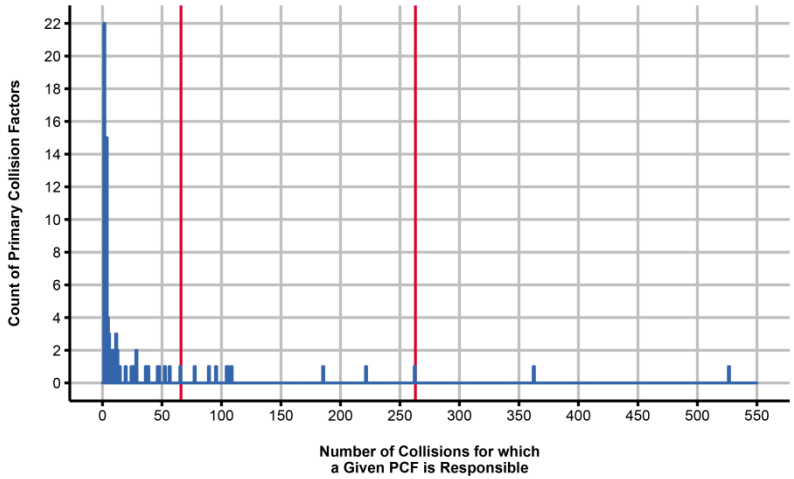
PCF Grouping Analysis Results - City-wide (continued)

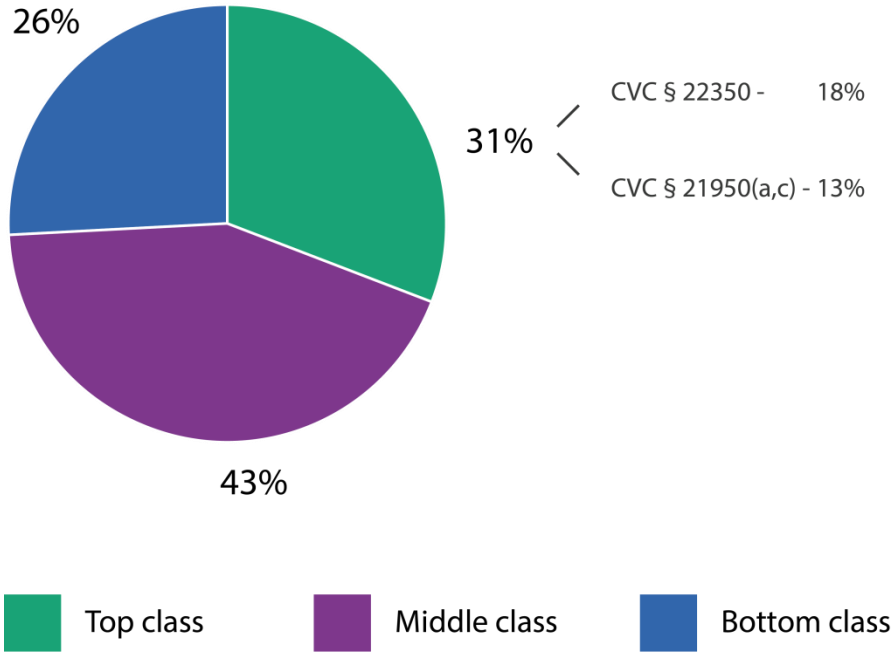
PCF	Description	Count
22352(a)(2)	Operating vehicle in excess of 15 MPH at freeway intersection with no clear field of vision	2
22526(a,b)	Blocking intersection (gridlock) prohibited	2
23109(a-c)	Engaging in or abetting a speed contest or exhibition of speed	2
7.2.35	Parking on grades	2
21106(b)	Use of crosswalks where prohibited by sign	1
21200(a)	Bicycle riding - general rights and responsibilities	1
21204(b)	Riding bicycle on other than a permanent seat	1
21210	Bicycle parked - impeding pedestrian traffic prohibited	1
21281	Improperly equipped assistive mobility device	1
21452(b)	Failure of pedestrian to properly respond to signal of yellow light or arrow	1
21457(a)	Actions required at flashing red signal	1
21462	Failure to obey a traffic control signal	1
21463	No person shall illegally operate signals	1
21651(c)	Willfully driving wrong way on divided highway and causing injury or death	1
21660	Failure of approaching vehicles to pass to the right	1
21708	Running over unprotected fire/chemical hose prohibited	1
21753	Failure to yield to overtaking vehicle	1
21968	Motorized skateboard prohibited	1
22100.5	U-Turn at controlled intersection	1
22351(a,b)	Driving in excess of prima facie speed limits established in VC 22352	1
22360	Violation of local speed limits between business and residence districts	1
24252(a-c)	Maintenance of lamps and devices required	1
2800(a)	Refusal to obey a peace officer	1
2800.2(a)	Fleeing a peace officer - reckless driving	1
7.2.13	Non-motorized user-propelled vehicle - unspecified violation	1
7.2.13(b)	Riding a non-motorized user-propelled vehicle in the roadway	1

Appendix B

PCF Grouping Analysis Results - City-wide

Distribution of Primary Collision Factors





The top two classes account for 74% of collisions with known primary factors (excluding complaint of pain cases)

Appendix B

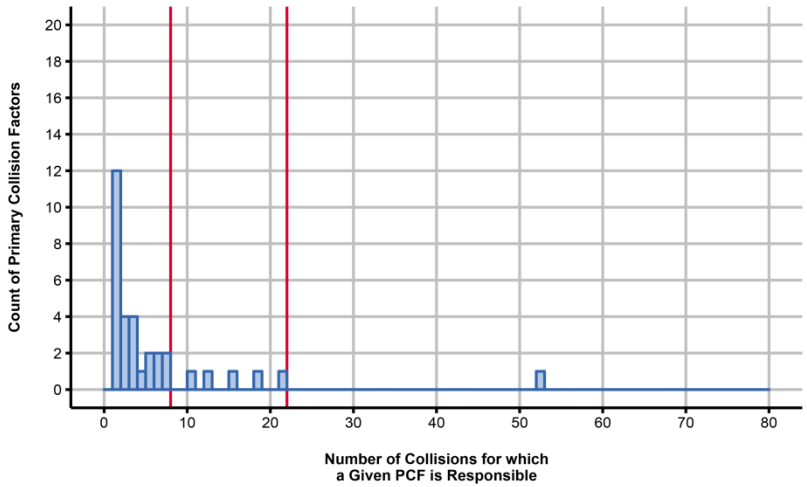
PCF Grouping Analysis Results - Bayview Police District

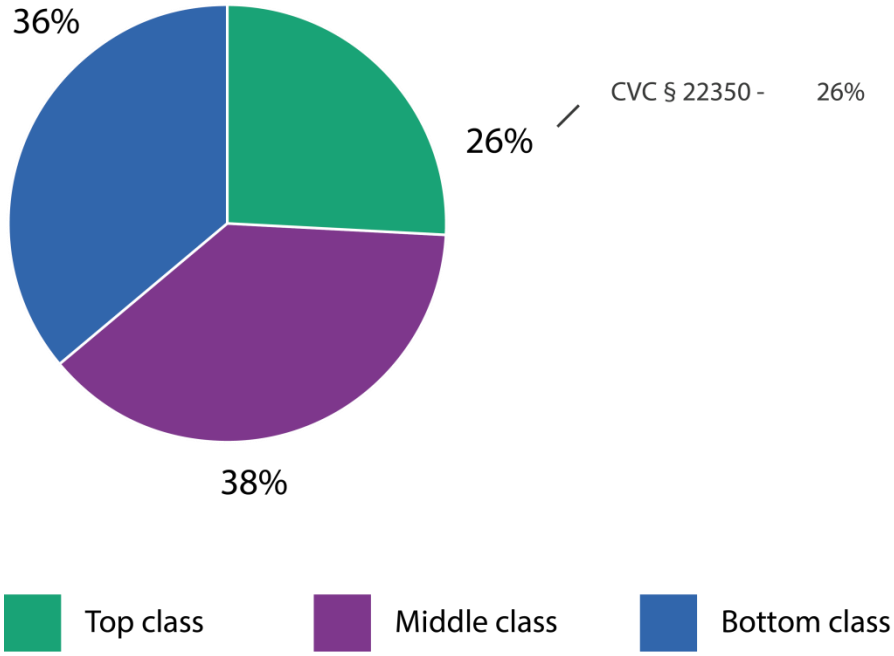
PCF	Description	Count
22350	Unsafe speed for prevailing conditions	52
22107	Unsafe turn or lane change prohibited	21
21950(a,c)	Driver to yield right-of-way at crosswalks	18
23152	Driving under the influence of alcohol or drug	15
21453(a,c)	"Red" signal - vehicular responsibilities	12
22450(a)	Failure to stop at STOP sign	10
21801(a,b)	Violation of right-of-way - left turn	7
21955	Crossing between controlled intersections (Jaywalking)	7
21658(a,b)	Lane straddling/failure to use specified lanes	6
21802(a,b)	Violation of right-of-way - entering through highway	6
21954(a)	Pedestrians must yield right-of-way outside of crosswalks	5
22106	Unsafe starting or backing on highway	5
21453(d)	"Red" signal - pedestrian responsibilities	4
21456(a,b)	Pedestrian violation of "Walk" or "Wait" signals	3
21650	Failure to keep to right side of road	3
21750	Overtaking and passing unsafely	3
21755(a)	Unsafe passing on right shoulder	3
21201(a-d)	Equipment requirements for bicycles	2
21800(a-d)	Violation of right-of-way	2
21804(a,b)	Entering highway from alley or driveway	2
21956(a)	Pedestrian on roadway prohibited	2
21202(a)	Bicyclist at less than normal speed must keep to the right	1
21460(a,b)	Improper turns over double lines/solid lines to right prohibited	1
21461(a)	Driver failure to obey signs/signals	1
21651(a)	Driving across dividing section on freeway prohibited	1
21712(a)	Allowing riding on portion of vehicle not designed for passenger use prohibited	1
21806(a,b)	Failure to yield to emergency vehicle	1
21950(b)	Pedestrian right-of-way at crosswalks regulated	1
21954(b)	Failure of driver to exercise due care for safety of pedestrian on roadway	1
22102	Illegal U-turn in business district	1
22515	Leaving vehicle unattended without setting the breaks or stopping the motor	1
22517	Opening door on traffic side when unsafe	1
23123(a)	Driving while using a wireless telephone not configured for hands-free use	1

Appendix B

PCF Grouping Analysis Results - Bayview Police District

Distribution of Primary Collision Factors





The top two classes account for 64% of collisions with known primary factors (excluding complaint of pain cases)

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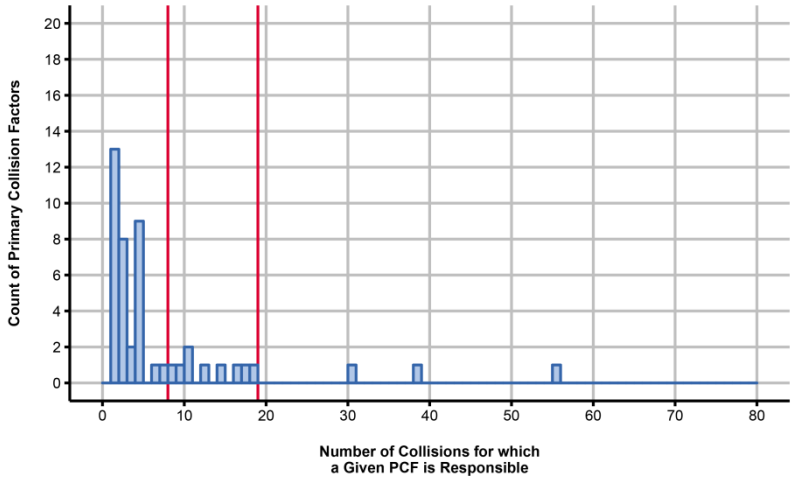
PCF Grouping Analysis Results - Central Police District

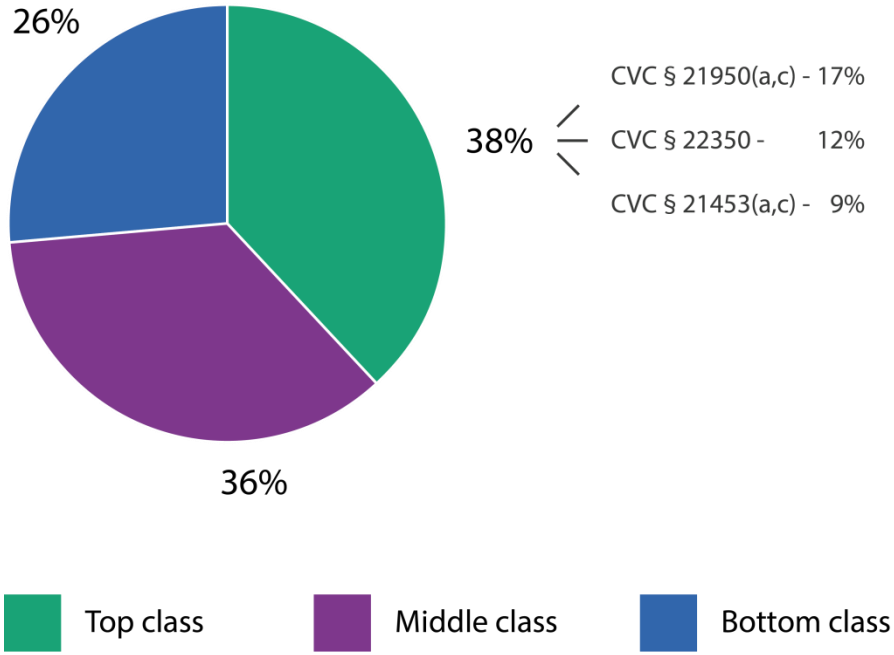
PCF	Description	Count
21950(a,c)	Driver to yield right-of-way at crosswalks	55
22350	Unsafe speed for prevailing conditions	38
21453(a,c)	"Red" signal - vehicular responsibilities	30
21955	Crossing between controlled intersections (Jaywalking)	18
22107	Unsafe turn or lane change prohibited	17
21954(a)	Pedestrians must yield right-of-way outside of crosswalks	16
22517	Opening door on traffic side when unsafe	14
21658(a,b)	Lane straddling/failure to use specified lanes	12
21801(a,b)	Violation of right-of-way - left turn	10
23152	Driving under the influence of alcohol or drug	10
21950(b)	Pedestrian right-of-way at crosswalks regulated	9
22106	Unsafe starting or backing on highway	8
21755(a)	Unsafe passing on right shoulder	7
21703	Following too closely prohibited	6
21202(a)	Bicyclist at less than normal speed must keep to the right	4
21453(d)	"Red" signal - pedestrian responsibilities	4
21456(a,b)	Pedestrian violation of "Walk" or "Wait" signals	4
21750	Overtaking and passing unsafely	4
21802(a,b)	Violation of right-of-way - entering through highway	4
21804(a,b)	Entering highway from alley or driveway	4
21956(a)	Pedestrian on roadway prohibited	4
22100(a,b)	Turn at intersection from wrong position	4
22450(a)	Failure to stop at STOP sign	4
21657	Driving against one-way traffic patterns	3
22400(a,b)	Minimum speed law - impeding traffic flow	3
21453(b)	"Red" signal - vehicular responsibilities with right turn	2
21650	Failure to keep to right side of road	2
21650.1	Bicycle to travel in same direction as vehicles	2
21663	Driving on sidewalk prohibited	2
21800(a-d)	Violation of right-of-way	2
22101(d)	Violating special traffic control markers	2
22102	Illegal U-turn in business district	2
22515	Leaving vehicle unattended without setting the breaks or stopping the motor	2
21200.5	Bicyclist riding under the influence	1
21201(a-d)	Equipment requirements for bicycles	1
21208(a,b)	Riding outside bicycle lane prohibited	1
21451(a,b)	"Green" signal - vehicular responsibilities	1
21451(c,d)	"Green" signal - pedestrian responsibilities	1
21712(a)	Allowing riding on portion of vehicle not designed for passenger use prohibited	1
21752(a,b,d)	Driving left of center - limited view/within 100 feet of bridge, viaduct, tunnel/within 100 feet or when traversing intersection - prohibited	1
21760(b,c,d)	Improper passing of a bicycle - Three Feet for Safety Act	1
21952	Failure to yield right-of-way on sidewalk to pedestrian	1
21954(b)	Failure of driver to exercise due care for safety of pedestrian on roadway	1
22348(a)	Driving in excess of the posted speed limit	1
22526(a,b)	Blocking intersection (gridlock) prohibited	1
23123(a)	Driving while using a wireless telephone not configured for hands-free use	1

Appendix B

PCF Grouping Analysis Results - Central Police District

Distribution of Primary Collision Factors





The top two classes account for 74% of collisions with known primary factors (excluding complaint of pain cases)

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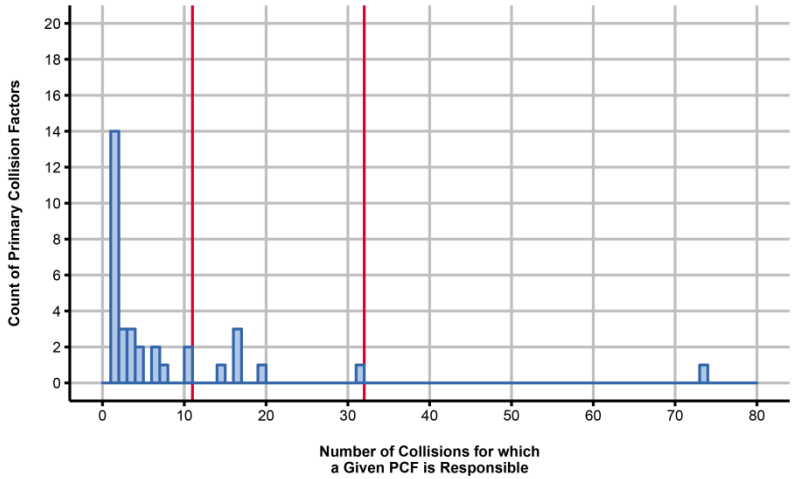
PCF Grouping Analysis Results - Ingleside Police District

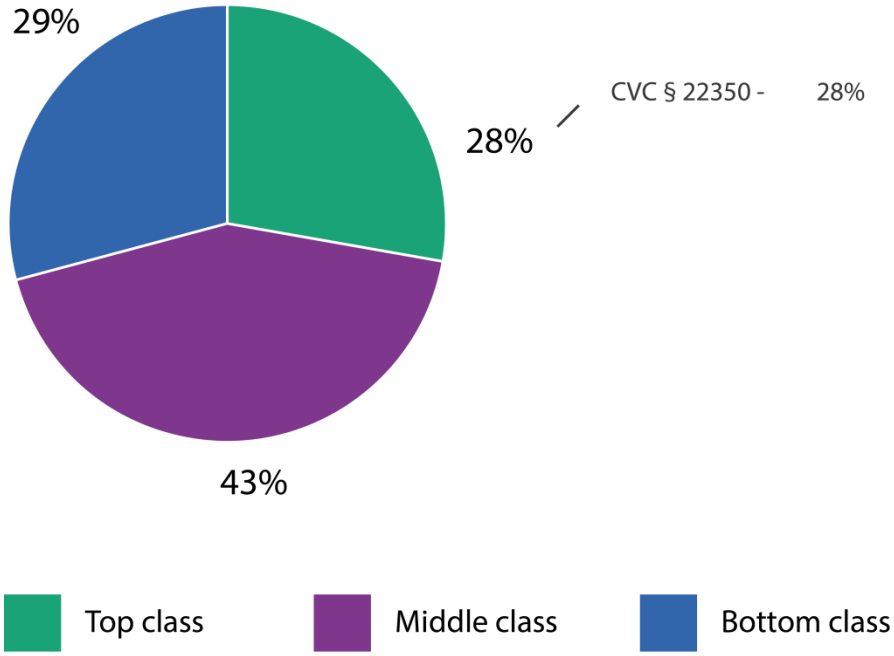
PCF	Description	Count
22350	Unsafe speed for prevailing conditions	73
21950(a,c)	Driver to yield right-of-way at crosswalks	31
21453(a,c)	"Red" signal - vehicular responsibilities	19
21801(a,b)	Violation of right-of-way - left turn	16
22107	Unsafe turn or lane change prohibited	16
23152	Driving under the influence of alcohol or drug	16
22450(a)	Failure to stop at STOP sign	14
21954(a)	Pedestrians must yield right-of-way outside of crosswalks	10
21955	Crossing between controlled intersections (Jaywalking)	10
21658(a,b)	Lane straddling/failure to use specified lanes	7
21802(a,b)	Violation of right-of-way - entering through highway	6
22106	Unsafe starting or backing on highway	6
21456(a,b)	Pedestrian violation of "Walk" or "Wait" signals	4
21804(a,b)	Entering highway from alley or driveway	4
21650	Failure to keep to right side of road	3
21950(b)	Pedestrian right-of-way at crosswalks regulated	3
22517	Opening door on traffic side when unsafe	3
21201(a-d)	Equipment requirements for bicycles	2
21703	Following too closely prohibited	2
22100(a,b)	Turn at intersection from wrong position	2
21202(a)	Bicyclist at less than normal speed must keep to the right	1
21208(a,b)	Riding outside bicycle lane prohibited	1
21750	Overtaking and passing unsafely	1
21752(a,b,d)	Driving left of center - limited view/within 100 feet of bridge, viaduct, tunnel/within 100 feet or when traversing intersection - prohibited	1
21800(a-d)	Violation of right-of-way	1
21806(a,b)	Failure to yield to emergency vehicle	1
21956(a)	Pedestrian on roadway prohibited	1
22101(d)	Violating special traffic control markers	1
22102	Illegal U-turn in business district	1
22103	Illegal U-turn in residential district	1
22352(a)(2)	Operating vehicle in excess of 15 MPH at freeway intersection with no clear field of vision	1
22500	Stopping, standing, parking in prohibited locations	1
2800.2(a)	Fleeing a peace officer - reckless driving	1
7.2.35	Parking on grades	1

Appendix B

PCF Grouping Analysis Results - Ingleside Police District

Distribution of Primary Collision Factors





The top two classes account for 71% of collisions with known primary factors (excluding complaint of pain cases)

Appendix B

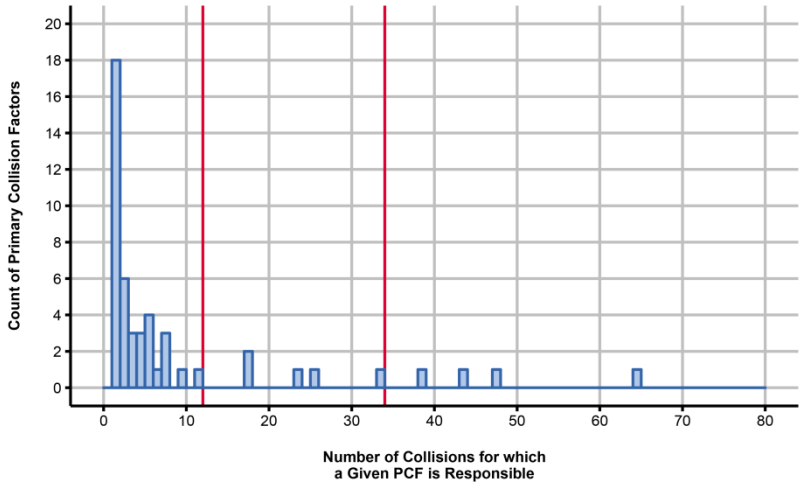
PCF Grouping Analysis Results - Mission Police District

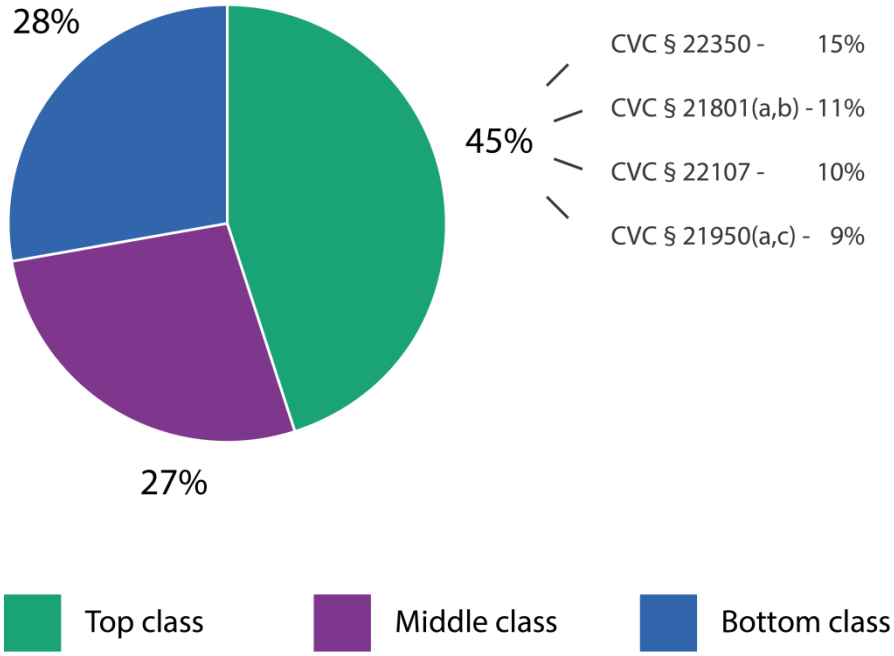
PCF	Description	Count
22350	Unsafe speed for prevailing conditions	64
21801(a,b)	Violation of right-of-way - left turn	47
22107	Unsafe turn or lane change prohibited	43
21950(a,c)	Driver to yield right-of-way at crosswalks	38
21453(a,c)	"Red" signal - vehicular responsibilities	33
22517	Opening door on traffic side when unsafe	25
21954(a)	Pedestrians must yield right-of-way outside of crosswalks	23
21955	Crossing between controlled intersections (Jaywalking)	17
23152	Driving under the influence of alcohol or drug	17
22106	Unsafe starting or backing on highway	11
22450(a)	Failure to stop at STOP sign	9
21456(a,b)	Pedestrian violation of "Walk" or "Wait" signals	7
21658(a,b)	Lane straddling/failure to use specified lanes	7
21755(a)	Unsafe passing on right shoulder	7
21453(d)	"Red" signal - pedestrian responsibilities	6
21703	Following too closely prohibited	5
21802(a,b)	Violation of right-of-way - entering through highway	5
21804(a,b)	Entering highway from alley or driveway	5
21950(b)	Pedestrian right-of-way at crosswalks regulated	5
21451(a,b)	"Green" signal - vehicular responsibilities	4
21750	Overtaking and passing unsafely	4
21956(a)	Pedestrian on roadway prohibited	4
21209(a)	Motor vehicle in bicycle lane prohibited	3
21650	Failure to keep to right side of road	3
21663	Driving on sidewalk prohibited	3
21650.1	Bicycle to travel in same direction as vehicles	2
21717	Turning across bicycle lane	2
22100(a,b)	Turn at intersection from wrong position	2
22101(d)	Violating special traffic control markers	2
22102	Illegal U-turn in business district	2
22103	Illegal U-turn in residential district	2
20002(a)	Hit and run - property damage	1
21211(a,b)	Illegally impeding bicycle lanes	1
21457(a)	Actions required at flashing red signal	1
21460(a,b)	Improper turns over double lines/solid lines to right prohibited	1
21708	Running over unprotected fire/chemical hose prohibited	1
21751	Passing without sufficient clearance	1
21754	Improper passing on right prohibited	1
21800(a-d)	Violation of right-of-way	1
21803(a,b)	Violation of "Yield" sign	1
21954(b)	Failure of driver to exercise due care for safety of pedestrian on roadway	1
22105	Illegal U-turn on highway without unobstructed view	1
22109	Sudden stopping without signaling	1
22348(a)	Driving in excess of the posted speed limit	1
22352(a)(2)	Operating vehicle in excess of 15 MPH at freeway intersection with no clear field of vision	1
22500	Stopping, standing, parking in prohibited locations	1
24252(a-c)	Maintenance of lamps and devices required	1
7.2.12	Bicycle riding restricted	1
7.2.13	Non-motorized user-propelled vehicle - unspecified violation	1

Appendix B

PCF Grouping Analysis Results - Mission Police District

Distribution of Primary Collision Factors





The top two classes account for 72% of collisions with known primary factors (excluding complaint of pain cases)

Appendix B

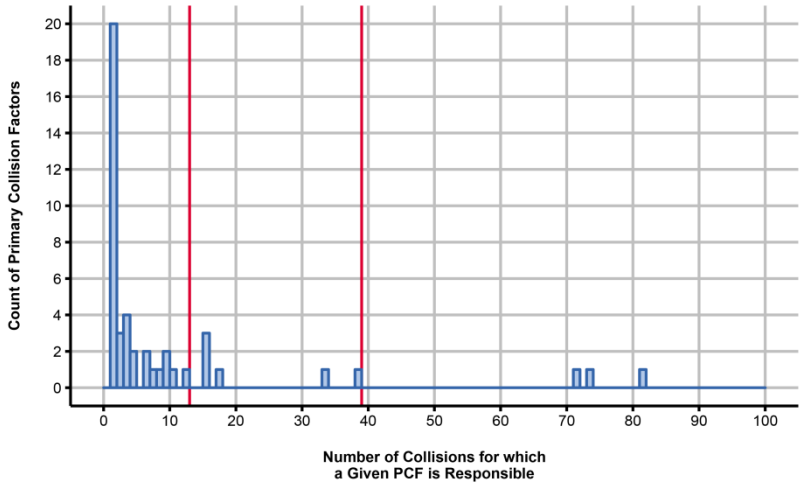
PCF Grouping Analysis Results - Northern Police District

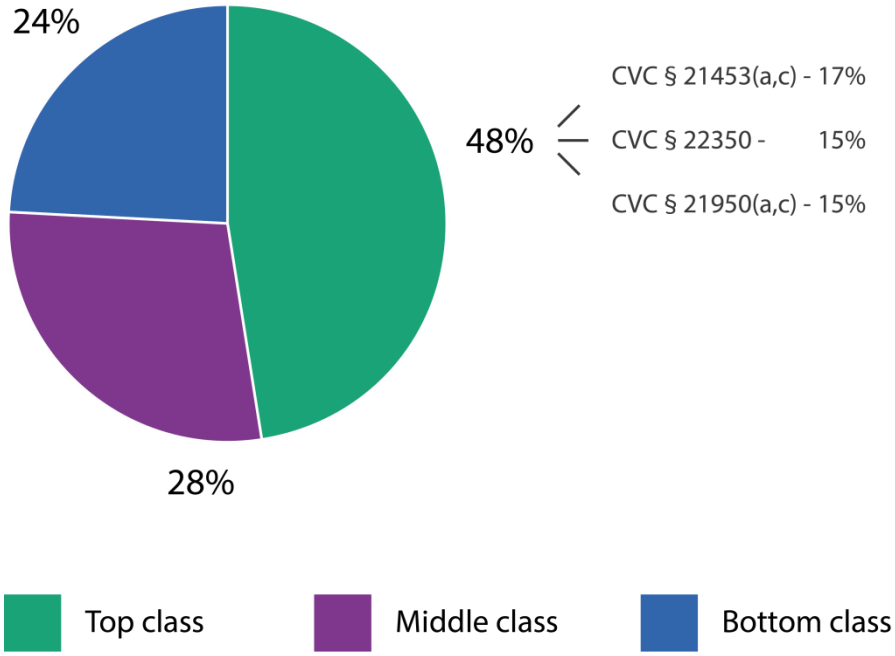
PCF	Description	Count
21453(a,c)	"Red" signal - vehicular responsibilities	81
22350	Unsafe speed for prevailing conditions	73
21950(a,c)	Driver to yield right-of-way at crosswalks	71
22107	Unsafe turn or lane change prohibited	38
21801(a,b)	Violation of right-of-way - left turn	33
21453(d)	"Red" signal - pedestrian responsibilities	17
22450(a)	Failure to stop at STOP sign	15
22517	Opening door on traffic side when unsafe	15
23152	Driving under the influence of alcohol or drug	15
21955	Crossing between controlled intersections (Jaywalking)	12
21954(a)	Pedestrians must yield right-of-way outside of crosswalks	10
21658(a,b)	Lane straddling/failure to use specified lanes	9
22106	Unsafe starting or backing on highway	9
21950(b)	Pedestrian right-of-way at crosswalks regulated	8
21755(a)	Unsafe passing on right shoulder	7
21703	Following too closely prohibited	6
22100(a,b)	Turn at intersection from wrong position	6
21456(a,b)	Pedestrian violation of "Walk" or "Wait" signals	4
21650	Failure to keep to right side of road	4
21657	Driving against one-way traffic patterns	3
21750	Overtaking and passing unsafely	3
22101(d)	Violating special traffic control markers	3
22103	Illegal U-turn in residential district	3
21800(a-d)	Violation of right-of-way	2
21802(a,b)	Violation of right-of-way - entering through highway	2
21956(a)	Pedestrian on roadway prohibited	2
21200(a)	Bicycle riding - general rights and responsibilities	1
21201(a-d)	Equipment requirements for bicycles	1
21202(a)	Bicyclist at less than normal speed must keep to the right	1
21451(a,b)	"Green" signal - vehicular responsibilities	1
21452(b)	Failure of pedestrian to properly respond to signal of yellow light or arrow	1
21460(a,b)	Improper turns over double lines/solid lines to right prohibited	1
21461(a)	Driver failure to obey signs/signals	1
21650.1	Bicycle to travel in same direction as vehicles	1
21651(a)	Driving across dividing section on freeway prohibited	1
21717	Turning across bicycle lane	1
21751	Passing without sufficient clearance	1
21804(a,b)	Entering highway from alley or driveway	1
21952	Failure to yield right-of-way on sidewalk to pedestrian	1
21954(b)	Failure of driver to exercise due care for safety of pedestrian on roadway	1
21968	Motorized skateboard prohibited	1
22108	Signal required before turning or changing lanes	1
22351(a,b)	Driving in excess of prima facie speed limits established in VC 22352	1
22515	Leaving vehicle unattended without setting the breaks or stopping the motor	1
23109(a-c)	Engaging in or abetting a speed contest or exhibition of speed	1
7.2.12	Bicycle riding restricted	1

Appendix B

PCF Grouping Analysis Results - Northern Police District

Distribution of Primary Collision Factors





The top two classes account for 76% of collisions with known primary factors (excluding complaint of pain cases)

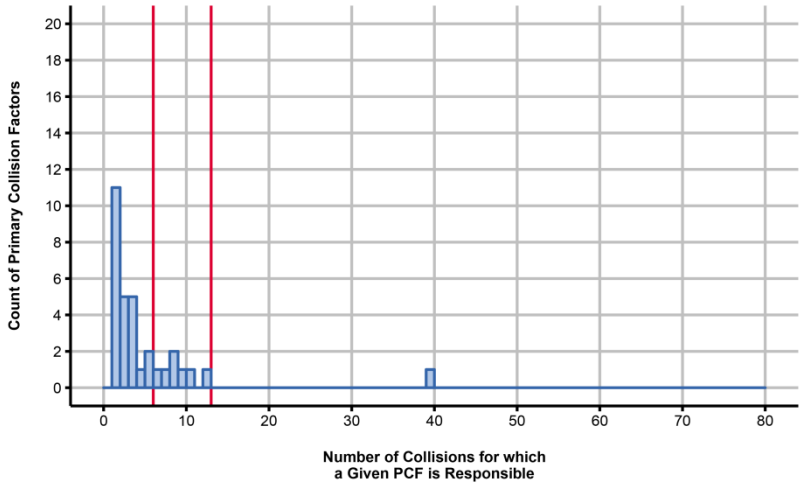
Appendix B

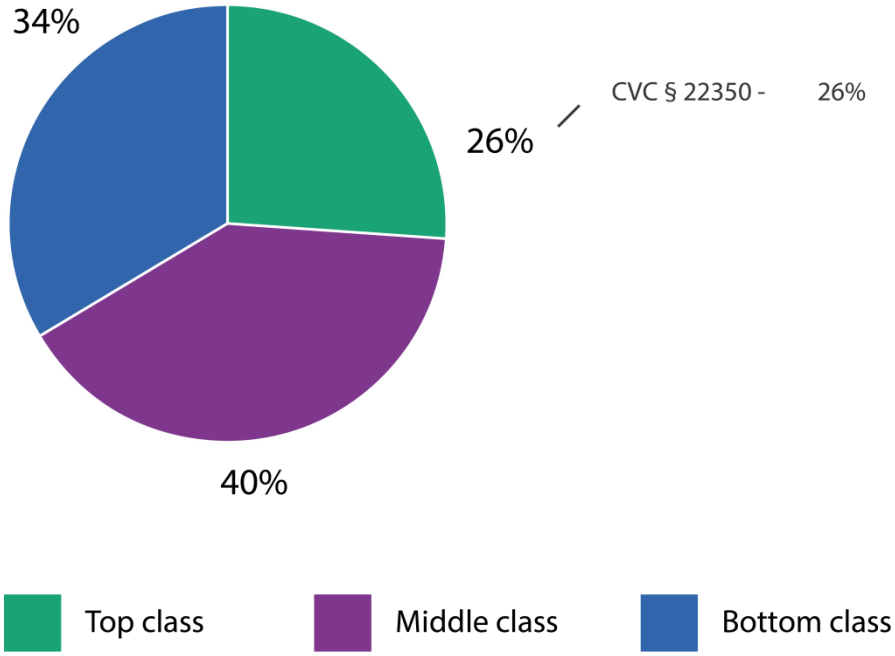
PCF Grouping Analysis Results - Park Police District

PCF	Description	Count
22350	Unsafe speed for prevailing conditions	39
21950(a,c)	Driver to yield right-of-way at crosswalks	12
21453(a,c)	"Red" signal - vehicular responsibilities	10
21703	Following too closely prohibited	9
21658(a,b)	Lane straddling/failure to use specified lanes	8
22106	Unsafe starting or backing on highway	8
22107	Unsafe turn or lane change prohibited	7
21955	Crossing between controlled intersections (Jaywalking)	6
21750	Overtaking and passing unsafely	5
21801(a,b)	Violation of right-of-way - left turn	5
22517	Opening door on traffic side when unsafe	4
21456(a,b)	Pedestrian violation of "Walk" or "Wait" signals	3
21802(a,b)	Violation of right-of-way - entering through highway	3
21954(a)	Pedestrians must yield right-of-way outside of crosswalks	3
22450(a)	Failure to stop at STOP sign	3
23152	Driving under the influence of alcohol or drug	3
21453(d)	"Red" signal - pedestrian responsibilities	2
21755(a)	Unsafe passing on right shoulder	2
21800(a-d)	Violation of right-of-way	2
21950(b)	Pedestrian right-of-way at crosswalks regulated	2
21956(a)	Pedestrian on roadway prohibited	2
21202(a)	Bicyclist at less than normal speed must keep to the right	1
21211(a,b)	Illegally impeding bicycle lanes	1
21460(a,b)	Improper turns over double lines/solid lines to right prohibited	1
21462	Failure to obey a traffic control signal	1
21650	Failure to keep to right side of road	1
21752(a,b,d)	Driving left of center - limited view/within 100 feet of bridge, viaduct, tunnel/within 100 feet or when traversing intersection - prohibited	1
22103	Illegal U-turn in residential district	1
22105	Illegal U-turn on highway without unobstructed view	1
22360	Violation of local speed limits between business and residence districts	1
22515	Leaving vehicle unattended without setting the breaks or stopping the motor	1
7.2.35	Parking on grades	1

PCF Grouping Analysis Results - Park Police District

Distribution of Primary Collision Factors





The top two classes account for 66% of collisions with known primary factors (excluding complaint of pain cases)

Appendix B

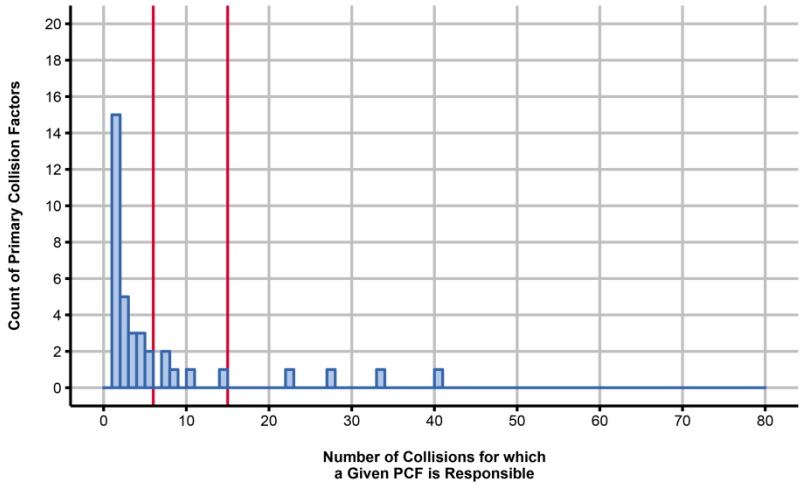
PCF Grouping Analysis Results - Richmond Police District

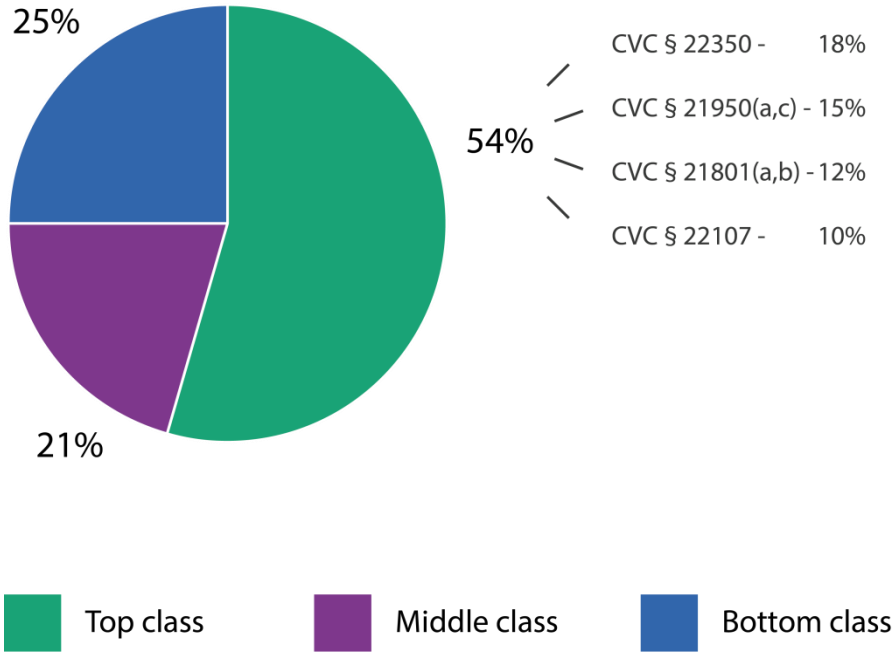
PCF	Description	Count
22350	Unsafe speed for prevailing conditions	40
21950(a,c)	Driver to yield right-of-way at crosswalks	33
21801(a,b)	Violation of right-of-way - left turn	27
22107	Unsafe turn or lane change prohibited	22
21453(a,c)	"Red" signal - vehicular responsibilities	14
21802(a,b)	Violation of right-of-way - entering through highway	10
22517	Opening door on traffic side when unsafe	8
21658(a,b)	Lane straddling/failure to use specified lanes	7
23152	Driving under the influence of alcohol or drug	7
21954(a)	Pedestrians must yield right-of-way outside of crosswalks	5
22450(a)	Failure to stop at STOP sign	5
21453(d)	"Red" signal - pedestrian responsibilities	4
21800(a-d)	Violation of right-of-way	4
21804(a,b)	Entering highway from alley or driveway	4
21950(b)	Pedestrian right-of-way at crosswalks regulated	3
21955	Crossing between controlled intersections (Jaywalking)	3
22106	Unsafe starting or backing on highway	3
21650	Failure to keep to right side of road	2
21717	Turning across bicycle lane	2
21750	Overtaking and passing unsafely	2
22100(a,b)	Turn at intersection from wrong position	2
22103	Illegal U-turn in residential district	2
21281	Improperly equipped assistive mobility device	1
21451(a,b)	"Green" signal - vehicular responsibilities	1
21451(c,d)	"Green" signal - pedestrian responsibilities	1
21460(a,b)	Improper turns over double lines/solid lines to right prohibited	1
21461.5	Pedestrian failure to obey signs/signals	1
21650.1	Bicycle to travel in same direction as vehicles	1
21703	Following too closely prohibited	1
21751	Passing without sufficient clearance	1
21754	Improper passing on right prohibited	1
21755(a)	Unsafe passing on right shoulder	1
21803(a,b)	Violation of "Yield" sign	1
21951	Overtaking vehicles stopped for pedestrians	1
21952	Failure to yield right-of-way on sidewalk to pedestrian	1
21956(a)	Pedestrian on roadway prohibited	1
22101(d)	Violating special traffic control markers	1

Appendix B

PCF Grouping Analysis Results - Richmond Police District

Distribution of Primary Collision Factors





The top two classes account for 75% of collisions with known primary factors (excluding complaint of pain cases)

Appendix B

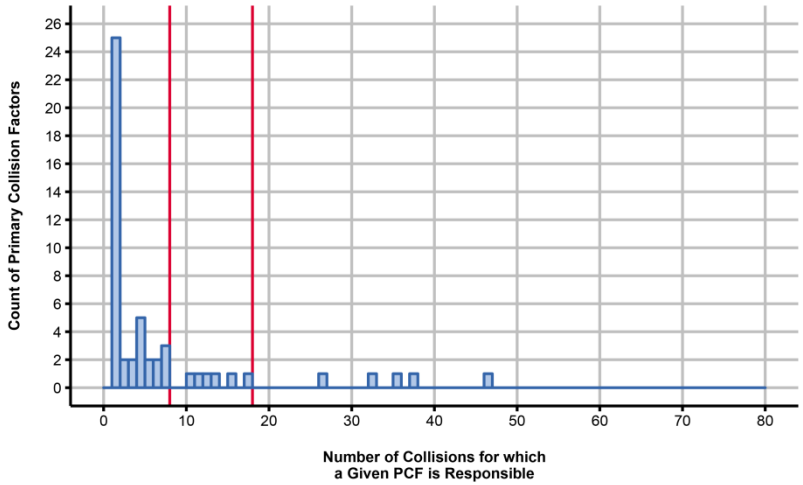
PCF Grouping Analysis Results - Southern Police District

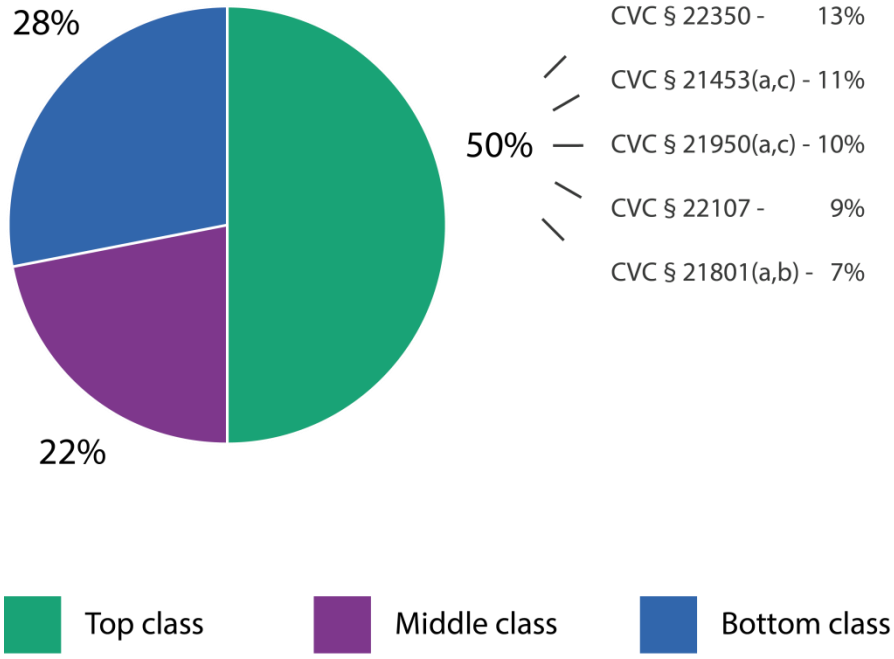
PCF	Description	Count
22350	Unsafe speed for prevailing conditions	46
21453(a,c)	"Red" signal - vehicular responsibilities	37
21950(a,c)	Driver to yield right-of-way at crosswalks	35
22107	Unsafe turn or lane change prohibited	32
21801(a,b)	Violation of right-of-way - left turn	26
22517	Opening door on traffic side when unsafe	17
21658(a,b)	Lane straddling/failure to use specified lanes	15
21954(a)	Pedestrians must yield right-of-way outside of crosswalks	13
22101(d)	Violating special traffic control markers	12
23152	Driving under the influence of alcohol or drug	11
21955	Crossing between controlled intersections (Jaywalking)	10
21456(a,b)	Pedestrian violation of "Walk" or "Wait" signals	7
21650	Failure to keep to right side of road	7
21755(a)	Unsafe passing on right shoulder	7
21703	Following too closely prohibited	6
22100(a,b)	Turn at intersection from wrong position	6
21453(d)	"Red" signal - pedestrian responsibilities	5
21650.1	Bicycle to travel in same direction as vehicles	5
21460(a,b)	Improper turns over double lines/solid lines to right prohibited	4
21804(a,b)	Entering highway from alley or driveway	4
21950(b)	Pedestrian right-of-way at crosswalks regulated	4
22102	Illegal U-turn in business district	4
22106	Unsafe starting or backing on highway	4
21657	Driving against one-way traffic patterns	3
21956(a)	Pedestrian on roadway prohibited	3
20002(a)	Hit and run - property damage	2
21802(a,b)	Violation of right-of-way - entering through highway	2
21106(b)	Use of crosswalks where prohibited by sign	1
21201(a-d)	Equipment requirements for bicycles	1
21202(a)	Bicyclist at less than normal speed must keep to the right	1
21204(b)	Riding bicycle on other than a permanent seat	1
21209(a)	Motor vehicle in bicycle lane prohibited	1
21210	Bicycle parked - impeding pedestrian traffic prohibited	1
21453(b)	"Red" signal - vehicular responsibilities with right turn	1
21461(a)	Driver failure to obey signs/signals	1
21461.5	Pedestrian failure to obey signs/signals	1
21660	Failure of approaching vehicles to pass to the right	1
21663	Driving on sidewalk prohibited	1
21750	Overtaking and passing unsafely	1
21753	Failure to yield to overtaking vehicle	1
21756(a-c)	Unsafe passing of standing streetcar, trolley coach, or bus safety zones	1
21800(a-d)	Violation of right-of-way	1
21803(a,b)	Violation of "Yield" sign	1
22100.5	U-Turn at controlled intersection	1
22108	Signal required before turning or changing lanes	1
22400(a,b)	Minimum speed law - impeding traffic flow	1
22450(a)	Failure to stop at STOP sign	1
22500	Stopping, standing, parking in prohibited locations	1
23109(a-c)	Engaging in or abetting a speed contest or exhibition of speed	1
23123(a)	Driving while using a wireless telephone not configured for hands-free use	1
2800(a)	Refusal to obey a peace officer	1
7.2.12	Bicycle riding restricted	1

Appendix B

PCF Grouping Analysis Results - Southern Police District

Distribution of Primary Collision Factors





The top two classes account for 72% of collisions with known primary factors (excluding complaint of pain cases)

Appendix B

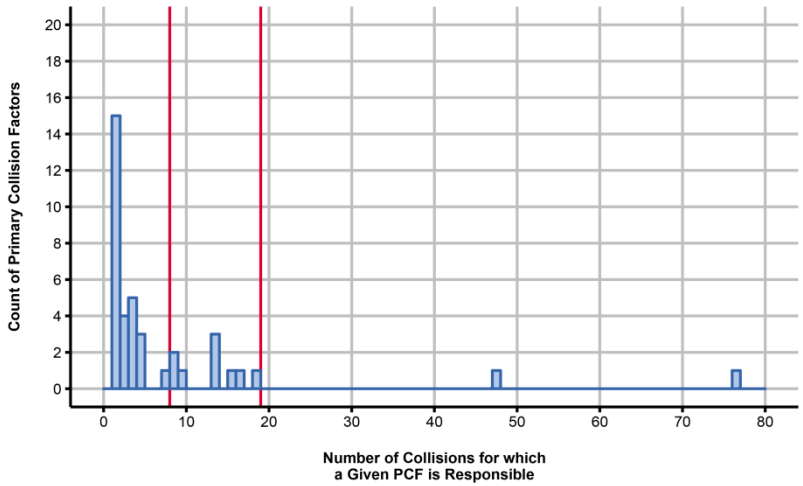
PCF Grouping Analysis Results - Taraval Police District

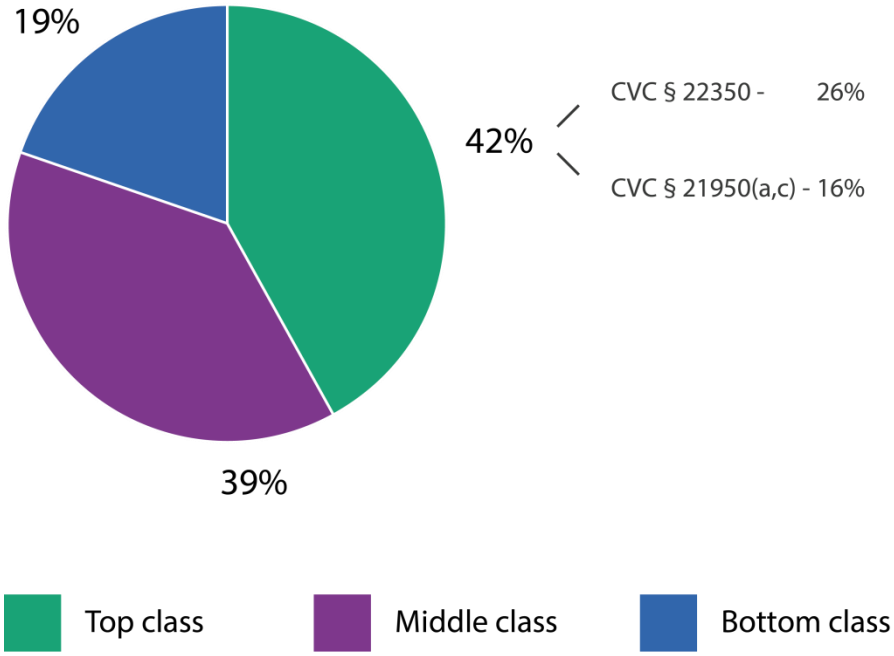
PCF	Description	Count
22350	Unsafe speed for prevailing conditions	76
21950(a,c)	Driver to yield right-of-way at crosswalks	47
21802(a,b)	Violation of right-of-way - entering through highway	18
22450(a)	Failure to stop at STOP sign	16
22107	Unsafe turn or lane change prohibited	15
21658(a,b)	Lane straddling/failure to use specified lanes	13
21801(a,b)	Violation of right-of-way - left turn	13
21954(a)	Pedestrians must yield right-of-way outside of crosswalks	13
21703	Following too closely prohibited	9
21453(a,c)	"Red" signal - vehicular responsibilities	8
23152	Driving under the influence of alcohol or drug	8
21950(b)	Pedestrian right-of-way at crosswalks regulated	7
21955	Crossing between controlled intersections (Jaywalking)	4
21956(a)	Pedestrian on roadway prohibited	4
22106	Unsafe starting or backing on highway	4
21453(d)	"Red" signal - pedestrian responsibilities	3
21650.1	Bicycle to travel in same direction as vehicles	3
21750	Overtaking and passing unsafely	3
21800(a-d)	Violation of right-of-way	3
22103	Illegal U-turn in residential district	3
21650	Failure to keep to right side of road	2
21657	Driving against one-way traffic patterns	2
21804(a,b)	Entering highway from alley or driveway	2
22100(a,b)	Turn at intersection from wrong position	2
21202(a)	Bicyclist at less than normal speed must keep to the right	1
21451(a,b)	"Green" signal - vehicular responsibilities	1
21453(b)	"Red" signal - vehicular responsibilities with right turn	1
21456(a,b)	Pedestrian violation of "Walk" or "Wait" signals	1
21460(a,b)	Improper turns over double lines/solid lines to right prohibited	1
21461(a)	Driver failure to obey signs/signals	1
21651(a)	Driving across dividing section on freeway prohibited	1
21756(a-c)	Unsafe passing of standing streetcar, trolley coach, or bus safety zones	1
21806(a,b)	Failure to yield to emergency vehicle	1
21951	Overtaking vehicles stopped for pedestrians	1
22101(d)	Violating special traffic control markers	1
22105	Illegal U-turn on highway without unobstructed view	1
22109	Sudden stopping without signaling	1
22526(a,b)	Blocking intersection (gridlock) prohibited	1
7.2.13(b)	Riding a non-motorized user-propelled vehicle in the roadway	1

Appendix B

PCF Grouping Analysis Results - Taraval Police District

Distribution of Primary Collision Factors





The top two classes account for 81% of collisions with known primary factors (excluding complaint of pain cases)

Appendix B

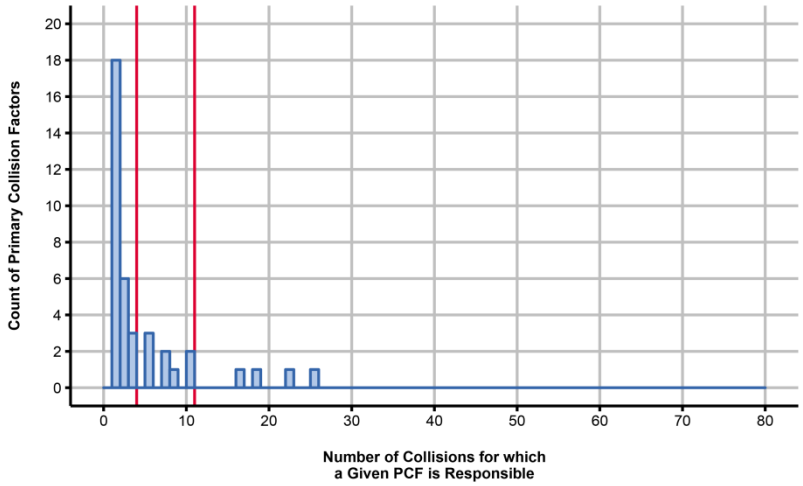
PCF Grouping Analysis Results - Tenderloin Police District

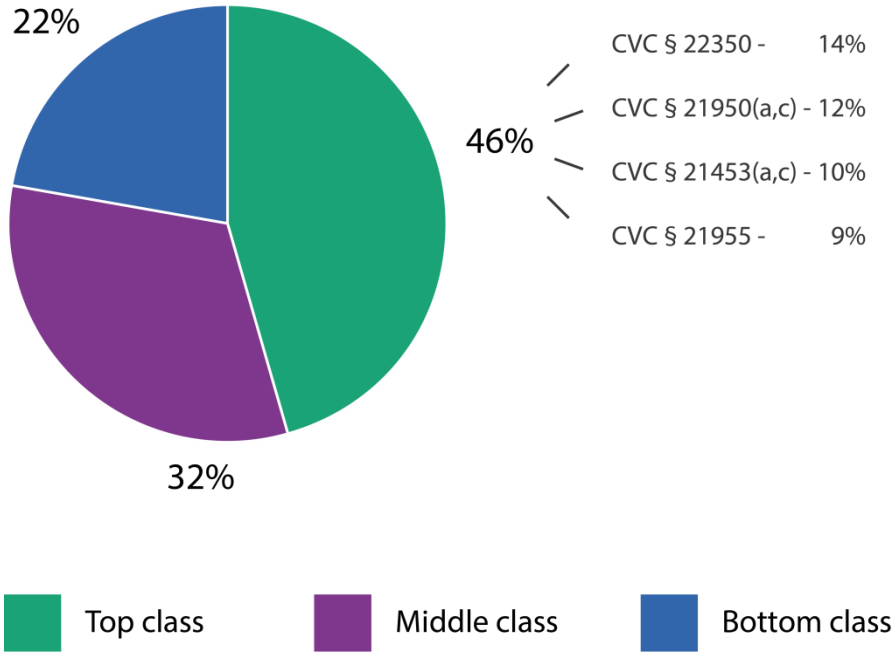
PCF	Description	Count
22350	Unsafe speed for prevailing conditions	25
21950(a,c)	Driver to yield right-of-way at crosswalks	22
21453(a,c)	"Red" signal - vehicular responsibilities	18
21955	Crossing between controlled intersections (Jaywalking)	16
21954(a)	Pedestrians must yield right-of-way outside of crosswalks	10
22107	Unsafe turn or lane change prohibited	10
22517	Opening door on traffic side when unsafe	8
21453(d)	"Red" signal - pedestrian responsibilities	7
22106	Unsafe starting or backing on highway	7
21456(a,b)	Pedestrian violation of "Walk" or "Wait" signals	5
21658(a,b)	Lane straddling/failure to use specified lanes	5
21950(b)	Pedestrian right-of-way at crosswalks regulated	5
21663	Driving on sidewalk prohibited	3
21956(a)	Pedestrian on roadway prohibited	3
23152	Driving under the influence of alcohol or drug	3
21200.5	Bicyclist riding under the influence	2
21703	Following too closely prohibited	2
21750	Overtaking and passing unsafely	2
21755(a)	Unsafe passing on right shoulder	2
21804(a,b)	Entering highway from alley or driveway	2
22101(d)	Violating special traffic control markers	2
21201(a-d)	Equipment requirements for bicycles	1
21202(a)	Bicyclist at less than normal speed must keep to the right	1
21453(b)	"Red" signal - vehicular responsibilities with right turn	1
21460(a,b)	Improper turns over double lines/solid lines to right prohibited	1
21461.5	Pedestrian failure to obey signs/signals	1
21463	No person shall illegally operate signals	1
21651(c)	Willfully driving wrong way on divided highway and causing injury or death	1
21657	Driving against one-way traffic patterns	1
21751	Passing without sufficient clearance	1
21754	Improper passing on right prohibited	1
21756(a-c)	Unsafe passing of standing streetcar, trolley coach, or bus safety zones	1
21760(b,c,d)	Improper passing of a bicycle - Three Feet for Safety Act	1
21800(a-d)	Violation of right-of-way	1
21801(a,b)	Violation of right-of-way - left turn	1
22100(a,b)	Turn at intersection from wrong position	1
22102	Illegal U-turn in business district	1
22109	Sudden stopping without signaling	1
22400(a,b)	Minimum speed law - impeding traffic flow	1

Appendix B

PCF Grouping Analysis Results - Tenderloin Police District

Distribution of Primary Collision Factors





The top two classes account for 78% of collisions with known primary factors (excluding complaint of pain cases)

Appendix C

PCF	Description	Total Count	# Fatal & Severe	% Fatal & Severe
22350	Unsafe speed for prevailing conditions	526	115	22
21950(a,c)	Driver to yield right-of-way at crosswalks	362	94	26
21453(a,c)	"Red" signal - vehicular responsibilities	262	60	23
22107	Unsafe turn or lane change prohibited	221	23	10
21801(a,b)	Violation of right-of-way - left turn	185	43	23
21954(a)	Pedestrians must yield right-of-way outside of crosswalks	108	31	29
23152	Driving under the influence of alcohol or drug	105	31	30
21955	Crossing between controlled intersections (Jaywalking)	104	33	32
22517	Opening door on traffic side when unsafe	95	10	11
21658(a,b)	Lane straddling/failure to use specified lanes	89	16	18
22450(a)	Failure to stop at STOP sign	77	12	16
22106	Unsafe starting or backing on highway	65	11	17
21802(a,b)	Violation of right-of-way - entering through highway	56	6	11
21453(d)	"Red" signal - pedestrian responsibilities	52	20	38
21950(b)	Pedestrian right-of-way at crosswalks regulated	47	9	19
21703	Following too closely prohibited	46	7	15
21456(a,b)	Pedestrian violation of "Walk" or "Wait" signals	38	14	37
21755(a)	Unsafe passing on right shoulder	36		
21750	Overtaking and passing unsafely	28		
21804(a,b)	Entering highway from alley or driveway	28		
21650	Failure to keep to right side of road	27		
21956(a)	Pedestrian on roadway prohibited	26		
22100(a,b)	Turn at intersection from wrong position	25		
22101(d)	Violating special traffic control markers	24	5	21
21800(a-d)	Violation of right-of-way	19		
21650.1	Bicycle to travel in same direction as vehicles	14		

Proportion of Fatal and Severe Injury Collisions associated with the Top Primary Collision Factors

Notes:

1. Shown here is a partial list of the city-wide collision factors provided in Appendix B.
2. The *Total Count* column is based on fatal, severe injury, and other visible injury cases. The PCFs listed here are sorted in descending order based on the *Total Count* of cases.
3. Blue shading represents the top collision factors identified through our primary collision factor analysis.
4. Red shading signifies the upper half of the top collision factors based on the percentage of fatal and severe collisions (i.e., the top 9 factors out of 18).

Focus on Enforcement

Insights from research and analysis in support of San Francisco's Vision Zero plan

Presentation to the Vision Zero Taskforce

Joe Lapka
Corina Monzón

12/13/2016

In support of VISION ZERO SF

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