Traffic Safety Statistics Report for the District of Columbia (2014-2016)

Submitted to:

District Department of Transportation
55 M Street SE
Washington, DC 20003

Prepared by:

Howard University Transportation Research Center
55 M Street SE
Washington, DC 20003

January 26th, 2018

Technical Report Documentation Page

1. Report No.: DDOT-PPSA-PM-002		**2. Report Date** 01/26/2018	
3. Title and Subtitle: Traffic Safety Statistics Report for the District of Columbia		**4. Contract or Grant No.** PO397719	
5. Author(s) Dr. Stephen Arhin, P.E., PTOE, PMP			
6. Performing Organization Name and Address: Howard University Transportation Safety Data & Research Center 2300 Sixth Street NW, Suite 2121 Washington, DC 20059		**7. Type of Report and Period Covered:** Highway Traffic Safety Data, 2014 - 2016	
8. Sponsoring Agency Name and Address: District Department of Transportation 55 M Street, SE Washington, DC 20003			
9. Supplementary Notes			
10. Abstract This report is a compilation crash statistics and analyses for roadways in the District of Columbia during the period 2014 through 2016. The data covers all roadway classifications and is critical for identifying safety problems and trends, as well as for determining the level of success in achieving highway safety goals of the District Department of Transportation. The crash information reported in this document is characterized by location, severity, vehicle type, crash type, time of the crashes, and various environmental conditions. The compilation is done for the City as a whole, by Wards, and Police Districts. The locations with high crash frequency and/or severity in the District of Columbia are clearly identified. The statistics and analysis presented in this report can be used for developing appropriate countermeasures and performance measures. Combined with similar three-year reports, the information in this report facilitates the analysis of the long-term impact of DDOT's highway safety programs and projects.			
11. Key Words Crash, Traffic Accident, Statistics, Frequency, Rate, Fatal, Injury, High-Hazardous Locations, Rank, Traffic Safety		**12. Distribution Statement** This document is available through DDOT.	
13. Security Classification of this report: Unclassified	**14. Security Classification of this page:** Unclassified	**15. No. of Pages** 134	**16. Price** N/A

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1 – INTRODUCTION

1.1 Objective

This report presents traffic crash statistics for the District of Columbia for the years from 2014 to 2016. The information presented in this report aims at aiding the District of Columbia to meet its federal requirements on reporting traffic crashes, provide a resource for identifying safety trends, aid in the development of countermeasures, and evaluating the results of highway safety programs, projects, and policies. The District of Columbia Metropolitan Police Department (MPD) records traffic crash information electronically on the PD-10 crash reporting form, which is the main source of the information presented in this report. The crash data was downloaded from secure servers at MPD into DDOT's database and was analyzed using an Oracle-based application, Traffic Accident Reporting and Analysis System (TARAS), and MS2 Crash Statistics module.

TARAS and MS2 contain data fields that include crash location, date, time, crash type, crash severity, and environmental conditions. This report presents a summary of all reported crash in TARAS and MS2 for 2014, 2015 and 2016. The results of the can be used to identify safety problems, develop performance measures, and support development and evaluation of highway and vehicle safety countermeasures.

This report was prepared by the Howard University Transportation Safety Data Center for the District Department of Transportation (DDOT).

1.2 Report Organization

This report is divided into seven chapters. Chapter 1 provides a summary of findings presented in this report. Chapter 2 describes the methodology and analytical methods used to obtain the results of the analysis. In Chapter 3, Quick Crash Facts and Trends that provide a brief summary of traffic crashes in District of Columbia for the period 2014 through 2016 are presented. Chapter 4 presents general crash statistics for the District of Columbia and contains statistics on various crash categories, vehicle classifications (e.g., truck, bus, and motorcycle), and pedestrian/ bicycle involvement. Chapter 5 identifies high-hazardous crash locations and patterns at intersections and corridors. Chapter 6 presents the exposure information regarding vehicle miles traveled, fatality and injury rates per 100 million vehicle miles traveled, and finally Chapter 7

(Appendix) presents detailed information on the top 100 high crash locations in the District of Columbia.

CHAPTER 2 – CRASH ANALYSIS METHODOLOGY

This section of the report focuses on the methodology used in obtaining the general traffic crash statistics and the determination of high hazardous crash locations. Descriptive statistics was used to determine the frequency of occurrence, the rates of crashes, as well as crash trends over the 3-year period from 2014 to 2016.

2.1 Traffic Crash Statistics

This report presents detailed statistics of the characteristics of traffic crashes and identifies factors that may have influenced their occurrence. The factors considered include vehicle characteristics, characteristics of persons involved (e.g., drivers, passengers, and pedestrians), physical environment (e.g., roadway type, traffic conditions, and weather conditions), and temporal crash characteristics (e.g., year, month, day, and time of day). The frequencies of crashes are summarized for each factor using descriptive statistics. The summary of the factors that contribute to crashes in the District of Columbia are presented in tabulated and graphical forms.

2.2 High-Hazardous Location Analysis

Frequency and severity of traffic crashes are two critical factors used in identifying high hazardous locations. Generally, a relatively high crash frequency at a location is an indicator of potential adverse condition(s) that may contribute to those crashes. Severity is defined as the extent of injury or damage sustained by individuals or properties involved in crashes. These two factors provide a better understanding of the level of susceptibility of the location of crashes. A macroscopic approach was used to determine the frequency and severity of traffic crashes in this report, thereby providing a starting point for more elaborate safety studies at identified high-hazardous intersections or corridors.

Several methods can be used to identify high hazardous locations based on the traffic crash data, exposure and location characteristics. The methods used include crash frequency, crash rate, crash severity, and crash trend (delta change). In addition to these methods, a composite crash index is used, which is a combination of severity and frequency of traffic crashes at a specific

location. Each of these methods has advantages and disadvantages. The following subsections provide a brief description of these methods.

2.2.1 Crash Frequency Method

Crash frequency represents the number of crashes that occurred within a defined time period at each location. The locations/sites are ranked in a decreasing order of frequency, from highest to the lowest. The site with the highest frequency of crashes is ranked highest on the basis of which a list of locations with their respective ranks is generated. This method of identifying high hazardous locations has some limitations, since it does not consider traffic exposure, location characteristics and contributing factors. Locations with high traffic volumes could experience a higher frequency of crashes, but represent a low to moderate risk for road users. In contrast, a low volume location with fewer crashes could present much greater risk to road users.

Crash frequency ranking presents a *preliminary* identification of locations that may be hazardous from a traffic safety perspective, and which should be further examined to determine critical contributing factors.

2.2.2 Crash Rate Method

Crash rate for an intersection is expressed as the average number of crashes per year divided by the volume of traffic entering the intersection per year. The following equation was used to calculate the intersection crash rate:

$$R = \frac{A \; x \; 1{,}000{,}000}{V \; x \; 365} \qquad [1]$$

where:

R = Crash Rate for an intersection (crashes per Million Entering Vehicles [MEV]);

A = Average number of crashes at the intersection per year; and

V = annual average daily traffic volume entering the intersection (vehicles/day)

Compared to the crash frequency method of ranking hazardous locations, the crash rate method is more appropriate since it takes traffic volumes (exposure) into account. In this report, the crash rate for each intersection was computed after which they were ranked and sorted in descending order of the crash rate. The location with the highest crash rate was ranked the highest. For locations where traffic volumes were unavailable, their ranking was skipped. The disadvantage of

the crash rate method is that, comparatively high crash rates could be computed for locations with low traffic volumes, which could lead to erroneous interpretation.

2.2.3 Crash Severity Cost Method

The PD-10s contain data fields with codes for injury severity for each person involved in a crash. These codes represent police officers' observation(s) of the level of injury severity experienced by persons involved in a crash, if any. In order to assess the extent of a crash due to the crash outcomes such as fatality, injury and property damage only (PDO) were utilized. This is intended help to avoid inaccuracies in the crash severity data. For example, the injury condition(s) of person(s) involved in a crash may be updated based on information received after the person(s) involved in the crash is/are sent to the hospital.

The resulting costs of traffic crashes were computed for each location to identify the severity indices, with a higher value of severity index indicating significant level injury or incapacitation. The costs were computed based on published crash cost rates by the Federal Highway Administration. The crash locations were then ranked in descending order based on the crash severity cost.

2.2.4 Composite Crash Index

Each of the methods described thus far provide some basis for identifying high-hazardous locations. However, the composite index method utilizes all of the factors: crash rate, severity and frequency to rank the reported crashes. The three types of rankings (rate, severity, and frequency) are combined to create a composite rank index. The crash rate, crash severity, and crash frequency rankings are combined in the model presented in Equation 2 to determine the composite index for the crashes.

$$\text{Composite Crash Index} = 0.25*RF + 0.25*RR + 0.50*RS \quad [2]$$

where:

RF = Rank of crash frequency

RR = Rank of crash rate; and

RS = Rank of crash severity

To determine the high hazardous crash locations, a ranked list was prepared for each of the three factors. The three rankings of each site were entered into Equation 2 to determine the crash composite index. The three normalized rank lists are weighted using values of 0.25 for frequency, 0.25 for rate, and 0.5 for severity (as shown in Equation 2). The intersections are then sorted in descending order of the crash composite index. The intersection with the lowest composite index is ranked the highest.

2.2.5 Delta Change

The delta-change method presents the change in the number of crashes over time, derived from the slope of a linear regression model. This technique utilizes the slope to determine the increase or decrease of crashes for a study location. In summary, the delta-change method represents the crash trend over a period of time with positive and negative slope values respectively signifying an increase and decrease in crashes. The results could be used to project the potential occurrence of traffic crashes over time, with the higher slope values indicating that the crashes are likely to increase at a higher rate, and vice versa. The following is the equation used for the delta-change method:

$$\frac{n\sum xy - n\sum x\sum y}{n\sum x^2 - (\sum x)^2} \quad [3]$$

where: n = Number of years;

x = Year of study; and

y = Number of crashes at study location in year x.

CHAPTER 3 – SUMMARY OF CRASH TRENDS AND FACTS

This Chapter presents an overview of the traffic crash trends in the District of Columbia for the years 2014 through 2016 and includes a summary of comparative crash statistics.

3.1 2016 DC Crash Statistics Quick Facts

Table 3.1 presents a summary of the crashes reported in the DC from 2014 through 2016. The pie chart in Figure 3.1 represents the percentage distribution of collisions by severity for 2016 only.

Table 3.1: DC Crash Quick Facts for 2016

Year	2014	2015	2016
Total Collisions	21,539	24,265	26,447
Fatal Collisions	24	26	27
Injury Collisions	5,811	6,215	6,305
Property Damage Only (PDO) Collisions	15,704	18,024	20,115
Fatalities	26	26	28
Total Non-Fatal Injuries	8,030	8,341	8,336
Disabling Injuries*	311	279	238
Non-Disabling Injuries*	1,490	2,065	2,283
Total Vehicles Involved	42,404	46,854	52,226
Total Persons Involved	51,550	60,958	64,819
Total Pedestrians Involved	1,258	1,243	1,091
Pedestrian Fatalities	10	15	9
Fatalities/100 Million VMT	0.70	0.70	0.76
Injuries/100,000 Population	1,218.71	1,240.80	1,238.32*

*Estimated

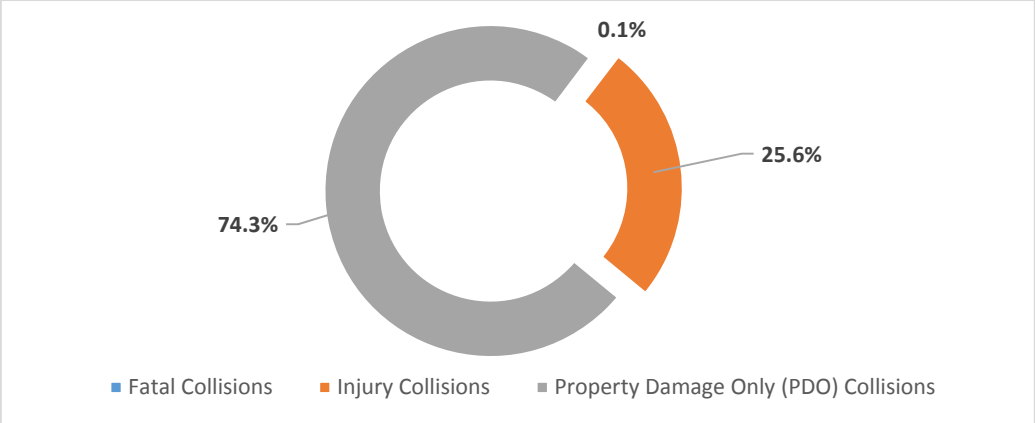


Figure 3.1: Crash Severity Types for 2016

Table 3.1 shows that the total number of crashes and fatalities recorded in 2016 increased by approximately 8% from the previous year. The most frequent crash severity type recorded in 2016 was Property Damage Only (PDO), which represented approximately 76.1% (20,115) of all crashes for that year. Injury and fatality crashes respectively represented about 23.8% (6,305) and 0.1% (27) of the total number of crashes recorded in 2016 as shown in Figure 3.1.

3.2 DC Crashes Trend for 2007 through 2016

Figure 3.2 shows the trend in total crashes and corresponding injuries by year from 2007 through 2016. The figure shows that there has been a gradual increase in the number of crashes from 2011 to 2016.

Figure 3.3 shows the number of fatalities by year, while Figure 3.4 presents the number of injured persons recorded by year from 2007 through 2016. The summary of the number of disabling and non-disabling injuries by year are presented in Figures 3.5 and 3.6, respectively.

Figure 3.2: Traffic Crashes and Injury Crashes from 2007 through 2016

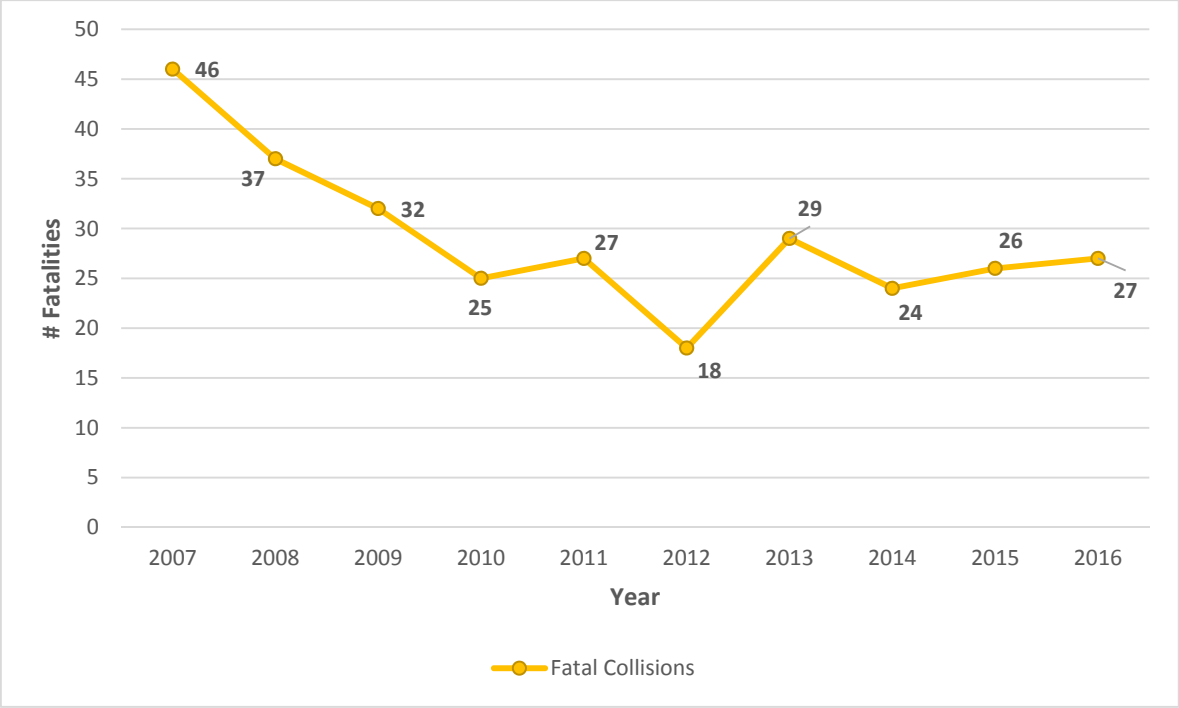


Figure 3.3: Number of Fatalities from 2007 through 2016

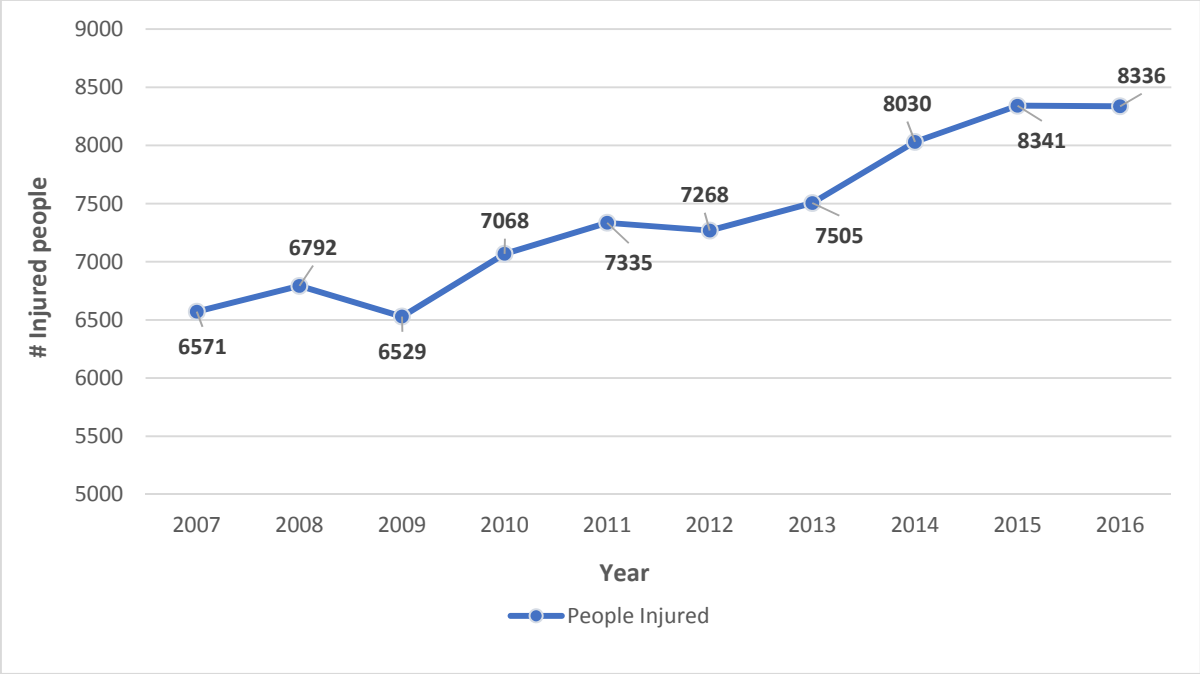


Figure 3.4: Number of Injured Persons from 2007 through 2016

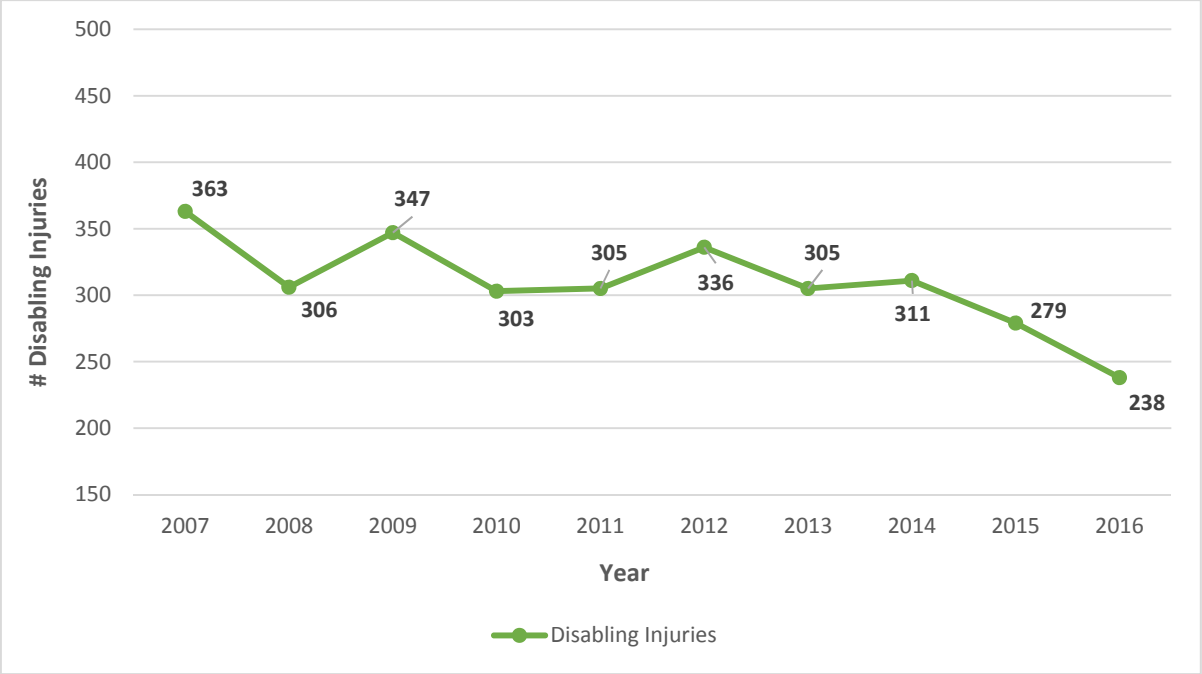


Figure 3.5: Number of Disabling Injuries from 2007 through 2016

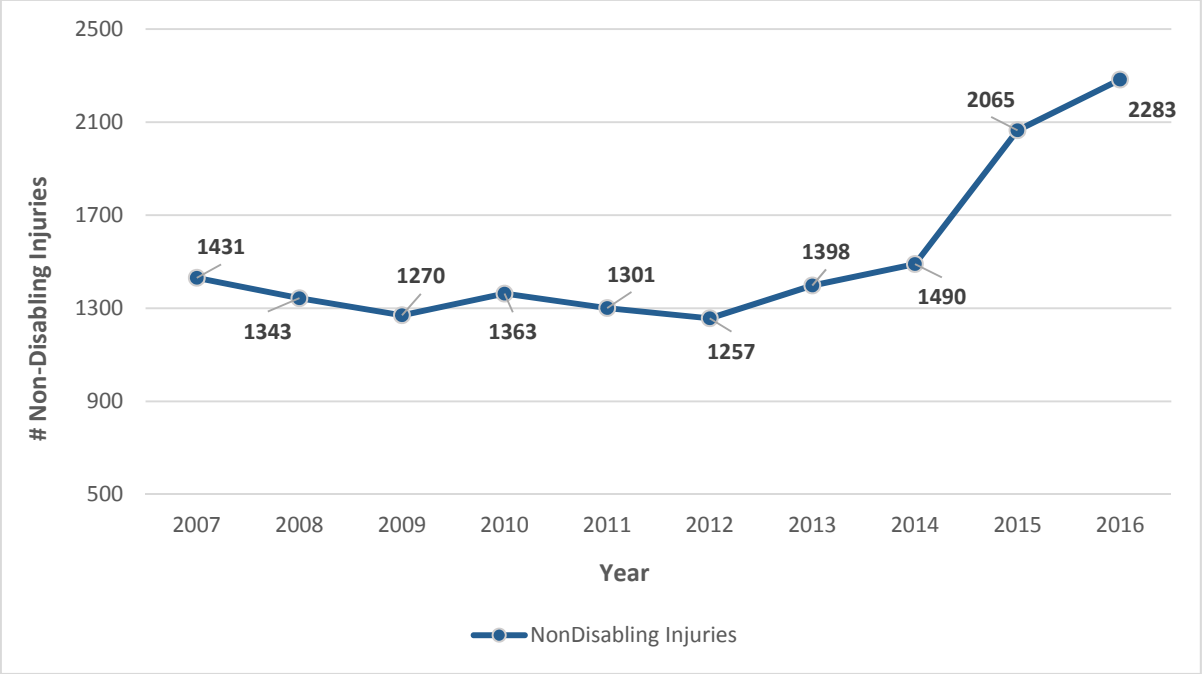


Figure 3.6: Number of Non-Disabling Injuries from 2007 through 2016

While there was an increase in the number of injured persons from 2009 to 2016 (Figure3.4) and for the number of non-disabling injuries from 2012 to 2016 (Figure3.6), there has been a decline in the number of disabling injuries from 2014 to 2016 (Figure 3.5).

CHAPTER 4 – CRASH STATISTICS AND TRENDS

This section of the report presents the descriptive statistics for traffic crashes reported in the District of Columbia from 2014 to 2016. Some of the characteristics analyzed include crash occurrence time, crash type, roadway user and vehicle contributing factors, road conditions and geometric characteristics. The analysis focused on following:

- *Temporal*: time of crash occurrence such as year, month, date, time and day of week;
- *Location*: crash location identified by pre-defined areas such as Ward, Quadrant, and Police District
- *Crash Characteristics*: involved roadway users, related vehicle types, and others
- *Crash Severity*: fatal crash, injury crash, or property damage only
- *Environmental Factors*: road condition, light condition, weather condition, etc.
- *Hit and Run*

4.1 Temporal

The tables and figures in this section present the frequencies and distributions of crashes by time of day, day of week, day of month, month and year.

4.1.1 Traffic Crashes and Injuries by Hour of the Day

Table 4.1 presents the frequency of crashes for weekdays and weekends by hour of day for 2016. From the table, the majority of the crashes were reported between the hours of 3 P.M. (hour 15) and 6 P.M. (hour 18), with the highest number of reported injuries (597) occurring in hour 15 (3 P.M.). The total number of fatalities in 2016 recorded by the hour is presented in Figure 4.1. The maximum number of fatalities (5) was recorded during hour 22 (10 P.M.).

Table 4.1: Crashes by Hour of the Day in 2016

Hour	Collisions	Fatalities	Injuries
00	662	0	207
01	513	3	137
02	500	4	131
03	517	2	169
04	300	3	83
05	320	0	117
06	579	1	216
07	1,131	0	404
08	1,569	0	510
09	1,518	0	483
10	1,219	0	354
11	1,211	0	360
12	1,347	0	381
13	1,312	0	421
14	1,327	1	474
15	1,776	2	597
16	1,890	0	546
17	2,053	0	594
18	1,745	2	549
19	1,298	1	401
20	1,029	1	319
21	886	1	325
22	930	5	320
23	815	1	238
Total	**26,447**	**27**	**8,336**

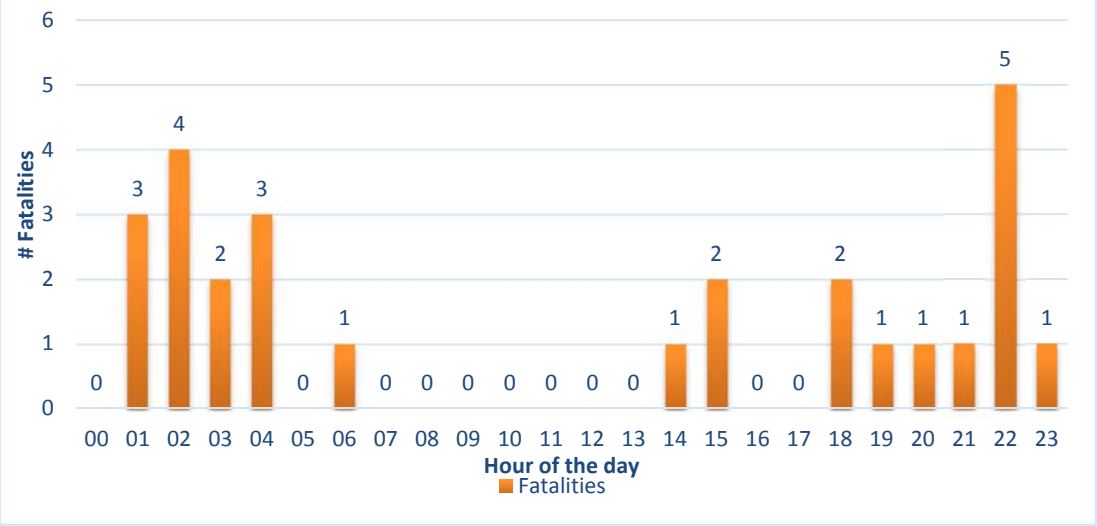


Figure 4.1: Total Fatalities by Hour in 2016

Figures 4.2 and 4.3 show the crashes and injuries by the hour of day for weekdays and weekends respectively. The figures show that the crash frequency in 2016 was highest during hour 17 (5 P.M.) for the weekdays and hour 17 (5 P.M.) for the weekends.

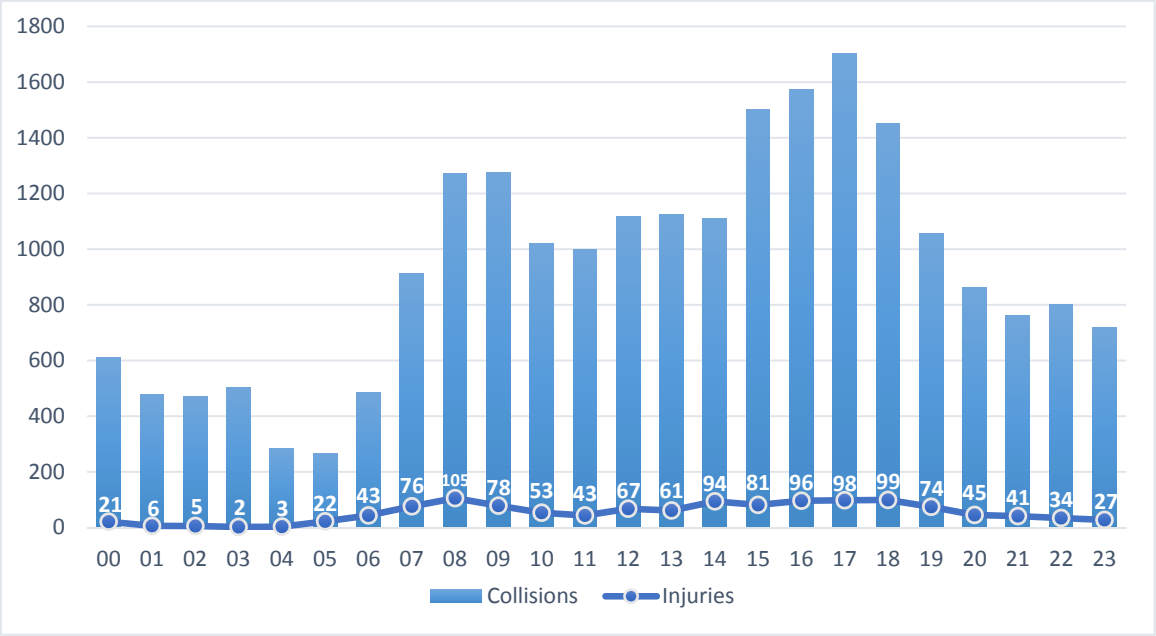


Figure 4.2: Crashes and Injuries by Hour of Day for Weekdays in 2016

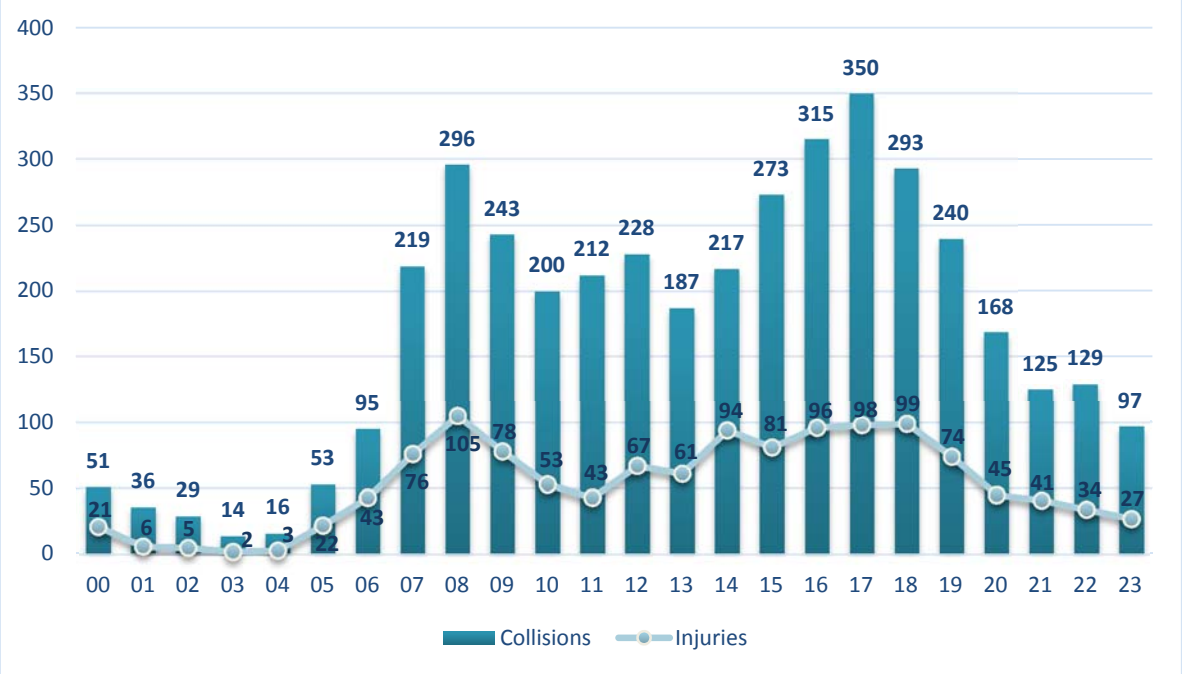


Figure 4.3: Crashes and Injuries by Hour of Day on Weekends in 2016

4.1.2 Traffic Crashes by Day of the Week

Table 4.2 shows the frequencies of crashes reported by the day of the week. This is also presented in Figure 4.4. From the table and figure, the highest number of crashes and injuries occurred on Friday while the highest number of fatalities occurred on Saturday. On the other hand, the lowest number of crashes and injuries was observed on Sunday.

Table 4.2: Crashes by Day of the week for 2016

	Collisions	Fatalities	Injuries
Sunday	2,807	3	914
Monday	3,448	2	1,146
Tuesday	4,041	4	1,288
Wednesday	4,086	3	1,274
Thursday	4,209	4	1,296
Friday	4,442	5	1,304
Saturday	3,414	6	1,114
Total	26,447	27	8,336

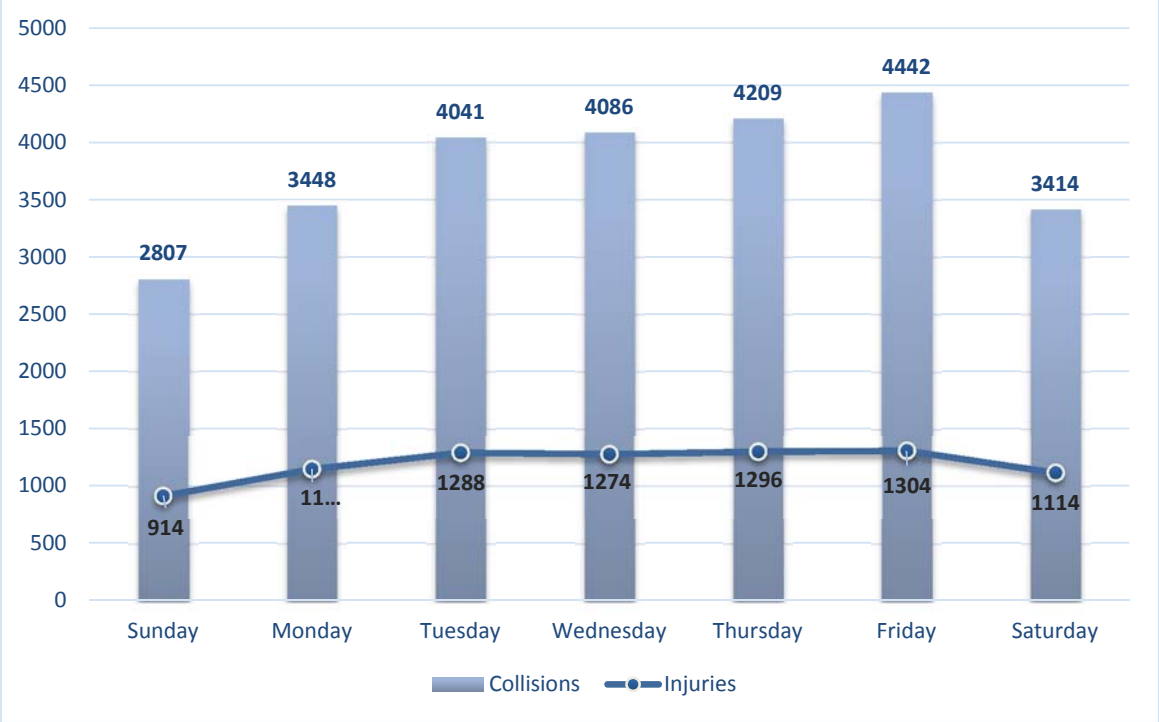


Figure 4.4: Crashes and Injuries by Day of Week in 2016

4.1.3 Traffic Crashes by Month

Table 4.3 and Figure 4.5 respectively show the overall vehicle crashes by month in 2016 and by month for 2014 through 2016. From the table, the highest number of crashes occurred in June while the lowest occurred in February.

Table 4.3: Crashes by Month in 2016

Month	Collisions	Fatalities	Injuries
January	1,888	1	475
February	1,800	1	486
March	2,272	1	688
April	2,302	3	737
May	2,354	1	779
June	2,434	3	748
July	2,268	4	767
August	2,190	4	788
September	2,339	3	732
October	2414	4	790
November	2,188	0	692
December	1,998	2	654
Total	**26,447**	**27**	**8,336**

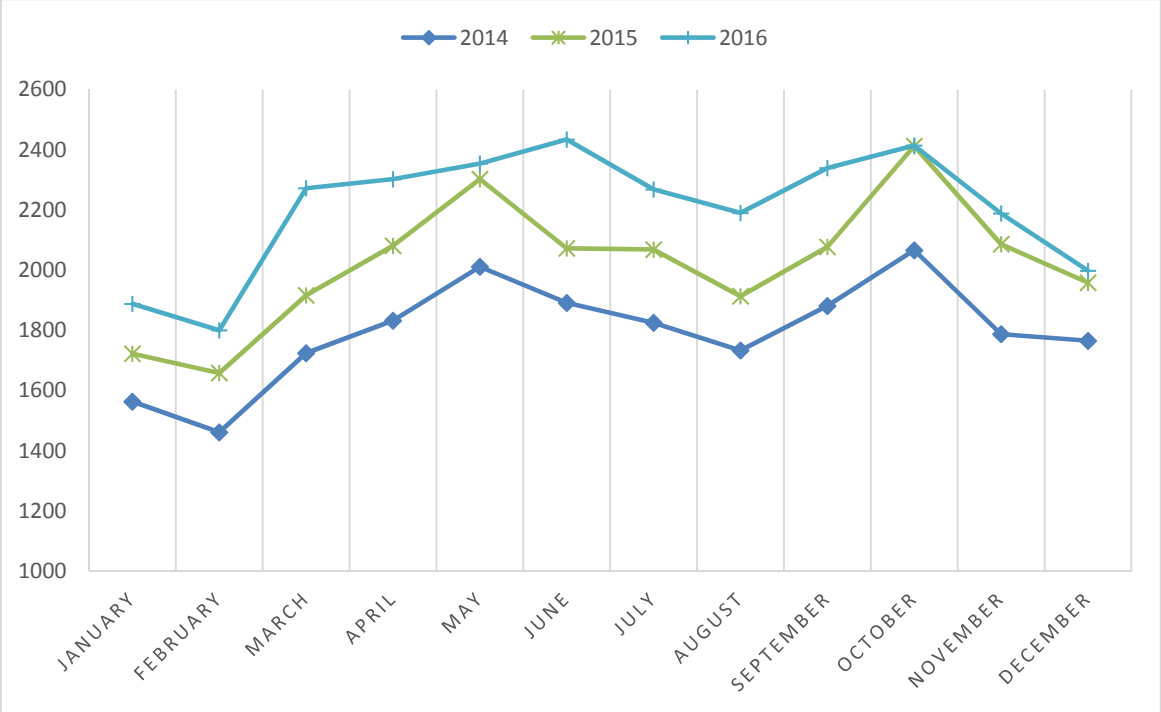


Figure 4.5: Total Crashes by Month for 2014-2016

4.2 Location

4.2.1 Crashes by Quadrant

This section presents the frequency of crashes reported in each quadrant in DC. The summary of the crashes by each quadrant is presented in Table 4.4 and shown in Figure 4.6. From the table and figure, it can be observed that the Northwest (NW) quadrant recorded the highest number of reported crashes in 2016. Since the NW quadrant is the largest coverage area and therefore has the highest mileage, most of the reported crashes occurred in that quadrant. The GIS map for the crashes by quadrant is presented in Figure 4.7.

Table 4.4: Crashes by Quadrant in 2016

	Collisions	Fatalities	Injuries
NW	12,125	8	3,174
NE	5,951	4	2,021
SE	4,609	11	1,566
SW	747	2	245
BN	1,702	1	709
Unknown	1,313	1	621
Total	26,447	27	8,336

Note: NW=Northwest, NE=Northeast, SE=Southeast, SW=Southwest, BR=Border

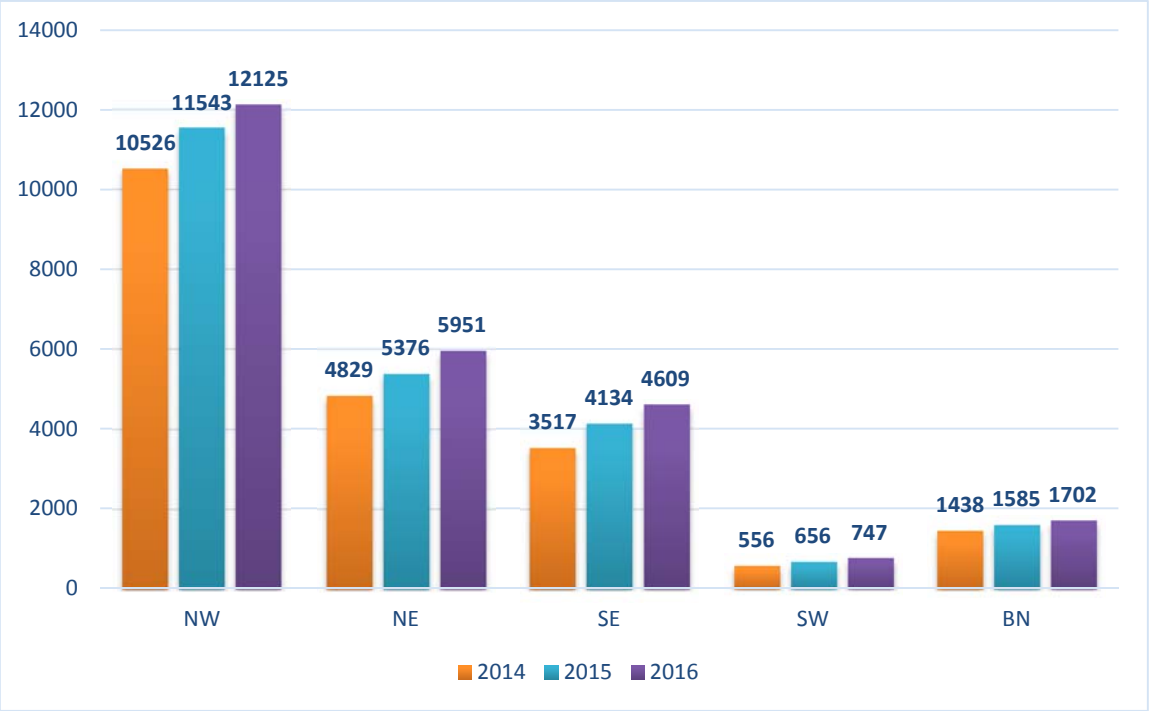


Figure 4.6: Total Crashes by Quadrant for 2014-2016

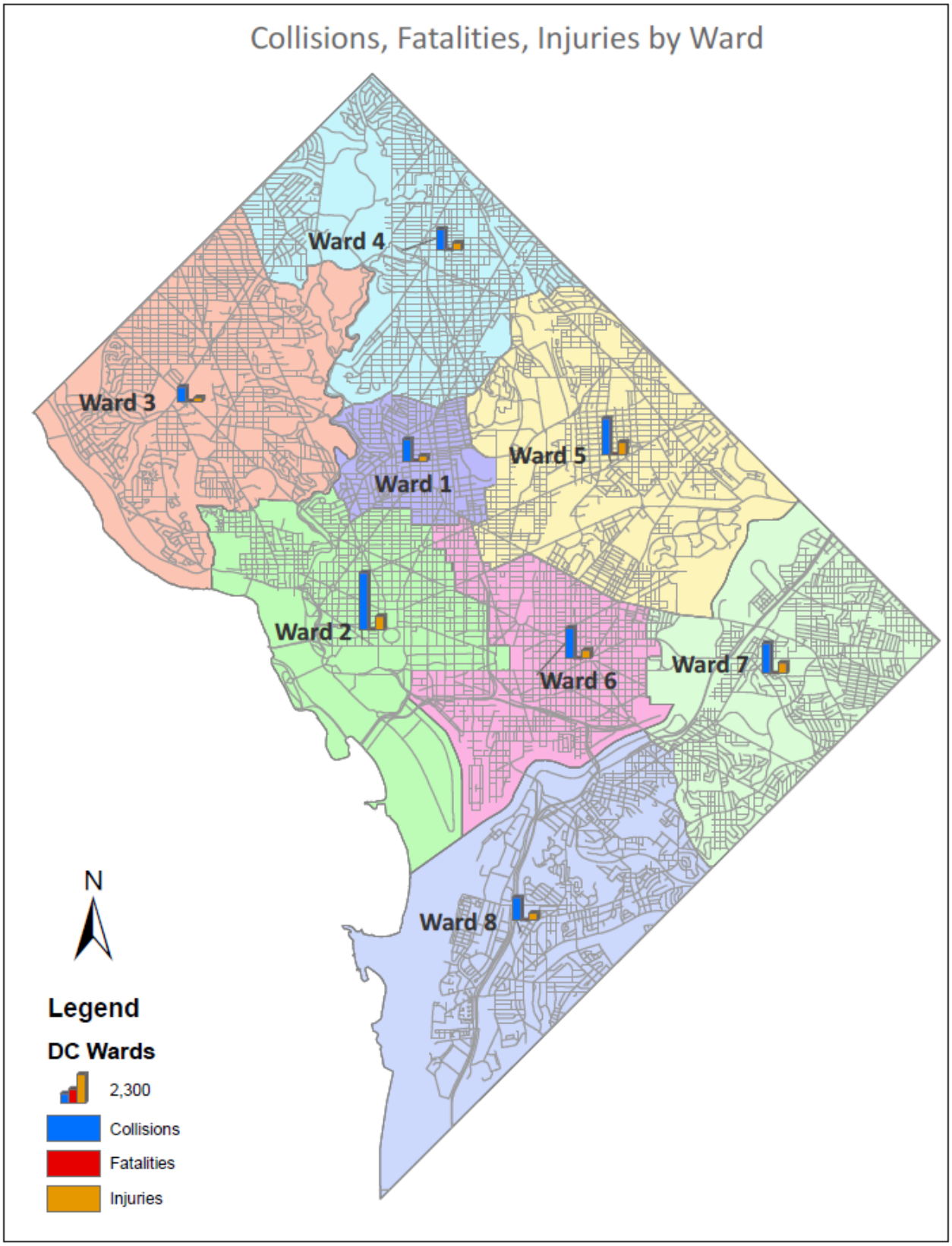


Figure 4.7: Crashes, Fatalities, Injuries by Wards for 2016

4.2.2 Crashes by Ward

The frequency and distribution of crashes by Ward are presented in Table 4.5 and Figure 4.7 for 2014 through 2016. The highest crash frequency occurred in Ward 2, representing approximately 17% of all traffic crashes in 2016, followed by Ward 5 with approximately 11% of the total crashes. Wards 2 and 5 experienced, again, the highest frequency of injury crashes as shown in Table 4.5. The summary also shows that, most of the Wards recorded increases (between 5-16%) in the number if crashes from 2014 to 2016.

Table 4.5: Crashes by Ward from 2014-2016

Ward	2014			2015			2016		
	Collisions	Fatalities	Injuries	Collisions	Fatalities	Injuries	Collisions	Fatalities	Injuries
1	1,637	0	505	1,600	0	457	1,775	2	446
2	4,211	2	1,089	4,311	2	1053	4,587	3	1,104
3	1,168	1	345	1,238	2	378	1,168	0	315
4	1,615	0	643	1,729	2	698	1,709	1	610
5	2,593	1	1,149	2,686	5	1,126	2,923	2	1,034
6	2,134	3	727	2,214	1	743	2,495	0	707
7	2,049	4	974	2,230	3	944	2,406	4	876
8	1,486	1	654	1,729	4	648	1,854	5	603
Border	1,879	5	739	1,939	0	664	2,071	2	659
Unknown	2,767	9	1,205	4,589	7	1,630	5,459	8	1,982
Total	21,539	26	8,030	24,265	26	8,341	26,447	27	8,336

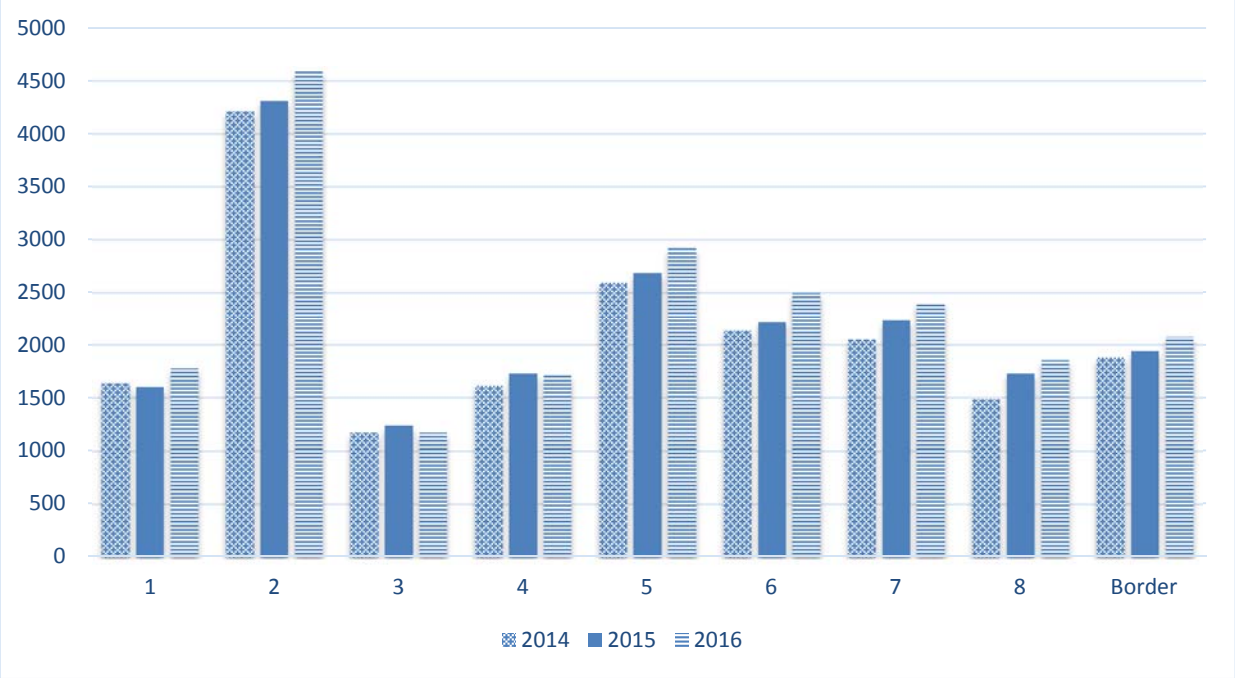


Figure 4.8: Total Crashes by Ward for 2014-2016

4.2.3 Crashes by Police Districts

The crash frequencies by Police Districts from 2014 through 2016 are shown in Table 4.6 and depicted in Figure 4.9. From the table and figure, Police District 1 recorded the highest frequency of crashes; an average of 20%, during the three year period. There were modest increases in the crash frequencies in some of the Police Districts over the 3-year period. Also, Districts 1 and 2 recorded approximately 40% of the total crashes combined from 2014 through 2016. The GIS map for the crashes by Police District in 2016 is presented in Figure 4.10.

Table 4.6: Crashes by Police District for 2014-2016

Police District	2014			2015			2016		
	Collisions	Fatalities	Injuries	Collisions	Fatalities	Injuries	Collisions	Fatalities	Injuries
1	4,248	7	1,546	4,904	1	1,697	5,402	2	1,659
2	4,173	5	1,047	4668	1	1,179	4,677	4	1,097
3	2602	2	816	2768	0	776	2,961	3	754
4	2,588	1	1,026	2,905	2	1,132	2,867	3	1,036
5	3,043	0	1,306	3376	3	1,264	3,671	1	1,243
6	2,760	7	1,340	3,109	1	1,296	3,239	6	1,229
7	1,966	4	896	2,403	2	955	2,626	8	973
Unknown	159	0	53	132	16	42	1,004	0	345
Total	21,539	26	8,030	24,265	26	8,341	26,447	27	8,336

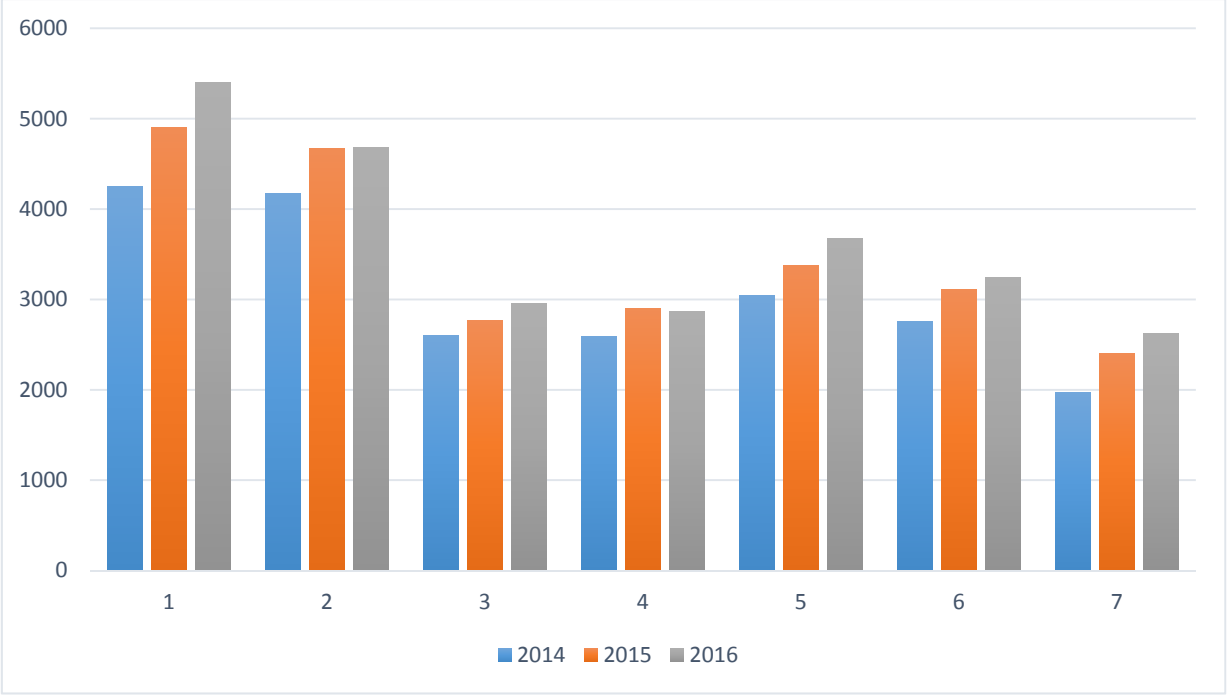


Figure 4.9: Total Crashes by Police District for 2014-2016

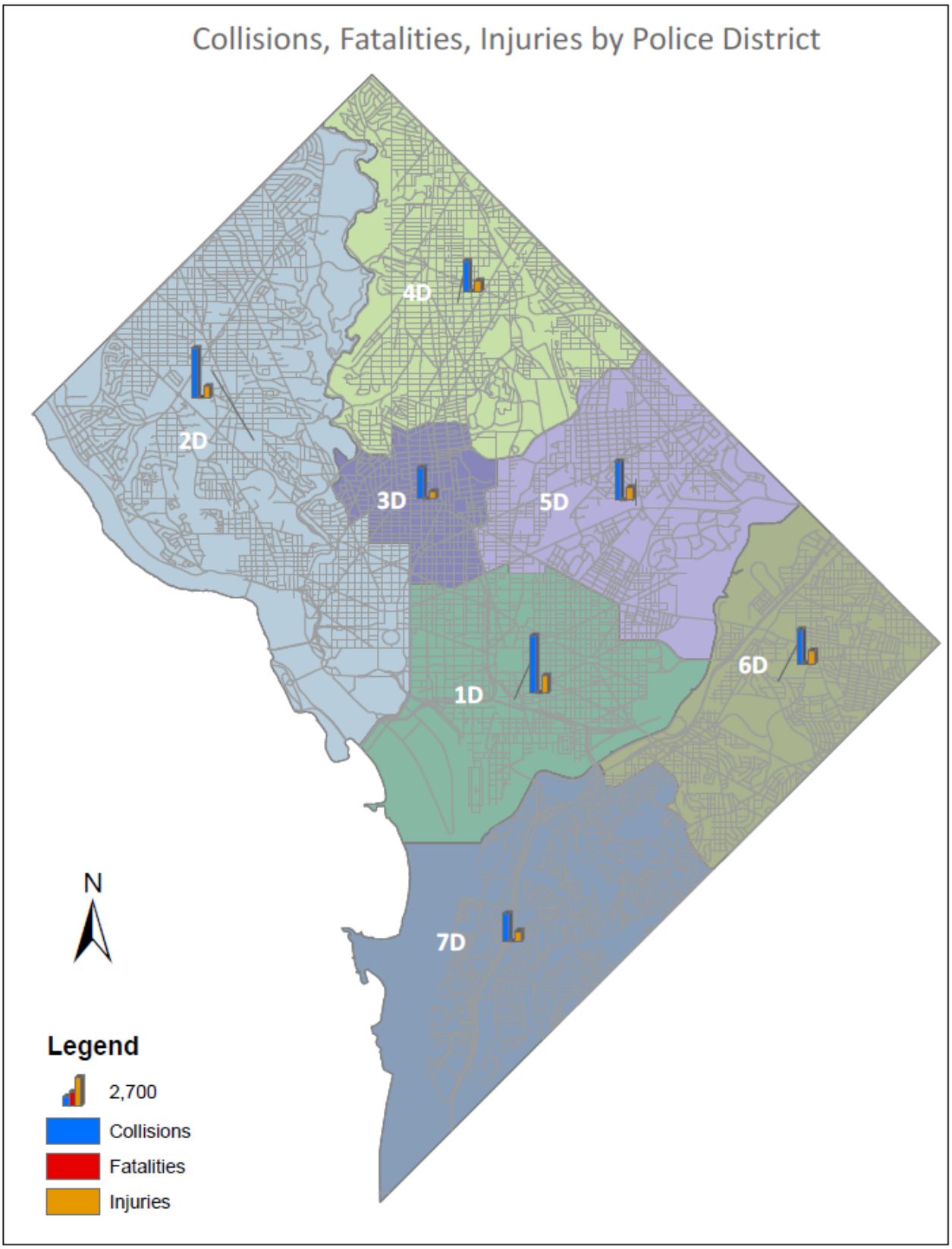


Figure 4.10: Crashes, Fatalities, Injuries by Police District for 2016

4.2.4 Crashes by Advisory Neighborhood Commissions (ANCs)

Washington, DC has 37 Advisory Neighborhood Commissions (ANCs). The summary of the crash statistics for each ANC is presented in Table 4.7.

Table 4.7: Crashes by ANCs in 2016

ANC	Description	Crashes	Fatalities	Injuries
Unknown	Unknown	5,459	8	1,982
1A	Columbia Heights, Pleasant Plains	416	1	116
1B	Cardozo, Howard University, LeDroit Park, Shaw	873	1	226
1C	Adams Morgan, Kalorama Heights, Lanier Heights, Western U Street	231	0	32
1D	Mount Pleasant	51	0	10
2A	Foggy Bottom, West End	648	0	141
2B	DuPont Circle	968	1	222
2C	Blagden Alley, Chinatown, Logan Circle, Mount Vernon Square, Shaw	593	0	142
2D	Kalorama, Sheridan	57	0	19
2E	Burleith, Georgetown, Hilandale	555	0	133
2F	Logan Circle	911	1	254
3B	Cathedral Heights, Glover Park	83	0	11
3C	Cathedral Heights, Cleveland Park, Massachusetts Heights, McLean Gardens, Woodley Park	391	0	110
3D	American University, Foxhall, Kent, The Palisades, Spring Valley, Wesley Heights	141	0	42
3E	American University Park, Friendship Heights, Tenleytown	126	0	36
3F	Forest Hills, North Cleveland Park, Tenleytown	223	0	57
3G	Chevy Chase	131	0	37
4A	Brightwood, Colonial Village, Crestwood, Shepherd Park, Sixteenth Street Heights	253	0	75
4B	Brightwood, Lamond-Riggs, Manor Park, Riggs Park, South Manor Park, Takoma	413	0	167
4C	Columbia Heights, Crestwood, Petworth, Sixteenth Street Heights	411	0	151
4D	Petworth	173	0	38
5A	Brookland, Fort Lincoln, Michigan Park, North Michigan Park, University Heights, Woodridge	607	1	265
5B	Arboretum, Brentwood, Brookland, Carver, Langdon, Langston, Ivy City, Trinidad	1,385	1	431
5C	Bloomingdale, Eckington, Edgewood	760	0	283
6A	North Lincoln Park, Rosedale, Stanton Park	404	0	131
6B	Barney Circle, Capitol Hill, Eastern Market	579	0	137
6C	Near Northeast, Penn Quarter, Union Station	1,145	0	300
6D	Carrollsburg, Fort McNair, Navy Yard, Near Southwest/Southeast, Waterfront	391	0	135
7A	Fort DuPont, Greenway, River Terrace	404	2	162
7B	Fairfax Village, Hillcrest, Penn Branch, Randle Highlands	331	0	127
7C	Burrville, Deanwood, Grant Park, Lincoln Heights	327	2	116
7D	Eastland Gardens, Kenilworth, Kingman Park, Mayfair	602	0	215
7E	Benning Heights, Capitol View, Fort Davis, Marshall Heights	347	0	98
8A	Anacostia, Fairlawn, Fort Stanton, Hillsdale	420	0	106
8B	Garfield Heights, Knox Hill, Shipley Terrace	434	0	124
8C	Barry Farms, Bolling Air Force Base, Congress Heights, St. Elizabeth's Hospital	391	0	163
8D	Bellevue, Far Southwest	198	1	48
8E	Congress Heights, Valley Green, Washington Highlands	240	2	104
Border	Border between ANCs	4,375	6	1,390
Total		26,447	27	8,336

From the summary presented in Table 4.7, ANC 5B (Arboretum, Brentwood, Brookland, Carver, Langdon, Langston, Ivy City, Trinidad) and 6C (Near Northeast, Penn Quarter, Union Station) were the top two ANCs that had the highest crash frequencies in 2016. The border lines between the various ANCs recorded the highest crash frequencies representing approximately 17% of the total number of crashes. Presented in Figure 4.11 is a GIS map showing the crash frequency distributions by the ANCs in 2016.

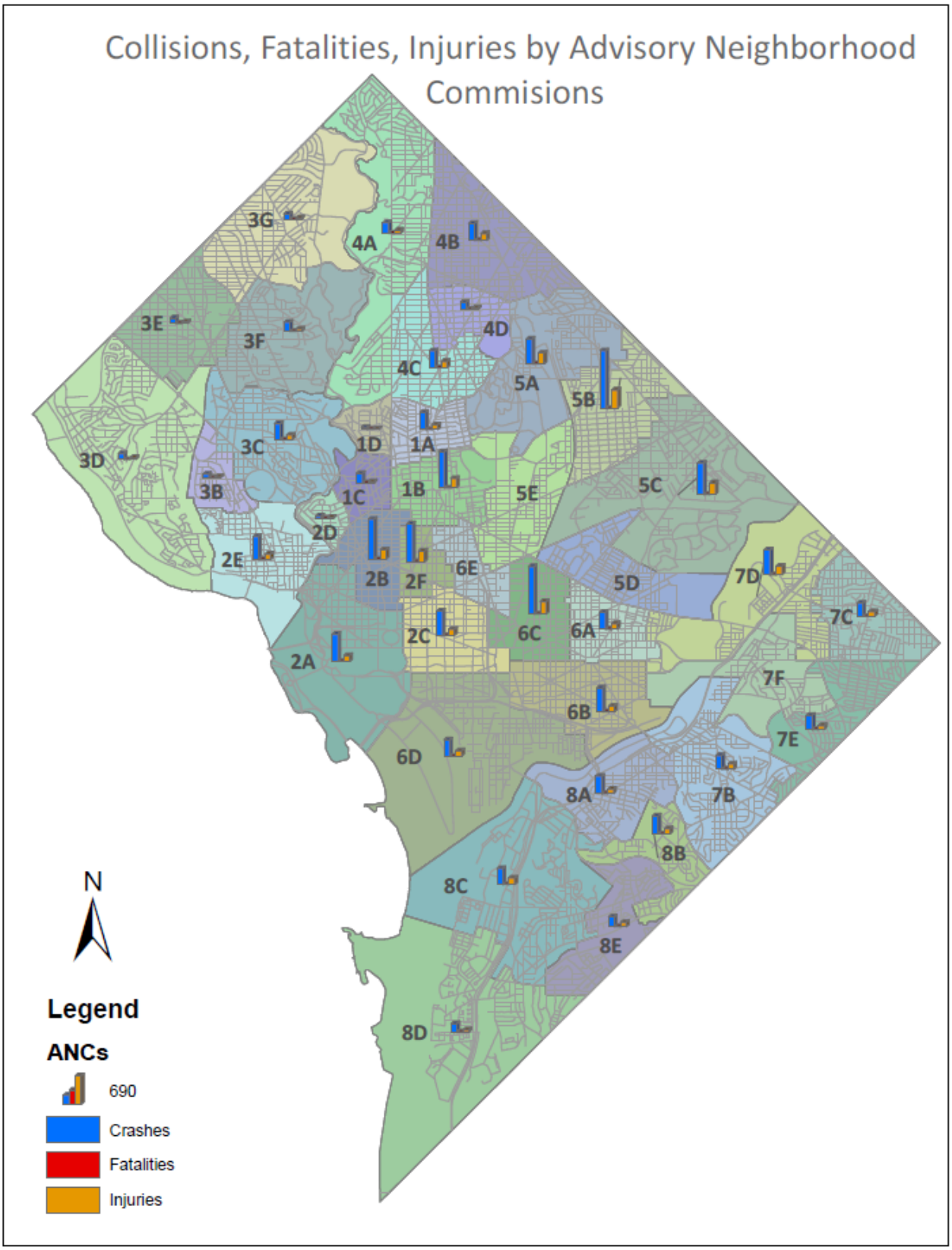


Figure 4.11: Crashes, Fatalities, Injuries by Advisory Neighborhood Commissions for 2016

4.2.5 Crashes in Construction Zones

Safety in construction zones continues to be a high priority for traffic engineering professionals and highway agencies. As a result, there is the need to assess crashes in such zones in order to identify mitigation strategies to reduce them. Table 4.8 shows the 3-year summary of crashes recorded in construction zones. From Table 4.9, there has been a steady decline in the frequency of crashes in construction zones from 2013 to 2016.

Table 4.8: Crashes in Construction Zones for 2013-2016

Year	2013	2014	2015	2016
Number of Collisions in Construction Zone	720	643	517	241
Percentage of Collisions in Construction Zone	3.70%	2.99%	2.40%	0.91%

4.3 Crash Classification

This section presents crash statistics by vehicle type, road-user characteristics, and factors related to the roadway environment.

4.3.1 Crash Severity Type

Figure 4.11 presents the summary of crashes recorded in the DC in 2016 by crash severity. The classifications are: fatalities, injury and PDOs.

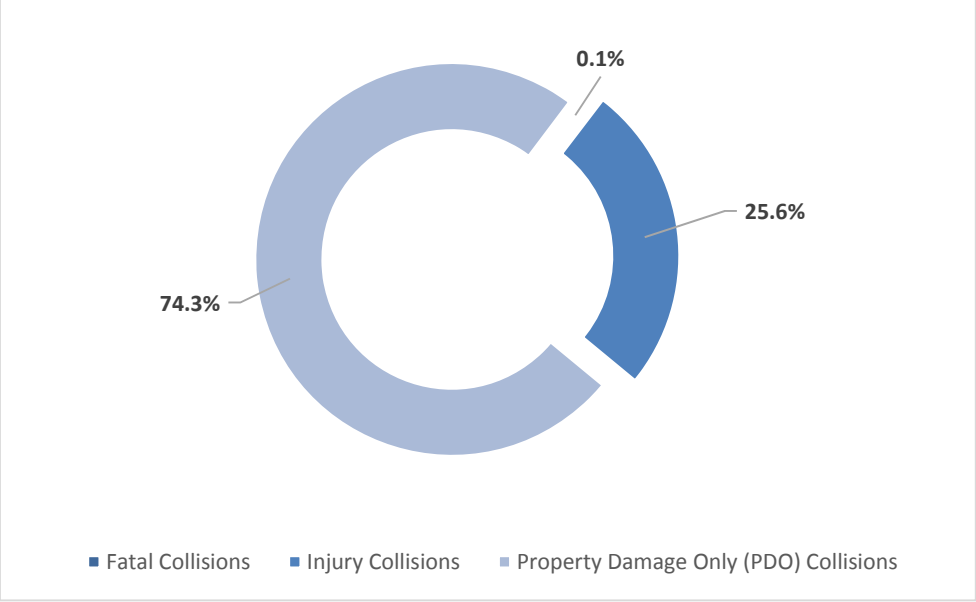


Figure 4.11: Crashes Severity Type in 2016

From Figure 4.11, the most crash severity type recorded was Property Damage Only (PDO), which represented approximately 74.3% of all crashes in 2016. Injury-related crashes represented approximately 26% of the crashes recorded while fatalities represent 0.1% of the total number of crashes.

4.3.2 Crash Type

Table 4.9 and Figure 4.12 present the summary of the total number of crashes distributed by crash type in 2016. From the table, side swipe, rear end, left-turn hit, right angle and parked vehicle crashes were the most common crashes in 2016. Together, they accounted for approximately 71% of the total number of crashes. Approximately 29% of the crashes were side swipe crashes, 23% rear-end crashes, and 7% each for right angle, left turn and parked vehicle crashes.

Table 4.9: Summary of Crashes by Type in 2016

Type of Crash	Total Crashes	Fatal Crashes	Injury Crashes	PDO Crashes	Fatalities	Injuries
Angle	2,803	0	1,075	1,728	0	890
Head On	2,726	0	1,136	1,590	0	881
Front to Rear	7,727	0	1,416	6,311	0	813
Rear to Front	753	0	211	542	0	335
Rear to Rear	283	0	95	188	0	132
Rear to Side	623	0	190	433	0	269
Sideswipe, Opposite Direction	1,000	0	313	687	0	473
Sideswipe, Same Direction	7,160	2	658	6,500	2	2,540
Other	2,469	0	857	1,612	0	1,490
Unknown	435	25	154	301	25	183
Blanks	468	0	200	223	0	330
Total	**26,447**	**27**	**6,305**	**20,115**	**27**	**8,336**

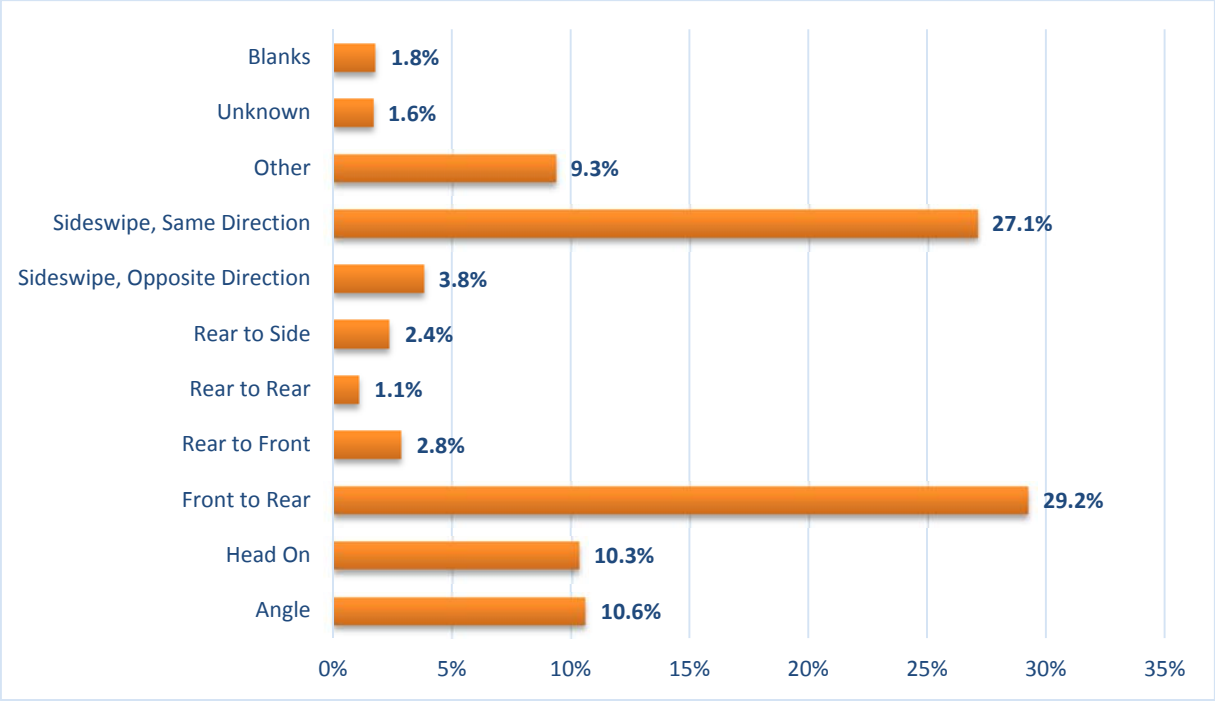


Figure 4.12: Crashes by Type in 2016

4.3.3 Hit-and-Run Crashes

The summary of reported hit-and-run crashes is presented in Figure 4.13. Hit and run crashes showed a significant increase of approximately 13% from 2015 to 2016. Figure 4.14 shows the resulting severity of hit and run crashes in 2016. In all, hit-and-run crashes resulted in no fatalities in 2016.

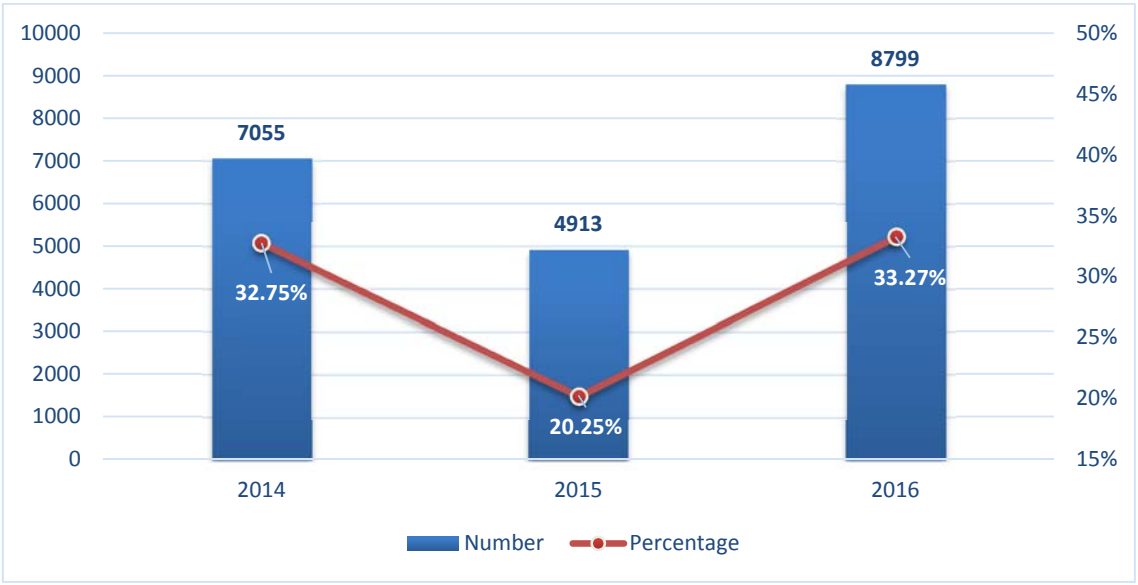


Figure 4.13: Hit and Run Crashes in 2016

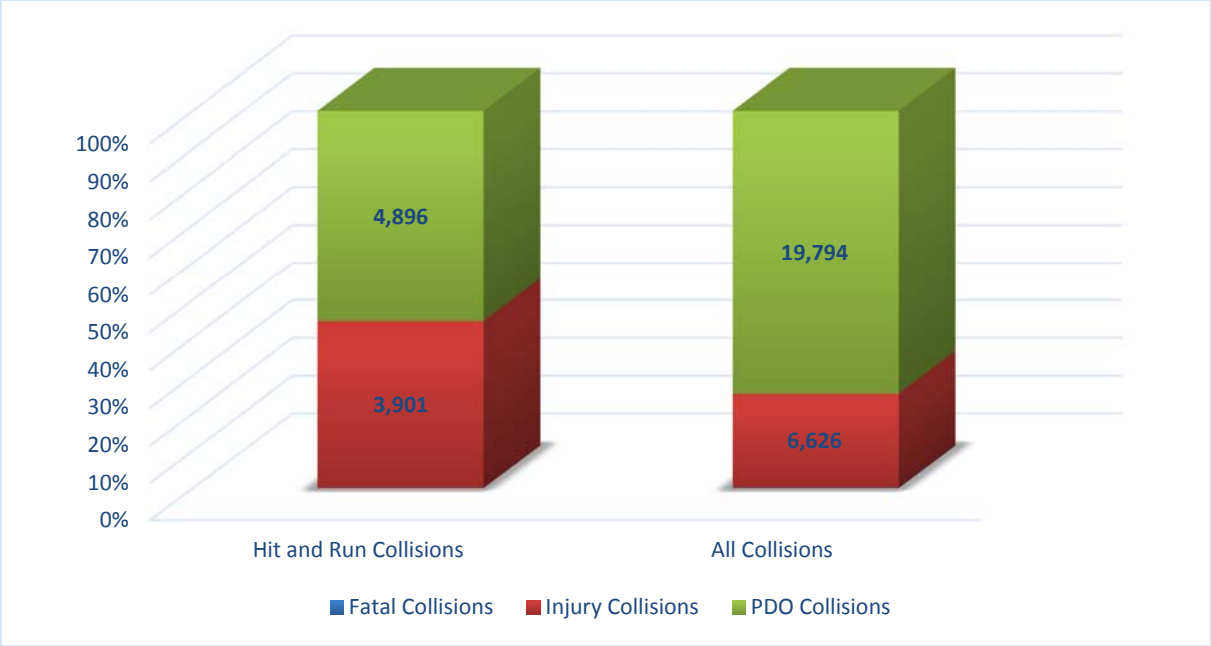


Figure 4.14: Severity of Hit and Run Crashes in 2016

4.3.4 Crashes by Vehicle Classification

Crashes involving buses, trucks, motorcycles, and bicycles are also of special interest. Crashes involving these special vehicles often pose increased risk of serious or fatal injuries. The summary of crash frequencies by vehicle classification in 2016 is presented in Table 4.10.

Table 4.10: Summary of Crash in 2016 by Vehicle Classification

Vehicle Involved	Crashes	Fatalities	Injuries
Passenger Auto	24,047	18	7,748
Bus	1,852	4	301
Taxi Cab	1,803	0	383
Motorcycle	228	5	143
Bicycle	-	-	-
Truck Trailer	833	0	227

*Bicycles are not considered in the "Vehicle Classification" field after 08/23/2015

From the table, passenger automobiles were the most involved in crashes followed by buses and taxi cabs. Crashes that resulted in fatalities and injuries were predominantly those involved with passenger cars as well. Overall, crashes involving motorcycles represented approximately 0.8% of the total number of crashes in 2016. Presented in Figures 4.15 through 4.17 are the 3-year crash trends by vehicle type and outcomes (injuries and fatalities).

Overall, the trend in reported crashes involving passenger autos showed a consistent increase from 2014 to 2016. On the other hand, crashes involving truck/trailers experienced a continuous decrease during the same timeframe. There was a significant decline in fatalities for trucks/trailers from 2014 to 2016. However, crash-related fatalities involving buses, motorcycles and passenger autos increased from 2015 to 2016.

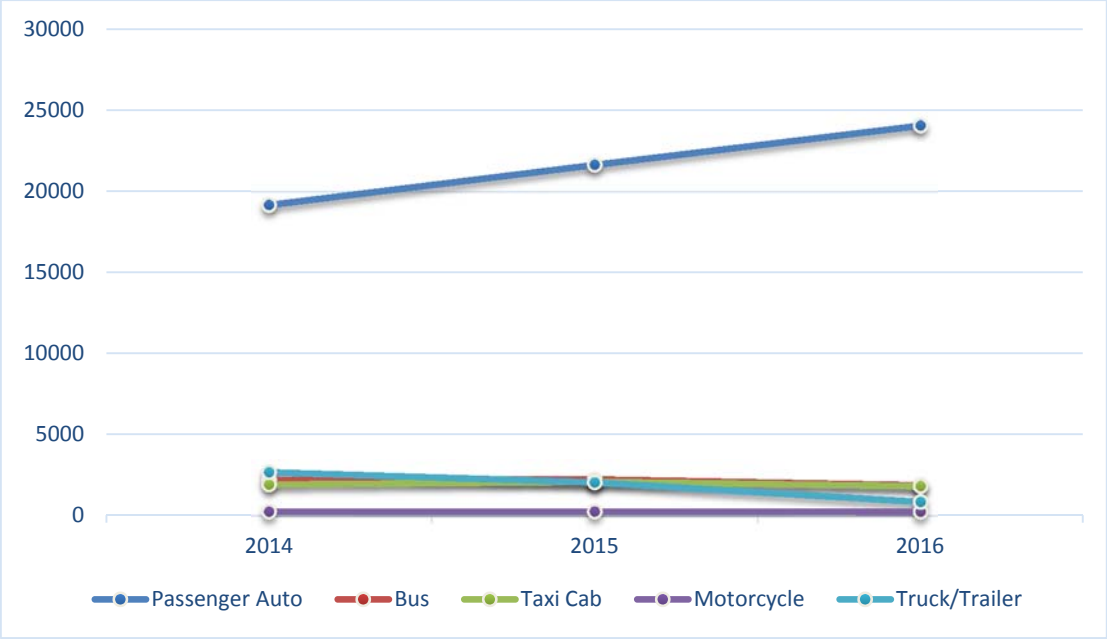


Figure 4.15: Three-year Trend of Crashes by Vehicle Type

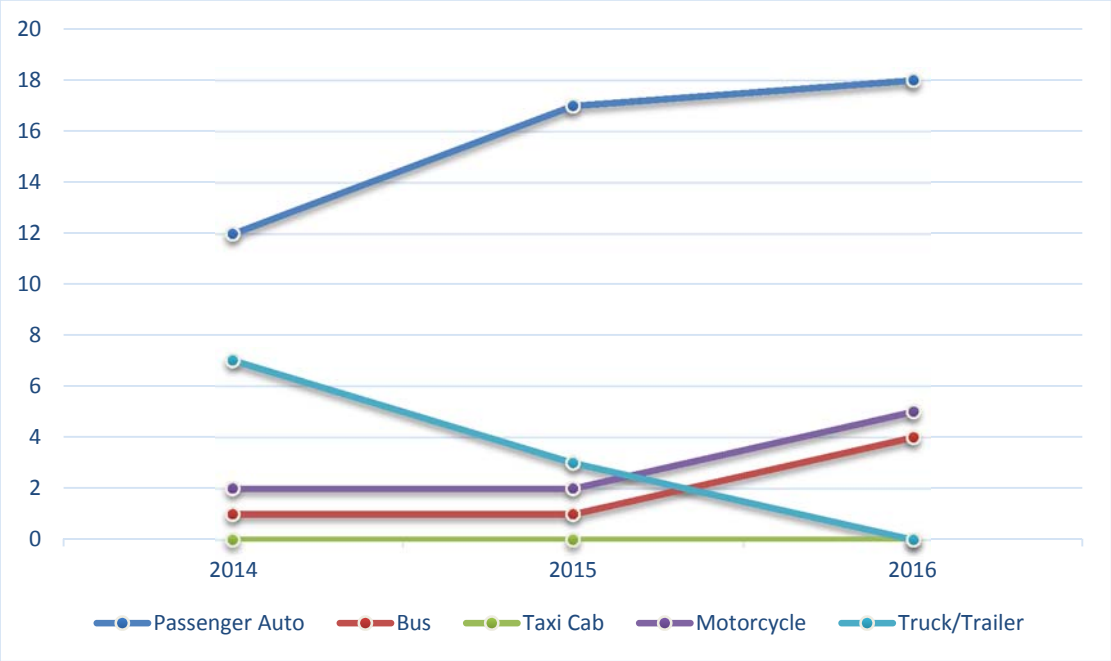


Figure 4.16: Three-year Trend of Fatalities by Vehicle Type

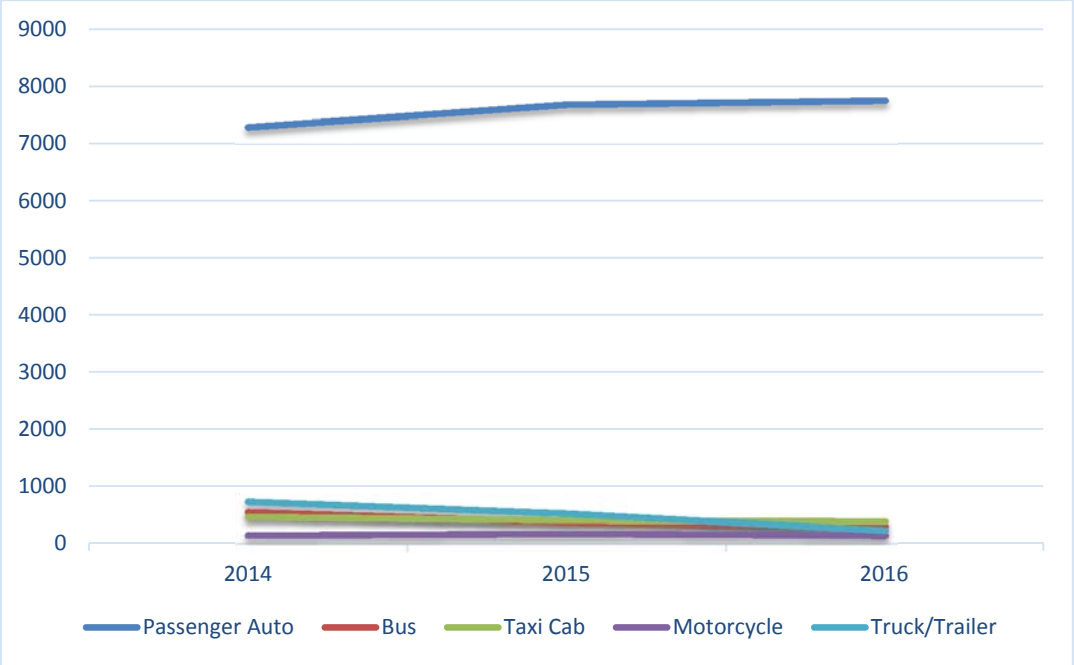


Figure 4.17: Three-year Trend of Injuries by Vehicle Type

4.3.5 Crashes involving Pedestrians

Since approximately 49% of workers in the District either commute by public transportation or walk to work, it is necessary to understand the causes and severity of crashes involving pedestrians. Presented in Figures 4.18 through 4.20 are the summaries of crashes involving pedestrians from 2014 through 2016 classified by age and gender. From the figures, there has been a continuous decrease in the total number of pedestrian-related crashes in 2016 compared to those in previous years. In addition, the distribution also shows that pedestrians in the age group of 21-30 were the most involved in crashes. Comparing crashes in 2015 to 2016, there was an increase in crashes involving female pedestrians. On the other hand, there was a decrease in crashes involving male pedestrians. Presented in Table 4.11 is a summary of injury codes reported by pedestrians in 2016 after being involved in a crash. Approximately 29% of the 1,091 pedestrians complained but did not have any visible injuries. Lastly, Figure 4.21 shows the pedestrian-involved crashes at intersections in 2016.

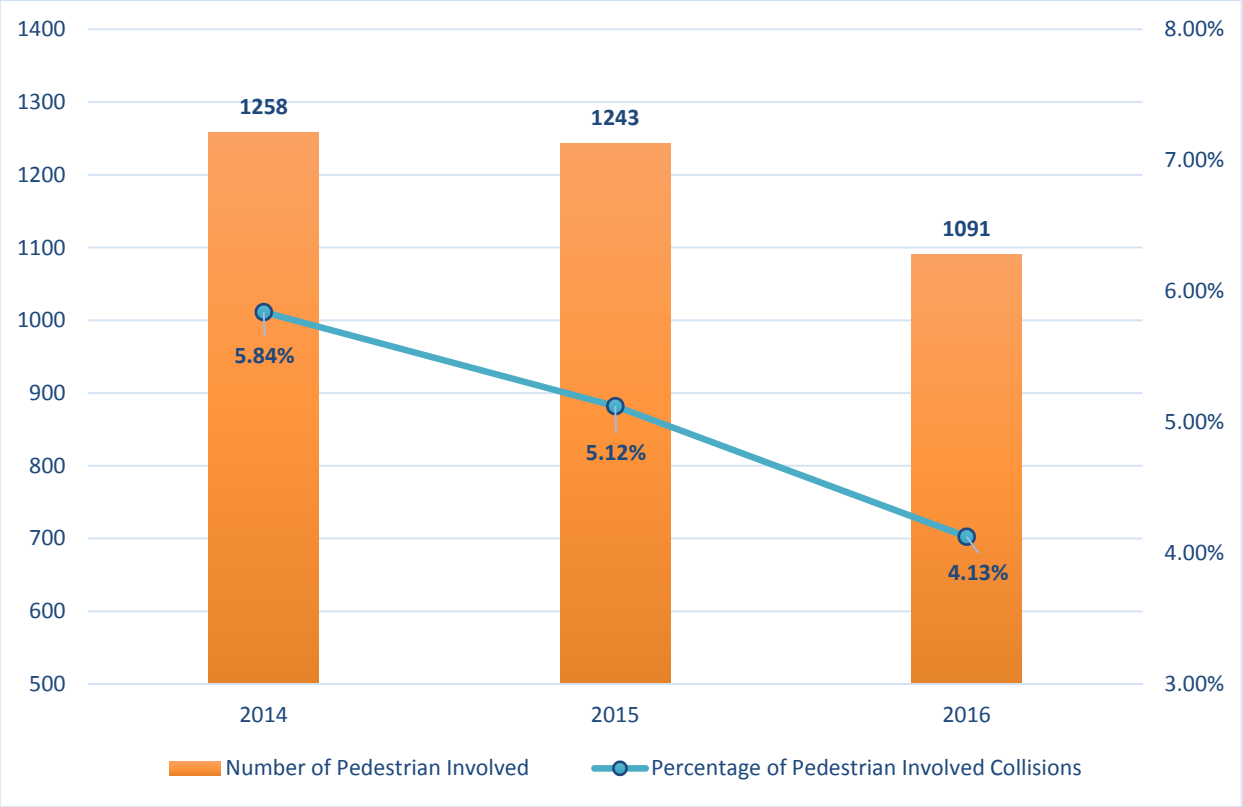


Figure 4.18: Three-year Trend of Crashes involving Pedestrians

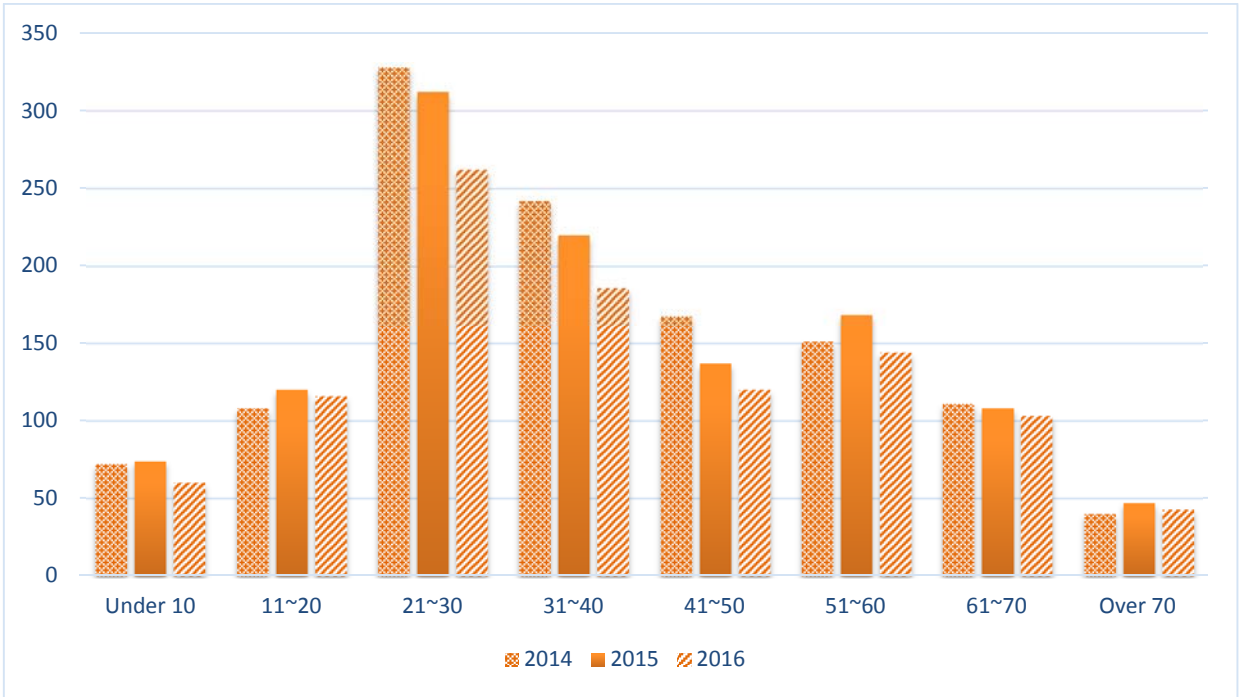


Figure 4.19: Three-year Trend of Crashes involving Pedestrians by Age

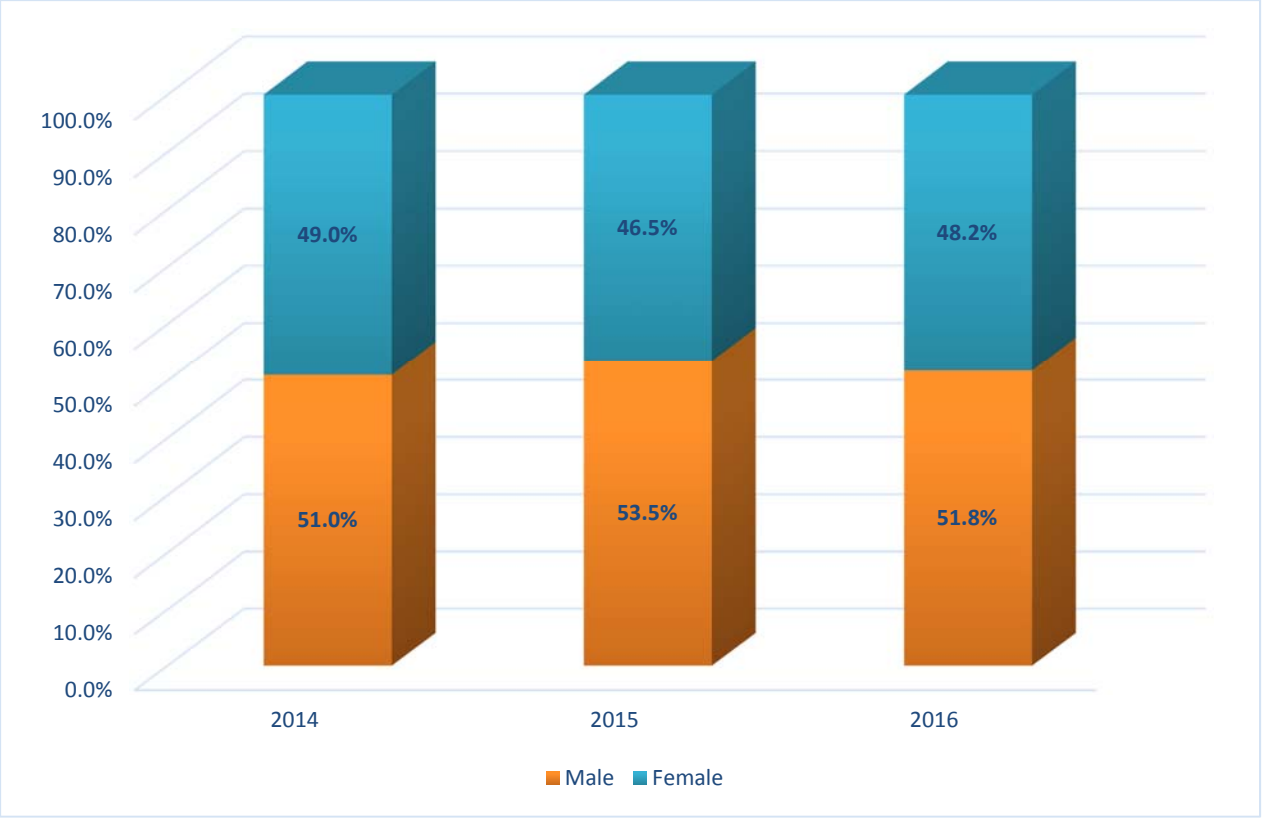


Figure 4.20: Three-year Trend of Crashes involving Pedestrians by Gender

Table 4.10: Pedestrian Involved Crashes by Injury Type in 2016

Injury Code	Frequency
Complaint but not visible	315
Disabling	72
Fatalities	9
Non-Disabling	170
No Injury	339
Unknown	94
Other	92
Total	**1,091**

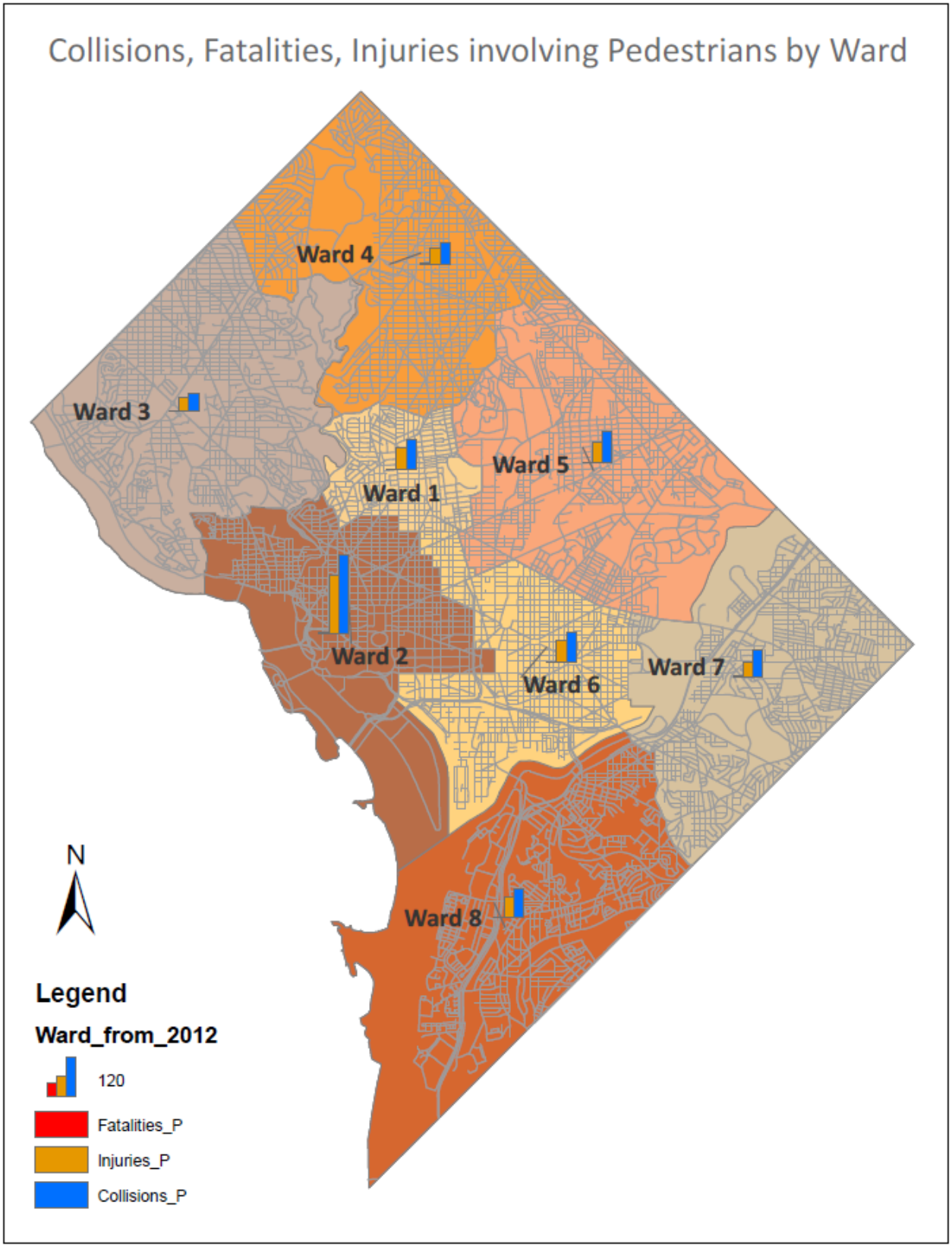


Figure 4.21: Pedestrian Involved Crashes at Intersections in 2016

4.3.6 Crashes involving Bicyclists

With the increasing use of bicycles in the District of Columbia, it is pertinent to determine crashes involving bicyclists. Figures 4.22 through 4.24 present the summaries of crashes involving bicyclists from 2014 through 2016 in terms of total crashes, by age and gender.

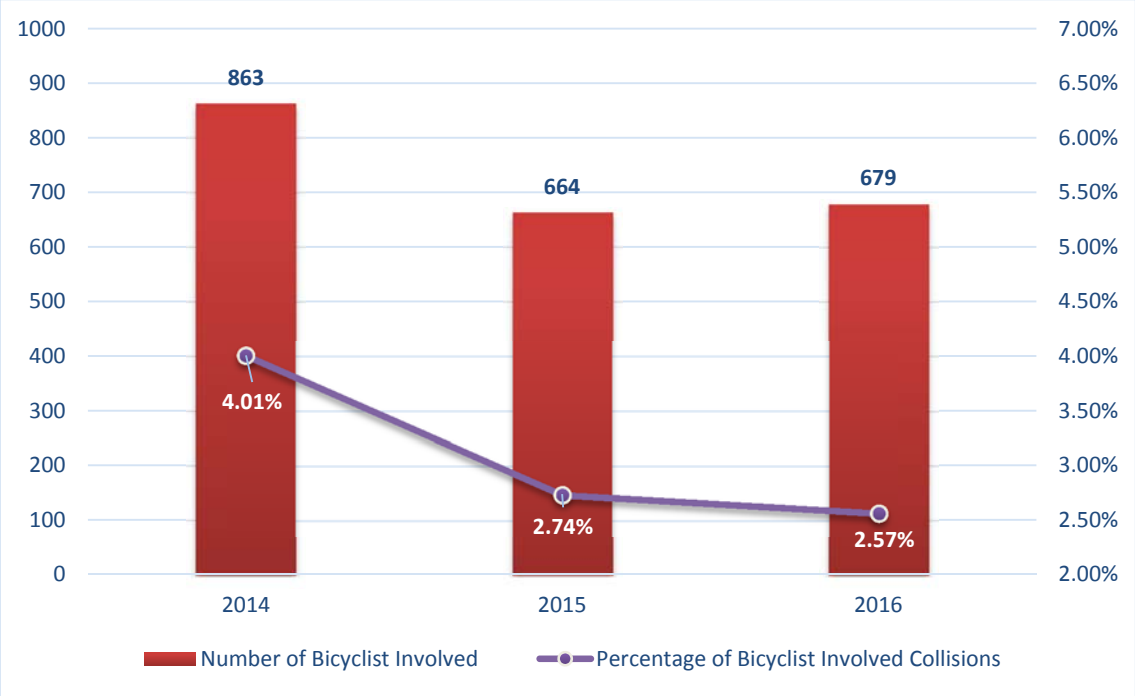


Figure 4.22: Three-year Trend of Crashes involving Bicyclists

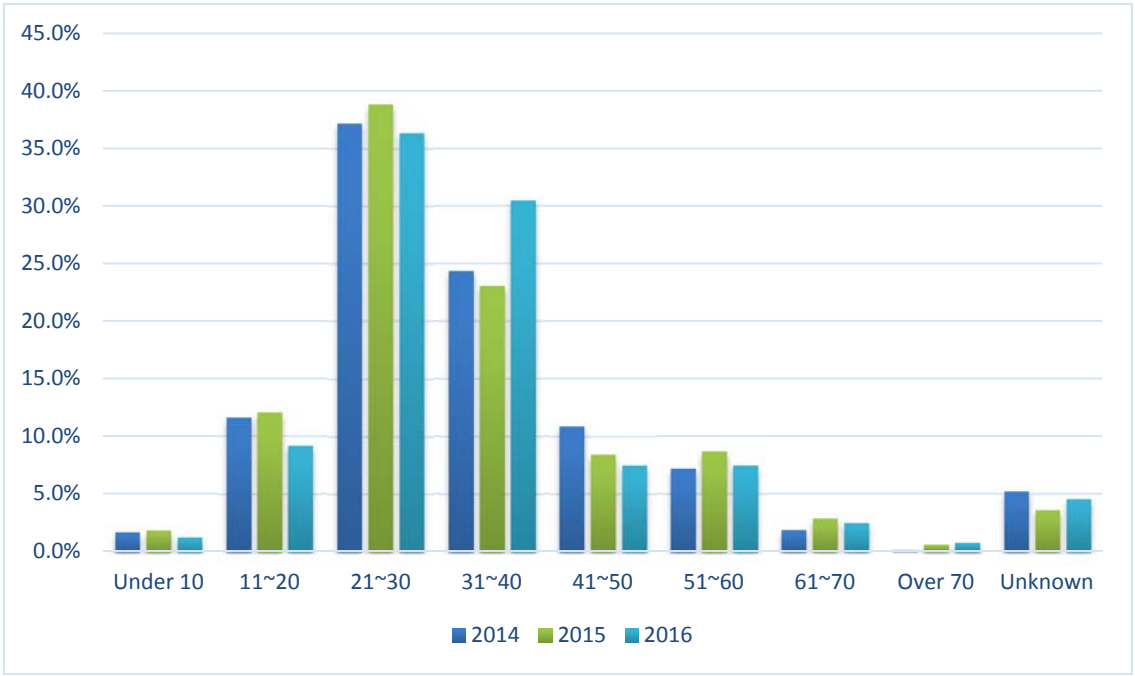


Figure 4.23: Three-year Trend of Crashes involving Bicyclists by Age

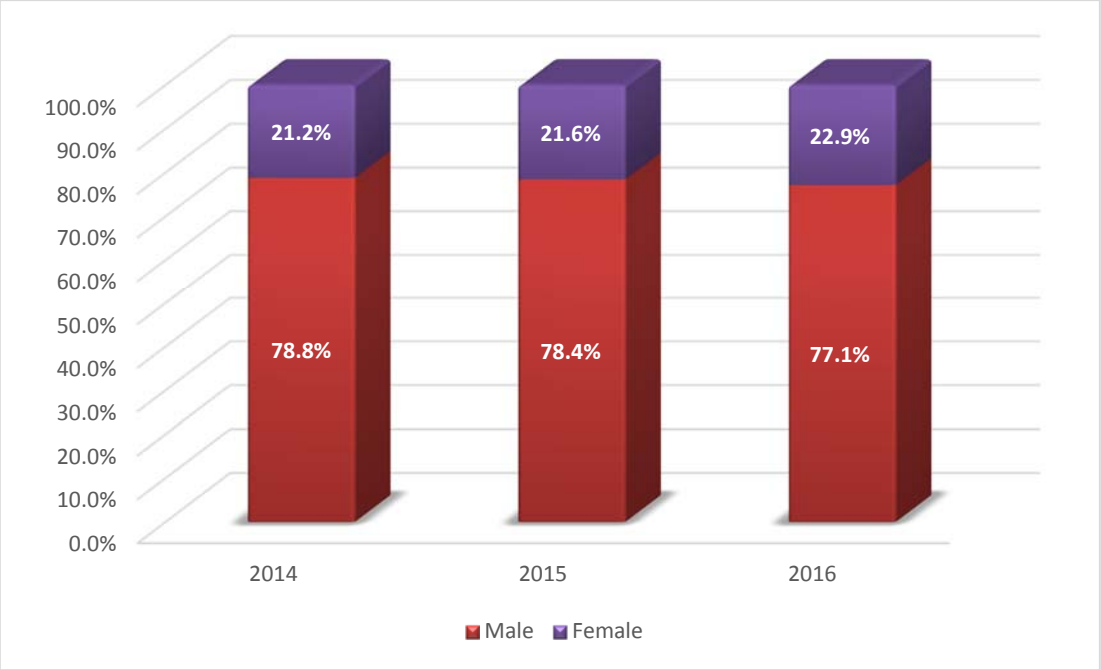


Figure 4.24: Three-year Trend of Crashes involving Bicyclists by Gender

From the figures, there was a modest increase in the total number of crashes involving bicyclists in 2016 compared with those in 2015. In addition, the distribution also shows that bicyclists in the age group of 21-30 were the most involved in those crashes. Compared to the reported 2015 bicycle crashes, there was a modest increase in 2016 involving female bicyclists while the number of male bicyclists involved in a collision was reduced. Figure 4.25 shows the GIS map for bicycle crashes at intersections in 2016.

Presented in Table 4.11 is a summary of injury types reported by bicyclists in 2016 after being involved in a crash. The majority of the pedestrians complained as a result of the accident but did not have disabling nor visible injuries.

Table 4.11: Bicycle Crashes by Injury Type in 2016

Injury Code	Frequency
Complaint but not visible	158
Disabling	137
Fatalities	58
Non-Disabling	23
No Injury	253
Unknown	50
Other	0
Total	**679**

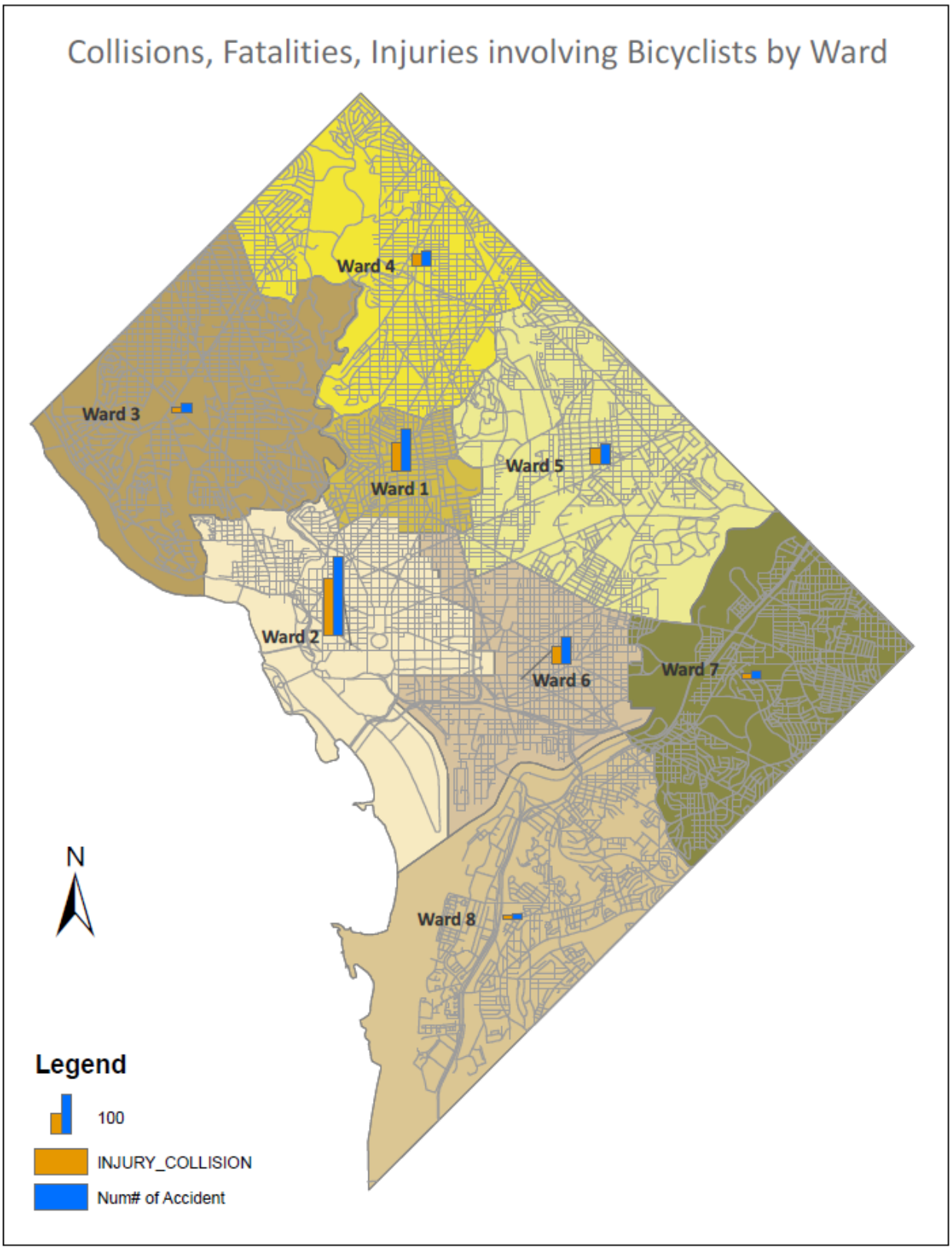


Figure 4.25: Crashes Involving Bicycles at Intersections in 2016

4.3.7 Crashes involving Motorcycles

The summaries of crashes involving motorcycles from 2014 through 2016 are presented in Figures 4.26 through 4.28. The summaries are presented in terms of total number of crashes, crashes by age and crashes by gender. From the figures, a consistent increase is observed from 2014 through 2016 of approximately 37% in the total number of crashes in 2016 compared to those in 2014. In addition, the distribution also shows that motorcyclists in the age group of 21-30 were the most involved in crashes. Similar to 2015, 10.7% of motorcycle-related crashes involved females in 2016.

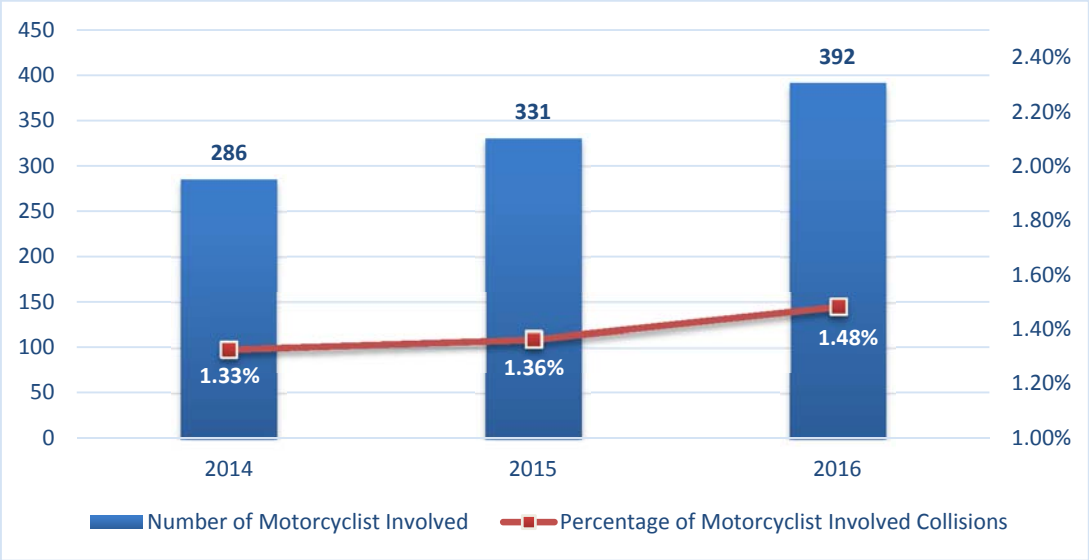


Figure 4.26: Three-year Trend of Crashes involving Motorcyclists

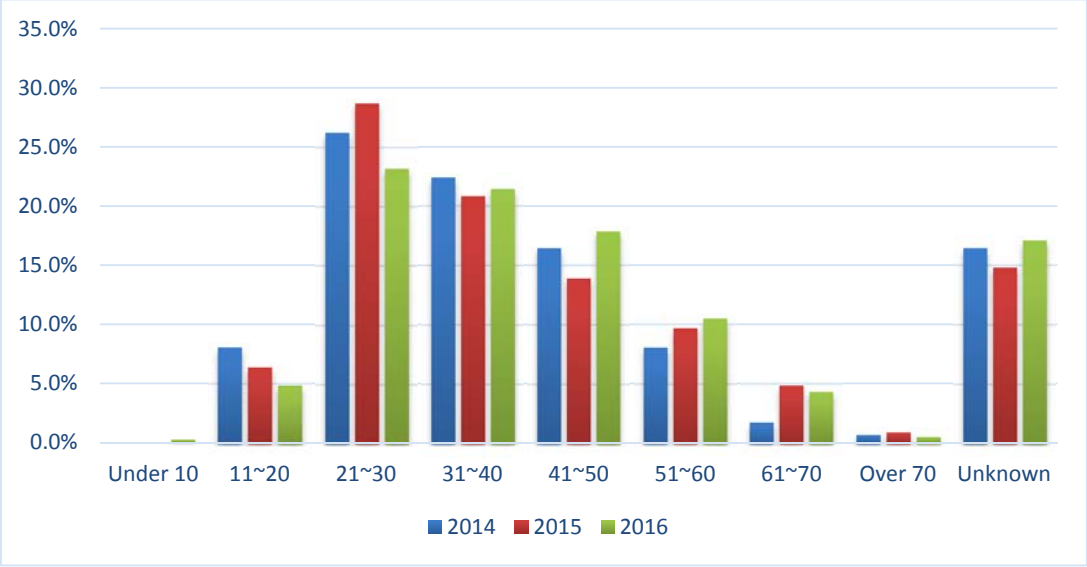


Figure 4.27: Three-year Trend of Crashes involving Motorcyclists by Age

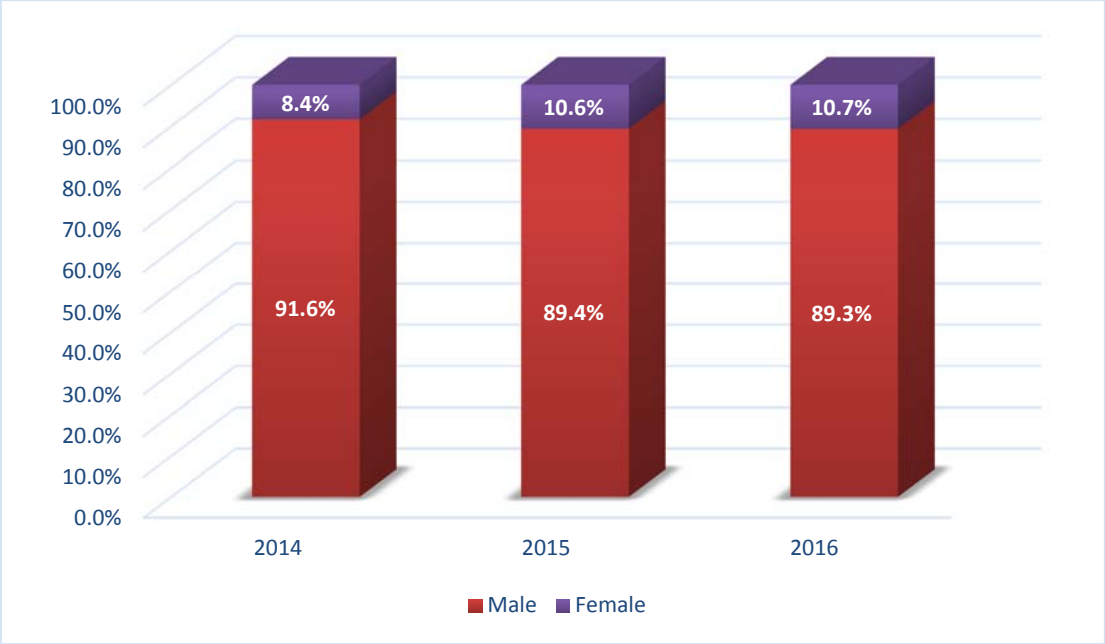


Figure 4.28: Three-year Trend of Crashes involving Motorcyclists by Gender

Presented in Table 4.12 is a summary of injury types reported by motorcyclists in 2016 after being involved in a crash. The majority of the motorcyclists (representing 115 out of 392 or ~34%) sustained disabling injuries.

Table 4.12: Motorcyclists Crashes by Injury Type in 2016

Injury Code	Frequency
Complaint but not visible	65
Disabling	115
Fatalities	22
Non-Disabling	25
No Injury	96
Unknown	63
Other	6
Total	**392**

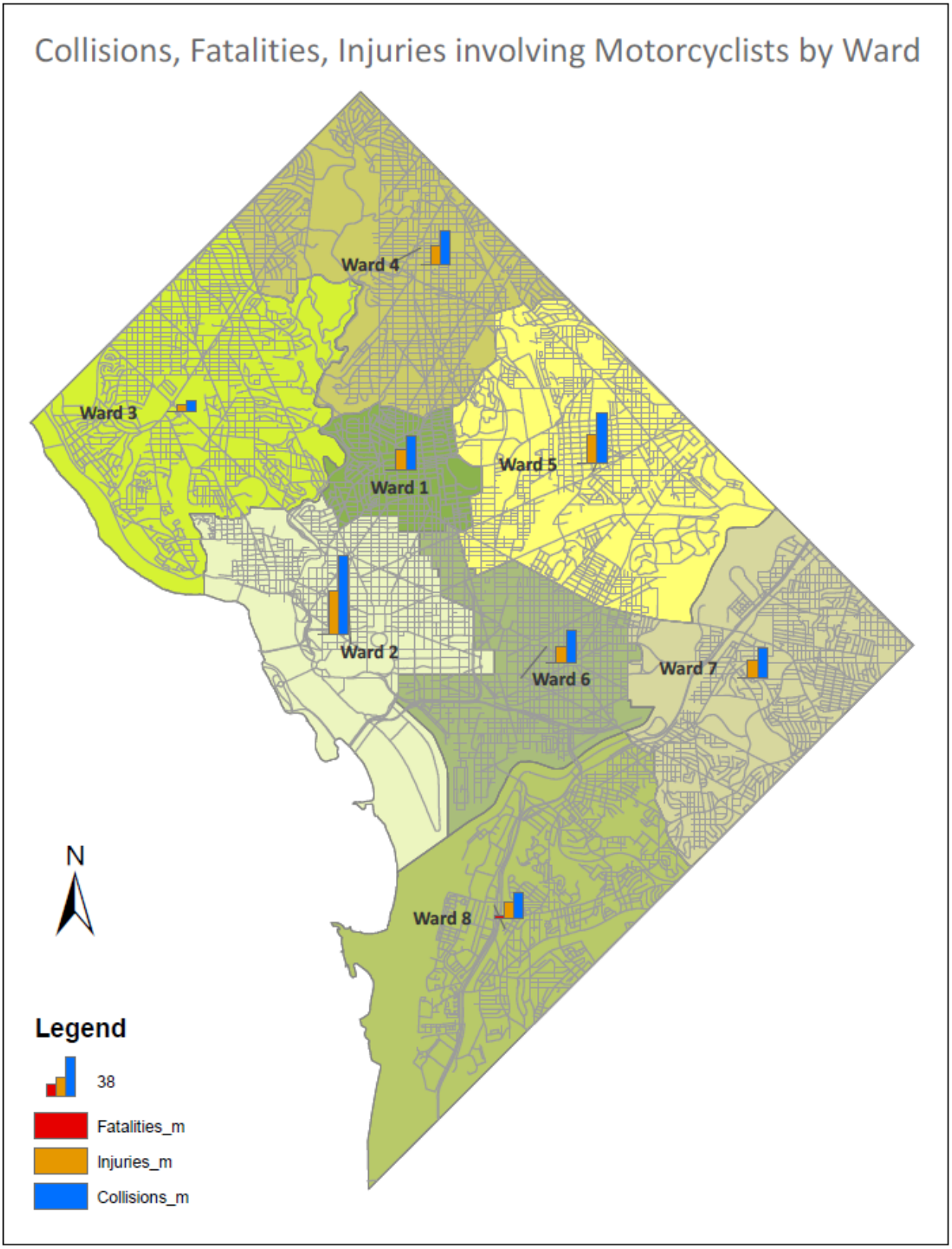


Figure 4.29: Motorcycle Involved Crashes at Intersections in 2016

4.4 Drivers

4.4.1 Drivers by Age

Crashes by driver age group continue to be important information for government agencies and local authorities to determine the appropriate crash prevention and mitigation strategies. From the summaries presented in Table 4.13 and Figure 4.30, it can be observed that crashes involving the age group of 26-30 were the most predominant in 2016 followed by the age group 31-35. The data shows that the age groups of approximately 12.3% of those involved in crashes in 2016 were not recorded or were unknown.

Figure 4.31 presents the types of injuries sustained of the drivers by age group in 2016. The majority of the drivers did not report any type of injury after a crash.

Table 4.13: Number Crashes by Age and Year of Drivers from 2014 to 2016

Age Group	# Crashes			Percentage		
	2014	2015	2016	2014	2015	2016
16~20	798	809	715	2.2%	2.0%	1.7%
21~25	3,373	3,719	3,700	9.3%	9.0%	8.9%
26~30	4,134	4,918	5,202	11.3%	11.9%	12.4%
31~35	3,899	4,419	4,876	10.7%	10.7%	11.7%
36~40	3,343	3,796	4,288	9.2%	9.2%	10.3%
41~45	3,234	3,465	3,716	8.9%	8.4%	8.9%
46~50	3,001	3,329	3,627	8.2%	8.0%	8.7%
51~55	2,711	3,214	3,384	7.4%	7.8%	8.1%
56~60	2,198	2,479	2,825	6.0%	6.0%	6.8%
61~65	1,453	1,664	1,939	4.0%	4.0%	4.6%
66~70	895	1,006	1,219	2.5%	2.4%	2.9%
71~75	430	530	619	1.2%	1.3%	1.5%
Over 75	492	569	554	1.3%	1.4%	1.3%
Unknown	6,487	7,513	5,127	17.8%	18.1%	12.3%
Total	36,448	41,430	41,791	100.0%	100.0%	100.0%

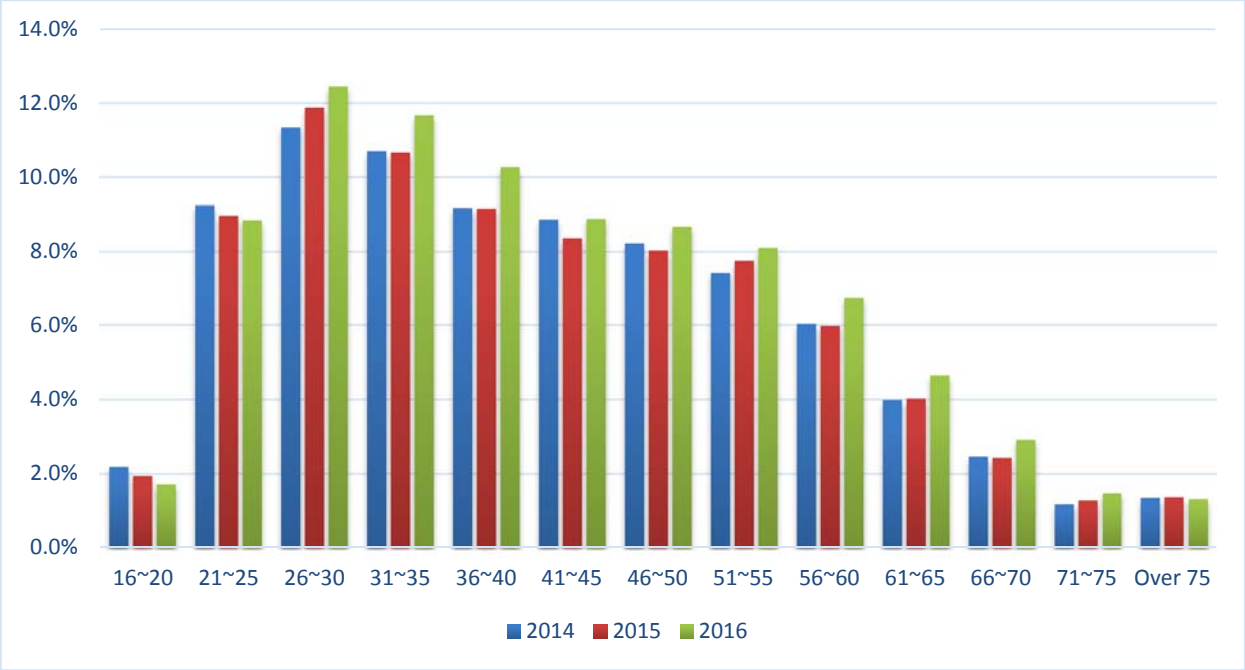


Figure 4.30: Crashes Drivers by Age from 2014 to 2016

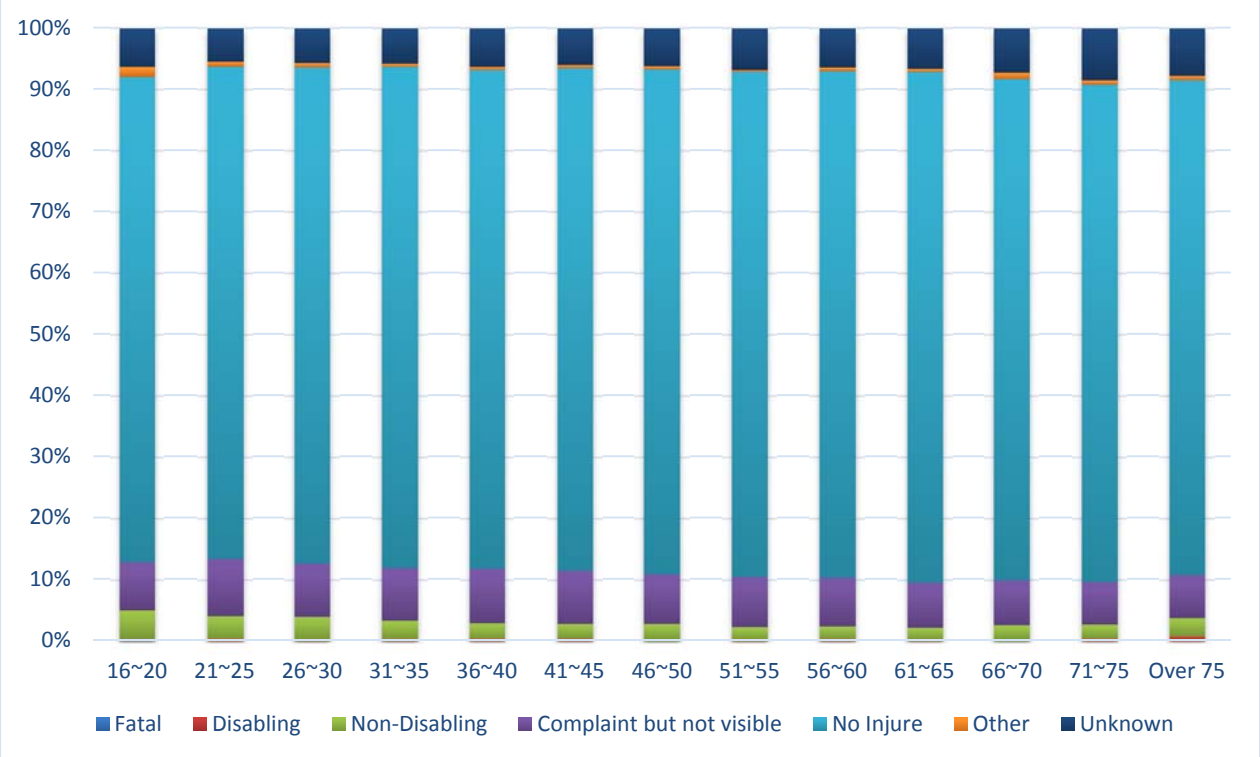


Figure 4.31: Injury Type Drivers by Age in 2016

4.4.2 Drivers by Gender

The summary of crashes recorded by the gender of drivers involved is presented in Figure 4.32. The figure shows that there was an increase of approximately 4% in the percentage of crashes for female drivers.

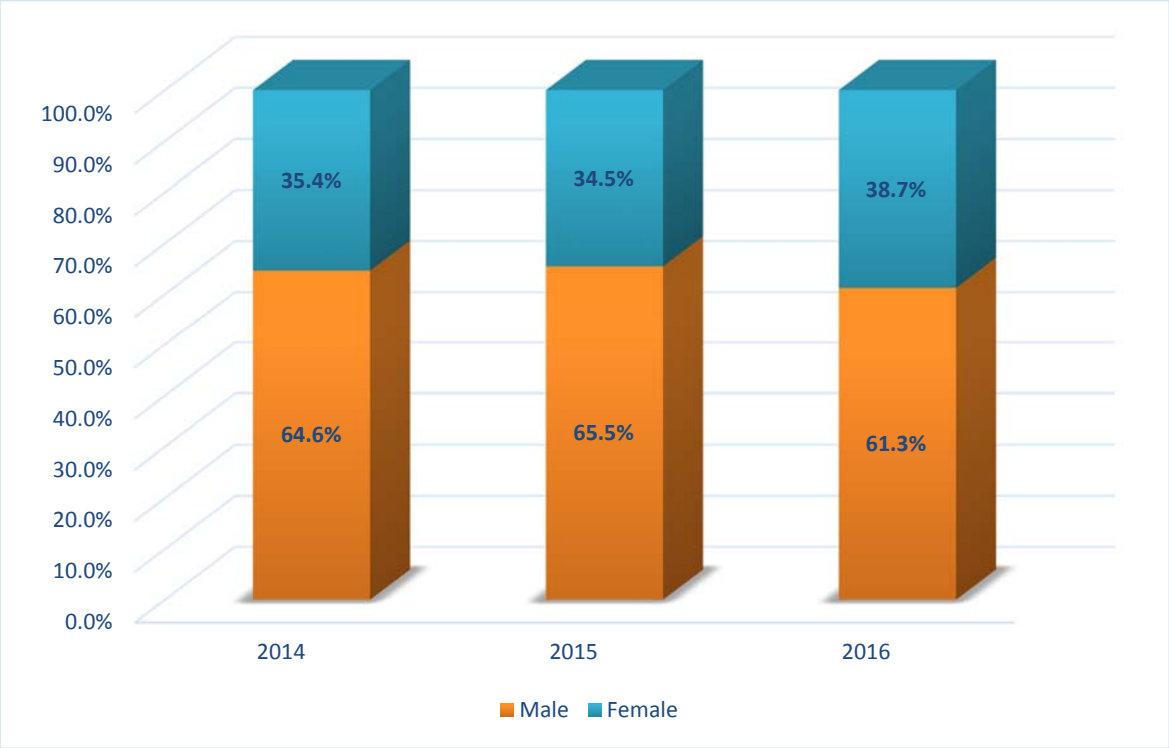


Figure 4.32: Crashes by Gender of Drivers from 2014 to 2016

4.4.3 Drivers by State Issued Driver's License

Since most who work in DC commute from the outer suburbs in neighboring states such as Maryland and Virginia, it is pertinent to determine the distribution of motor vehicle crashes based on drivers' state-issued licenses. The summary of the statistics for drivers' licenses are presented in Table 4.14 and Figure 4.33. From the table and figure, the majority of crashes (~25%) involved MD drivers, followed by 23.1% from DC and 9.3% from Virginia. The remainder were from other states or unknown.

Table 4.14: Driver Involvement by State of Permit from 2014 in 2016

State	# Collisions			Percentage		
	2014	2015	2016	2014	2015	2016
DC	13,678	9,685	12,076	38%	23%	23%
MD	11,379	7,834	12,882	31%	19%	25%
VA	4,496	3,340	4,888	12%	8%	9%
Other	6,358	14,498	2,301	17%	35%	4%
Unknown	537	6,073	20,079	2%	15%	38%
Total	**36,448**	**41,430**	**52,226**	**100%**	**100%**	**100%**

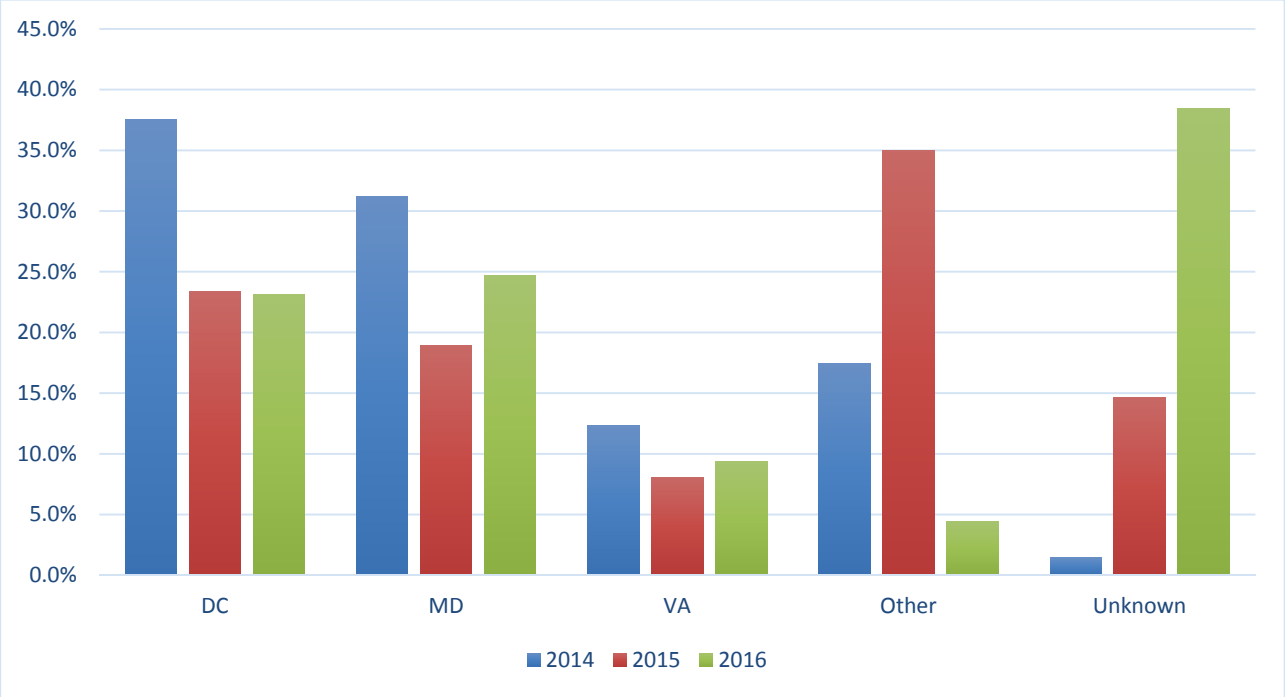


Figure 4.33: Drivers Involved in Crashes by State Issued License for 2014-2016

4.4.4 Crashes by Drivers' Action

The top three drivers' actions that were responsible for crashes in 2016 were: Parked Vehicle, Slowing/Stop/Stand Traffic Lane and Changing Lanes which represent respectively (approximately) 30.3%, 19.2% and 13.9% of the total crashes as presented in Table 4.15.

Table 4.15: Driver Involvement by Driver Action and Year for 2014-2016

Drivers Action	2014	2015	2016
Going Straight	7,840	5,430	0
Turning Left	1,843	2,363	3,004
Changing Lanes	1,484	2,063	3,050
Turning Right	1,252	1,485	1,906
Backing	1,057	1,274	1,727
Entering/Leaving Parked Position	578	418	
Slowing/Stopping	378	275	890
Merging	424	321	
Making U-turn	273	369	528
Parked	463	975	6,656
Overtaking	252	538	892
Stop/Stand Traffic Lane	368	2,080	4,212
Ran Off Road	203	112	0
Avoiding	127	108	0
Total	**16,542**	**17,811**	**22,865**

4.5 Environmental Conditions

4.5.1 Crashes by Roadway Conditions

The summary of crashes by roadway conditions are presented in Table 4.16 and Figure 4.34. The highest crashes occurred on roads with dry conditions from 2014 through 2016. The results also show that approximately 82% of the total motor vehicle crashes in 2016 occurred dry road surface condition.

Crashes occurring during icy roadway conditions were observed to be second highest; with 244 (or approximately 9%) being reported in 2016.

Table 4.16: Summary of Crashes by Roadway Conditions for 2014-2016

Police District	2014			2015			2016		
	Collisions	Fatalities	Injuries	Collisions	Fatalities	Injuries	Collisions	Fatalities	Injuries
Dry	17,072	22	6,533	19,221	21	6,821	21,586	22	6,997
Ice	125	0	53	190	0	42	244	0	64
Other	33	0	9	101	0	30	107	0	36
Repairing	33	0	12	26	1	9	0	0	0
Sand	22	0	10	22	0	5	33	0	14
Slush	96	0	23	103	0	31	85	0	13
Snow	236	1	62	264	0	60	162	0	17
Standing Water	6	0	1	63	0	19	98	0	26
Unknown	611	0	79	640	0	73	1018	1	160
Wet	2,842	1	1,119	3,359	1	1,183	3,114	4	1,009

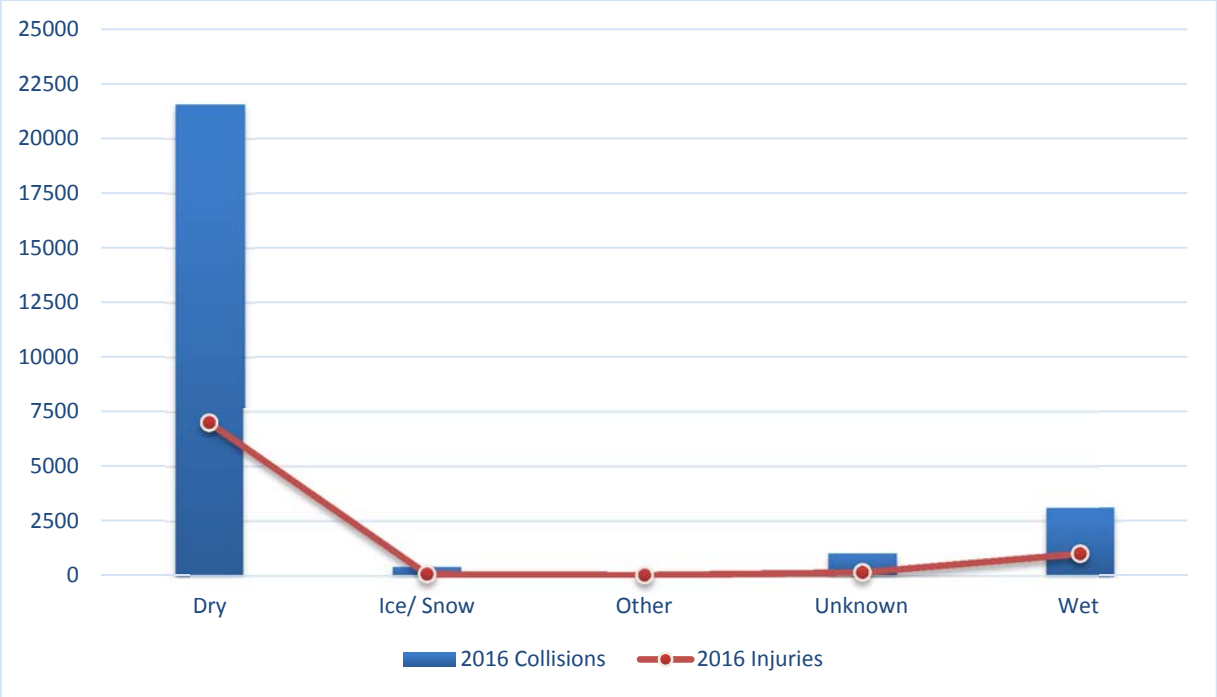


Figure 4.34: Number of Crashes and Injuries by Road Condition

4.5.2 Crashes by Weather Conditions

Adverse weather conditions may contribute to motor vehicle crashes. The summary weather-related of crashes by severity type are presented in Table 4.17 and Figure 4.35.

Table 4.17: Summary of Crashes by Weather Condition for 2014-2016

Weather	2014			2015			2016		
	Collisions	Fatalities	Injuries	Collisions	Fatalities	Injuries	Collisions	Fatalities	Injuries
Clear	19,221	21	6,821	21,586	22	6,997	17,608	21	5,591
Fog/Mist	190	0	42	244	0	64	280	2	100
Rain	101	0	30	107	0	36	1,742	2	577
Sleet	26	1	9	0	0	0	12	0	3
Snow	22	0	5	33	0	14	228	0	45
Other	103	0	31	85	0	13	2,008	0	608
Unknown	264	0	60	162	0	17	4,551	1	1,405
Total	**640**	**0**	**73**	**1,018**	**1**	**160**	**26,447**	**27**	**8,336**

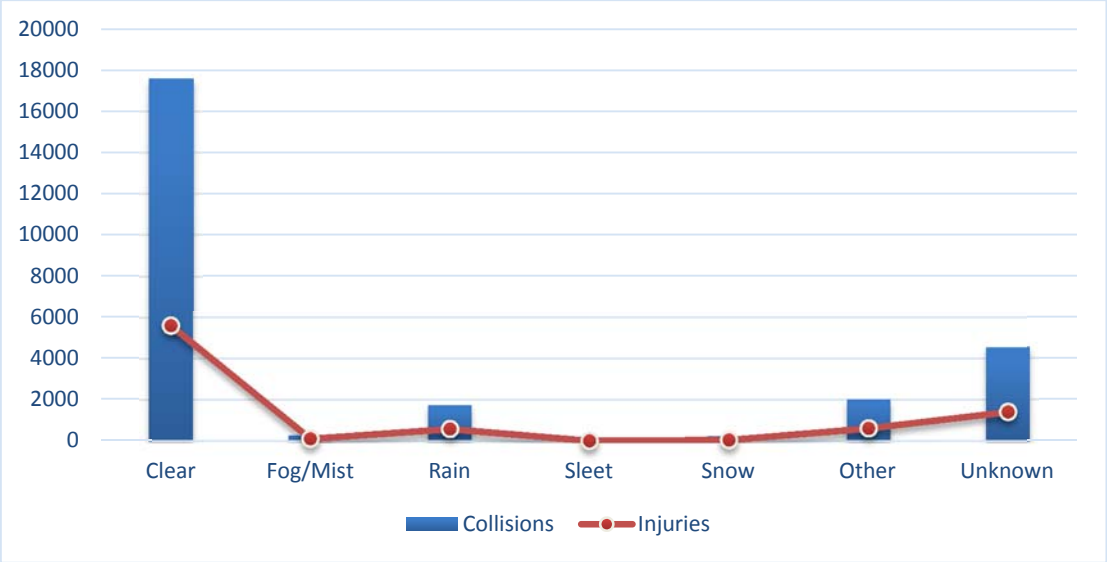


Figure 4.35: Number of Crashes and Injuries by Weather in 2016

From the summary, it can be observed that the majority of the crashes occurred under clear weather conditions which represent approximately 67% (or 17,608) of the total crashes in 2016. This is followed by crashes occurring during rainy conditions, representing approximately 7% (or 1,742) of the total crashes in 2016.

4.5.3 Crashes by Light Conditions

Street illumination is another crash contributing factor, especially at night. As shown in the summaries in Table 4.18 and Figure 4.36, the majority of the reported crashes occurred on roadways where the streetlights were off. These crashes occurred under such conditions in approximately 58% (15,451) of the total reported crashes in 2016. Approximately 33% (8,811) of the total reported motor vehicle crashes in 2016 occurred on roadways when street illumination was on.

Table 4.18: Summary of Crashes by Street Lighting for 2014-2016

Street Lightning	2014			2015			2016		
	Collisions	Fatalities	Injuries	Collisions	Fatalities	Injuries	Collisions	Fatalities	Injuries
Street Lights On	6,951	10	2,613	7,983	14	2,760	8,811	22	2,850
Street Lights Off	11,059	13	4,308	12,929	6	4,564	15,451	4	5,012
Defective	9	0	2	16	0	6	21	0	10
Unknown	1,817	2	465	1,967	3	465	1,908	1	393
None	1,703	1	642	1,370	3	546	0	0	0
Total	**21,539**	**26**	**8,030**	**24,265**	**26**	**8,341**	**26,447**	**27**	**8,336**

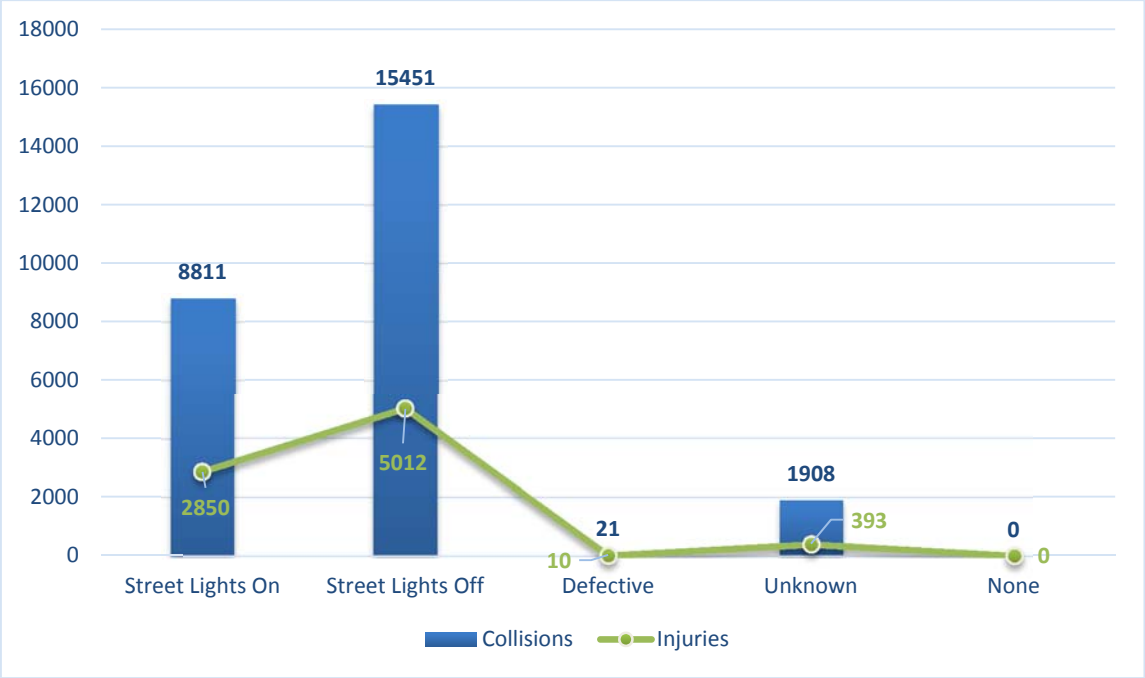


Figure 4.36: Number of Crashes and Injuries by Street Lighting

Furthermore, as shown in Table 4.19 and Figure 4.37, the majority of the crashes occurred during daylight conditions. This consisted of approximately 62% (16,511) of the total reported motor vehicle crashes in 2016. Approximately 31% (8,194) of the total reported crashes occurred in the dark in 2016.

Table 4.19 Summary of Crashes by Light Condition for 2014-2016

Street Lightning	2014			2015			2016		
	Collisions	Fatalities	Injuries	Collisions	Fatalities	Injuries	Collisions	Fatalities	Injuries
Dark	6,732	11	2,519	7,584	13	2,616	8,194	22	2,600
Dawn/Dusk	482	0	172	622	2	232	817	0	280
Daylight	13,159	14	5,103	14,800	8	5,244	16,511	5	5,332
Unknown	1,166	1	236	1,259	3	249	925	1	124
Total	**21,539**	**26**	**8,030**	**24,265**	**26**	**8,341**	**26,447**	**27**	**8,336**

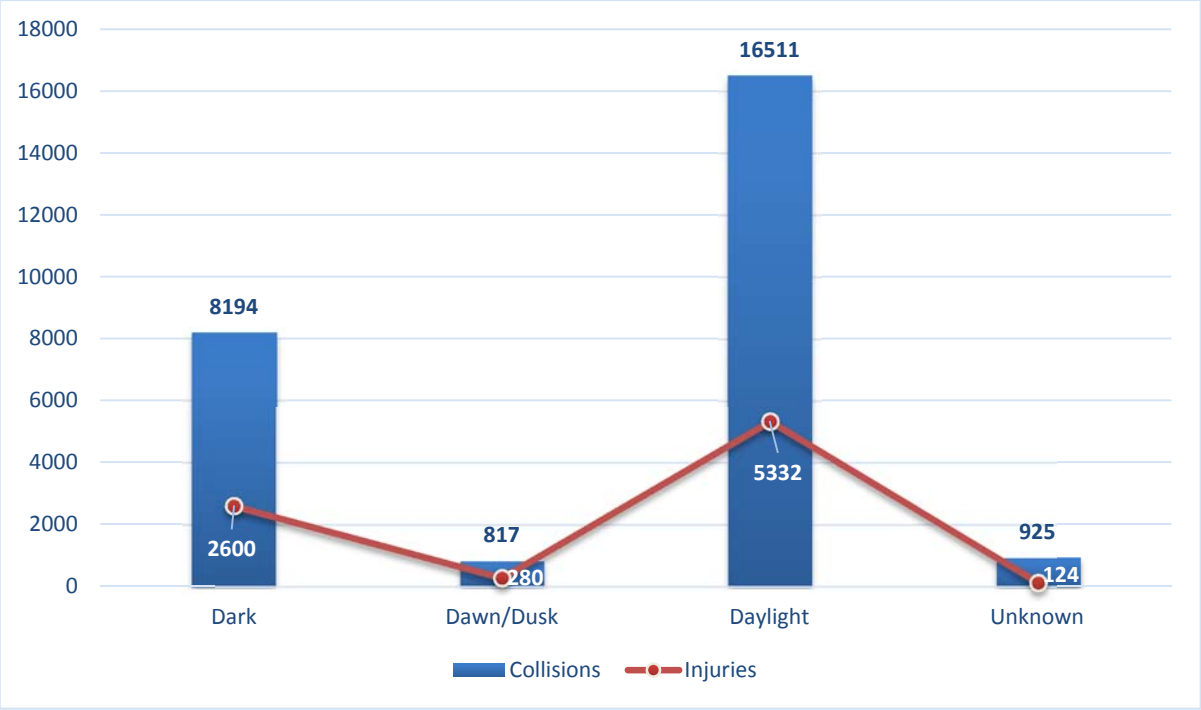


Figure 4.37: Number of Crashes and Injuries by Light Condition in 2016

4.5.4 Crashes by Traffic Conditions

Traffic exposure is a new data field that was included in the new traffic crash reports (PD-10 forms) to obtain approximate traffic volume conditions at the time of crash. This information was based on police officer's observation of the traffic conditions. The summary of this is presented in Table 4.20 as well as in Figure 4.38. The results show that approximately 34% of the total reported crashes in 2016 occurred in medium (9,077) traffic conditions with approximately 31% under light (8,266) traffic conditions.

Table 4.20: Summary of Crashes by Traffic Conditions in 2014-2016

Traffic Condition	2014			2015			2016		
	Collisions	Fatalities	Injuries	Collisions	Fatalities	Injuries	c	Fatalities	Injuries
Heavy	3,833	2	1,593	4,441	3	1,718	4,823	0	1,711
Medium	7,073	6	3,014	8,069	6	3,067	9,077	6	3,251
Light	6,605	16	2,298	7,455	12	2,438	8,266	20	2,376
Other	266	0	49	194	1	32	0	0	0
Unknown	3,762	2	1,076	4,106	4	1,086	4,281	1	998
Total	**21,539**	**26**	**8,030**	**24,265**	**26**	**8,341**	**26,447**	**27**	**8,336**

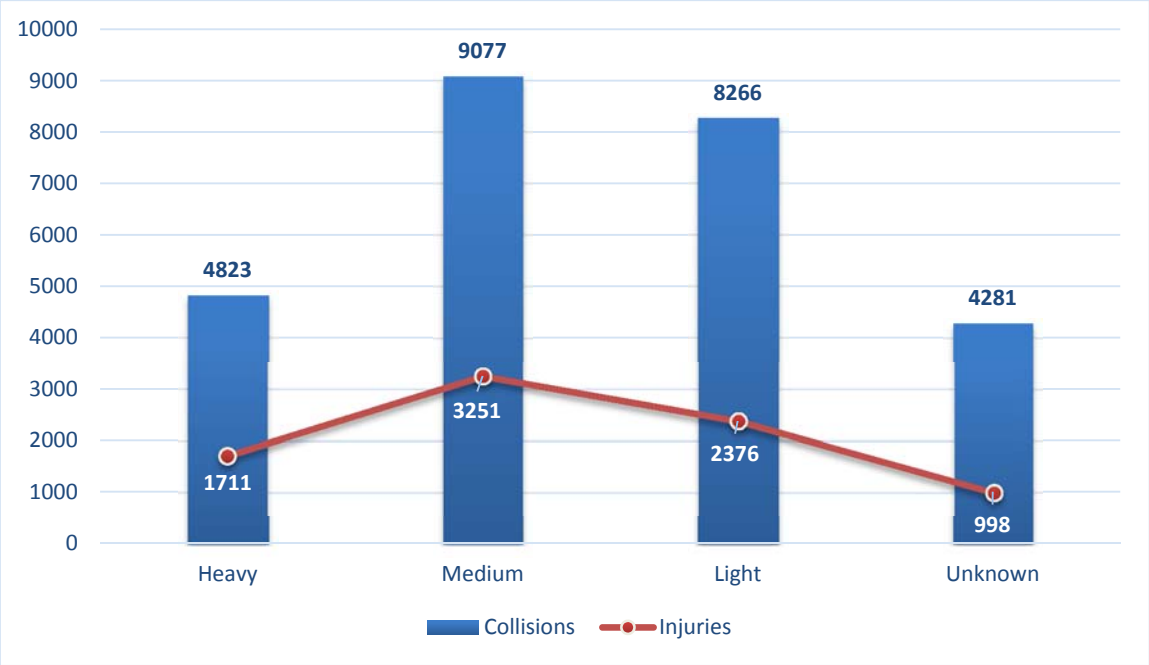


Figure 4.38: Number of Crashes and Injuries by Traffic Conditions in 2016

4.5.5 Crashes by Traffic Control

Traffic control devices serve as an important vehicular and pedestrian guidance to ensure the safety of general public. The summary of crashes by the presence and type of traffic control device is presented in Table 4.21 and graphically in Figure 4.39 for 2016. From the results, approximately 28% of crashes occurred at or close to a signalized intersection. The majority of the crashes (54%) occurred at locations where there is no traffic control.

Table 4.21: Summary of Crashes by Traffic Control in 2014-2016

Traffic Controls	2014			2015			2016		
	Collisions	Fatalities	Injuries	Collisions	Fatalities	Injuries	Collisions	Fatalities	Injuries
Signal	7,838	7	3,521	5,423	4	2,212	7,500	6	2,810
None	10,556	13	3,288	7,506	10	2,229	14,224	19	3,921
Stop Sign	1,599	2	727	1,137	0	483	1,670	0	708
Other	533	2	233	9,068	9	3,091	2,211	1	707
Unknown	1,013	2	261	1,131	3	326	842	1	190
Total	**21,539**	**26**	**8,030**	**24,265**	**26**	**8,341**	**26,447**	**27**	**8,336**

* "Other" includes yield, flashing, turn restricted and officer.
* "None" includes mid-block crashes.

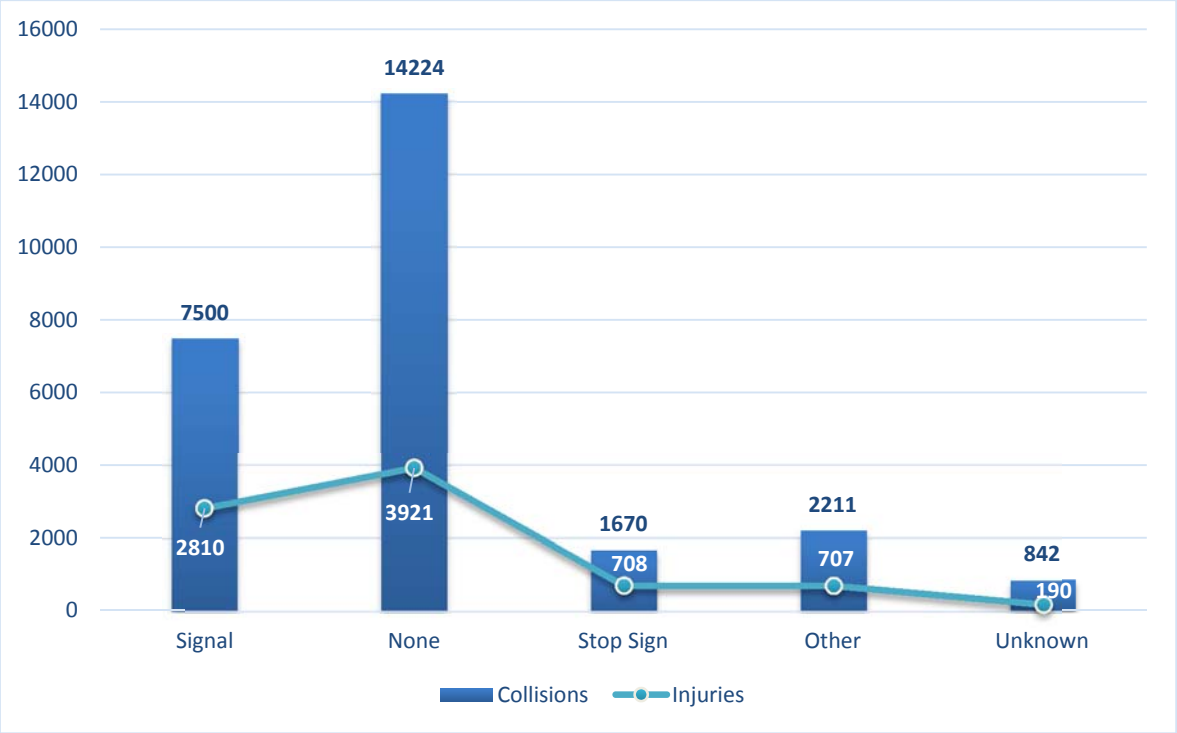


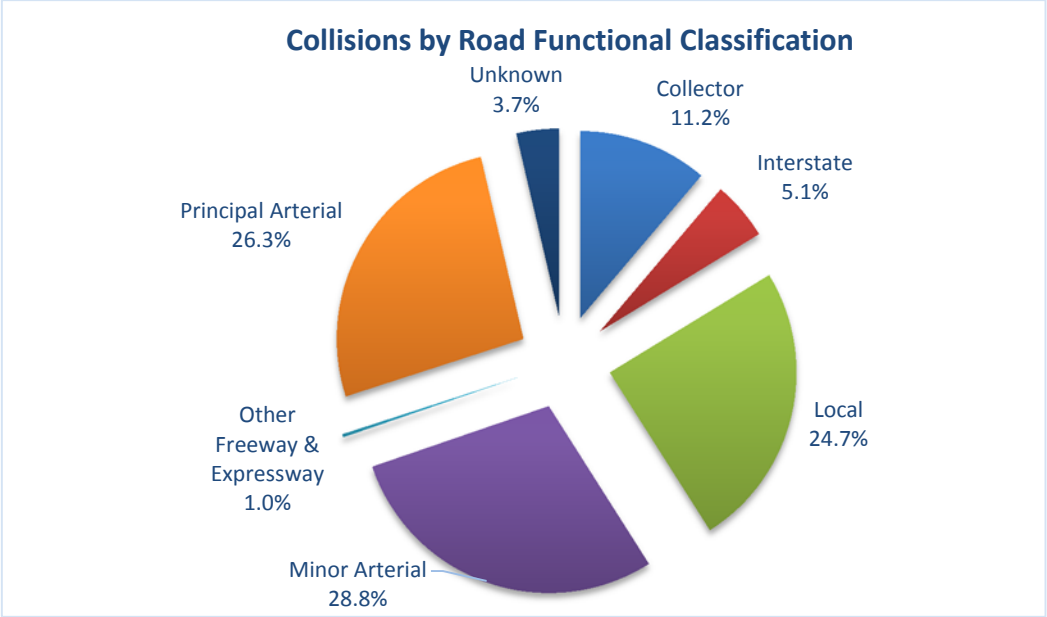
Figure 4.39: Number of Crashes and Injuries by Traffic Control

4.5.7 Crashes by Roadway Functional Classification

It is important to assess the relationship between roadway functional classifications and vehicle crashes. Speed-related injuries by roadway functional classification are also presented in this section. As shown in Table 4.22 and Figure 4.40, the number of injuries for all roadway functional systems from 2014 to 2016 showed for the most part an increasing trend.

Table 4.22: Summary of Crashes by Roadway Functional Classification from 2014-2016

Road Functional Classification	2014			2015			2016		
	Collisions	Fatalities	Injuries	Collisions	Fatalities	Injuries	Collisions	Fatalities	Injuries
Collector	2,766	1	1,009	2,696	3	894	2,967	1	885
Interstate	267	1	150	299	0	146	1,337	2	650
Local	6,092	6	1,848	5,890	3	1,698	6,536	4	1,574
Minor Arterial	6,105	9	2,512	6,386	9	2,384	7,605	13	2,568
Other Freeway & Expressway	53	1	30	79	2	46	74	1	44
Principal Arterial	5,257	4	1,963	5,960	7	2,060	6957	6	2,232
Unknown	999	4	518	2,955	2	1,113	971	0	383
Total	**21,539**	**26**	**8,030**	**24,265**	**26**	**8,341**	**26,447**	**27**	**8,336**



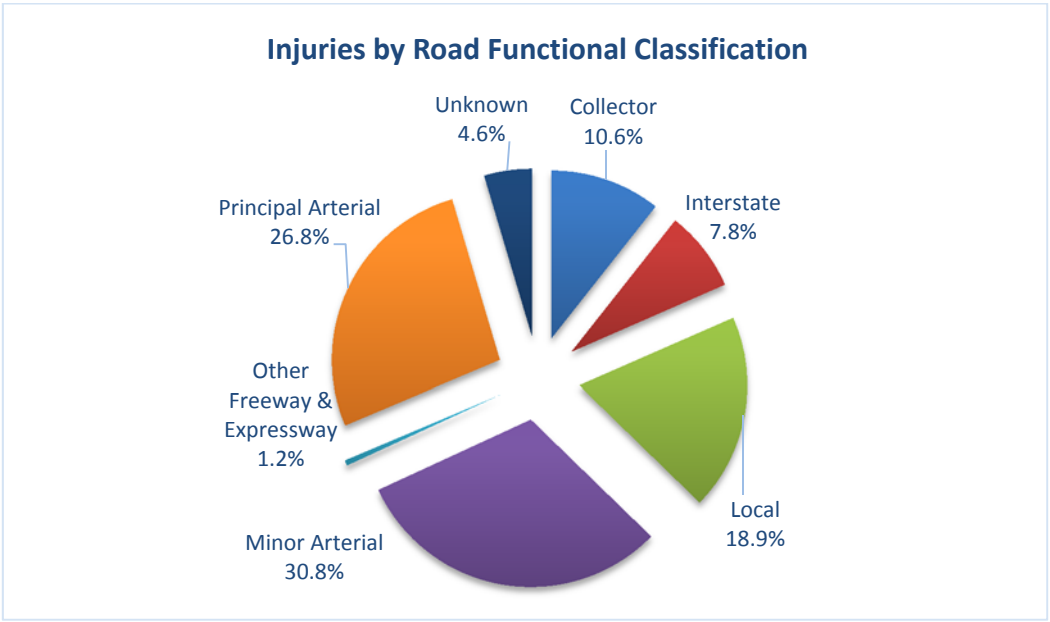


Figure 4.40: Crashes and Injuries by Functional Classification

Figures 4.41 and 4.42 respectively present the frequency of speed-related crashes and injuries on all functional classifications from 2014 to 2016.

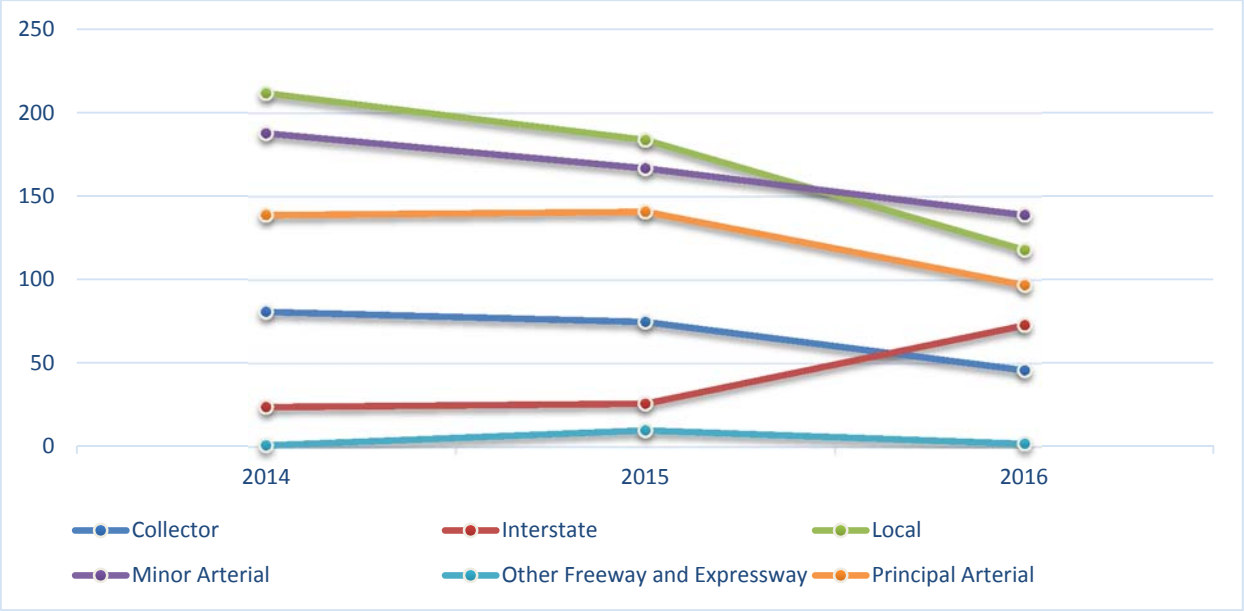


Figure 4.41: Number of Speed-Related Crashes by Roadway Functional Classification

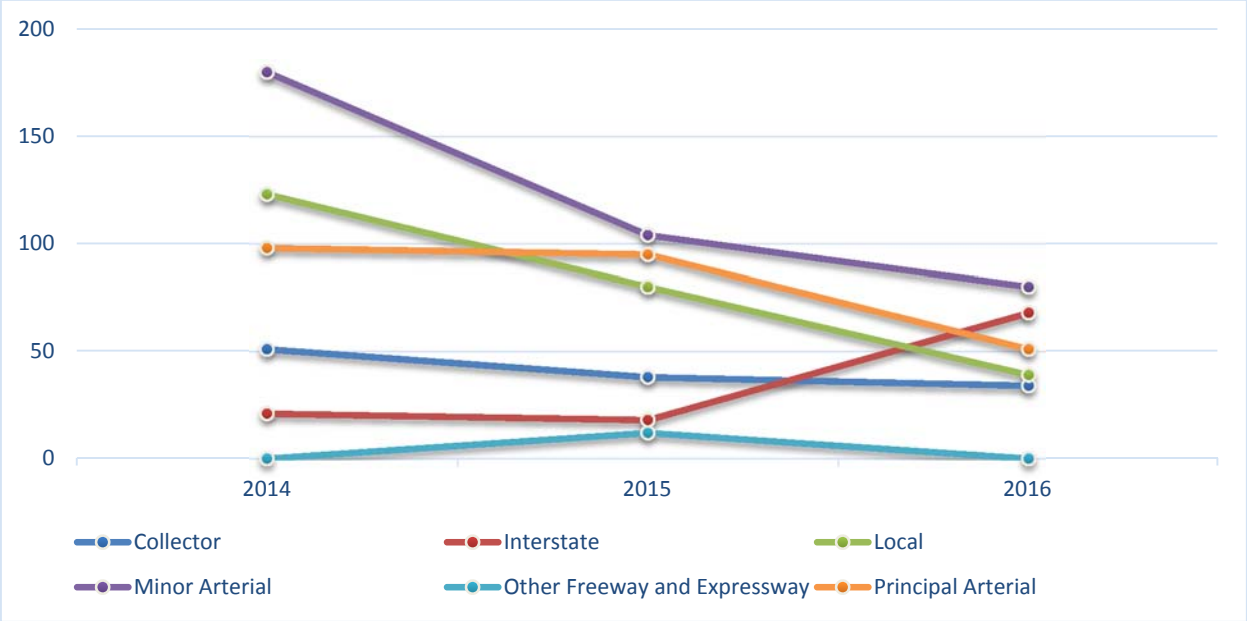


Figure 4.42: Number of Speed-Related Injuries by Roadway Functional Classification

In addition, Figure 4.43 shows the number of crashes and injuries per lane-miles by roadway functional classification in 2016. The highest number of crashes and injuries per lane-mile was reported on Interstate roads.

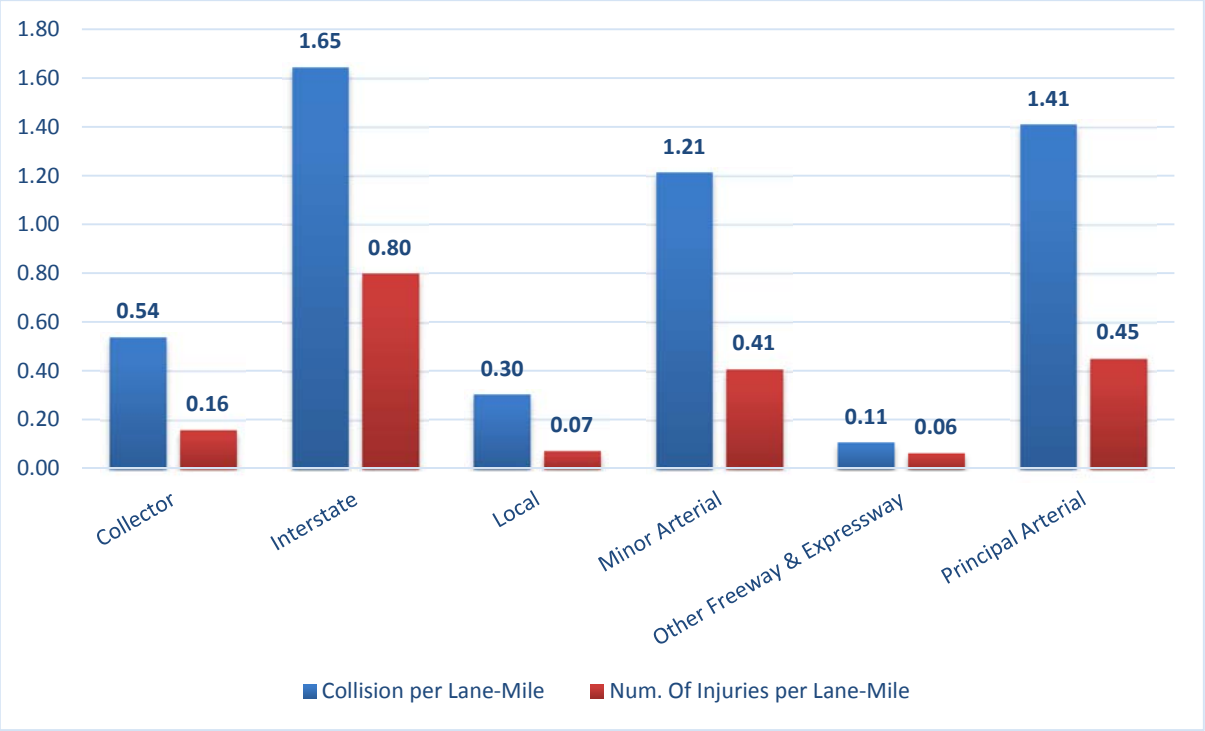


Figure 4.43: Number of Crashes and Injuries per lane-mile by Functional Classification in 2016

4.6 Contributing Factors

4.6.1 Crashes by Primary Crash Contributing Factors

Table 4.23 presents the summary of all reported contributing factors for the crashes in DC from 2014 through 2016. With the exception of "No violation" and "Other", the prominent contributing factors of crashes reported in 2016 included "failed to yield right-of-way", "following-too-close", and "failed to keep in proper lane".

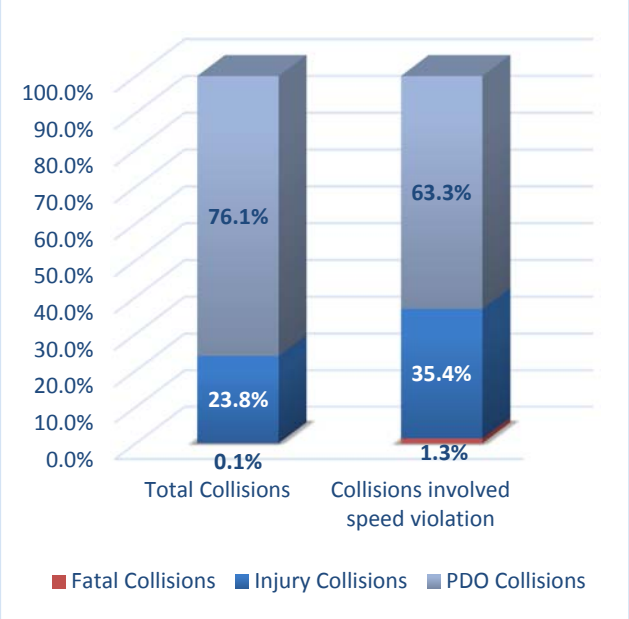
Table 4.23: Number of Crashes by Contributing Factors in 2014-2016

Drivers Action	2014	2015	2016
No Violation	21,087	20,682	18,638
Other	4,082	4,496	3,898
Driver Inattention	3,743	2,643	0
Following too Close	1,465	1,855	2,122
Changing Lanes W/O Caution	1,571	1,145	0
Failed To Yield Right-of-way	0	848	2,442
Speed	735	697	536
Improper Backing	531	679	912
Improper Passing	513	662	622
Failed To Keep In Proper Lane	0	651	2,086
Auto/Ped. Right of Way	911	557	0
Improper Turn	0	350	970
Red Light Violation	377	345	344
Other Distraction	280	260	0
Alcohol/Drug Influence	461	246	0
Stop Sign	170	179	104
Wrong Way/Side of Street	125	136	121
Pedestrian Violation	230	134	0
Open Door to Traffic	231	120	0
Diregarded Marking/Signing	0	115	299
Road Defects	79	78	0
Driver Vision Obstructed	83	77	0
Defective Brakes, Lights, etc.	81	48	0
Cell Phone/Other Electronic Device	46	30	0
Yield Sign	36	21	0
Right Turn on Red	16	13	0
Fail to Set Parking Brake	25	11	0
Flashing/Directional Light	4	8	0
Total	**36,882**	**37,086**	**52,226**

4.6.2 Speed-Related Crashes

Speeding is one of the most common contributing factors of traffic crashes. The summary of crashes related to speeding is presented in Figure 4.44. Approximately, 2% of the reported crashes were speed-related, which represents a decrease compared to the same in 2015.

Table 4.24 and Figure 4.45 are the speed-related crashes by age and gender. From the table and figure, male drivers between 26 and 30 years old were reported as the group with the highest incidence of speed-related crashes.



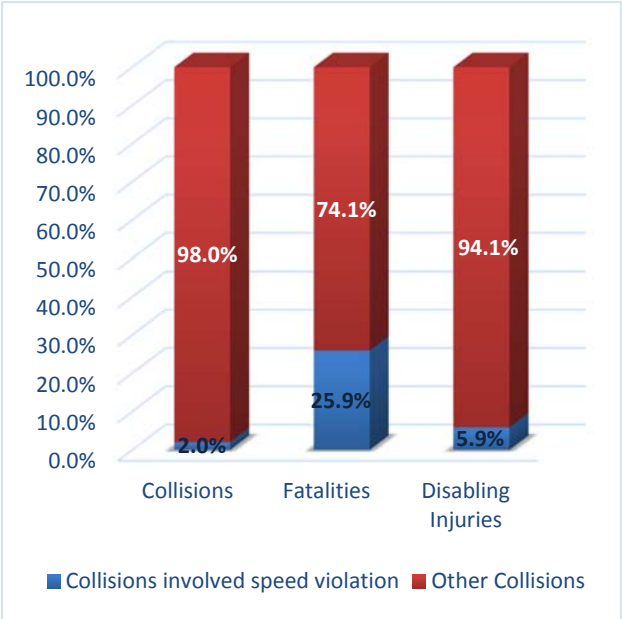


Figure 4.44: Speed-Related Crashes in 2016

Table 4.24: Speed-Related Crashes by Age and Gender for 2016

Age Group	Female	Male	Total
16~20	8	19	27
21~25	24	41	65
26~30	34	58	92
31~35	15	42	57
36~40	18	31	49
41~45	18	21	39
46~50	19	20	39
51~55	9	22	31
56~60	7	15	22
61~65	0	8	8
66~70	5	7	11
71~75	2	3	5
Over 75	1	3	4
Unknown	10	46	56
Total	170	336	505

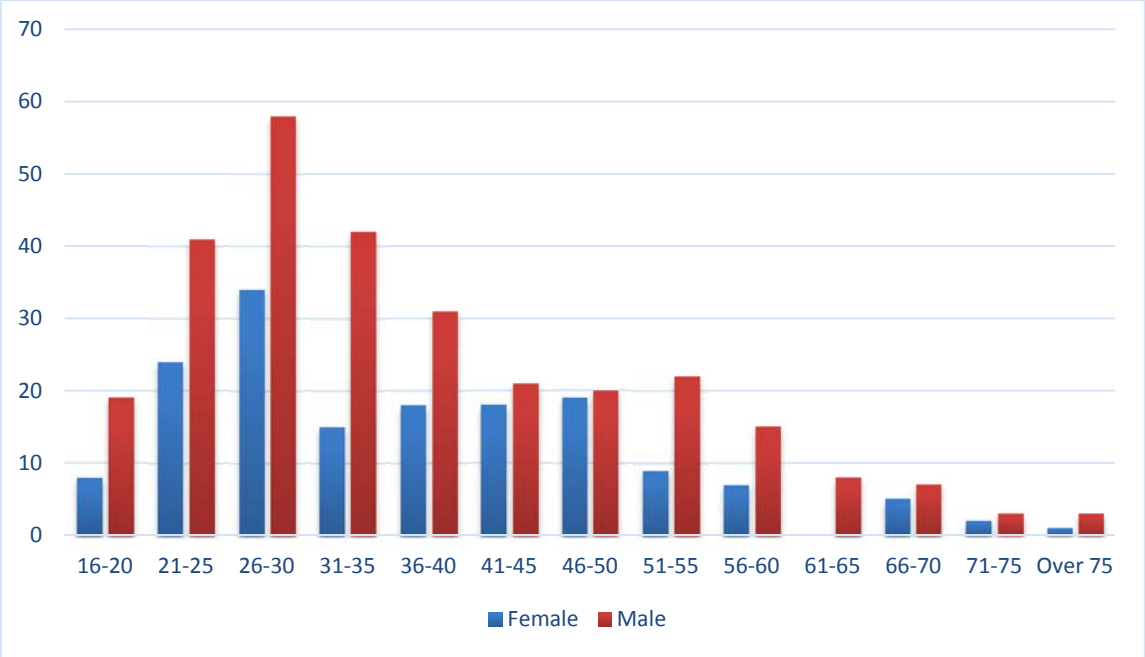


Figure 4.45: Speed-Related Crashes by Age and Gender

4.6.3 Crashes by Restraint Use (Seatbelts or Airbags)

Restraint devices such as seatbelts and airbags usage have a significant influence on the severity of injury during a crash, based on several research studies. Table 4.25 and Figure 4.46 present the summary of crashes related to the airbag restraint. The results show that approximately 74% (24,513) of the injuries in 2016 were reported as a result of air bag failing to deploy. The majority of injuries involved vehicles with installed air bags.

Table 4.25: Frequency of Injures by Injury Code and Air Bag Restraint in 2016

Air Bag	Fatal	Disabling	Non-Disabling	Complaint but not visible	None	Other	Unknown	Total
Airbag Deployed	8	45	489	77	1,731	131	442	2,923
Airbag Installed	0	0	0	0	0	0	0	0
Airbag Failed	1	48	819	2,516	18,040	149	2,940	24,513
Other	0	0	0	0	0	0	0	0
Side-Impact Airbags	0	0	0	0	0	0	0	0
Use Unknown	11	93	578	62	2,237	8	2,868	5,857
Total	**20**	**186**	**1,886**	**2,655**	**22,008**	**288**	**6,250**	**33,293**

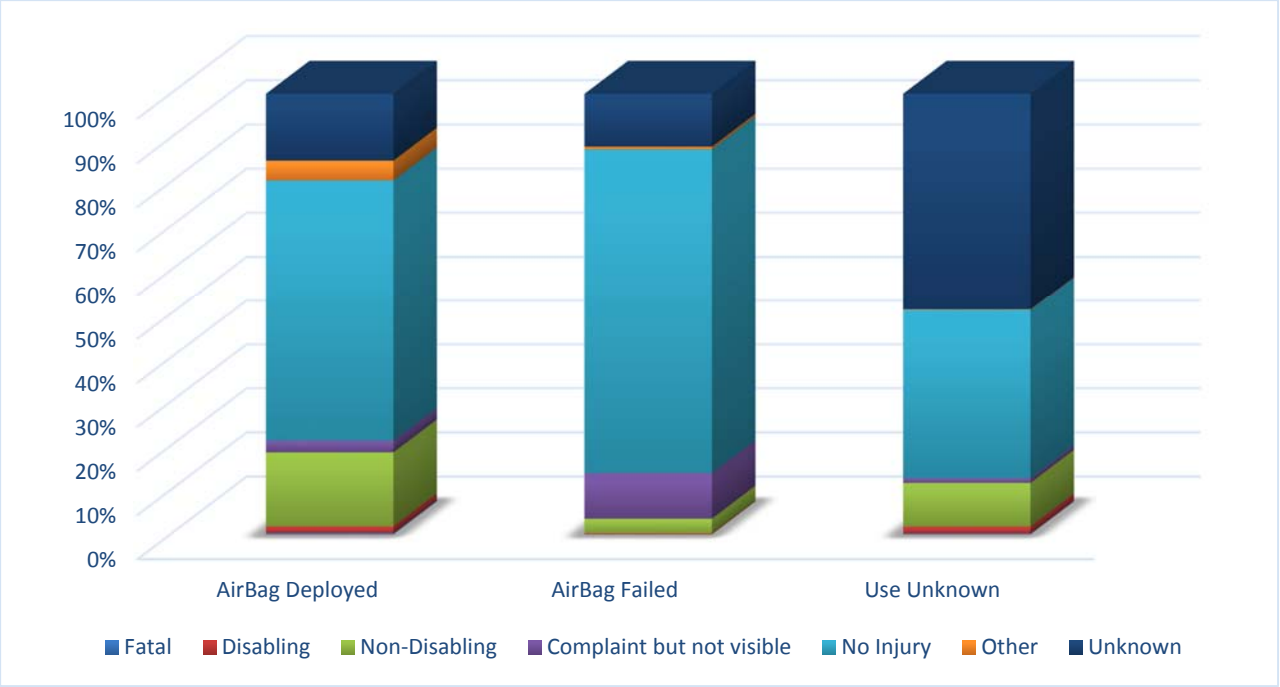


Figure 4.46: Crash Severity by Air Bag Restraint in 2016

The use of seat belts is another important safety restraint device. The analysis focused on its usage to examine the correlation of severity of motor vehicle crashes and its usage. The results are presented on Table 4.26 and Figure 4.47. The results show that in 2016, approximately 52% (7,871) of drivers or passengers involved in crashes used their seat belts. Approximately 42% (6,487) of drivers or passengers involved in crashes were reported with unknown seat belt usage. Overall, only a small fraction (or approximately 2%) of drivers or passengers were reported with seat belt not fastened.

Table 4.26: Number of Injuries by Injury Code and Seat Belt Restraint in 2016

Seat Belt	Fatal	Disabling	Non-Disabling	Complaint but not visible	No Injury	Other	Unknown	Total
Child Restraint	0	1	25	36	238	5	43	348
Fastened	1	47	770	2,513	4,106	127	307	7,871
Helmet	4	16	91	60	26	13	8	218
Not Fastened	6	9	73	111	86	18	22	325
Other	0	2	10	10	16	2	7	49
Use Unknown	3	52	500	1,641	3,320	150	821	6,487
Total	**14**	**127**	**1,469**	**4,371**	**7,792**	**315**	**1,208**	**15,298**

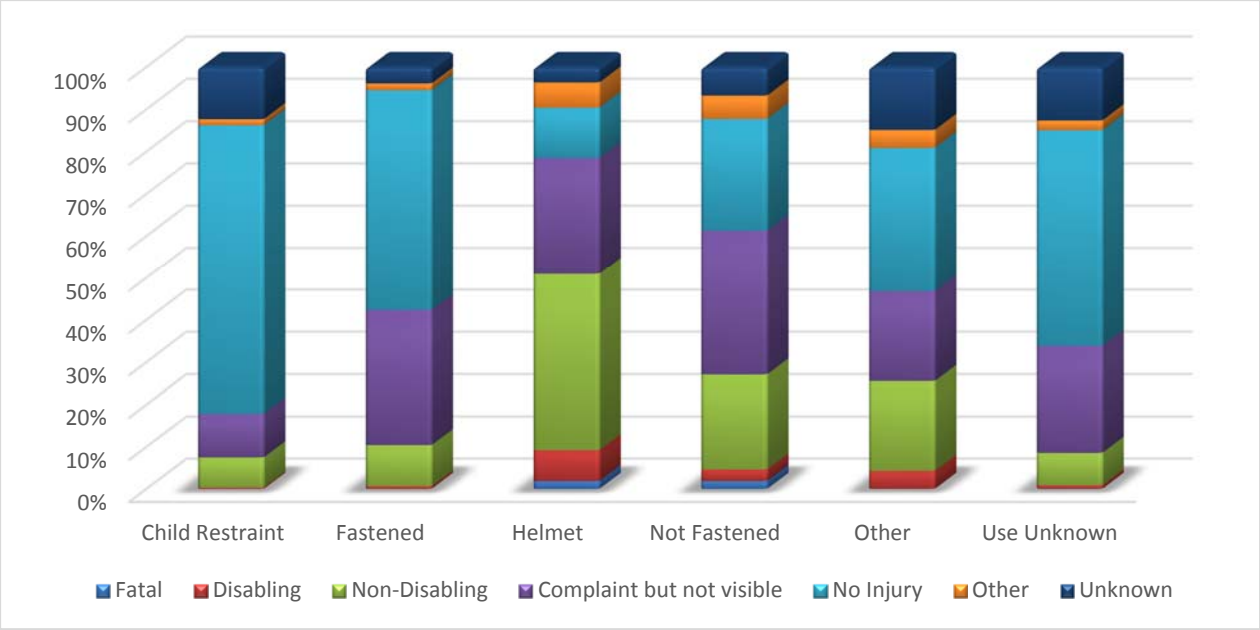


Figure 4.47: Crash Severity by Seatbelt Restraint in 2016

CHAPTER 5 – HIGH CRASH LOCATIONS

High-hazardous traffic safety locations can be identified at specific intersections, line segments (e.g., street corridors), and areas (e.g., Wards). Methods used to identify these high-hazardous traffic locations were presented in Chapter 2. This section focuses on the identification of high-hazardous intersections and corridors.

5.1 Identification of High Hazardous Intersections

Five ranking methods were used to identify high-hazardous intersections in the following order: crash rate, crash severity, crash frequency, crash severity cost and composite index (which is calculated based on the combination of previous three ranking). To rank high hazardous intersections based on the three-year crash data, each intersection is given a rank based on its calculated values. The first ranking is based on the crash rate followed by crash severity index, crash frequency and finally, by composite index. The highest hazardous intersections are those with the lowest composite index.

5.1.1 Ranking of High Hazardous Intersections (2014-2016)

The top 20 high hazardous locations based on each individual ranking for Crash Rate, Crash Cost, Crash Frequency, delta method and Composite Index as well as for the 3-year duration are presented in Tables 5.1 through 5.8 and Figures 5.1 and 5.2. The complete list of the top 100 high frequency crash locations is presented in the Appendix.

The crash occurrences for various intersections from 2014 through 2016 were compiled and arranged in order of magnitude to identify the high frequency crash location rankings. From Table 5.1, the intersection of New York Avenue and Bladensburg Road (NE) ranked the highest from 2014 to 2016. The intersection of Minnesota Avenue and Benning Road NE ranked the second highest in 2016. Overall, the intersection of New York Avenue and Bladensburg Road (NE) was found to be the most hazardous intersection in the District from 2014 to 2016 based on the crash frequencies.

Table 5.1: Top 20 Hazardous Intersections by Crash Frequency in 2014-2016

INTERSECTION NAME	Quad	2014		2015		2016	
		Freq	Rank	Freq	Rank	Freq	Rank
NEW YORK AVE AND BLADENSBURG RD	NE	119	1	133	1	140	1
MINNESOTA AVE AND BENNING RD	NE	50	10	78	3	91	2
1ST ST AND NEW YORK AVE	NE	49	11	55	8	83	3
1ST ST AND UNION STATION PLAZA	NE	67	3	84	2	76	4
14TH ST AND U ST	NW	60	4	69	4	73	5
WISCONSIN AVE AND M ST	NW	48	12	58	7	62	6
FAIRLAWN AVE AND PENNSYLVANIA AVE	SE	44	15	39	18	58	7
NEW YORK AVE AND NORTH CAPITOL ST	BN	68	2	66	5	57	8
14TH ST AND K ST	NW	52	8	35	22	48	9
7TH ST AND FLORIDA AVE	NW	51	9	45	13	47	10
BENNING RD AND BLADENSBURG RD	NE	38	22	32	31	47	10
NEW YORK AVE AND SOUTH DAKOTA AVE	NE	53	6	47	9	46	12
1ST ST AND NEW YORK AVE	NW	22	96	44	14	46	12
9TH ST AND MASSACHUSETTS AVE	NW	39	19	47	9	45	14
MONTANA AVE AND NEW YORK AVE	NE	53	6	47	9	43	15
RHODE ISLAND AVE AND NORTH CAPITOL ST	BN	36	24	42	15	43	15
31ST ST AND M ST	NW	34	27	30	38	43	15
1ST ST AND H ST	NW	16	193	26	62	42	18
36TH ST AND BENNING RD	NE	21	104	25	68	40	19
9TH ST AND U ST	NW	23	82	42	15	39	20

Table 5.2: Top 20 Hazardous Intersections by Crash Frequency for 3-Year Periods

INTERSECTION NAME	Quad	2013-2015		2014-2016	
		Freq	Rank	Freq	Rank
NEW YORK AVE AND BLADENSBURG RD	NE	335	1	388	1
1ST ST AND UNION STATION PLAZA	NE	203	2	227	2
MINNESOTA AVE AND BENNING RD	NE	184	4	218	3
14TH ST AND U ST	NW	182	5	209	4
NEW YORK AVE AND NORTH CAPITOL ST	BN	191	3	197	5
1ST ST AND NEW YORK AVE	NE	152	9	180	6
WISCONSIN AVE AND M ST	NW	155	7	166	7
FLORIDA AVE AND NEW YORK AVE	NE	166	6	150	8
MONTANA AVE AND NEW YORK AVE	NE	135	10	148	9
7TH ST AND FLORIDA AVE	NW	134	11	145	10
FAIRLAWN AVE AND PENNSYLVANIA AVE	SE	122	16	141	11
14TH ST AND K ST	NW	127	13	134	12
9TH ST AND MASSACHUSETTS AVE	NW	127	13	128	13
FIRTH STERLING AVE AND SUITLAND PKWY	SE	130	12	126	14
BENNING RD AND BLADENSBURG RD	NE	94	29	125	15
MINNESOTA AVE AND PENNSYLVANIA AVE	SE	118	19	124	16
RHODE ISLAND AVE AND NORTH CAPITOL ST	BN	106	21	123	17
1ST ST AND NEW YORK AVE	NW	98	25	118	18
KENILWORTH AVE AND EAST CAPITOL ST	BN	101	23	117	19
I ST AND S CAPITOL ST	BN	121	17	117	19

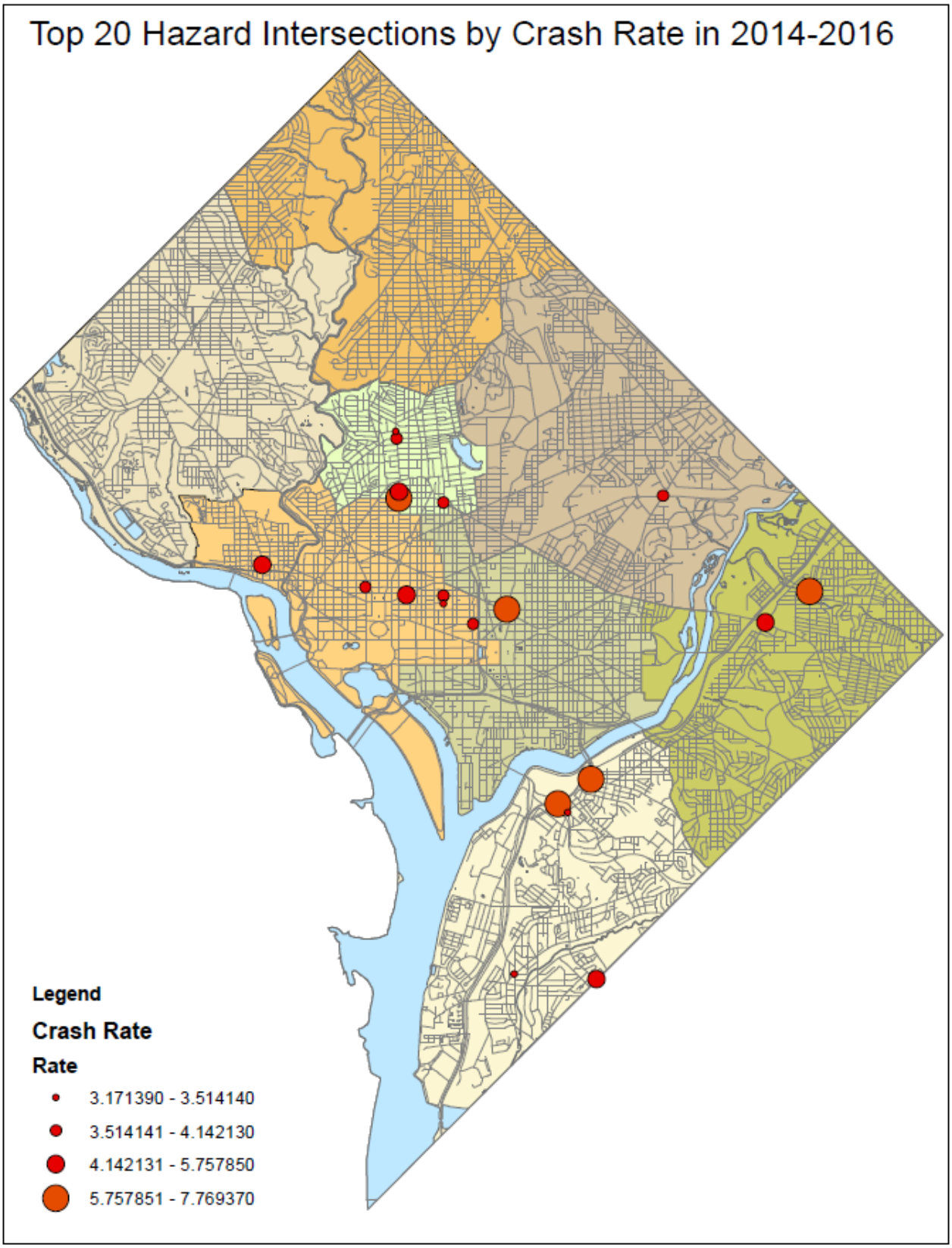


Figure 5.1: Top 20 Hazardous Intersections by Crash Rate in 2014-2016

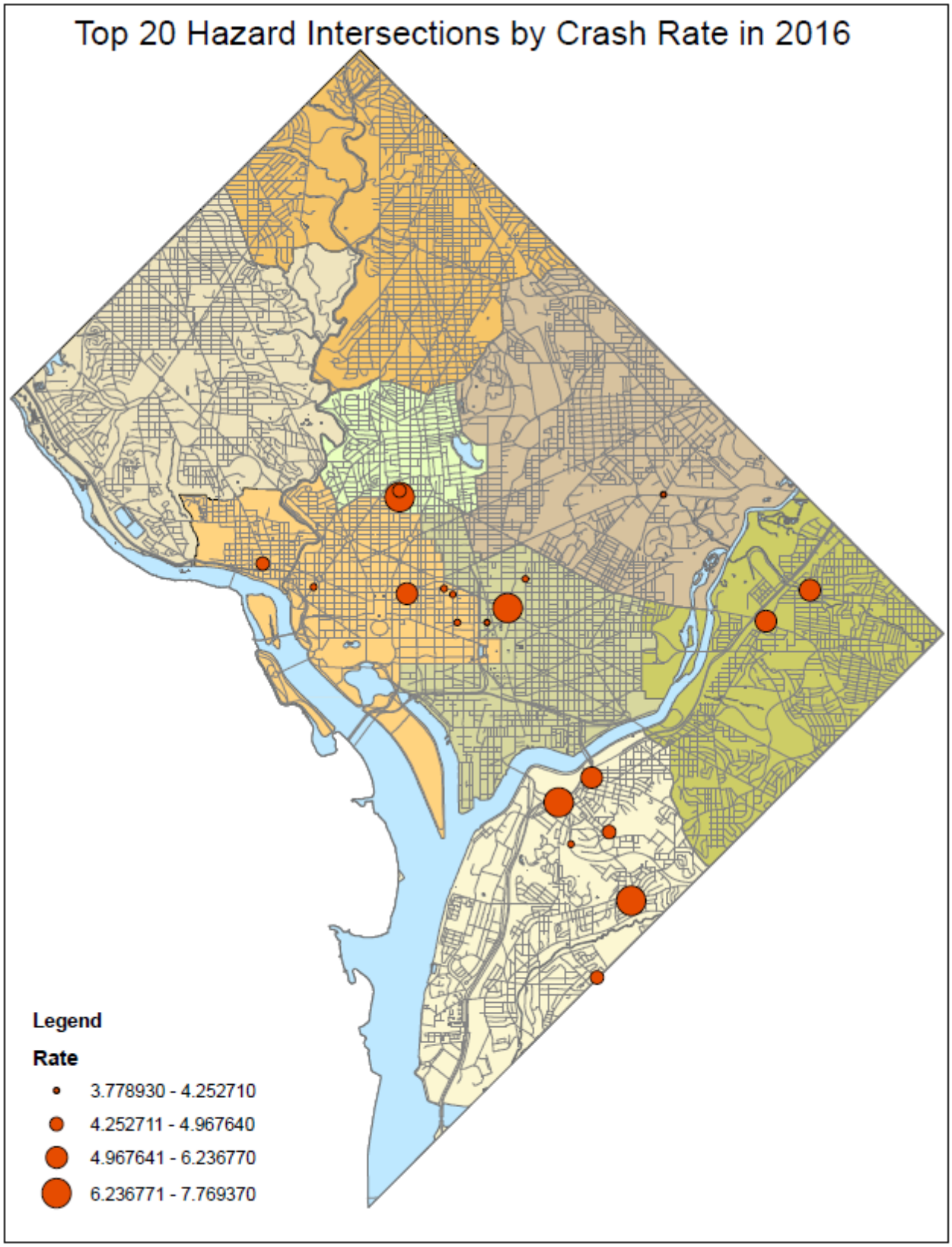


Figure 5.2: Top 20 Hazardous Intersections by Crash Rate in 2016

Based on the crash rate calculations, which took into consideration the traffic volumes for each intersection, the summary in Table 5.3 shows that the intersection of First Street and Union Station Plaza NE was ranked the highest in 2016. The intersection of Firth Sterling Avenue and Howard Road SE was ranked second highest based on the crash rate ranking presented in Table 5.3. These crash rates were calculated based on the methodology discussed in Chapter 2.

Table 5.3: Top 20 Hazardous Intersections by Crash Rate in 2014-2016

INTERSECTION NAME	Quad	2014		2015		2016	
		Rate	Rank	Rate	Rank	Rate	Rank
1ST ST AND UNION STATION PLAZA	NE	6.84932	1	8.5872	2	7.76937	1
FIRTH STERLING AVE AND HOWARD RD	SE	3.59308	18	3.59308	15	7.33588	2
14TH ST AND U ST	NW	5.64892	2	6.49626	3	6.87285	3
MARTIN LUTHER KING AVE AND GOOD HOPE RD	SE	4.90032	3	8.68694	1	6.23677	4
44TH ST AND NANNIE HELEN BURROUGHS AVE	NE	4.73046	6	3.35074	20	6.11018	5
MINNESOTA AVE AND BENNING RD	NE	3.16366	27	4.9353	4	5.75785	6
NEW YORK AVE AND H ST	NW	2.84864	40	3.18378	27	5.69729	7
SOUTHERN AVE AND WHEELER RD	SE	3.91389	12	4.51603	6	4.96764	8
14TH ST AND V ST	NW	3.49181	22	2.95461	33	4.56621	9
WISCONSIN AVE AND M ST	NW	3.52565	19	4.26016	7	4.55397	10
NEW YORK AVE AND BLADENSBURG RD	NE	3.52081	20	3.93503	10	4.14213	11
7TH ST AND FLORIDA AVE	NW	4.08556	11	3.6049	14	3.76512	12
14TH ST AND COLUMBIA RD	NW	3.65297	17	3.02674	29	3.75734	13
3RD ST AND D ST	NW	2.38237	65	4.91364	5	3.72245	14
17TH ST AND I ST	NW	4.65574	7	2.98445	30	3.70072	15
7TH ST AND H ST	NW	3.04961	35	2.95123	34	3.63985	16
MARTIN LUTHER KING AVE AND HOWARD RD	SE	3.51414	21	2.21261	72	3.51414	17
1ST ST AND MISSISSIPPI AVE	SE	2.96187	38	3.94915	9	3.45551	18
14TH ST AND IRVING ST	NW	3.77893	14	3.58999	16	3.30657	19
7TH ST AND G ST	NW	4.75708	5	3.87614	11	3.17139	20

Table 5.4: Top 20 Hazardous Intersections by Crash Rate for 3-Year Periods

INTERSECTION NAME	Quad	2013-2015		2014-2016	
		Rate	Rank	Rate	Rank
1ST ST AND UNION STATION PLAZA	NE	6.91747	1	7.7353	1
MARTIN LUTHER KING AVE AND GOOD HOPE RD	SE	5.6428	3	6.75651	2
14TH ST AND U ST	NW	5.71169	2	6.55902	3
FIRTH STERLING AVE AND HOWARD RD	SE	3.8426	8	4.84068	4
SOUTHERN AVE AND WHEELER RD	SE	4.16478	5	4.71674	5
44TH ST AND NANNIE HELEN BURROUGHS AVE	NE	4.27056	4	4.66476	6
MINNESOTA AVE AND BENNING RD	NE	3.88075	7	4.59785	7
17TH ST AND I ST	NW	3.70072	11	4.49657	8
WISCONSIN AVE AND M ST	NW	3.79497	9	4.06429	9
7TH ST AND FLORIDA AVE	NW	3.5782	13	3.87193	10
NEW YORK AVE AND BLADENSBURG RD	NE	3.30385	18	3.82654	11
7TH ST AND G ST	NW	3.52376	15	3.75868	12
3RD ST AND D ST	NW	3.52392	14	3.62319	13
1ST ST AND MISSISSIPPI AVE	SE	2.79732	31	3.62006	14
14TH ST AND V ST	NW	3.58134	12	3.58134	15
NEW YORK AVE AND H ST	NW	2.4018	48	3.57477	16
14TH ST AND IRVING ST	NW	3.77893	10	3.55849	17
14TH ST AND COLUMBIA RD	NW	3.40944	16	3.47902	18
7TH ST AND H ST	NW	3.11519	23	3.37752	19
MARTIN LUTHER KING AVE AND HOWARD RD	SE	3.08029	25	3.29722	20

Table 5.5 shows that the intersection of New York Ave and Bladensburg Road NE ranked the highest based on the crash cost index for each individual year. When the three-year crash costs were taken into consideration (Table 5.6), the same intersection ranked the highest.

Table 5.5: Top 20 Hazardous Intersections by Crash Severity Cost for 2014-2016

INTERSECTION NAME	Quad	2014		2015		2016	
		Cost	Rank	Cost	Rank	Cost	Rank
NEW YORK AVE AND BLADENSBURG RD	NE	1,352	1	1,512	1	1,275	1
MINNESOTA AVE AND BENNING RD	NE	746	4	803	2	1,028	2
1ST ST AND NEW YORK AVE	NE	465	19	488	15	750	3
14TH ST AND U ST	NW	548	12	675	4	668	4
1ST ST AND UNION STATION PLAZA	NE	548	12	668	5	630	5
WISCONSIN AVE AND M ST	NW	435	22	540	11	624	6
FAIRLAWN AVE AND PENNSYLVANIA AVE	SE	489	18	525	13	602	7
NEW YORK AVE AND NORTH CAPITOL ST	BN	750	3	705	3	585	8
RHODE ISLAND AVE AND NORTH CAPITOL ST	BN	512	15	548	10	488	9
1ST ST AND NEW YORK AVE	NW	233	117	503	14	473	10
7TH ST AND FLORIDA AVE	NW	557	11	458	17	465	11
MONTANA AVE AND NEW YORK AVE	NE	585	9	570	8	428	12
14TH ST AND K ST	NW	518	14	384	26	428	12
BENNING RD AND BLADENSBURG RD	NE	413	27	308	45	428	12
I ST AND S CAPITOL ST	BN	504	16	420	21	420	15
FIRTH STERLING AVE AND SUITLAND PKWY	SE	722	7	555	9	398	16
MINNESOTA AVE AND PENNSYLVANIA AVE	SE	729	6	398	25	390	17
KENILWORTH AVE AND EAST CAPITOL ST	BN	497	17	458	17	375	18
FLORIDA AVE AND NEW YORK AVE	NE	563	10	578	7	323	19
STANTON RD AND SUITLAND PKWY	SE	746	4	618	6	219	20

Table 5.6: Top 20 Hazardous Intersections by Crash Severity Cost for 3-Year Periods

INTERSECTION NAME	Quad	2013-2015		2014-2016	
		Cost	Rank	Cost	Rank
NEW YORK AVE AND BLADENSBURG RD	NE	3704	1	4180	1
MINNESOTA AVE AND BENNING RD	NE	2232	3	2576	2
NEW YORK AVE AND NORTH CAPITOL ST	BN	1958	4	2154	3
FIRTH STERLING AVE AND SUITLAND PKWY	SE	2240	2	2005	4
14TH ST AND U ST	NW	1680	8	1997	5
1ST ST AND UNION STATION PLAZA	NE	1635	9	1830	6
1ST ST AND NEW YORK AVE	NE	1403	17	1658	7
STANTON RD AND SUITLAND PKWY	SE	1851	5	1606	8
FAIRLAWN AVE AND PENNSYLVANIA AVE	SE	1464	15	1593	9
MONTANA AVE AND NEW YORK AVE	NE	1523	11	1590	10
7TH ST AND FLORIDA AVE	NW	1427	16	1584	11
WISCONSIN AVE AND M ST	NW	1472	14	1577	12
RHODE ISLAND AVE AND NORTH CAPITOL ST	BN	1547	10	1554	13
MINNESOTA AVE AND PENNSYLVANIA AVE	SE	1494	13	1487	14
KENILWORTH AVE AND EAST CAPITOL ST	BN	1520	12	1457	15
FLORIDA AVE AND NEW YORK AVE	NE	1697	7	1425	16
1ST ST AND NEW YORK AVE	NW	1097	28	1368	17
I ST AND S CAPITOL ST	BN	1367	18	1367	18
14TH ST AND K ST	NW	1254	19	1322	19
BENNING RD AND BLADENSBURG RD	NE	1067	29	1238	20

In order to examine the effect of the various rankings, the crash composite index methodology was employed to identify the characteristics of intersections or corridors. Based on the results presented in Table 5.7, it was determined that the intersection of Minnesota Ave and Benning Road (NE) ranked the highest using the composite index method. When the three-year crash composite index ranking was taken into consideration as shown in Table 5.8, Minnesota Ave and Benning Road (NE) and New York Avenue and Bladensburg Avenue (NE) were the top two most hazardous intersections. The GIS maps for the top 20 hazardous intersections by crash cost from 2014 through 2016 and the top 20 hazardous intersection by crash cost in 2016 are respectively presented in Figures 5.3 and 5.4 respectively. Figures 5.5 and 5.6 present the top 20 hazardous intersections by crash composite index from 2014 to 2016 and the top 20 hazardous intersection by crash composite index in 2016 respectively.

Table 5.7: Top 20 Hazardous Intersections by Composite Index for 2014-2016

INTERSECTION NAME	Quad	2014		2015		2016	
		Comp	Rank	Comp	Rank	Comp	Rank
MINNESOTA AVE AND BENNING RD	NE	11.25	5	2.75	1	3.25	1
1ST ST AND UNION STATION PLAZA	NE	7	2	3.5	3	3.75	2
NEW YORK AVE AND BLADENSBURG RD	NE	5.75	1	3.25	2	4.25	3
14TH ST AND U ST	NW	7.5	3	3.75	4	4.25	3
FIRTH STERLING AVE AND HOWARD RD	SE	55.25	31	63.75	40	6.25	5
WISCONSIN AVE AND M ST	NW	18.75	7	9	5	7.5	6
7TH ST AND FLORIDA AVE	NW	10.5	4	15.25	6	16	7
SOUTHERN AVE AND WHEELER RD	SE	57.25	34	29.5	15	22	8
9TH ST AND MASSACHUSETTS AVE	NW	34	18	17.25	7	29	9
9TH ST AND U ST	NW	136	86	19.5	9	29	9
14TH ST AND K ST	NW	20	8	47	27	29.25	11
13TH ST AND U ST	NW	33.25	17	61.25	38	29.5	12
7TH ST AND H ST	NW	51.25	27	55	31	36	13
14TH ST AND COLUMBIA RD	NW	27.25	14	48.75	29	37.5	14
17TH ST AND I ST	NW	25.5	12	75	47	49	15
14TH ST AND IRVING ST	NW	26.75	13	23.25	12	52.5	16
MONTANA AVE AND NEW YORK AVE	NE	31.25	15	37.75	21	62	17
FIRTH STERLING AVE AND SUITLAND PKWY	SE	21.25	9	18.75	8	65.5	18
MINNESOTA AVE AND NANNIE HELEN	NE	31.25	15	20.5	11	91.75	19
STANTON RD AND SUITLAND PKWY	SE	17.75	6	20	10	279.25	20

Table 5.8: Top 20 Hazardous Intersections by Composite Index for 3-Year Periods

INTERSECTION NAME	Quad	2013-2015		2014-2016	
		Cost	Rank	Cost	Rank
MINNESOTA AVE AND BENNING RD	NE	4.25	1	3.5	1
NEW YORK AVE AND BLADENSBURG RD	NE	5.25	2	3.5	1
1ST ST AND UNION STATION PLAZA	NE	5.25	2	3.75	3
14TH ST AND U ST	NW	5.75	4	4.25	4
WISCONSIN AVE AND M ST	NW	11	5	10.5	5
7TH ST AND FLORIDA AVE	NW	14	6	11.25	6
FIRTH STERLING AVE AND SUITLAND PKWY	SE	15	7	18.5	7
9TH ST AND MASSACHUSETTS AVE	NW	20.25	10	22.5	8
FIRTH STERLING AVE AND HOWARD RD	SE	40	22	23.5	9
SOUTHERN AVE AND WHEELER RD	SE	24.5	11	25	10
17TH ST AND I ST	NW	35	19	25	10
14TH ST AND K ST	NW	26.25	12	25.75	12
14TH ST AND IRVING ST	NW	20	9	26.25	13
9TH ST AND U ST	NW	44.5	26	30.5	14
STANTON RD AND SUITLAND PKWY	SE	15.75	8	31.5	15
MONTANA AVE AND NEW YORK AVE	NE	35.75	20	32.5	16
MINNESOTA AVE AND NANNIE HELEN BURROUGHS	NE	27.25	15	33	17
14TH ST AND COLUMBIA RD	NW	26.75	13	33.5	18
13TH ST AND U ST	NW	26.75	13	33.5	18
7TH ST AND H ST	NW	31.75	16	36.5	20

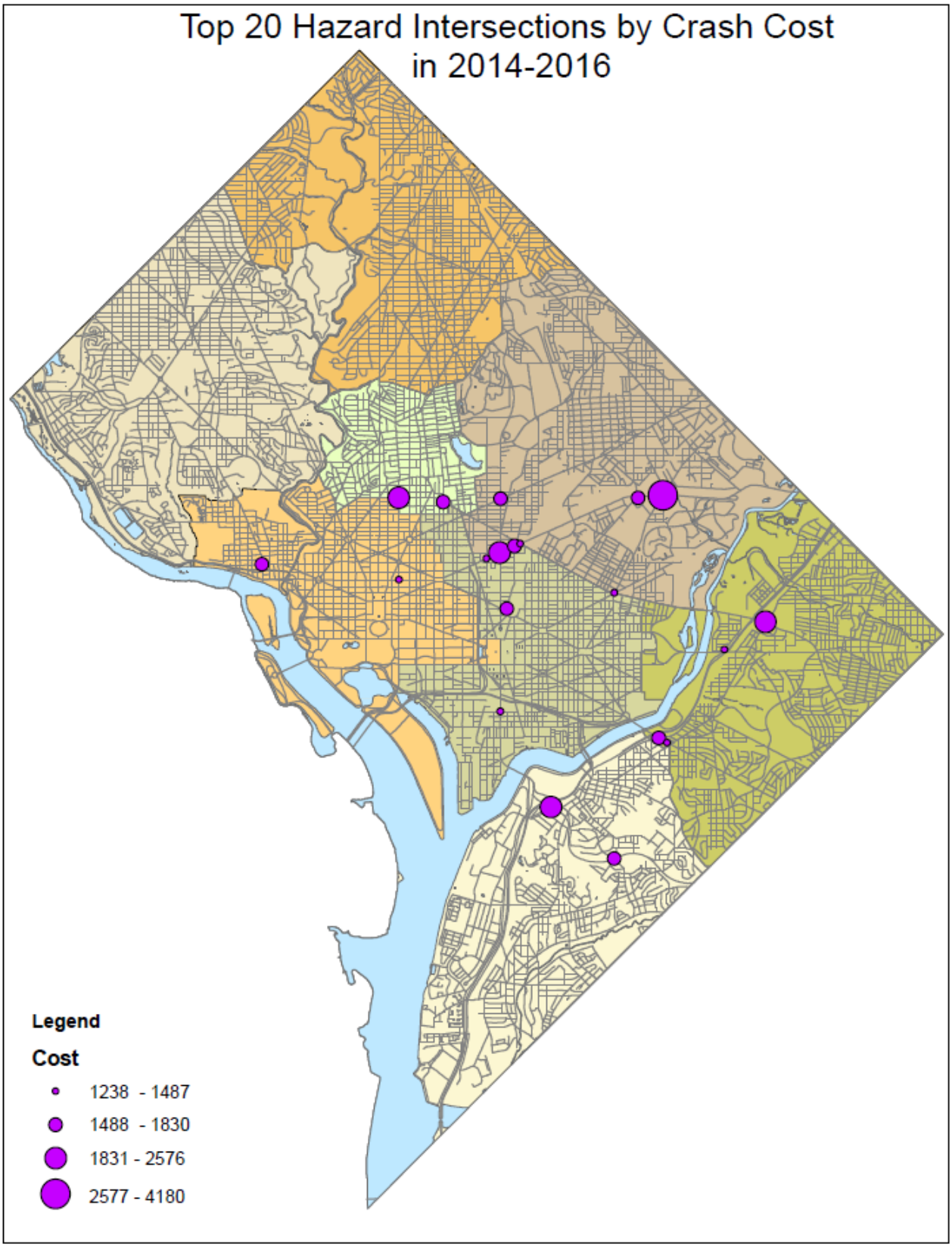


Figure 5.3: Top 20 Hazardous Intersections by Crash Cost in 2014-2016

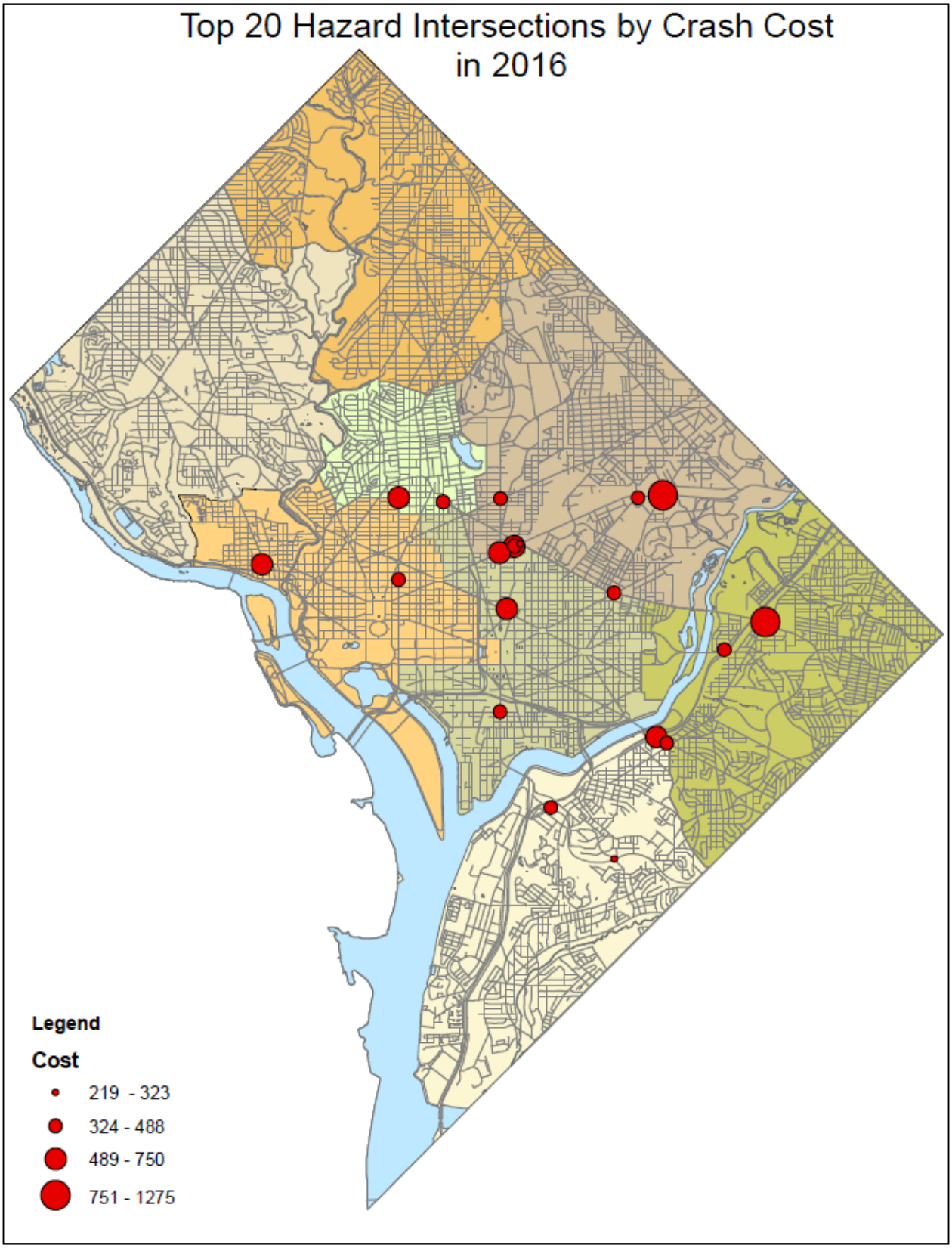


Figure 5.4: Top 20 Hazardous Intersections by Crash Cost in 2016

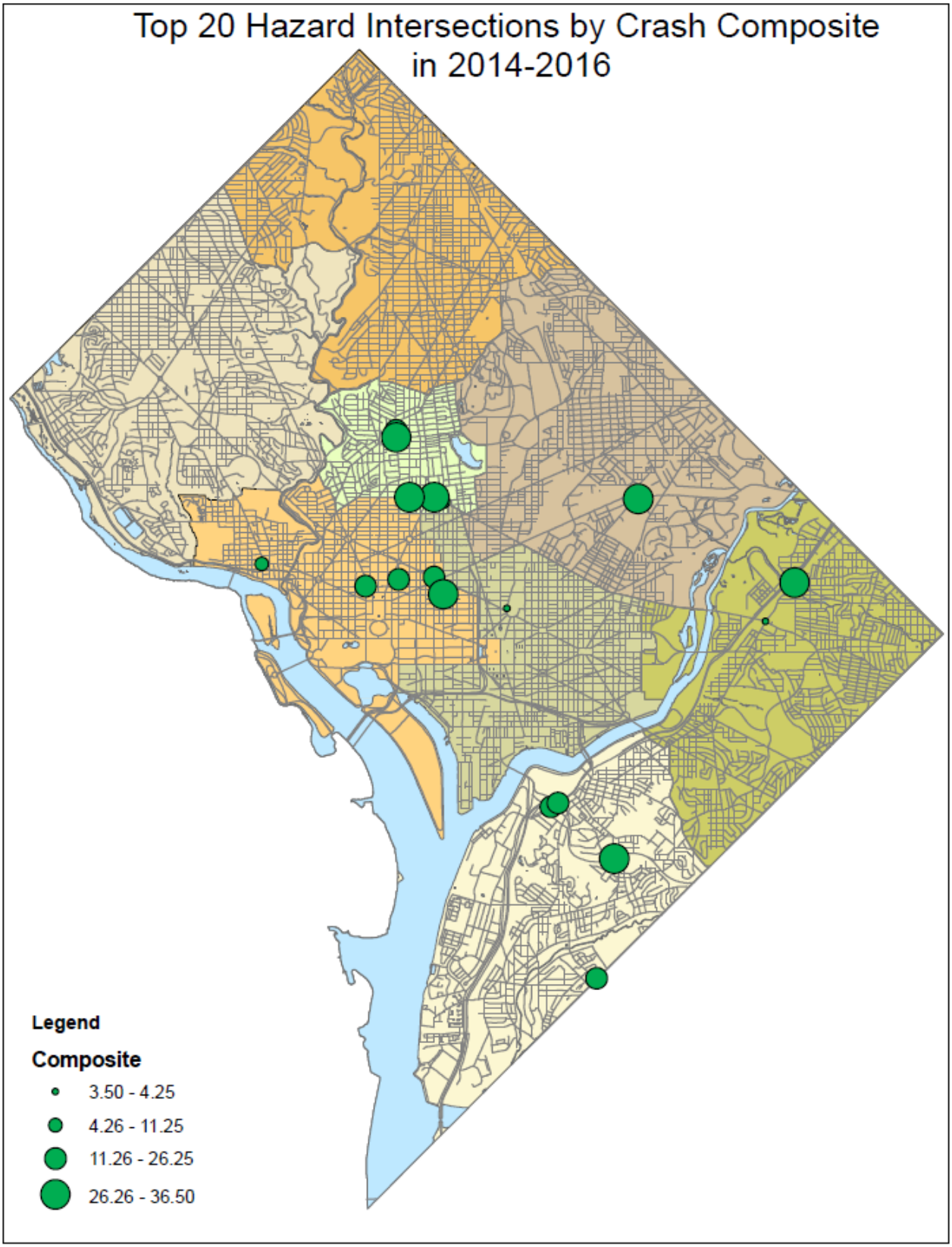


Figure 5.5: Top 20 Hazardous Intersections by Crash Composite Index 2014-2016

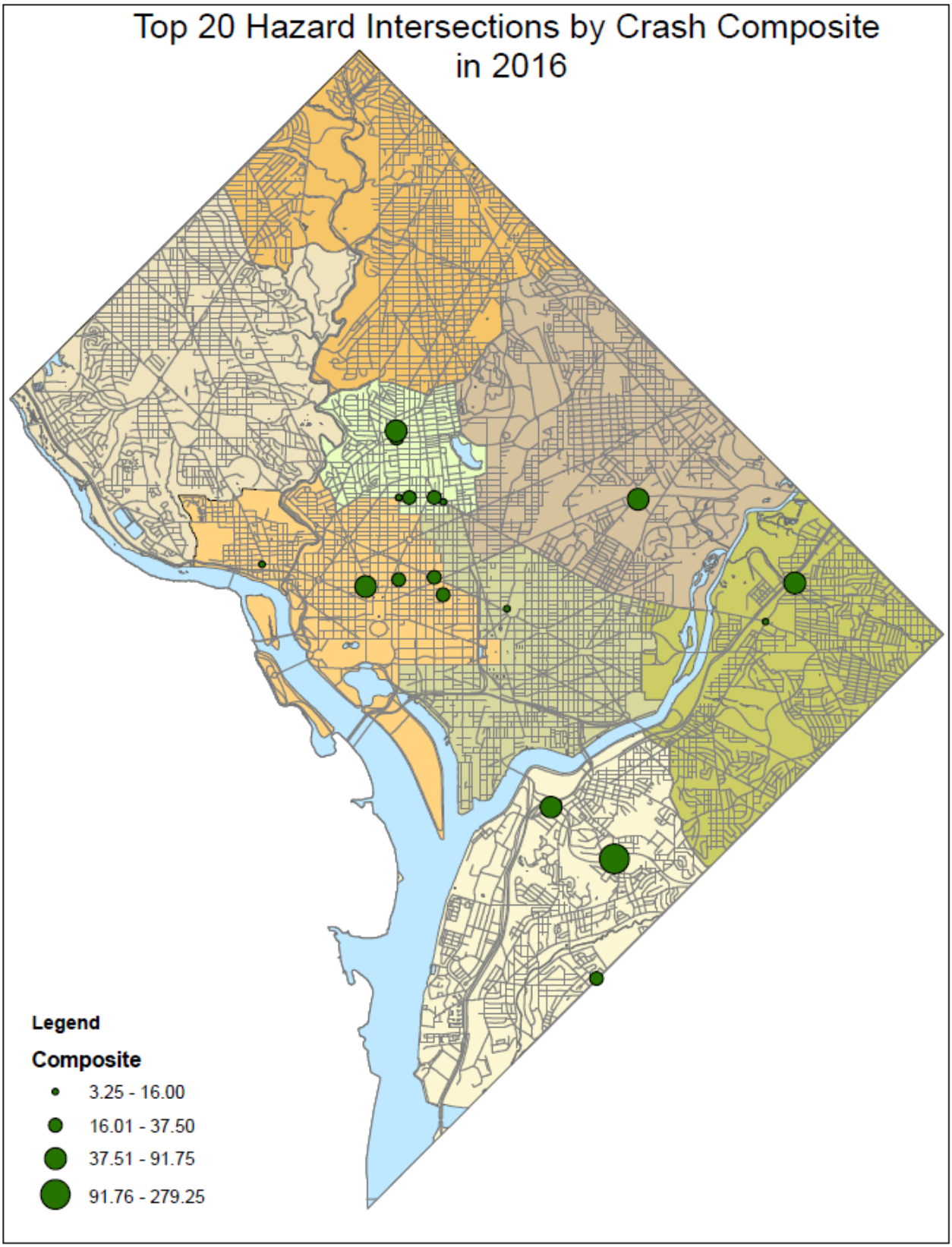


Figure 5.6: Top 20 Hazardous Intersections by Crash Composite Index for 2016

5.2 High Frequency Crash Intersection by Type

In order to determine the crash patterns at each of the identified top 20 high frequency crash locations, the crash types for those locations were further analyzed and are presented in Table 5.9. From the table, in 2016, side swipe was the leading crash type for most of the high frequency crash locations, whereas parked-vehicle and unknown crashes were the second and third most frequently reported crashes for the top 20 high frequency crash locations.

Table 5.9: Top 20 Hazardous Intersections by Crash Type in 2016

Type of Collision	Backing	Fixed Object	Head On	Left Turn	Non-Collision	Other	Parked Vehicle	Ran Off Roadway	Rear End	Right Angle	Right Turn	Side Swiped	Straight	Override	Unknown	Total Crash
NEW YORK AVE AND BLADENSBURG RD, NE							8					31			101	140
MINNESOTA AVE AND BENNING RD, NE							4					34			53	91
1ST ST AND NEW YORK AVE, NE						1	5					19			58	83
1ST ST AND UNION STATION PLAZA, NE							3					40			33	76
14TH ST AND U ST, NW							5					32			36	73
WISCONSIN AVE AND M ST, NW							4					25			33	62
FAIRLAWN AVE AND PENNSYLVANIA AVE, SE						2	0					13			43	58
NEW YORK AVE AND NORTH CAPITOL ST, BN							1					17			39	57
FIRTH STERLING AVE AND HOWARD RD, SE						2	0					13			34	49
14TH ST AND K ST, NW							2					20			26	48
BENNING RD AND BLADENSBURG RD, NE							3					19			25	47
7TH ST AND FLORIDA AVE, NW							2					20			25	47
1ST ST AND NEW YORK AVE, NW							1					15			30	46
NEW YORK AVE AND SOUTH DAKOTA AVE, NE							2					14			30	46
9TH ST AND MASSACHUSETTS AVE, NW							1					20			24	45
15TH PL AND ALABAMA AVE, SE							3					13			28	44
13TH ST AND U ST, NW							6					14			24	44
MONTANA AVE AND NEW YORK AVE, NE							1					16			26	43
RHODE ISLAND AVE AND NORTH CAPITOL ST, BN							4					5			34	43
31ST ST AND M ST, NW							4					20			19	43

*The type of collision information is not available after 08/23/2015

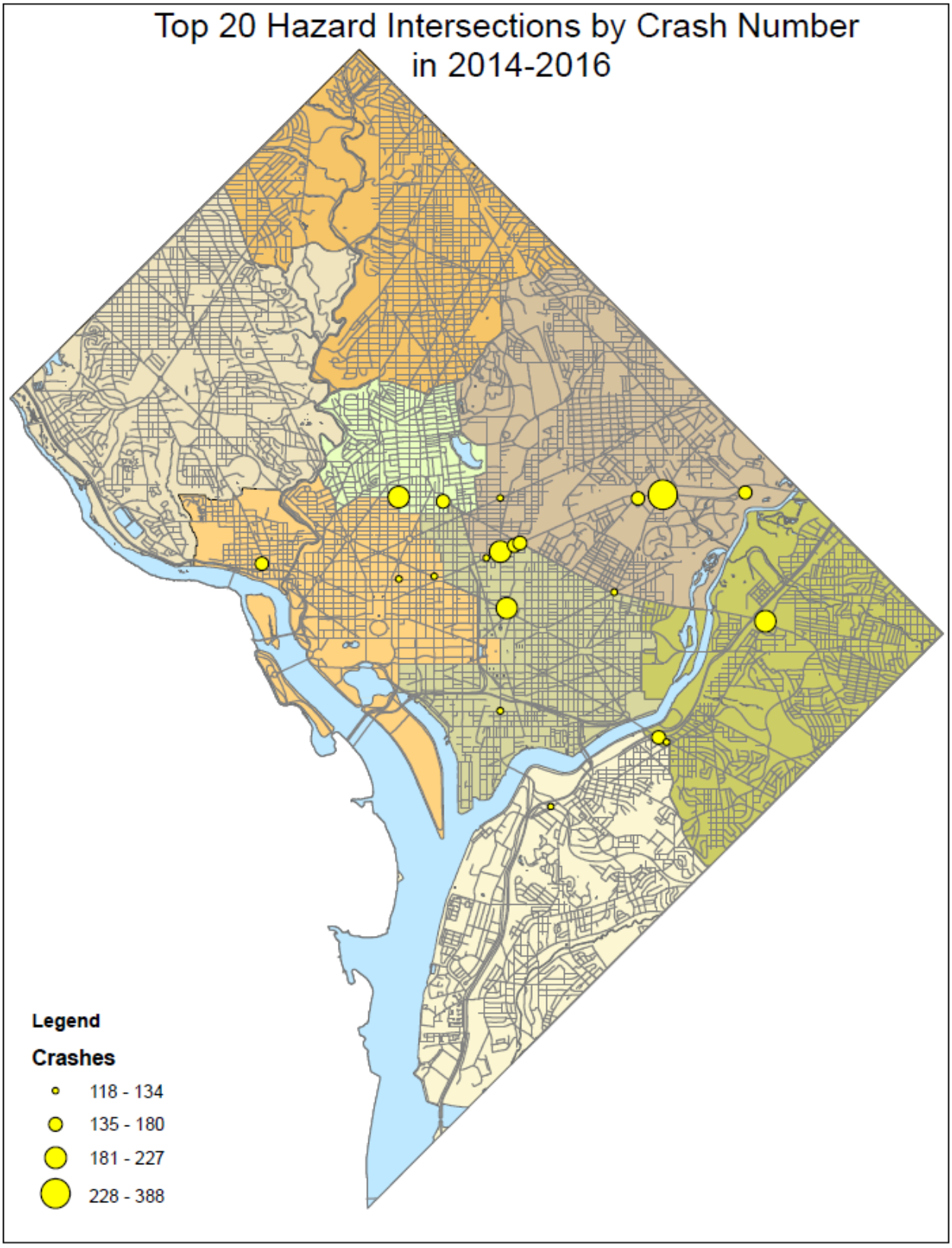


Figure 5.8: Top 20 Hazardous Intersections by Crash Frequency Index in 2014-2016

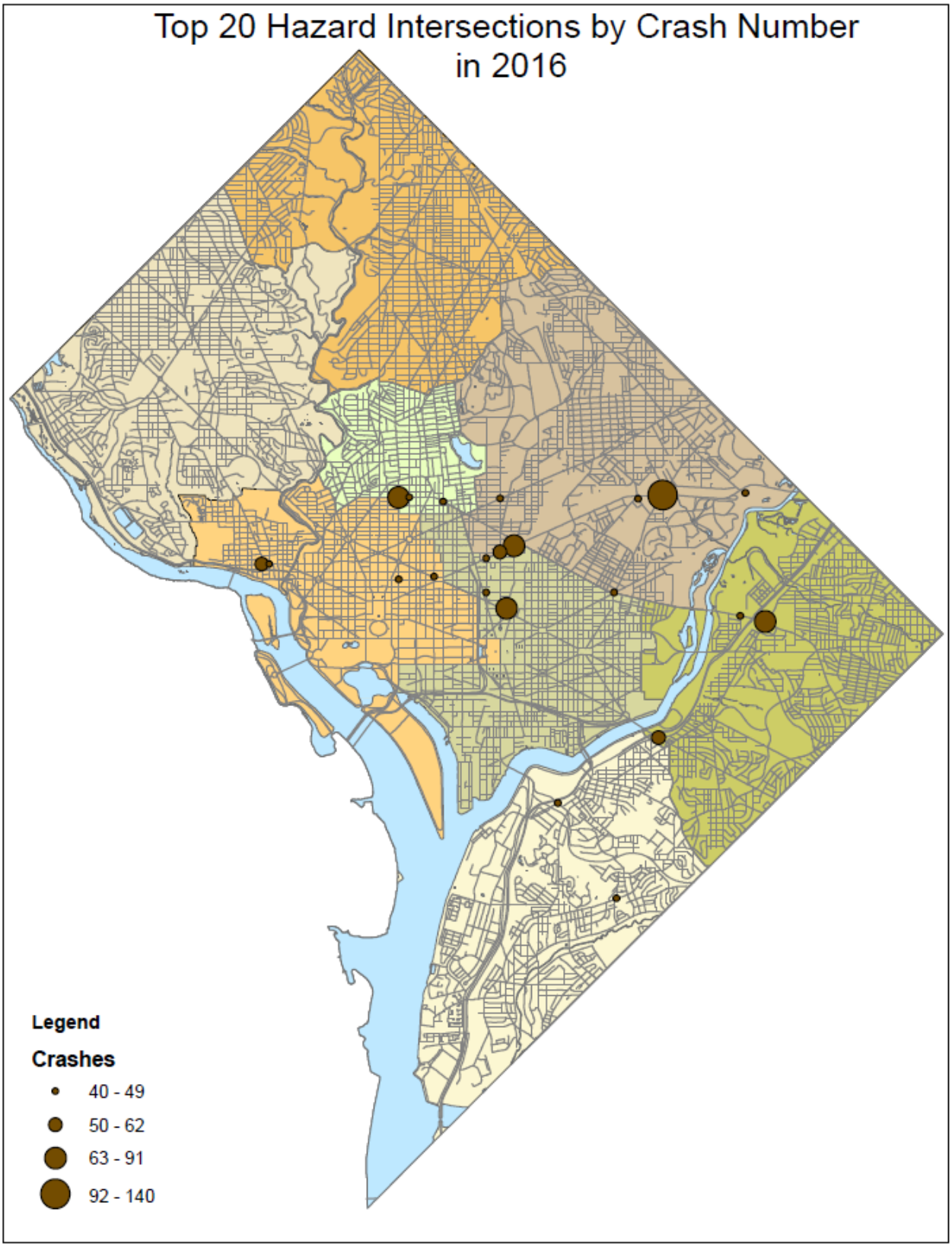


Figure 5.9: Top 20 Hazardous Intersections by Crash Frequency in 2016

CHAPTER 6: EXPOSURE

6.1 Fatality Rate per 100 Million Vehicle Miles Traveled (VMT)

Using the exposure data, the fatality rates per 100 million vehicle miles traveled (VMT) were computed based on data obtained from the National Highway Traffic Safety Administration's (NHTSA) database. This was used to examine and compare the motor vehicle crash fatality rate in Washington, DC with the national rate from 2008 to 2016.

The results are presented in Table 6.1 and Figure 6.1. From the table and figure, it can be determined that the fatalities per 100 million VMT of the District from 2008 to 2016 were substantially lower than the national rate.

Table 6.1: Fatality Rate from 2008 through 2016

Year/State		Fatalities	Total Vehicle Miles Traveled (Millions)	Fatalities Per 100 Million Vehicle Miles Traveled	Total Population	Fatalities Per 100,000 Population
2008	Dist of Columbia	39	3,611	1.08	590,074	6.61
	US	37,423	2,973,509	1.26	304,374,846	12.30
2009	Dist of Columbia	33	3,607	0.91	599,657	5.50
	US	33,883	2,979,321	1.14	307,006,550	11.04
2010	Dist of Columbia	25	3,614	0.69	601,723	4.15
	US	32,999	2,999,821	1.10	308,745,538	10.69
2011	Dist of Columbia	32	3,614	0.89	617,996	5.18
	US	32,367	2,964,121	1.09	314,168,000	10.30
2012	Dist of Columbia	19	3,629	0.52	632,323	3.00
	US	33,561	2,957,394	1.13	313,914,040	10.69
2013	Dist of Columbia	29	3,651	0.79	646,449	4.49
	US	32,719	2,972,287	1.10	315,091,138	10.38
2014	Dist of Columbia	26	3,699	0.70	658,893	3.95
	US	32,675	3,015,620	1.08	320,282,544	10.28
2015	Dist of Columbia	26	3,720	0.70	672,228	3.87
	US	38,300	3,147,848	1.15	321,773,631	11.06
2016	Dist of Columbia	27	3,553	0.76	681,170	3.96
	US	37,461	3,217,956	1.08	323,127,513	11.59

Data was obtained from the NHTSA except for the fatalities data for the District of Columbia.

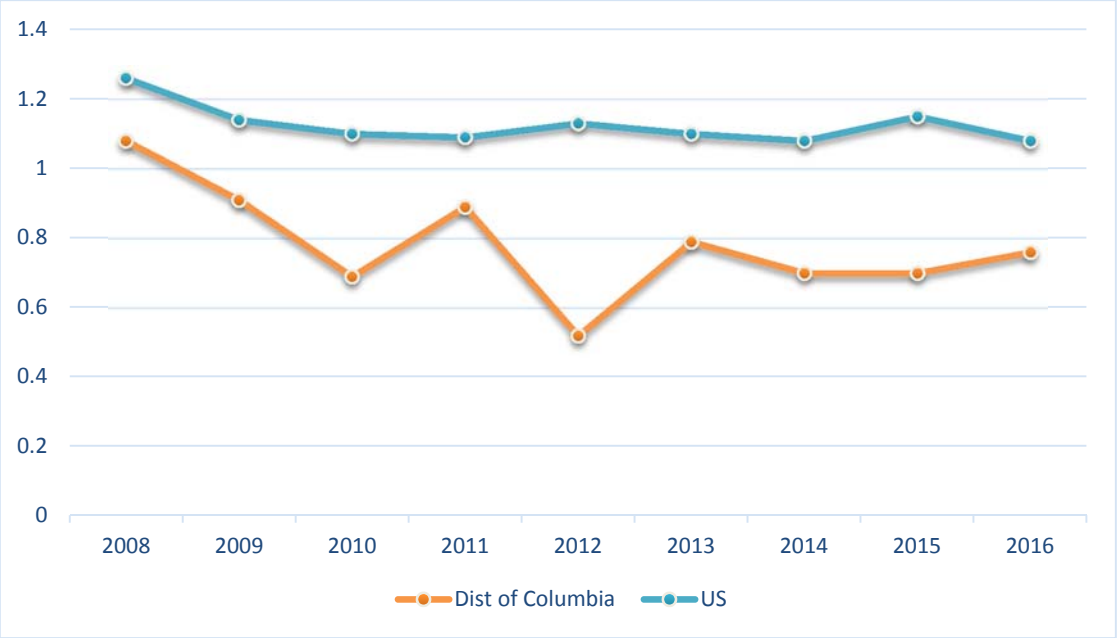


Figure 6.1: Fatality Rate per 100 Million VMT from 2008 through 2016

6.2 Injury Rate per 100 Million Vehicle Miles Traveled (VMT)

The injury rate per 100 million vehicle miles traveled (VMT) information from 2008 to 2016 was also obtained from NHTSA to examine and compare the injury rate of motor vehicle crashes in Washington, DC to the national rate. The summarized results are presented in Table 6.2 and Figure 6.2. The results show that the number of injuries per 100 million VMT in the District from 2008 to 2016 area considerably higher than the national values.

Table 6.2: Injury Rate from 2008 to 2016

Year/State		Injuries	Total Vehicle Miles Traveled (Millions)	Injuries Per 100 Million Vehicle Miles Traveled	Total Population	Injuries Per 100,000 Population
2008	Dist of Columbia	6,792	3,611	188.09	590,074	1151.04
	US	2,346,000	2,973,509	78.90	304,374,846	770.76
2009	Dist of Columbia	6,529	3,607	181.01	599,657	1088.79
	US	2,217,000	2,979,321	74.41	307,006,550	722.13
2010	Dist of Columbia	7,068	3,614	195.57	601,723	1174.63
	US	2,239,074	2,999,821	75.15	308,745,538	725.22
2011	Dist of Columbia	7,335	3,614	202.96	617,996	1186.90
	US	2,217,000	2,964,121	74.79	314,168,000	705.67
2012	Dist of Columbia	7,268	3,629	200.28	632,323	1149.41
	US	2,362,000	2,957,394	79.87	313,914,040	752.44
2013	Dist of Columbia	7,505	3,651	205.56	646,449	1160.96
	US	2,313,000	2,972,287	77.82	315,091,138	734.07
2014	Dist of Columbia	8,030	3,699	217.09	658,893	1218.71
	US	2,338,000	3,015,620	77.53	320,282,544	729.98
2015	Dist of Columbia	8,341	3,720	224.22	672,228	1240.80
	US	2,338,000	3,147,848	74.27	321,773,631	726.60
2016	Dist of Columbia	8,336	3,553	231.23*	681,170	1,262.85*
	US	2,363.00*	3,217,956	74.58*	323,127,513	726.24*

Data was obtained from the NHTSA except for the fatalities data for the District of Columbia. * These are estimated values

CHAPTER 7: APPENDICES

7.1 Top 100 Hazardous Intersections

7.1.1 Rank by Crash Frequency

Table 7.1: Intersection Rank by Crash Frequency for 2014- 2016 (Rank 1~40)

INTERSECTION NAME	Quad	2014		2015		2016	
		Freq	Rank	Freq	Rank	Freq	Rank
NEW YORK AVE AND BLADENSBURG RD	NE	119	1	129	1	140	1
MINNESOTA AVE AND BENNING RD	NE	50	10	77	3	91	2
1ST ST AND NEW YORK AVE	NE	49	11	48	11	83	3
1ST ST AND UNION STATION PLAZA	NE	67	3	84	2	76	4
14TH ST AND U ST	NW	60	4	76	4	73	5
WISCONSIN AVE AND M ST	NW	48	12	56	7	62	6
FAIRLAWN AVE AND PENNSYLVANIA AVE	SE	44	15	39	24	58	7
NEW YORK AVE AND NORTH CAPITOL ST	BN	68	2	72	5	57	8
FIRTH STERLING AVE AND HOWARD RD	SE	24	73	24	81	49	9
14TH ST AND K ST	NW	52	8	34	32	48	10
BENNING RD AND BLADENSBURG RD	NE	38	23	40	23	47	11
7TH ST AND FLORIDA AVE	NW	51	9	47	12	47	11
1ST ST AND NEW YORK AVE	NW	22	96	50	9	46	13
NEW YORK AVE AND SOUTH DAKOTA AVE	NE	53	6	47	12	46	13
9TH ST AND MASSACHUSETTS AVE	NW	39	21	44	16	45	15
15TH PL AND ALABAMA AVE	SE	9	510	18	168	44	16
13TH ST AND U ST	NW	37	24	28	55	44	16
MONTANA AVE AND NEW YORK AVE	NE	53	6	52	8	43	18
RHODE ISLAND AVE AND NORTH CAPITOL ST	BN	36	25	44	16	43	18
31ST ST AND M ST	NW	34	28	28	55	43	18
1ST ST AND H ST	NW	16	193	25	70	42	21
36TH ST AND BENNING RD	NE	21	104	23	88	40	22
14TH ST AND CONSTITUTION AVE	NW	30	40	33	34	39	23
9TH ST AND U ST	NW	23	83	42	21	39	23
4TH ST AND NEW YORK AVE	NW	40	17	30	49	39	23
1ST ST AND FLORIDA AVE	NE	15	223	31	42	38	26
KENILWORTH AVE AND EAST CAPITOL ST	BN	33	32	37	26	37	27
9TH ST AND NEW YORK AVE	NW	30	40	34	32	37	27
7TH ST AND H ST	NW	31	38	35	28	37	27
6TH ST AND H ST	NW	8	595	23	88	37	27
FOOTE PL AND MINNESOTA AVE	NE	16	193	19	146	36	31
14TH ST AND COLUMBIA RD	NW	35	27	29	50	36	31
17TH ST AND K ST	NW	11	384	17	189	36	31
MINNESOTA AVE AND AMES ST	NE	18	147	23	88	36	31
MONTANA AVE AND NEW YORK AVE	NE	53	6	52	8	36	31
MINNESOTA AVE AND PENNSYLVANIA AVE	SE	55	5	33	34	36	31
14TH ST AND IRVING ST	NW	40	17	38	25	35	37
IRVING ST AND KENYON ST	NW	23	83	19	146	35	37
KENILWORTH AVE AND BENNING RD	NE	33	32	37	26	35	37
FLORIDA AVE AND NEW YORK AVE	NE	47	13	69	6	34	40

Table 7.2: Intersection Rank by Crash Frequency for 2014-2016(Rank: 40~81)

INTERSECTION NAME	Quad	2014		2015		2016	
		Freq	Rank	Freq	Rank	Freq	Rank
I ST AND S CAPITOL ST	BN	40	17	44	16	34	40
NEW YORK AVE AND H ST	NW	17	162	13	320	34	40
4TH ST AND NEW YORK AVE	NE	40	17	30	49	34	40
FIRTH STERLING AVE AND SUITLAND PKWY	SE	44	15	49	10	33	44
16TH ST AND K ST	NW	36	25	31	42	33	44
SOUTHERN AVE AND WHEELER RD	SE	26	58	35	28	33	44
NEW YORK AVE AND FENWICK ST	NE	9	510	20	125	32	47
PENNSYLVANIA AVE AND PROUT ST	SE	10	442	15	247	32	47
44TH ST AND NANNIE HELEN BURROUGHS AVE	NE	24	73	16	224	31	49
MASSACHUSETTS AVE AND NORTH CAPITOL ST	BN	21	104	24	79	31	49
MONTANA AVE AND EDWIN ST	NE	15	223	16	223	31	49
17TH ST AND I ST	NW	39	21	43	19	31	49
RHODE ISLAND AVE AND REED ST	NE	33	32	28	55	31	49
14TH ST AND L ST	NW	22	96	26	67	30	54
16TH ST AND NEW YORK AVE	NE	25	64	27	62	30	54
16TH ST AND L ST	NW	13	278	18	168	30	54
18TH ST AND MASSACHUSETTS AVE	NW	20	118	25	70	30	54
18TH ST AND M ST	NW	25	64	18	168	30	54
42ND ST AND KENILWORTH AVE	NE	6	843	14	276	29	59
6TH ST AND FLORIDA AVE	NW	20	118	17	189	29	59
9TH ST AND PENNSYLVANIA AVE	NW	19	132	16	223	29	59
MARTIN LUTHER KING AVE AND TALBERT ST	SE	13	278	16	223	28	62
16TH ST AND SPRING PL	NW	18	147	10	469	28	62
MONTANA AVE AND BLADENSBURG RD	NE	15	223	17	189	28	62
14TH ST AND INDEPENDENCE AVE	SW	24	73	27	62	28	62
M ST AND S CAPITOL ST	BN	19	132	18	168	28	62
14TH ST AND H ST	NE	15	223	22	99	28	62
BRANCH AVE AND PENNSYLVANIA AVE	SE	24	73	27	62	28	62
MARTIN LUTHER KING AVE AND GOOD HOPE RD	SE	22	96	41	22	28	62
12TH ST AND CONSTITUTION AVE	NW	24	73	22	100	28	62
BLADENSBURG RD AND T ST	NE	8	595	12	368	28	62
MINNESOTA AVE AND BLAINE ST	NE	8	595	20	125	28	62
MINNESOTA AVE AND NANNIE HELEN	NE	33	32	35	28	27	73
MARTIN LUTHER KING AVE AND HOWARD RD	SE	27	51	22	100	27	73
16TH ST AND I ST	NW	16	193	24	79	27	73
6TH ST AND MASSACHUSETTS AVE	NW	10	442	12	368	27	73
17TH ST AND PENNSYLVANIA AVE	NW	27	51	26	67	27	73
4TH ST AND MICHIGAN AVE	NE	20	118	16	146	27	73
13TH ST AND K ST	NW	19	132	14	276	27	73
3RD ST AND NEW YORK AVE	NW	7	707	13	320	27	73
7TH ST AND I ST	NW	12	330	43	19	26	81
13TH ST AND SOUTHERN AVE	SE	13	278	33	34	26	81
16TH ST AND NEW HAMPSHIRE AVE	NW	27	51	35	28	26	81
29TH ST AND M ST	NW	26	58	19	146	26	81
5TH ST AND RHODE ISLAND AVE	NE	18	147	25	70	26	81
45TH ST AND BENNING RD	NE	10	442	16	223	26	81

Table 7.3: Intersection Rank by Crash Frequency for 2014-2016 (Rank: 81~88)

INTERSECTION NAME	Quad	2014		2015		2016	
		Freq	Rank	Freq	Rank	Freq	Rank
H ST AND NORTH CAPITOL ST	BN	26	58	43	19	26	81
14TH ST AND RHODE ISLAND AVE	NW	33	32	29	50	25	88
3RD ST AND D ST	NW	16	193	32	39	25	88
22ND ST AND M ST	NW	17	162	17	189	25	88
ANACOSTIA AVE AND BENNING RD	NE	13	278	15	247	25	88
15TH ST AND MASSACHUSETTS AVE	NW	27	51	17	189	25	88
33RD PL AND SOUTH DAKOTA AVE	NE	25	64	23	89	25	88
14TH ST AND PENNSYLVANIA AVE	NW	29	46	20	125	25	88
ALABAMA AVE AND BRANCH AVE	SE	24	73	18	168	25	88
GEORGIA AVE AND ROCK CREEK FORD RD	NW	8	595	16	223	25	88
SOUTHERN AVE AND SOUTHVIEW DR	SE	11	384	10	469	25	88
36TH ST AND M ST	NW	28	48	26	67	25	88
CONNECTICUT AVE AND R ST	NW	21	104	25	70	25	88
23RD ST AND M ST	NW	9	510	12	368	25	88

Table 7.4: Intersection Rank by Crash Frequency for 3-Year Periods (Rank: 1~43)

INTERSECTION NAME	Quad	2013-2015		2014-2016	
		Freq	Rank	Freq	Rank
NEW YORK AVE AND BLADENSBURG RD	NE	335	1	388	1
1ST ST AND UNION STATION PLAZA	NE	203	2	227	2
MINNESOTA AVE AND BENNING RD	NE	184	4	218	3
14TH ST AND U ST	NW	182	5	209	4
NEW YORK AVE AND NORTH CAPITOL ST	BN	191	3	197	5
1ST ST AND NEW YORK AVE	NE	152	9	180	6
WISCONSIN AVE AND M ST	NW	155	7	166	7
FLORIDA AVE AND NEW YORK AVE	NE	166	6	150	8
MONTANA AVE AND NEW YORK AVE	NE	135	10	148	9
NEW YORK AVE AND SOUTH DAKOTA AVE	NE	153	8	146	10
7TH ST AND FLORIDA AVE	NW	134	11	145	11
FAIRLAWN AVE AND PENNSYLVANIA AVE	SE	122	16	141	12
14TH ST AND K ST	NW	127	13	134	13
9TH ST AND MASSACHUSETTS AVE	NW	127	13	128	14
FIRTH STERLING AVE AND SUITLAND PKWY	SE	130	12	126	15
BENNING RD AND BLADENSBURG RD	NE	94	29	125	16
MINNESOTA AVE AND PENNSYLVANIA AVE	SE	118	19	124	17
RHODE ISLAND AVE AND NORTH CAPITOL ST	BN	106	21	123	18
1ST ST AND NEW YORK AVE	NW	152	9	118	19
I ST AND S CAPITOL ST	BN	121	17	118	19
KENILWORTH AVE AND EAST CAPITOL ST	BN	101	23	117	21
14TH ST AND IRVING ST	NW	120	19	113	22
17TH ST AND I ST	NW	93	31	113	22
4TH ST AND NEW YORK AVE	NW	94	29	109	24
13TH ST AND U ST	NW	106	25	109	24
STANTON RD AND SUITLAND PKWY	SE	127	13	105	26
31ST ST AND M ST	NW	102	22	105	26
KENILWORTH AVE AND BENNING RD	NE	99	24	105	26
9TH ST AND U ST	NW	93	31	104	29
7TH ST AND H ST	NW	95	28	103	30
14TH ST AND CONSTITUTION AVE	NW	90	37	102	31
9TH ST AND NEW YORK AVE	NW	92	36	101	32
16TH ST AND K ST	NW	91	37	100	33
14TH ST AND COLUMBIA RD	NW	98	25	100	33
FIRTH STERLING AVE AND HOWARD RD	SE	77	52	97	35
MINNESOTA AVE AND NANNIE HELEN BURROUGHS	NE	93	31	95	36
H ST AND NORTH CAPITOL ST	BN	93	31	95	36
SOUTHERN AVE AND WHEELER RD	SE	83	45	94	38
RHODE ISLAND AVE AND REED ST	NE	85	44	92	39
MARTIN LUTHER KING AVE AND GOOD HOPE RD	SE	76	54	91	40
15TH ST AND K ST	NW	90	37	89	41
16TH ST AND NEW HAMPSHIRE AVE	NW	82	46	88	42
14TH ST AND RHODE ISLAND AVE	NW	89	39	87	43

Table 7.5: Intersection Rank by Crash Frequency for 3-Year Periods
(Rank: 44~85)

INTERSECTION NAME	Quad	2013-2015		2014-2016	
		Freq	Rank	Freq	Rank
4TH ST AND NEW YORK AVE	NE	75	59	85	44
36TH ST AND BENNING RD	NE	66	82	84	45
1ST ST AND FLORIDA AVE	NE	57	119	84	45
K ST AND NORTH CAPITOL ST	BN	78	50	83	47
16TH ST AND NEW YORK AVE	NE	82	46	82	48
17TH ST AND PENNSYLVANIA AVE	NW	71	64	80	49
BRANCH AVE AND PENNSYLVANIA AVE	SE	72	62	79	50
1ST ST AND H ST	NW	40	264	79	50
36TH ST AND M ST	NW	66	84	79	50
CONNECTICUT AVE AND K ST	NW	89	39	79	50
14TH ST AND INDEPENDENCE AVE	SW	70	74	79	50
14TH ST AND L ST	NW	78	53	78	55
NORTH CAPITOL ST AND RIGGS RD	BN	93	33	78	55
24TH ST AND M ST	NW	77	59	77	57
IRVING ST AND KENYON ST	NW	62	97	77	57
6TH ST AND H ST	NW	63	92	77	57
MINNESOTA AVE AND AMES ST	NE	48	180	77	57
MARTIN LUTHER KING AVE AND HOWARD RD	SE	76	61	76	61
MASSACHUSETTS AVE AND NORTH CAPITOL ST	BN	57	119	76	61
CONNECTICUT AVE AND N ST	NW	63	92	75	63
15TH ST AND H ST	NW	63	92	75	63
PENNSYLVANIA AVE AND ANACOSTIA FRWY	SE	78	53	75	63
18TH ST AND MASSACHUSETTS AVE	NW	68	81	75	63
12TH ST AND CONSTITUTION AVE	NW	69	77	74	67
BENNING RD AND EAST CAPITOL ST	BN	101	29	74	67
14TH ST AND PENNSYLVANIA AVE	NW	64	87	74	67
MICHIGAN AVE AND NORTH CAPITOL ST	BN	91	37	74	67
18TH ST AND M ST	NW	55	132	73	71
33RD PL AND SOUTH DAKOTA AVE	NE	63	92	73	71
3RD ST AND D ST	NW	70	74	73	71
24TH ST AND PENNSYLVANIA AVE	NW	84	46	73	71
14TH ST AND PARK RD	NW	89	39	73	71
13TH ST AND SOUTHERN AVE	SE	62	97	72	76
17TH ST AND BENNING RD	NE	71	71	72	76
6TH ST AND NEW YORK AVE	NW	73	64	72	76
ALABAMA AVE AND PENNSYLVANIA AVE	SE	79	52	71	79
44TH ST AND NANNIE HELEN BURROUGHS AVE	NE	64	87	71	79
15TH PL AND ALABAMA AVE	SE	41	248	71	79
CONNECTICUT AVE AND R ST	NW	72	67	71	79
29TH ST AND M ST	NW	61	101	71	79
FOOTE PL AND MINNESOTA AVE	NE	42	236	71	79
MONTANA AVE AND NEW YORK AVE	NE	140	10	70	85
FLORIDA AVE AND NORTH CAPITOL ST	BN	73	64	70	85

Table 7.6: Intersection Rank by Crash Frequency for 3-Year Periods (Rank: 85~98)

INTERSECTION NAME	Quad	2013-2015		2014-2016	
		Freq	Rank	Freq	Rank
CONNECTICUT AVE AND M ST	NW	64	87	70	85
1ST ST AND MICHIGAN AVE	NW	78	53	69	88
5TH ST AND RHODE ISLAND AVE	NE	60	108	69	88
15TH ST AND MASSACHUSETTS AVE	NW	59	111	69	88
17TH ST AND BLADENSBURG RD	NE	78	53	69	88
SOUTHERN AVE AND BENNING RD	SE	69	77	68	92
12TH ST AND U ST	NW	69	77	68	92
SOUTH DAKOTA AVE AND BLADENSBURG RD	NE	81	49	68	92
ALABAMA AVE AND BRANCH AVE	SE	63	92	67	95
16TH ST AND I ST	NW	58	115	67	95
21ST ST AND K ST	NW	71	71	67	95
23RD ST AND I ST	NW	74	63	66	98
6TH ST AND FLORIDA AVE	NW	57	119	66	98
14TH ST AND F ST	NW	65	86	66	98

7.1.2 Rank by Crash Rate

Table 7.7: Intersection Rank by Crash Rate for 2014-2016 (Rank: 1~44)

INTERSECTION NAME	Quad	2014		2015		2016	
		Rate	Rank	Rate	Rank	Rate	Rank
1ST ST AND UNION STATION PLAZA	NE	6.849	1	8.587	2	7.769	1
FIRTH STERLING AVE AND HOWARD RD	SE	3.593	18	3.593	15	7.336	2
SAVANNAH ST AND STANTON RD	SE	0.000	1131	1.423	240	7.116	3
14TH ST AND U ST	NW	5.649	2	7.155	3	6.873	4
MARTIN LUTHER KING AVE AND GOOD HOPE RD	SE	4.900	3	9.132	1	6.237	5
44TH ST AND NANNIE HELEN BURROUGHS AVE	NE	4.730	6	3.154	28	6.110	6
MINNESOTA AVE AND BENNING RD	NE	3.164	27	4.872	6	5.758	7
NEW YORK AVE AND H ST	NW	2.849	40	2.178	77	5.697	8
SOUTHERN AVE AND WHEELER RD	SE	3.914	12	5.269	4	4.968	9
MORRIS RD AND POMEROY RD	SE	0.818	506	0.818	517	4.907	10
14TH ST AND V ST	NW	3.492	22	2.686	46	4.566	11
WISCONSIN AVE AND M ST	NW	3.526	19	4.113	9	4.554	12
7TH ST AND I ST	NW	1.963	110	1.309	281	4.253	13
NEW YORK AVE AND BLADENSBURG RD	NE	3.521	20	3.817	10	4.142	14
5TH ST AND D ST	NW	2.740	47	1.918	118	4.110	15
1ST ST AND D ST	NW	1.476	200	0.738	577	4.059	16
6TH ST AND H ST	NW	1.809	130	2.447	53	3.937	17
2ND ST AND K ST	NE	1.606	165	1.071	391	3.927	18
POMEROY RD AND SHERIDAN RD	SE	1.544	181	3.087	29	3.859	19
24TH ST AND NEW HAMPSHIRE AVE	NW	0.315	904	0.945	451	3.779	20
7TH ST AND FLORIDA AVE	NW	4.086	11	3.765	11	3.765	21
14TH ST AND COLUMBIA RD	NW	3.653	17	3.027	32	3.757	22
10TH ST AND F ST	NW	3.063	33	1.021	417	3.744	23

3RD ST AND D ST	NW	2.382	65	4.765	7	3.722	24
17TH ST AND I ST	NW	4.656	7	5.133	5	3.701	25
7TH ST AND H ST	NW	3.050	35	3.443	20	3.640	26
1ST ST AND MARTIN LUTHER KING AVE	SE	1.628	158	0.814	518	3.526	27
MARTIN LUTHER KING AVE AND HOWARD RD	SE	3.514	21	2.863	38	3.514	28
8TH ST AND H ST	NW	2.094	94	3.316	24	3.490	29
1ST ST AND MISSISSIPPI AVE	SE	2.962	38	4.443	8	3.456	30
6TH ST AND G ST	NW	2.985	37	3.198	27	3.411	31
14TH ST AND IRVING ST	NW	3.779	14	3.590	16	3.307	32
9TH ST AND U ST	NW	1.942	114	3.546	17	3.293	33
SOUTHERN AVE AND NAYLOR RD	SE	3.836	13	2.466	50	3.288	34
9TH ST AND MASSACHUSETTS AVE	NW	2.846	41	3.210	26	3.283	35
13TH ST AND U ST	NW	2.725	48	2.062	94	3.241	36
6TH ST AND FLORIDA AVE	NW	2.214	82	1.882	125	3.210	37
7TH ST AND G ST	NW	4.757	5	3.348	22	3.171	38
3RD ST AND C ST	NW	3.161	28	1.581	199	3.161	39
SOUTHERN AVE AND BENNING RD	SE	2.832	42	3.681	13	3.115	40
ALABAMA AVE AND GOOD HOPE RD	SE	2.778	46	3.704	12	3.087	41
21ST ST AND MARYLAND AVE	NE	3.378	23	0.375	866	3.002	42
NEW JERSEY AVE AND E ST	NW	2.443	61	2.269	66	2.967	43
14TH ST AND H ST	NE	1.587	171	2.327	59	2.962	44

Table 7.8: Intersection Rank by Crash Rate for 2014-2016 (Rank: 44~91)

INTERSECTION NAME	Quad	2014		2015		2016	
		Rate	Rank	Rate	Rank	Rate	Rank
ATLANTIC ST AND BARNABY ST	SE	1.481	196	2.962	36	2.962	44
1ST ST AND FLORIDA AVE	NE	1.168	315	2.413	55	2.958	46
IRVING ST AND KENYON ST	NW	1.936	115	1.599	192	2.946	47
NEW HAMPSHIRE AVE AND V ST	NW	2.332	70	0.000	1254	2.915	48
6TH ST AND BRENTWOOD PKWY	NE	0.777	536	1.166	339	2.915	48
9TH ST AND I ST	NW	1.328	248	1.826	139	2.823	50
3RD ST AND C ST	SE	0.937	441	0.000	0	2.810	51
25TH PL AND BLADENSBURG RD	NE	1.230	286	1.118	363	2.796	52
9TH ST AND F ST	NW	2.040	104	2.186	76	2.769	53
17TH ST AND K ST	NW	0.837	491	1.294	286	2.740	54
19TH ST AND I ST	NW	1.570	174	1.998	102	2.711	55
44TH ST AND BENNING RD	NE	2.043	103	1.923	116	2.644	56
6TH ST AND F ST	NW	2.641	52	1.100	371	2.641	57
24TH ST AND M ST	NW	4.234	10	2.740	43	2.615	58
ALABAMA AVE AND WHEELER RD	SE	1.621	159	2.107	86	2.594	59
MINNESOTA AVE AND NANNIE HELEN	NE	3.150	30	3.341	23	2.577	60
14TH ST AND K ST	NW	2.783	44	1.819	141	2.568	61
NEW JERSEY AVE AND D ST	NW	1.950	113	0.780	545	2.535	62
MONTANA AVE AND BLADENSBURG RD	NE	1.352	241	1.532	209	2.523	63
10TH ST AND E ST	NW	1.598	167	0.913	471	2.511	64
1ST ST AND M ST	NW	1.249	275	1.561	203	2.498	65
13TH ST AND F ST	NW	1.315	252	1.461	226	2.484	66
1ST ST AND P ST	NW	1.241	281	0.827	511	2.481	67
11TH ST AND K ST	NW	1.603	166	1.312	279	2.477	68
BRENTWOOD RD AND W ST	NE	1.851	125	2.468	49	2.468	69
7TH ST AND S ST	NW	3.161	28	1.405	248	2.459	70

7TH ST AND D ST	NW	2.453	59	1.309	281	2.453	71
14TH ST AND RHODE ISLAND AVE	NW	3.195	26	2.807	40	2.420	72
7TH ST AND R ST	NW	2.068	100	1.206	322	2.412	73
17TH ST AND PENNSYLVANIA AVE	NW	2.398	64	2.309	61	2.398	74
13TH ST AND FLORIDA AVE	NE	0.704	588	1.549	206	2.395	75
7TH ST AND F ST	NW	2.219	81	3.073	30	2.390	76
GEORGIA AVE AND BRYANT ST	NW	1.261	271	1.682	174	2.382	77
20TH ST AND NEW HAMPSHIRE AVE	NW	0.889	461	1.481	220	2.369	78
CATHEDRAL AVE AND WOODLEY RD	NW	0.945	434	1.417	243	2.362	79
CONSTITUTION AVE AND DELAWARE AVE	NE	0.000	1131	0.000	1254	2.359	80
24TH ST AND L ST	NW	2.358	69	2.220	73	2.358	81
9TH ST AND NEW YORK AVE	NW	1.894	121	2.146	83	2.336	82
1ST ST AND E ST	NW	0.583	675	1.894	122	2.332	83
18TH ST AND M ST	NW	1.932	116	1.391	254	2.319	84
7TH ST AND M ST	NW	1.159	321	1.655	182	2.318	85
23RD ST AND M ST	NW	0.825	503	1.100	373	2.291	86
5TH ST AND K ST	NW	2.453	59	1.799	146	2.290	87
2ND ST AND D ST	NW	1.370	236	2.283	64	2.283	88
16TH ST AND L ST	NW	0.989	402	1.370	262	2.283	88
15TH ST AND POTOMAC AVE	SE	0.284	931	1.420	242	2.271	90
1ST ST AND M ST	NE	4.776	4	2.011	101	2.262	91

Table 7.9: Intersection Rank by Crash Rate for 2014-2016 (Rank: 92~100)

INTERSECTION NAME	Quad	2014		2015		2016	
		Rate	Rank	Rate	Rank	Rate	Rank
BLAIR RD AND RIGGS RD	NE	0.682	602	0.682	611	2.242	92
4TH ST AND D ST	NW	2.516	55	2.237	70	2.237	93
ROCK CREEK CHURCH RD AND WEBSTER ST	NW	0.000	1131	0.637	665	2.230	94
4TH ST AND T ST	NE	1.481	196	0.740	575	2.221	95
4TH ST AND K ST	NW	0.916	447	0.916	469	2.199	96
GEORGIA AVE AND IRVING ST	NW	1.718	139	1.336	270	2.196	97
13TH ST AND K ST	NW	1.540	182	1.135	352	2.189	98
5TH ST AND H ST	NW	1.256	274	2.397	56	2.169	99
6TH ST AND MASSACHUSETTS AVE	NW	0.802	521	0.963	442	2.166	100

Table 7.10: Intersection Rank by Crash Rate for 3-Year Periods (Rank: 1~43)

INTERSECTION NAME	Quad	2013-2015		2014-2016	
		Rate	Rank	Rate	Rank
1ST ST AND UNION STATION PLAZA	NE	6.91747	1	7.7353	1
MARTIN LUTHER KING AVE AND GOOD HOPE RD	SE	5.6428	3	6.75651	2
14TH ST AND U ST	NW	5.71169	2	6.55902	3
FIRTH STERLING AVE AND HOWARD RD	SE	3.8426	8	4.84068	4
SOUTHERN AVE AND WHEELER RD	SE	4.16478	5	4.71674	5
44TH ST AND NANNIE HELEN BURROUGHS AVE	NE	4.27056	4	4.66476	6
MINNESOTA AVE AND BENNING RD	NE	3.88075	7	4.59785	7
17TH ST AND I ST	NW	3.70072	11	4.49657	8
WISCONSIN AVE AND M ST	NW	3.79497	9	4.06429	9
7TH ST AND FLORIDA AVE	NW	3.5782	13	3.87193	10
NEW YORK AVE AND BLADENSBURG RD	NE	3.30385	18	3.82654	11
7TH ST AND G ST	NW	3.52376	15	3.75868	12
3RD ST AND D ST	NW	3.52392	14	3.62319	13
1ST ST AND MISSISSIPPI AVE	SE	2.79732	31	3.62006	14
14TH ST AND V ST	NW	3.58134	12	3.58134	15
NEW YORK AVE AND H ST	NW	2.4018	48	3.57477	16
14TH ST AND IRVING ST	NW	3.77893	10	3.55849	17
14TH ST AND COLUMBIA RD	NW	3.40944	16	3.47902	18
7TH ST AND H ST	NW	3.11519	23	3.37752	19
MARTIN LUTHER KING AVE AND HOWARD RD	SE	3.08029	25	3.29722	20
SOUTHERN AVE AND BENNING RD	SE	3.30372	19	3.20933	21
6TH ST AND G ST	NW	3.05598	26	3.19812	22
24TH ST AND M ST	NW	3.0303	27	3.19635	23
SOUTHERN AVE AND NAYLOR RD	SE	3.28767	20	3.19635	23
ALABAMA AVE AND GOOD HOPE RD	SE	3.24137	21	3.18992	25
9TH ST AND MASSACHUSETTS AVE	NW	3.08873	24	3.11305	26
MINNESOTA AVE AND NANNIE HELEN BURROUGHS	NE	2.95929	28	3.02293	27
1ST ST AND M ST	NE	4.02162	6	3.01621	28
8TH ST AND H ST	NW	2.50124	43	2.96658	29
9TH ST AND U ST	NW	2.6173	37	2.92688	30
5TH ST AND D ST	NW	2.19178	58	2.92237	31
SAVANNAH ST AND STANTON RD	SE	1.42323	203	2.84647	32
POMEROY RD AND SHERIDAN RD	SE	2.05801	70	2.82976	33
14TH ST AND RHODE ISLAND AVE	NW	2.87203	29	2.80749	34
6TH ST AND H ST	NW	2.3762	51	2.73086	35
13TH ST AND U ST	NW	2.6759	33	2.6759	36
3RD ST AND C ST	NW	2.28311	53	2.63435	37
14TH ST AND W ST	NW	2.84932	30	2.63014	38
24TH ST AND PENNSYLVANIA AVE	NW	3.12803	22	2.62467	39
10TH ST AND F ST	NW	1.92859	86	2.60926	40
EASTERN AVE AND MINNESOTA AVE	NE	2.64708	35	2.59414	41
7TH ST AND F ST	NW	2.67429	34	2.56049	42
NEW JERSEY AVE AND E ST	NW	1.80322	102	2.5594	43

Table 7.11: Intersection Rank by Crash Rate for 3-Year Periods (Rank: 44~87)

INTERSECTION NAME	Quad	2013-2015		2014-2016	
		Rate	Rank	Rate	Rank
14TH ST AND SPRING RD	NW	2.38533	50	2.52164	44
7TH ST AND I ST	NW	2.01731	76	2.50801	45
10TH ST AND MASSACHUSETTS AVE	NW	2.55708	39	2.50489	46
ATLANTIC ST AND BARNABY ST	SE	1.48093	184	2.46822	47
2ND ST AND E ST	NW	2.2013	57	2.43928	48
6TH ST AND FLORIDA AVE	NW	2.14012	61	2.43531	49
14TH ST AND K ST	NW	2.26527	54	2.39013	50
FIRTH STERLING AVE AND SUITLAND PKWY	SE	2.4631	44	2.38731	51
23RD ST AND I ST	NW	2.62467	36	2.37299	52
17TH ST AND PENNSYLVANIA AVE	NW	2.10179	64	2.36821	53
7TH ST AND S ST	NW	2.22456	56	2.34165	54
18TH ST AND KALORAMA RD	NW	2.57504	38	2.3355	55
9TH ST AND F ST	NW	1.84591	98	2.33168	56
4TH ST AND D ST	NW	2.05014	73	2.3297	57
24TH ST AND L ST	NW	2.35825	52	2.31201	58
14TH ST AND H ST	NE	1.76302	111	2.29192	59
19TH ST AND INDEPENDENCE AVE	SE	2.71119	32	2.28311	60
1ST ST AND MICHIGAN AVE	NW	2.52948	41	2.26668	61
BRENTWOOD RD AND W ST	NE	1.97458	82	2.26254	62
21ST ST AND MARYLAND AVE	NE	1.50122	180	2.25183	63
1ST ST AND K ST	NE	2.14041	60	2.23554	64
8TH ST AND D ST	NW	2.43531	47	2.23237	65
14TH ST AND P ST	NW	2.43996	46	2.23082	66
11TH ST AND COLUMBIA RD	NW	2.38595	49	2.2214	67
ALABAMA AVE AND STANTON RD	SE	1.93535	85	2.21759	68
44TH ST AND BENNING RD	NE	1.72234	122	2.203	69
2ND ST AND K ST	NE	1.60635	154	2.2013	70
19TH ST AND N ST	NW	1.98531	81	2.18384	71
5TH ST AND K ST	NW	1.85374	96	2.18088	72
MORRIS RD AND POMEROY RD	SE	0.54522	714	2.18088	72
1ST ST AND FLORIDA AVE	NE	1.47883	185	2.17933	74
CENTRAL AVE AND SOUTHERN AVE	SE	2.17134	59	2.17134	75
IRVING ST AND KENYON ST	NW	1.87979	92	2.16036	76
14TH ST AND S ST	NW	1.90951	90	2.15857	77
SOUTHERN AVE AND S CAPITOL ST	BN	2.46083	45	2.13272	78
6TH ST AND F ST	NW	1.68711	131	2.12723	79
9TH ST AND NEW YORK AVE	NW	1.9359	84	2.12529	80
15TH ST AND H ST	NW	1.77575	108	2.11399	81
ALABAMA AVE AND WHEELER RD	SE	1.62114	149	2.10748	82
STANTON RD AND SUITLAND PKWY	SE	2.53789	40	2.09826	83
19TH ST AND I ST	NW	1.56963	163	2.09285	84
1ST ST AND D ST	NW	1.16846	294	2.09092	85
VERMONT AVE AND U ST	NW	1.99012	80	2.07857	86
7TH ST AND D ST	NW	1.58114	162	2.07183	87

Table 7.12: Intersection Rank by Crash Rate for 3-Year Periods (Rank: 88~100)

INTERSECTION NAME	Quad	2013-2015		2014-2016	
		Rate	Rank	Rate	Rank
ROCK CREEK CHURCH RD AND SPRING RD	NW	2.05801	70	2.05801	88
PARK RD AND WARDER ST	NW	1.81439	100	2.05631	89
GEORGIA AVE AND PARK RD	NW	2.11579	63	2.02943	90
9TH ST AND I ST	NW	1.60509	155	1.99253	91
11TH ST AND U ST	NW	2.09655	66	1.98994	92
1ST ST AND MARTIN LUTHER KING AVE	SE	1.26588	249	1.98924	93
2ND ST AND D ST	NW	1.52207	175	1.97869	94
GEORGIA AVE AND BARRY PL	NW	2.5131	42	1.97458	95
H ST AND NORTH CAPITOL ST	BN	1.92588	87	1.9673	96
5TH ST AND H ST	NW	1.48402	183	1.94064	97
12TH ST AND K ST	NW	2.06772	68	1.92987	98
MONTANA AVE AND NEW YORK AVE	NE	1.81482	99	1.91852	99
DIVISION AVE AND NANNIE HELEN BURROUGHS AVE	NE	1.734	121	1.9074	100

7.1.3 Rank by Crash Cost

Table 7.13: Intersection Rank by Crash Severity Cost for 3-Year Periods (Rank: 1~35)

INTERSECTION NAME	Quad	2013-2015		2014-2016	
		Cost	Rank	Cost	Rank
NEW YORK AVE AND BLADENSBURG RD	NE	3704	1	4180	1
MINNESOTA AVE AND BENNING RD	NE	2232	3	2576	2
NEW YORK AVE AND NORTH CAPITOL ST	BN	1958	4	2154	3
FIRTH STERLING AVE AND SUITLAND PKWY	SE	2240	2	2005	4
14TH ST AND U ST	NW	1680	8	1997	5
1ST ST AND UNION STATION PLAZA	NE	1635	9	1830	6
NEW YORK AVE AND SOUTH DAKOTA AVE	NE	1734	6	1674	7
1ST ST AND NEW YORK AVE	NE	1403	17	1658	8
STANTON RD AND SUITLAND PKWY	SE	1851	5	1606	9
FAIRLAWN AVE AND PENNSYLVANIA AVE	SE	1464	15	1593	10
MONTANA AVE AND NEW YORK AVE	NE	1523	11	1590	11
7TH ST AND FLORIDA AVE	NW	1427	16	1584	12
WISCONSIN AVE AND M ST	NW	1472	14	1577	13
RHODE ISLAND AVE AND NORTH CAPITOL ST	BN	1547	10	1554	14
MINNESOTA AVE AND PENNSYLVANIA AVE	SE	1494	13	1487	15
KENILWORTH AVE AND EAST CAPITOL ST	BN	1520	12	1457	16
FLORIDA AVE AND NEW YORK AVE	NE	1697	7	1425	17
1ST ST AND NEW YORK AVE	NW	1097	28	1368	18
I ST AND S CAPITOL ST	BN	1367	18	1367	19
14TH ST AND K ST	NW	1254	19	1322	20
PENNSYLVANIA AVE AND ANACOSTIA FRWY	SE	1156	20	1322	20
KENILWORTH AVE AND BENNING RD	NE	1127	23	1263	22
BENNING RD AND BLADENSBURG RD	NE	1067	29	1238	23
MINNESOTA AVE AND AMES ST	NE	731	81	1220	24
9TH ST AND MASSACHUSETTS AVE	NW	1133	22	1155	25
36TH ST AND BENNING RD	NE	981	37	1154	26
13TH ST AND SOUTHERN AVE	SE	753	75	1150	27
FIRTH STERLING AVE AND HOWARD RD	SE	900	50	1142	28
SOUTHERN AVE AND WHEELER RD	SE	1122	24	1127	29
H ST AND NORTH CAPITOL ST	BN	1058	30	1080	30
14TH ST AND CONSTITUTION AVE	NW	924	44	1061	31
9TH ST AND U ST	NW	855	55	1046	32
14TH ST AND IRVING ST	NW	1112	26	1044	33
RHODE ISLAND AVE AND REED ST	NE	977	39	1044	33
17TH ST AND I ST	NW	902	49	1043	35
MINNESOTA AVE AND NANNIE HELEN BURROUGHS	NE	1118	25	1043	35
13TH ST AND U ST	NW	1106	27	1037	37
SOUTH DAKOTA AVE AND BLADENSBURG RD	NE	1023	32	1026	38
4TH ST AND NEW YORK AVE	NE	870	54	1023	39
16TH ST AND K ST	NW	915	46	1007	40
16TH ST AND NEW YORK AVE	NE	924	44	999	41
14TH ST AND COLUMBIA RD	NW	1005	33	990	42

Table 7.14: Intersection Rank by Crash Severity Cost for 3-Year Periods (Rank: 36~71)

INTERSECTION NAME	Quad	2013-2015		2014-2016	
		Cost	Rank	Cost	Rank
4TH ST AND NEW YORK AVE	NW	1145	21	986	43
31ST ST AND M ST	NW	1005	33	984	44
16TH ST AND NEW HAMPSHIRE AVE	NW	972	41	962	45
MARTIN LUTHER KING AVE AND HOWARD RD	SE	773	71	954	46
15TH ST AND K ST	NW	963	42	950	47
1ST ST AND FLORIDA AVE	NE	585	147	948	48
7TH ST AND H ST	NW	978	38	932	49
33RD PL AND SOUTH DAKOTA AVE	NE	789	67	926	50
17TH ST AND BENNING RD	NE	825	61	918	51
BRANCH AVE AND PENNSYLVANIA AVE	SE	851	56	911	52
NORTH CAPITOL ST AND RIGGS RD	BN	977	39	902	53
9TH ST AND NEW YORK AVE	NW	842	57	900	54
MICHIGAN AVE AND NORTH CAPITOL ST	BN	990	35	893	55
CONNECTICUT AVE AND K ST	NW	987	36	890	56
44TH ST AND NANNIE HELEN BURROUGHS AVE	NE	888	51	879	57
K ST AND NORTH CAPITOL ST	BN	795	64	872	58
12TH ST AND CONSTITUTION AVE	NW	653	115	864	59
6TH ST AND NEW YORK AVE	NW	827	60	864	59
1ST ST AND H ST	NW	437	274	858	61
FLORIDA AVE AND NORTH CAPITOL ST	BN	729	83	857	62
30TH ST AND NAYLOR RD	SE	725	86	845	63
14TH ST AND RHODE ISLAND AVE	NW	878	53	840	64
29TH ST AND M ST	NW	701	93	837	65
ALABAMA AVE AND GOOD HOPE RD	SE	722	86	828	66
ALABAMA AVE AND PENNSYLVANIA AVE	SE	881	52	828	66
4TH ST AND MICHIGAN AVE	NE	684	97	827	68
MONTANA AVE AND NEW YORK AVE	NE	1530	13	819	69
SOUTHERN AVE AND BENNING RD	SE	908	48	818	70
14TH ST AND INDEPENDENCE AVE	SW	653	105	812	71
24TH ST AND M ST	NW	776	70	791	72
ALABAMA AVE AND BRANCH AVE	SE	722	86	789	73
CONNECTICUT AVE AND N ST	NW	669	108	789	73
1ST ST AND MICHIGAN AVE	NW	818	62	782	75
17TH ST AND K ST	NW	414	300	777	76
17TH ST AND L ST	NW	495	212	776	77
IRVING ST AND KENYON ST	NW	765	73	773	78
15TH PL AND ALABAMA AVE	SE	443	267	765	79
MARTIN LUTHER KING AVE AND GOOD HOPE RD	SE	683	104	765	79
14TH ST AND PARK RD	NW	962	43	758	81
15TH ST AND MASSACHUSETTS AVE	NW	731	81	753	82
9TH ST AND PENNSYLVANIA AVE	NW	734	80	746	83
14TH ST AND L ST	NW	660	110	744	84
11TH ST AND M ST	SE	728	84	743	85
14TH ST AND PENNSYLVANIA AVE	NW	722	86	743	85

Table 7.15: Intersection Rank by Crash Severity Cost for 3-Year Periods (Rank: 71~99)

INTERSECTION NAME	Quad	2013-2015		2014-2016	
		Cost	Rank	Cost	Rank
14TH ST AND H ST	NE	657	112	738	88
MONTANA AVE AND RHODE ISLAND AVE	NE	687	96	731	89
RHODE ISLAND AVE AND SOUTH DAKOTA AVE	NE	714	91	731	89
5TH ST AND RHODE ISLAND AVE	NE	608	134	729	91
6TH ST AND FLORIDA AVE	NW	699	94	729	91
36TH ST AND M ST	NW	762	74	728	93
3RD ST AND D ST	NW	737	78	720	94
BENNING RD AND EAST CAPITOL ST	BN	1052	31	720	94
17TH ST AND BLADENSBURG RD	NE	750	76	714	96
MONTANA AVE AND EDWIN ST	NE	474	227	714	96
CONNECTICUT AVE AND R ST	NW	788	69	705	98
18TH ST AND MASSACHUSETTS AVE	NW	632	122	699	99
24TH ST AND PENNSYLVANIA AVE	NW	842	57	699	99

7.1.4 Rank by Crash Composite Index

Table 7.16: Intersection Rank by Crash Composite Index for 2014-2016 (Rank: 1~44)

INTERSECTION NAME	Quad	2014		2015		2016	
		Comp	Rank	Comp	Rank	Comp	Rank
MINNESOTA AVE AND BENNING RD	NE	11.25	5	4.25	2	3.25	1
1ST ST AND UNION STATION PLAZA	NE	7	2	4.5	4	3.75	2
14TH ST AND U ST	NW	7.5	3	4.25	2	4.25	3
NEW YORK AVE AND BLADENSBURG RD	NE	5.75	1	3.25	1	4.25	3
FIRTH STERLING AVE AND HOWARD RD	SE	55.25	31	79.5	46	6.25	5
WISCONSIN AVE AND M ST	NW	18.75	7	12	6	7.5	6
7TH ST AND FLORIDA AVE	NW	10.5	4	11.75	5	16	7
SOUTHERN AVE AND WHEELER RD	SE	57.25	34	21.5	9	22	8
1ST ST AND FLORIDA AVE	NE	292.5	219	51.25	27	24.25	9
17TH ST AND K ST	NW	484.75	400	201.25	145	28.5	10
9TH ST AND MASSACHUSETTS AVE	NW	34	18	26	13	29	11
9TH ST AND U ST	NW	136	86	21.5	9	29	11
14TH ST AND K ST	NW	20	8	60.25	33	29.25	13
13TH ST AND U ST	NW	33.25	17	88	48	29.5	14
44TH ST AND NANNIE HELEN BURROUGHS AVE	NE	56.25	32	155.25	106	31.25	15
7TH ST AND H ST	NW	51.25	27	52.5	28	36	16
14TH ST AND COLUMBIA RD	NW	27.25	14	63.25	37	37.5	17
6TH ST AND H ST	NW	219.5	162	112.75	69	41.25	18
NEW YORK AVE AND H ST	NW	157.5	113	334.25	250	42.25	19
MARTIN LUTHER KING AVE AND HOWARD RD	SE	54.75	30	73.75	43	45.25	20
17TH ST AND I ST	NW	25.5	12	24	11	49	21
1ST ST AND NEW YORK AVE	NW	200.25	148	31.75	18	49	21
IRVING ST AND KENYON ST	NW	117.25	76	143.5	100	49.25	23
9TH ST AND NEW YORK AVE	NW	85.25	53	64.25	39	50.5	24

14TH ST AND IRVING ST	NW	26.75	13	26.75	14	52.5	25
MONTANA AVE AND NEW YORK AVE	NE	31.25	15	32.25	19	62	26
BLAIR RD AND RIGGS RD	NE	689.75	639	719.75	700	64.5	27
FIRTH STERLING AVE AND SUITLAND PKWY	SE	21.25	9	13.75	7	65.5	28
RHODE ISLAND AVE AND NORTH CAPITOL ST	BN	79.25	45	61	34	66.75	29
I ST AND S CAPITOL ST	BN	43.25	25	35.75	20	70.25	30
14TH ST AND L ST	NW	151.5	109	133	87	70.5	31
3RD ST AND D ST	NW	200	147	47	23	70.5	31
16TH ST AND L ST	NW	467	381	241	170	71	33
2ND ST AND K ST	NE	217.25	159	505.5	428	71.25	34
4TH ST AND NEW YORK AVE	NE	112	73	145.5	101	72	35
NEW YORK AVE AND NORTH CAPITOL ST	BN	39.25	21	40.25	21	73.25	36
6TH ST AND FLORIDA AVE	NW	89	56	171	118	73.5	37
14TH ST AND H ST	NE	141.5	96	109.5	67	74	38
4TH ST AND NEW YORK AVE	NW	41	23	151	105	74.25	39
7TH ST AND I ST	NW	407	324	651.75	605	77	40
4TH ST AND MICHIGAN AVE	NE	150.5	106	141.25	98	78.25	41
16TH ST AND K ST	NW	51.5	28	74.25	44	79	42
17TH ST AND L ST	NW	244.5	177	121.5	77	80.75	43
MARTIN LUTHER KING AVE AND GOOD HOPE RD	SE	111.75	72	28.75	16	84.75	44

Table 7.17: Intersection Rank by Crash Composite Index for 2014-2016 (Rank: 45~90)

INTERSECTION NAME	Quad	2014		2015		2016	
		Comp	Rank	Comp	Rank	Comp	Rank
13TH ST AND K ST	NW	165.5	120	310.5	225	85.25	45
MASSACHUSETTS AVE AND NORTH CAPITOL ST	BN	166	122	142.5	99	87.25	46
18TH ST AND M ST	NW	108.25	69	249	179	88	47
14TH ST AND CONSTITUTION AVE	NW	137.5	89	120	74	88.25	48
25TH PL AND BLADENSBURG RD	NE	362.5	280	584	516	88.5	49
ALABAMA AVE AND GOOD HOPE RD	SE	106.75	67	50.25	26	88.5	49
18TH ST AND MASSACHUSETTS AVE	NW	143.5	99	139.75	95	88.75	51
MONTANA AVE AND BLADENSBURG RD	NE	330	253	282	205	89.75	52
MINNESOTA AVE AND NANNIE HELEN	NE	31.25	15	25.25	12	91.75	53
MINNESOTA AVE AND PENNSYLVANIA AVE	SE	25.25	11	98.25	56	91.75	53
9TH ST AND PENNSYLVANIA AVE	NW	137.75	91	203.25	146	94.75	55
16TH ST AND V ST	NW	253.5	184	335	251	96.5	56
ALABAMA AVE AND BRANCH AVE	SE	72.5	41	193.75	139	96.5	56
MONTANA AVE AND NEW YORK AVE	NE	31.25	15	32.25	19	96.5	56
BRANCH AVE AND PENNSYLVANIA AVE	SE	77.75	44	105.75	61	98	59
SOUTHERN AVE AND BENNING RD	SE	103.5	63	41.75	22	98.25	60
6TH ST AND MASSACHUSETTS AVE	NW	564.75	497	402.5	330	101.75	61
12TH ST AND CONSTITUTION AVE	NW	166.75	123	179.75	127	103.25	62
19TH ST AND I ST	NW	436.5	352	329.5	247	105	63
1ST ST AND D ST	NW	561.25	493			107.75	64
16TH ST AND NEW HAMPSHIRE AVE	NW	68.5	37	56	32	109	65
1ST ST AND MICHIGAN AVE	NW	92.5	57	70.75	42	109	65
H ST AND NORTH CAPITOL ST	BN	69.25	39	30.25	17	110.25	67
14TH ST AND RHODE ISLAND AVE	NW	40.75	22	53.75	29	114	68
6TH ST AND NEW YORK AVE	NW	107.75	68	92.5	53	116.25	69
17TH ST AND PENNSYLVANIA AVE	NW	68.5	37	109.25	66	117.75	70

44TH ST AND BENNING RD	NE	163.25	119	267.25	196	117.75	70
BENNING RD AND BLADENSBURG RD	NE	138.75	92	140.75	97	118.25	72
16TH ST AND I ST	NW	286.75	216	129.75	83	119.5	73
23RD ST AND M ST	NW	615.75	557	455.25	383	124.5	74
GEORGIA AVE AND IRVING ST	NW	122	79	336.5	256	125.75	75
BRENTWOOD RD AND W ST	NE	262.5	190	91	51	128	76
6TH ST AND BRENTWOOD PKWY	NE			610.5	557	130	77
CONNECTICUT AVE AND R ST	NW	144.75	100	81.75	47	130.5	78
GEORGIA AVE AND BRYANT ST	NW	557.75	490	405.5	335	131.75	79
3RD ST AND RIGGS RD	NE	231.75	170	245.75	175	132.5	80
NEW YORK AVE AND SOUTH DAKOTA AVE	NE	104.5	64	130.5	85	134.5	81
19TH ST AND L ST	NW	232.5	171	257.75	189	137.75	82
FLORIDA AVE AND NEW YORK AVE	NE	56.75	33	28	15	139.25	83
22ND ST AND M ST	NW	179.5	131	278.75	202	139.75	84
13TH ST AND H ST	NE	86.5	55	309.25	224	140.25	85
14TH ST AND INDEPENDENCE AVE	SW	185.5	137	159.25	109	144.5	86
15TH ST AND MASSACHUSETTS AVE	NW	74.75	43	248.75	178	145.5	87
GEORGIA AVE AND NEW HAMPSHIRE AVE	NW	233.75	173	156.5	107	145.75	88
K ST AND NORTH CAPITOL ST	BN	120.5	78	61.5	35	146.5	89
5TH ST AND K ST	NW	177.5	130	359.75	283	147	90

Table 7.18: Intersection Rank by Crash Composite Index for 2014-2016 (Rank: 91~100)

INTERSECTION NAME	Quad	2014		2015		2016	
		Comp	Rank	Comp	Rank	Comp	Rank
MONTANA AVE AND RHODE ISLAND AVE	NE	141.5	96	210.75	147	157.75	91
17TH ST AND BENNING RD	NE	169.5	124	133.5	88	158.25	92
NEW JERSEY AVE AND E ST	NW	272	205	315.5	231	161.75	93
17TH ST AND H ST	NW	280.75	211	108.25	65	163	94
7TH ST AND R ST	NW	302.5	227	554.25	481	166.5	95
1ST ST AND E ST	NW	773.5	744	264	193	167.25	96
8TH ST AND H ST	NW	279	208	129.75	83	169	97
13TH ST AND FLORIDA AVE	NE	320.25	978	425.75	351	169.75	98
4TH ST AND RHODE ISLAND AVE	NE	40.75	22	189	134	171	99
14TH ST AND PENNSYLVANIA AVE	NW	85.25	53	256.25	187	171.5	100

Table 7.19: Intersection Rank by Crash Composite Index for 3-Year Periods (Rank: 1~43)

INTERSECTION NAME	Quad	2013-2015		2014-2016	
		Comp	Rank	Comp	Rank
MINNESOTA AVE AND BENNING RD	NE	4.75	2	3.5	1
NEW YORK AVE AND BLADENSBURG RD	NE	5.75	3	3.5	1
1ST ST AND UNION STATION PLAZA	NE	5.75	3	3.75	3
14TH ST AND U ST	NW	4.5	1	4.25	4
WISCONSIN AVE AND M ST	NW	12	6	10.5	5
7TH ST AND FLORIDA AVE	NW	11.75	5	11.25	6
FIRTH STERLING AVE AND SUITLAND PKWY	SE	15.5	8	18.5	7
9TH ST AND MASSACHUSETTS AVE	NW	25.5	12	22.5	8
FIRTH STERLING AVE AND HOWARD RD	SE	43	23	23.5	9
17TH ST AND I ST	NW	23.75	10	25	10
SOUTHERN AVE AND WHEELER RD	SE	24.25	11	25	10
14TH ST AND K ST	NW	27.75	13	25.75	12
14TH ST AND IRVING ST	NW	21.75	9	26.25	13
9TH ST AND U ST	NW	44	25	30.5	14
STANTON RD AND SUITLAND PKWY	SE	15	7	31.5	15
MONTANA AVE AND NEW YORK AVE	NE	33.75	20	32.5	16
MINNESOTA AVE AND NANNIE HELEN BURROUGHS	NE	30.75	15	33	17
13TH ST AND U ST	NW	30.5	14	33.5	18
14TH ST AND COLUMBIA RD	NW	31.25	16	33.5	18
7TH ST AND H ST	NW	32.5	19	36.5	20
I ST AND S CAPITOL ST	BN	31.75	17	40.5	21
MARTIN LUTHER KING AVE AND HOWARD RD	SE	46.25	26	43	22
NEW YORK AVE AND NORTH CAPITOL ST	BN	40.25	22	44.5	23
H ST AND NORTH CAPITOL ST	BN	35.25	21	47.75	24
44TH ST AND NANNIE HELEN BURROUGHS AVE	NE	52.5	31	49.5	25
MARTIN LUTHER KING AVE AND GOOD HOPE RD	SE	66	42	49.75	26
14TH ST AND RHODE ISLAND AVE	NW	46.25	26	51.25	27
MINNESOTA AVE AND PENNSYLVANIA AVE	SE	50.75	30	52.75	28
1ST ST AND FLORIDA AVE	NE	149	99	53.75	29
16TH ST AND K ST	NW	64.25	40	54.5	30
9TH ST AND NEW YORK AVE	NW	60.75	38	54.75	31
24TH ST AND M ST	NW	55.25	35	55.75	32
FLORIDA AVE AND NEW YORK AVE	NE	31.75	17	56.25	33
4TH ST AND NEW YORK AVE	NW	43.75	24	58.5	34
1ST ST AND NEW YORK AVE	NW	71.25	45	60.75	35
16TH ST AND NEW HAMPSHIRE AVE	NW	65.25	41	61.25	36
SOUTHERN AVE AND BENNING RD	SE	50	28	63.25	37
RHODE ISLAND AVE AND NORTH CAPITOL ST	BN	71.5	46	64.75	38
15TH ST AND K ST	NW	57.5	37	66.75	39
3RD ST AND D ST	NW	66.25	43	67.75	40
ALABAMA AVE AND GOOD HOPE RD	SE	77.75	47	67.75	40
IRVING ST AND KENYON ST	NW	109	70	72	42
1ST ST AND MICHIGAN AVE	NW	56	36	74.5	43

Table 7.20: Intersection Rank by Crash Composite Index for 3-Year Periods (Rank: 44~86)

INTERSECTION NAME	Quad	2013-2015		2014-2016	
		Comp	Rank	Comp	Rank
6TH ST AND H ST	NW	108.5	69	75.75	44
BRANCH AVE AND PENNSYLVANIA AVE	SE	96.75	60	75.75	44
17TH ST AND PENNSYLVANIA AVE	NW	79.25	48	76	46
24TH ST AND PENNSYLVANIA AVE	NW	53.25	33	76.75	47
6TH ST AND FLORIDA AVE	NW	92.25	56	82.25	48
ALABAMA AVE AND PENNSYLVANIA AVE	SE	52.75	32	83	49
7TH ST AND G ST	NW	98.5	63	83.75	50
14TH ST AND H ST	NE	124.25	78	84.25	51
14TH ST AND L ST	NW	97.5	62	89.5	52
K ST AND NORTH CAPITOL ST	BN	84.25	52	89.75	53
6TH ST AND NEW YORK AVE	NW	84	51	91.5	54
ALABAMA AVE AND BRANCH AVE	SE	96	59	92	55
CONNECTICUT AVE AND R ST	NW	84.5	53	96.25	56
4TH ST AND NEW YORK AVE	NE	104.5	66	97.75	57
18TH ST AND MASSACHUSETTS AVE	NW	120.75	73	98.75	58
NEW YORK AVE AND H ST	NW	300.25	220	100.25	59
17TH ST AND L ST	NW	194.25	147	100.5	60
15TH ST AND H ST	NW	141.75	93	102.75	61
4TH ST AND MICHIGAN AVE	NE	147.75	97	103.5	62
14TH ST AND CONSTITUTION AVE	NW	133	85	103.75	63
17TH ST AND K ST	NW	310	230	105.5	64
18TH ST AND M ST	NW	184.25	137	106.25	65
MASSACHUSETTS AVE AND NORTH CAPITOL ST	BN	139.75	91	108.5	66
SOUTH DAKOTA AVE AND BLADENSBURG RD	NE	67	44	111.75	67
14TH ST AND PARK RD	NW	62.25	39	116.5	68
14TH ST AND P ST	NW	91.5	55	116.75	69
ALABAMA AVE AND STANTON RD	SE	126.5	80	117.75	70
NEW YORK AVE AND SOUTH DAKOTA AVE	NE	106	67	118.25	71
9TH ST AND PENNSYLVANIA AVE	NW	162.25	113	118.5	72
15TH ST AND MASSACHUSETTS AVE	NW	139.25	89	119	73
12TH ST AND K ST	NW	106.5	68	119.25	74
BRENTWOOD RD AND W ST	NE	127.5	82	121.25	75
13TH ST AND H ST	NE	124	77	122.75	76
19TH ST AND M ST	NW	50	28	123.5	77
CONNECTICUT AVE AND K ST	NW	82	50	123.75	78
23RD ST AND I ST	NW	86.25	54	124.5	79
12TH ST AND CONSTITUTION AVE	NW	158.5	108	125	80
BENNING RD AND BLADENSBURG RD	NE	154	106	125.75	81
21ST ST AND K ST	NW	102.25	65	128.25	82
14TH ST AND F ST	NW	126.5	80	130	83
17TH ST AND BLADENSBURG RD	NE	92.5	57	130.75	84
MICHIGAN AVE AND NORTH CAPITOL ST	BN	81	49	131.75	85
14TH ST AND PENNSYLVANIA AVE	NW	149	99	132.5	86

Table 7.21: Intersection Rank by Crash Composite Index for 3-Year Periods (Rank: 87~99)

INTERSECTION NAME	Quad	2013-2015		2014-2016	
		Comp	Rank	Comp	Rank
BENNING RD AND EAST CAPITOL ST	BN	54.75	34	135.75	87
13TH ST AND K ST	NW	162	112	136.5	88
17TH ST AND BENNING RD	NE	139	87	138	89
NORTH CAPITOL ST AND RIGGS RD	BN	94	58	142	90
7TH ST AND NEW YORK AVE	NW	121.75	74	142.75	91
18TH ST AND ADAMS MILL RD	NW	98.75	64	144	92
16TH ST AND I ST	NW	181.5	133	144.5	93
MONTANA AVE AND RHODE ISLAND AVE	NE	178	128	145.5	94
VERMONT AVE AND U ST	NW	142.75	94	147	95
14TH ST AND INDEPENDENCE AVE	SW	182.75	136	147.5	96
GEORGIA AVE AND IRVING ST	NW	239	179	148	97
GEORGIA AVE AND NEW HAMPSHIRE AVE	NW	149	99	148.5	98
44TH ST AND BENNING RD	NE	227	173	149.5	99
BLADENSBURG RD AND QUEENS CHAPEL RD	NE	131	83	149.5	99

7.2 PD-10 Form