

ITSMR Research Note

KEY FINDINGS

In 2016:

- 320 pedestrians were killed in motor vehicle crashes, compared to 312 in 2012.
- Pedestrian fatalities accounted for 31% of all traffic fatalities, up from 27% in 2012.
- Alcohol involvement was a factor for 21% of the pedestrians killed in traffic crashes, down from 28% in 2012.
- 15,346 pedestrians were injured in crashes, compared to 15,607 in 2012.
- Top 3 contributing factors in fatal and personal injury pedestrian crashes were Driver Inattention/Distraction (26%), Failure to Yield Right-of-Way (24%) and Pedestrian/Bicyclist Error/Confusion (23%).

From 2012 to 2016:

- 46% of the pedestrian fatalities occurred in New York City, 31% occurred Upstate and 23% occurred on Long Island
- 40% of all fatal pedestrian crashes occurred from 6pm to midnight, while 42% of all personal injury crashes occurred from 3pm to 9pm.
- 47% of the pedestrians killed were ages 55 and older, while 49% of the pedestrians injured were ages 15-44.
- 65% of the pedestrians killed were male.

Conclusions:

- Pedestrian safety continues to be a serious concern, with pedestrians accounting for 3 out of 10 fatalities on New York roadways.
- Not surprisingly, New York City remains the area of greatest concern, accounting for more than 4 out of 10 pedestrian fatalities and approximately 7 out of 10 pedestrians injured.

Crashes Involving Pedestrians on New York Roadways: 2012-2016

INTRODUCTION

Recognizing that pedestrian safety continues to be a serious concern in New York State, the Governor's Traffic Safety Committee (GTSC) provided funding to the Institute for Traffic Safety Management and Research (ITSMR) to analyze the data collected on motor vehicle crashes involving pedestrians. This Research Note presents information about pedestrian crashes, fatalities and injuries as follows:

- Overview
- Environmental Characteristics
- Time of Day and Day of Week
- Age and Gender
- Alcohol Involvement
- Crash Contributing Factors and Pedestrian Actions
- Manner of Collision and Vehicle Type
- Fatalities and Injuries by Region
- Fatalities and Injuries by County

All crash data were obtained from the NYS Department of Motor Vehicles' Accident Information System (AIS). Much of the data can be viewed through New York's Traffic Safety Statistical Repository (TSSR) at www.itsmr.org/tssr. Population data were obtained from the U.S. Census Bureau. Unknown values were removed before calculating percentages.

OVERVIEW

Although year-to-year fluctuations in the number of pedestrians killed or injured occurred between 2012 and 2016, the number of pedestrians killed or injured in motor vehicle crashes in 2016 was comparable to the number killed or injured in 2012. Table 1 shows that 320 pedestrians were killed in 2016, compared to 312 in 2012. Despite this similarity, there is a marked difference with regard to the proportion of total motor vehicle fatalities that were pedestrians. As shown in Table 1, pedestrians accounted for 31% of the motor vehicle fatalities in 2016, up from 27% in 2012. To put these percentages for New York in perspective, on a national level pedestrians accounted for 15% of all motor vehicle fatalities in 2015, the most recent year for which national data are available.¹

Table 1 Total and Pedestrians Killed/Injured in Traffic Crashes

	2012	2013	2014	2015	2016
Total Killed	1,163	1,188	1,026	1,116	1,029
Pedestrians Killed	312	344	268	321	320
% of Total Killed	26.8%	29.0%	26.1%	28.8%	31.1%
Total Injured	169,206	169,177	160,497	159,025	169,884
Pedestrians Injured	15,607	16,278	14,906	13,413	15,346
% of Total Injured	9.2%	9.6%	9.3%	8.4%	9.0%

The numbers of pedestrians injured dropped slightly from 15,607 in 2012 to 15,346 in 2016, accounting for 9% of all persons injured in 2016. Again, to put this percentage in perspective, in 2015, 8% of the people injured in motor vehicle crashes in New York were pedestrians, compared to an estimated national average of 3%.¹

ENVIRONMENTAL CHARACTERISTICS

Figures 1-3 provide information on several environmental characteristics – month of the year, light condition and weather – for motor vehicle crashes in which pedestrians were killed or injured during the five-year period, 2012-2016. Since the data showed little variation from year to year, the data for these five years were aggregated for analysis purposes.

In the five-year period 2012-2016, 32% of the fatal pedestrian crashes and 29% of the personal injury pedestrian crashes occurred October to December (Figure 1).

Figure 1 Fatal and Personal Injury Pedestrian Crashes by Month, 2012-2016

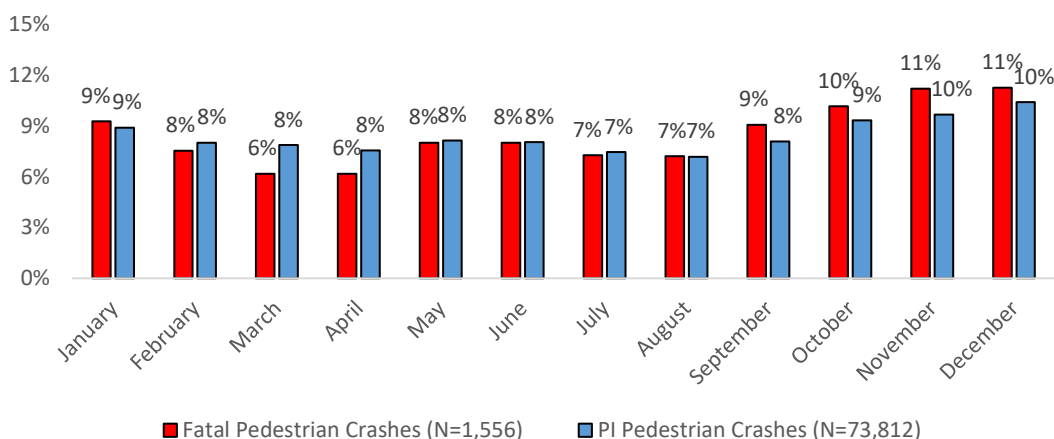


Figure 2 shows that from 2012 to 2016, 61% of the fatal pedestrian crashes occurred in the dark and 35% occurred during daylight. In contrast, 61% of the personal injury pedestrian crashes occurred in daylight and 33% occurred in the dark.

70% of the fatal and personal injury pedestrian motor vehicle crashes from 2012 to 2016 occurred during clear weather (Figure 3).

Figure 2 Fatal and Personal Injury Pedestrian Crashes by Light Condition, 2012-2016

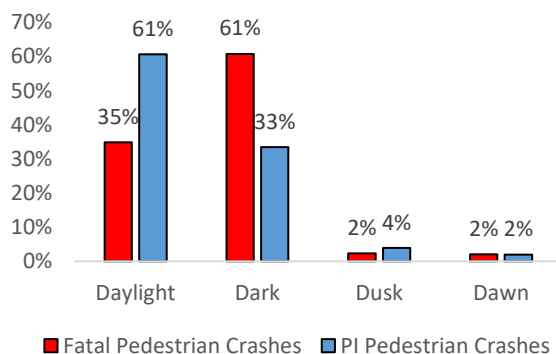
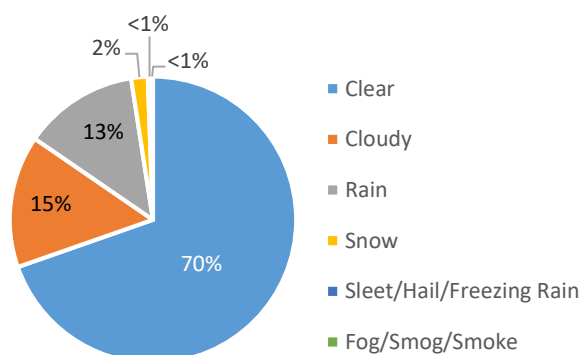


Figure 3 Fatal and Personal Injury Pedestrian Crashes by Weather, 2012-2016



TIME OF DAY AND DAY OF WEEK

Similar to the data on environmental characteristics, since the data on time of day and day of week showed little variation from year to year, the data for these five years were aggregated for analysis purposes. Figure 4 shows that the greatest percentage of fatal pedestrian crashes from 2012 to 2016 occurred during the 3-hour time period 6 to 9pm (22%), followed by 9pm to midnight (18%). The greatest percentages of personal injury pedestrian crashes during the same years occurred from 3 to 6pm and from 6 to 9pm (both 21%).

Figure 4 Fatal Pedestrian Crashes by Time of Day, 2012-2016

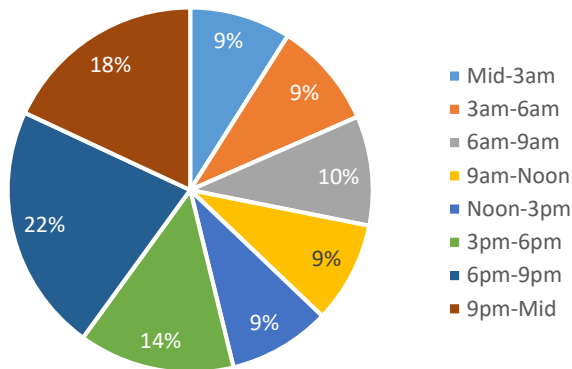


Figure 5 Personal Injury Pedestrian Crashes by Time of Day, 2012-2016

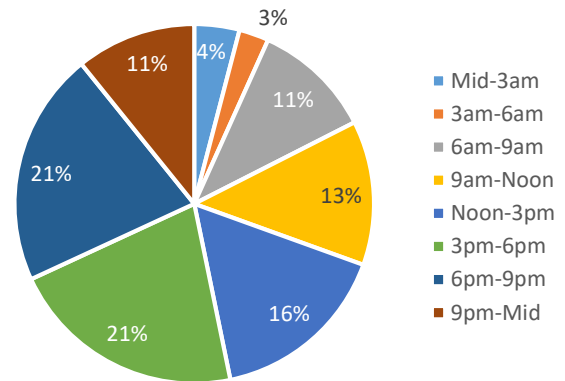
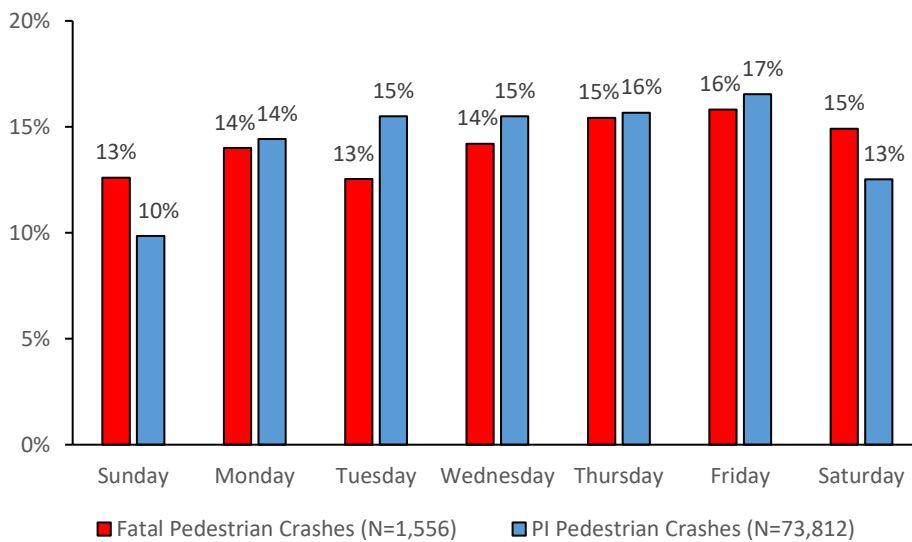


Figure 6 Fatal and Personal Injury Pedestrian Crashes by Day of Week, 2012-2016



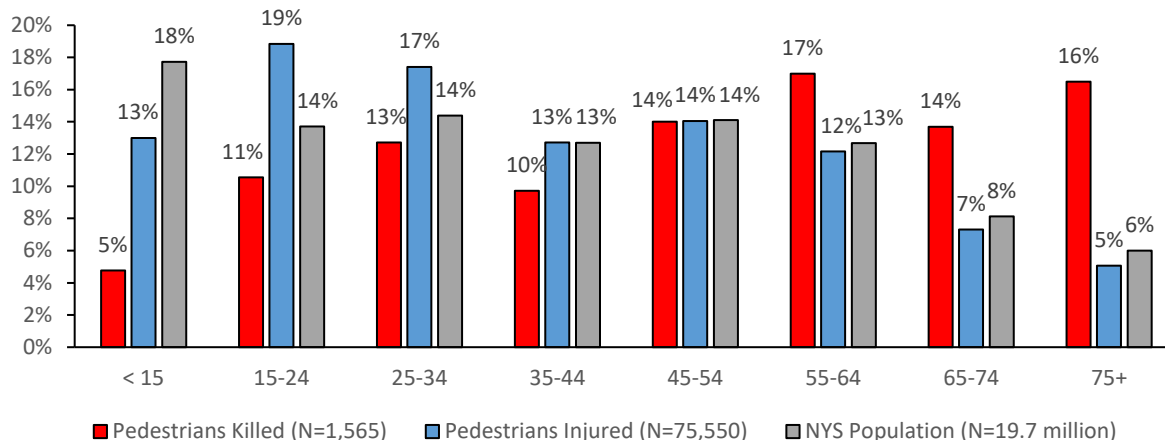
From 2012 to 2016, 28% of fatal pedestrian crashes occurred on the weekends (Saturday or Sunday), and 23% of personal injury pedestrian crashes happened on weekends (Figure 6).

AGE AND GENDER

The data on age and gender were also aggregated for the five years, 2012-2016, due to little variation in the data from year to year. As shown in Figure 7, pedestrians ages 55 and older were overrepresented with respect to fatalities in motor vehicle crashes, with 47% of the pedestrians killed being ages 55 and older, compared to 27% of the population.

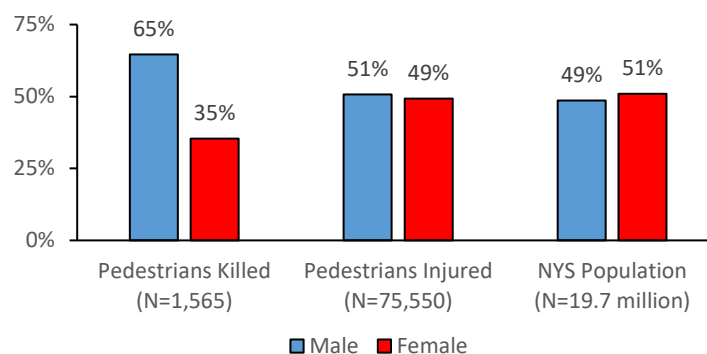
During the same years, pedestrians ages 15-34 were overrepresented with respect to persons injured in motor vehicle crashes. Figure 7 shows that 36% of the pedestrians injured were in this age group, compared to 28% of the population.

Figure 7 Pedestrians Killed and Injured by Age, 2012-2016



As indicated in Figure 8, 65% of the pedestrians killed and 51% of those injured in motor vehicle crashes from 2012 to 2016 were male, compared to 49% of males in the population of New York State during the same years.

Figure 8 Pedestrians Killed and Injured by Gender, 2012-2016



ALCOHOL INVOLVEMENT

The analyses conducted with regard to alcohol involvement focused on 1) the number of fatal and personal injury pedestrian crashes that involved alcohol and 2) the extent to which alcohol involvement was reported for the pedestrian. New York State defines an alcohol-related motor vehicle crash as one in which at least one of the following three factors is present: 1) "alcohol involvement" was noted as a contributing factor on the police crash report form, 2) a ticket for impaired driving was issued to one or more drivers involved in the crash, or 3) a BAC was reported for the impaired driver, pedestrian or bicyclist involved.

Table 2 presents the number of alcohol-related fatal and personal injury pedestrian crashes as a percentage of all fatal and personal injury pedestrian crashes from 2012 to 2016. This proportion remained constant over the five-year period at 3%.

Table 2 Total Fatal and Personal Injury Pedestrian Crashes; Alcohol-Related Pedestrian Crashes

	2012	2013	2014	2015	2016
Fatal and Personal Injury Pedestrian Crashes	15,808	16,413	14,919	13,189	15,039
Alcohol-Related F & PI Pedestrian Crashes	493	493	445	398	495
% of F & PI Pedestrian Crashes	3.1%	3.0%	3.0%	3.0%	3.3%

Table 3 shows the extent to which alcohol involvement was reported for pedestrians. The data presented may underrepresent the full extent of pedestrian alcohol involvement since there is no requirement that pedestrians killed or injured in a motor vehicle crash be tested for the presence of alcohol. As indicated in Table 3, alcohol involvement was

reported for 21% of the pedestrians killed in 2016, down from 28% in 2012. The proportion of pedestrians injured for whom alcohol involvement was reported remained fairly constant at 1%-2% in each of the five years.

Table 3 Pedestrians Killed and Injured in MV Crashes; Alcohol Involvement Reported for Pedestrians Killed and Injured

	2012	2013	2014	2015	2016
Pedestrians Killed	312	344	268	321	320
Alcohol Involvement Reported	86	82	58	76	67
<i>% of Pedestrians Killed</i>	<i>27.6%</i>	<i>23.8%</i>	<i>21.6%</i>	<i>23.7%</i>	<i>20.9%</i>
Pedestrians Injured	15,607	16,278	14,906	13,413	15,346
Alcohol Involvement Reported	234	235	204	205	284
<i>% of Pedestrians Injured</i>	<i>1.5%</i>	<i>1.4%</i>	<i>1.4%</i>	<i>1.5%</i>	<i>1.9%</i>

CRASH CONTRIBUTING FACTORS AND PEDESTRIAN ACTIONS

Since data on contributing factors and pedestrian actions in crashes are only captured on the police accident report form, the analyses conducted on contributing factors and pedestrian actions focused on police-reported crashes.

- Driver Inattention/Distraction, Failure to Yield Right-of-Way and Pedestrian/Bicyclist Error/Confusion were the top three contributing factors reported in pedestrian fatal and personal injury crashes each year. As shown in Table 4, in 2016, 26% of the crashes had Driver Inattention/Distraction reported as a contributing factor, 24% had Failure to Yield Right-of-Way reported and 23% had Pedestrian/Bicyclist Error/Confusion reported.

Table 4: Select Contributing Factors in Police-Reported Fatal and Personal Injury Pedestrian Crashes

	2012	2013	2014	2015	2016
F & PI Pedestrian Crashes	N=15,206	N=15,875	N=14,383	N=12,679	N=14,576
Contributing Factors					
Driver Inattention/Distraction	23.2%	24.1%	25.0%	26.6%	25.5%
Failure to Yield Right-of-Way	21.2%	22.8%	24.5%	26.2%	24.3%
Pedestrian/Bicyclist Error/Confusion	23.6%	22.7%	22.9%	22.8%	23.4%
Backing Unsafely	5.2%	5.6%	6.1%	5.6%	5.5%
Traffic Control Device Disregarded	2.9%	3.5%	3.4%	3.5%	3.4%
Unsafe Speed	3.0%	2.8%	2.9%	3.4%	3.0%
Alcohol Involvement	2.7%	2.6%	2.7%	2.6%	2.5%

- In each year, the most frequent police-reported pedestrian action for pedestrians killed or injured in crashes was crossing with a traffic signal (28%-31%) (Table 5). The second most frequently reported pedestrian action was crossing at a place where there was no traffic signal or crosswalk (21%-22%).

Table 5 Select Actions for Pedestrians Killed or Injured in Police-Reported MV Crashes

	2012	2013	2014	2015	2016
Pedestrians Killed or Injured	N=15,308	N=16,065	N=14,614	N=13,219	N=15,191
Pedestrian Actions					
Crossing, With Signal	28.9%	31.3%	31.4%	30.4%	28.2%
Crossing, No Signal or Crosswalk	22.0%	21.0%	21.1%	21.1%	21.7%
Crossing, Against Signal	10.5%	9.9%	9.3%	8.8%	7.8%
Crossing, No Signal, Marked Crosswalk	8.2%	8.6%	8.32%	8.7%	8.8%

MANNER OF COLLISION AND VEHICLE TYPE

Table 6 Total and Single-Vehicle Fatal and Personal Injury Pedestrian Crashes

	2012	2013	2014	2015	2016
Total F & PI Pedestrian Crashes	15,808	16,413	14,919	13,189	15,039
Fatal Pedestrian Crashes	312	343	269	316	316
% Involving Single Vehicle	85.9%	87.8%	88.1%	89.9%	87.0%
Personal Injury Pedestrian Crashes	15,496	16,070	14,650	12,873	14,723
% Involving Single Vehicle	96.5%	96.3%	96.0%	96.3%	96.2%

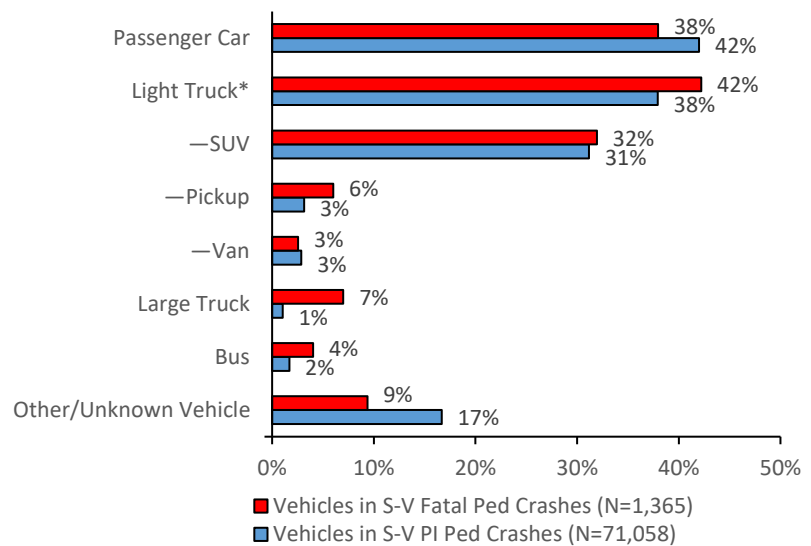
The proportion of fatal pedestrian crashes involving a single vehicle increased steadily from 86% in 2012 to 90% in 2015, followed by a drop to 87% in 2016 (Table 6).

In each of the five years, 96% of all personal injury pedestrian crashes involved a single vehicle.

Figure 9 illustrates the proportions of the types of vehicles involved in single-vehicle fatal and personal injury pedestrian crashes during the five-year period 2012-2016.

- 42% of the vehicles involved in single-vehicle fatal pedestrian crashes from 2012 to 2016 were light trucks, including SUVs, pickups and vans and another 38% were passenger cars.
- 42% of the vehicles involved in single-vehicle personal injury pedestrian crashes were passenger cars, and 38% were light trucks.

Figure 9 Type of Vehicle Involved in Single-Vehicle Fatal and Personal Injury Pedestrian Crashes, 2012-2016



*Light truck totals include other/unknown light trucks.

Table 7 shows a decrease of 2 percentage points in the proportions of passenger cars involved in single-vehicle fatal and personal injury pedestrian crashes over the five-year period, from 45% in 2012 to 43% in 2016. At the same time, the proportions of SUVs involved in these crashes increased by 4 points, from 29% in 2012 to 33% in 2016.

Table 7 Vehicles Involved in Single-Vehicle Fatal and Personal Injury Pedestrian Crashes by Vehicle Type

Vehicles Involved in Single-Vehicle F & PI Pedestrian Crashes	2012 N=15,227	2013 N=15,777	2014 N=14,301	2015 N=12,686	2016 N=14,432
Vehicle Type					
Passenger Car	45.0%	43.2%	40.8%	40.3%	43.0%
Light Truck*	35.5%	36.8%	39.5%	40.2%	38.7%
—SUV	28.7%	29.8%	32.4%	33.0%	32.5%
—Pickup	3.0%	2.9%	3.2%	3.4%	3.4%
—Van	3.0%	3.2%	2.9%	2.9%	2.3%
Large Truck	1.0%	1.2%	1.2%	1.2%	1.1%
Bus	1.9%	1.8%	1.7%	1.7%	1.4%
Other/Unknown Vehicle	16.6%	17.0%	16.8%	16.6%	15.8%

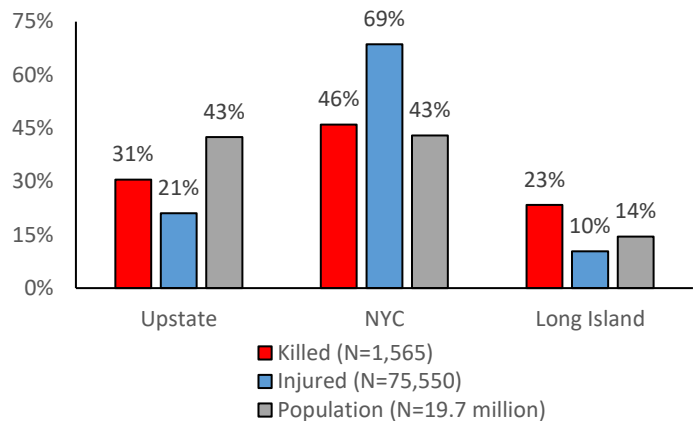
*Light truck totals include other/unknown light trucks.

FATALITIES AND INJURIES BY REGION

For purposes of analyzing crash data, New York State is typically divided into three regions: Upstate, Long Island and New York City. The Upstate region consists of the 55 counties north of New York City, the Long Island region includes the two counties of Nassau and Suffolk, and the New York City region is comprised of five counties (Bronx, Kings, New York, Queens and Richmond).

Over the five-year period 2012-2016, New York City accounted for 46% of the state's pedestrian fatalities and 69% of the pedestrians injured in motor vehicle crashes, but 43% of the state's population (Figure 10). In comparison, 31% of the pedestrians were killed and 21% were injured in the Upstate region, where another 43% of the state's population lived. The remaining 23% of the pedestrians were killed and 10% were injured on Long Island, which had 14% of the population. New York City, therefore, was overrepresented with respect to fatalities and injuries, and Long Island with respect to fatalities.

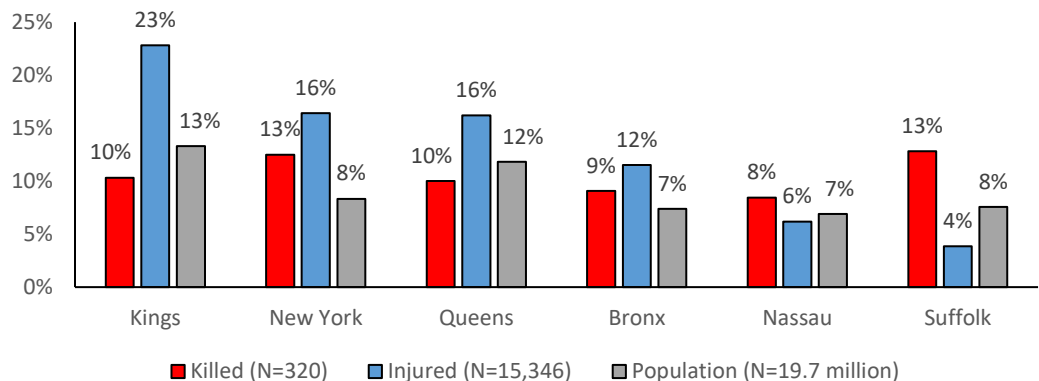
Figure 10 Pedestrians Killed and Injured Compared to Population by Region, 2012-2016



FATALITIES AND INJURIES BY COUNTY

The six counties shown in Figure 11 have consistently had the greatest numbers of pedestrians killed or injured in crashes in the state. Together they accounted for 55% of New York's population but 63% of the pedestrians killed and 77% of those injured in

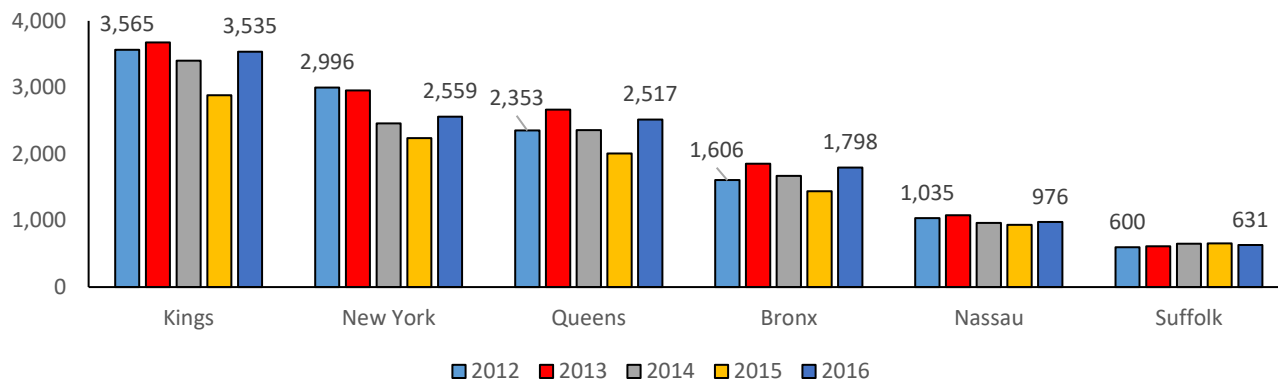
Figure 11 Pedestrians Killed and Injured Compared to Population by County, Top 6 Counties, 2016



2016. The counties of New York and the Bronx were overrepresented in terms of pedestrian fatalities and injuries. Kings and Queens were overrepresented in terms of pedestrian injuries. Nassau and Suffolk were overrepresented with respect to pedestrian fatalities.

Figure 12 illustrates the up and down pattern in the numbers of pedestrians killed or injured in each of these top six counties over the five-year period 2012-2016. Compared to 2012, the county of New York experienced the greatest decrease in the number of pedestrians killed or injured in 2016 (2,996 vs. 2,559), while the Bronx experienced the greatest increase (1,606 vs. 1,798).

Figure 12 Pedestrians Killed or Injured by County, Top 6 Counties, 2012-2016



For New York State and for each of the 20 counties with the highest numbers of pedestrians killed or injured in motor vehicle crashes in 2016, Table 8 presents the total population, number of persons killed or injured, number of pedestrians killed or injured, percentage of pedestrians killed or injured of persons killed or injured, and the rates of persons killed or injured and pedestrians killed or injured per 100,000 population. In 2016:

- As shown in Figure 12 and Table 8, pedestrian fatalities and injuries were highest in Kings County (3,535), followed by New York County (2,559), Queens (2,517) and Bronx (1,798).
- Statewide, 9.2% of the persons killed or injured in traffic crashes were pedestrians. The county proportions were highest in the five boroughs of New York City: New York (24.5%), Kings (16.4%), Bronx (14.3%), Queens (12.1%) and Richmond (11.5%).
- In New York State, 7.93 pedestrians were killed or injured per 10,000 population. New York County had the highest county rate (15.57), followed by Kings (13.45), Bronx (12.35), and Queens (10.79).

Table 8 Persons Killed or Injured in Motor Vehicle Crashes, Pedestrians Killed or Injured, NYS and Top 20 Counties, 2016

	Population	Persons Killed or Injured in MV Crashes	Pedestrians Killed or Injured	% of Persons Killed or Injured	Persons Killed or Injured per 10,000 Population	
					Total	Pedestrians
NEW YORK STATE	19,745,289	170,913	15,666	9.2%	86.56	7.93
COUNTY						
Kings	2,629,150	21,503	3,535	16.4%	81.79	13.45
New York	1,643,734	10,459	2,559	24.5%	63.63	15.57
Queens	2,333,054	20,718	2,517	12.1%	88.80	10.79
Bronx	1,455,720	12,601	1,798	14.3%	86.56	12.35
Nassau	1,361,500	17,273	976	5.7%	126.87	7.17
Suffolk	1,492,583	17,689	631	3.6%	118.51	4.23
Westchester	974,542	7,839	519	6.6%	80.44	5.33
Erie	921,046	9,687	514	5.3%	105.17	5.58
Richmond	476,015	3,383	388	11.5%	71.07	8.15
Monroe	747,727	5,929	349	5.9%	79.29	4.67
Albany	308,846	3,059	215	7.0%	99.05	6.96
Onondaga	466,194	4,038	192	4.8%	86.62	4.12
Rockland	326,780	3,124	165	5.3%	95.60	5.05
Orange	379,210	3,884	147	3.8%	102.42	3.88
Broome	195,334	1,463	97	6.6%	74.90	4.97
Dutchess	294,473	2,498	83	3.3%	84.83	2.82
Schenectady	154,553	1,170	82	7.0%	75.70	5.31
Oneida	231,190	1,696	71	4.2%	73.36	3.07
Niagara	211,758	1,545	68	4.4%	72.96	3.21
Rensselaer	160,070	1,057	56	5.3%	66.03	3.50

CONCLUSION

This Research Note contains information about motor vehicle crashes, fatalities and injuries involving pedestrians on New York roadways. Compared to 2012, the numbers of pedestrians killed and injured on New York roadways in 2016 remained substantially unchanged. In 2016, 320 pedestrians were killed, compared to 312 in 2012, and 15,346 pedestrians were injured, compared to 15,607 in 2012. In 2016, pedestrian fatalities accounted for 31% of total fatalities, up from 27% in 2012. The analyses also indicate that New York City remains the area of greatest concern, accounting for 46% of the pedestrian fatalities and 69% of the pedestrians injured during the five years, 2012-2016. These findings show that much work remains to reduce crashes involving pedestrians throughout the state. Results presented here should be useful to the GTSC and New York's pedestrian safety community, in developing countermeasures that address problems related to pedestrian safety.

¹National Center for Statistics and Analysis (2017, February). Pedestrians: 2015 data. (Traffic Safety Facts. Report No. DOT HS 812 375). Washington, DC: National Highway Traffic Safety Administration.

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