ITSMR Research Note

KEY FINDINGS

In 2020:

- 241 pedestrians were killed in motor vehicle crashes, compared to 320 in 2016.
- Pedestrian fatalities accounted for 23% of all traffic fatalities, down from 31% in 2016.
- Alcohol involvement was a factor for 23% of the pedestrians killed in traffic crashes, up slightly from 21% in 2016.
- 10,667 pedestrians were injured in crashes, compared to 15,346 in 2016.
- The top 3 contributing factors in fatal and personal injury pedestrian crashes were Driver Inattention/Distraction (32%), Failure to Yield Right-of-Way (31%), and Pedestrian/Bicyclist Error/Confusion (21%).

From 2016 to 2020:

- 42% of the pedestrian fatalities occurred in New York City, 36% occurred Upstate and 22% occurred on Long Island
- 41% of all fatal pedestrian crashes occurred from 6pm to midnight, while 43% of all personal injury crashes occurred from 3pm to 9pm.
- 51% of the pedestrians killed were ages 55 and older, while half 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 almost one quarter of the 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 more than 7 out of 10 pedestrians injured.

Crashes Involving Pedestrians on New York Roadways: 2016-2020

INTRODUCTION

New York State Vehicle and Traffic Law defines a pedestrian as any person afoot or in a wheelchair (§ 130). This includes people on personal conveyances such as roller skates, skateboards and scooters. 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. Unless otherwise noted, unknown values were removed before calculating percentages.

OVERVIEW

Although year-to-year fluctuations in the numbers of pedestrians killed or injured in motor vehicle crashes occurred between 2016 and 2020, the numbers of pedestrians killed or injured in 2020, the first year of the COVID-19 pandemic in the US, saw a sharp decline compared to previous years. Table 1 shows that 241 pedestrians were killed in 2020, compared to 320 in 2016, a decline of 25%. Similarly, 31% fewer pedestrians were injured in 2020 compared to 2016. In addition, as indicated in Table 1, pedestrians accounted for 23% of the motor vehicle fatalities in 2020, down from 31% in 2016 and 2019 and 29% in 2018. To put these percentages for New York in perspective, on a

national level pedestrians accounted for 17% of all motor vehicle fatalities in 2019, the most recent year for which national data are available.[1]

Table 1 Total and Pedestrians Killed/Injured in Traffic Crashes

	2016	2017	2018	2019	2020	% Change 2016-20
Total Killed	1,029	1,000	936	938	1,032	**0.3%**
Pedestrians Killed	320	252	272	286	241	**-24.7%**
% of Total Killed	*31.1%*	*25.2%*	*29.1%*	*30.5%*	*23.4%*	
Total Injured	169,884	169,752	168,304	166,988	124,172	**-26.9%**
Pedestrians Injured	15,346	15,581	15,767	15,600	10,667	**-30.5%**
% of Total Injured	*9.0%*	*9.2%*	*9.4%*	*9.3%*	*8.6%*	

The numbers of pedestrians injured declined from 15,346 in 2016 to 10,667 in 2020, accounting for 9% of all persons injured in New York State in 2020. This proportion remained consistent over the five-year period. To put this percentage in perspective, in 2019, an estimated average of 3% of the people injured in motor vehicle crashes nationwide were pedestrians.[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 2016-2020. Because of minor year-to-year differences, the data for these five years were aggregated.

In the five-year period 2016-2020, 42% of the fatal pedestrian crashes and 39% of the personal injury pedestrian crashes occurred from September to December (Figure 1).

Figure 1 Fatal and Personal Injury Pedestrian Crashes by Month, 2016-2020

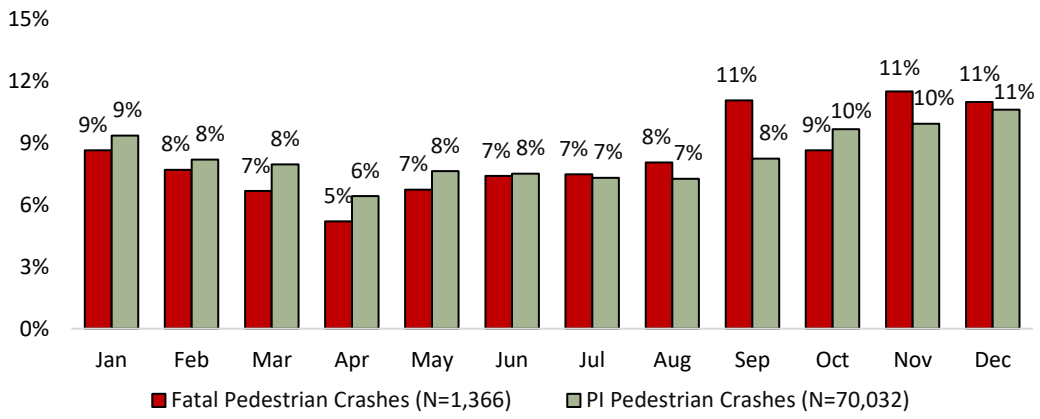


Figure 2 shows that from 2016 to 2020, 63% of the fatal pedestrian crashes occurred in the dark and 33% occurred during daylight. In contrast, 59% of the personal injury pedestrian crashes occurred in daylight and 35% occurred in the dark.

70% of the fatal and personal injury pedestrian motor vehicle crashes from 2016 to 2020 occurred during clear weather (Figure 3).

Figure 2 Fatal and Personal Injury Pedestrian Crashes by Light Condition, 2016-2020

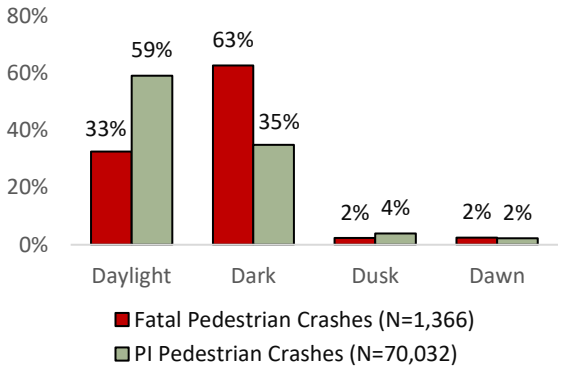
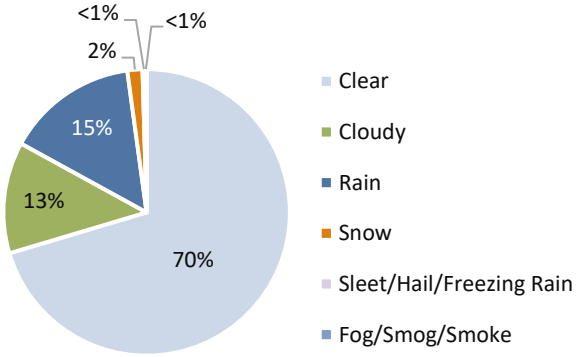


Figure 3 Fatal and Personal Injury Pedestrian Crashes by Weather, 2016-2020 (N=71,398)



TIME OF DAY AND DAY OF WEEK

Similar to the data on environmental characteristics, the data on time of day and day of week for these five years were aggregated for analysis purposes. Figure 4 shows that 41% of the fatal pedestrian crashes from 2016 to 2020 occurred from 6pm to midnight. 43% of the personal injury pedestrian crashes during the same years occurred from 3pm to 9pm.

Figure 4 Fatal Pedestrian Crashes by Time of Day, 2016-2020 (N=1,366)

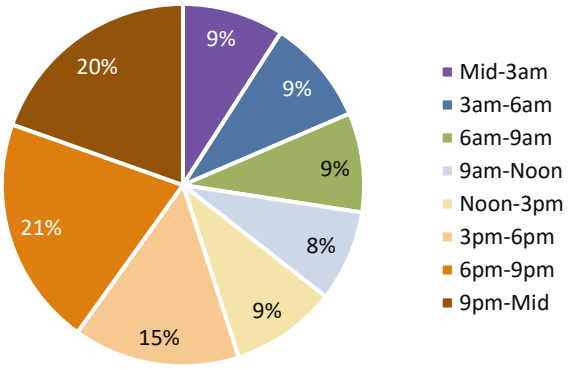


Figure 5 Personal Injury Pedestrian Crashes by Time of Day, 2016-2020 (N=70,032)

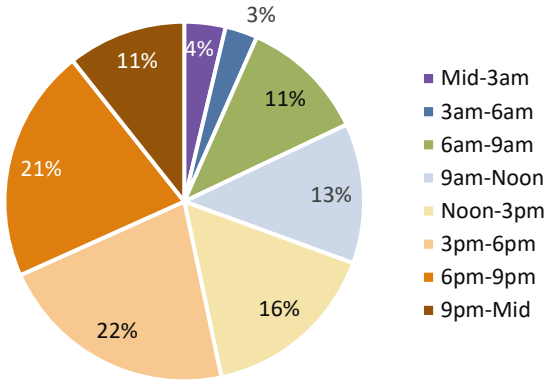
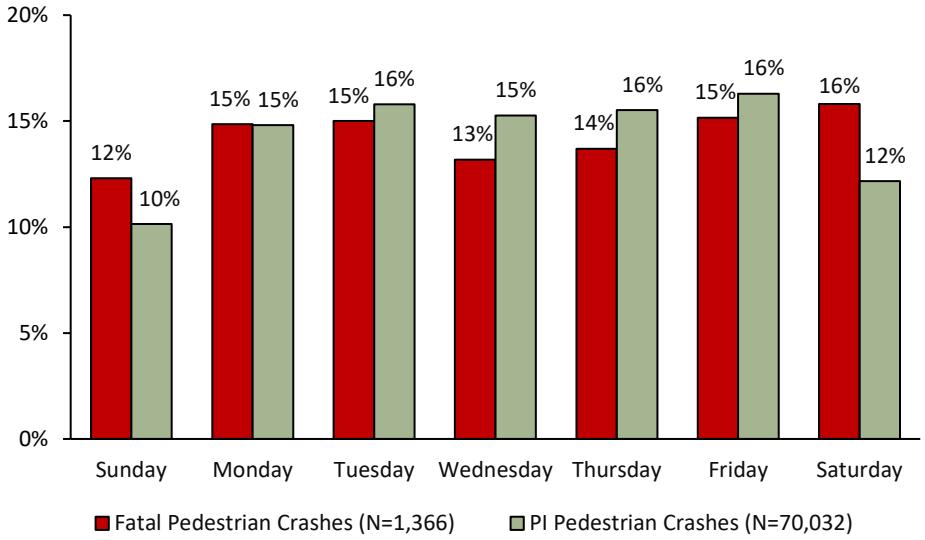


Figure 6 Fatal and Personal Injury Pedestrian Crashes by Day of Week, 2016-2020



From 2016 to 2020, 28% of fatal pedestrian crashes occurred on the weekends (Saturday or Sunday), and 22% 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 2016-2020, due to little variation 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 51% of the pedestrians killed being ages 55 and older, compared to 30% of the population.

During the same years, pedestrians ages 15-44 were overrepresented with respect to persons injured in motor vehicle crashes. Half of the pedestrians injured were ages 15-44, compared to 40% of the population (Figure 7).

Figure 7 Pedestrians Killed and Injured by Age, 2016-2020

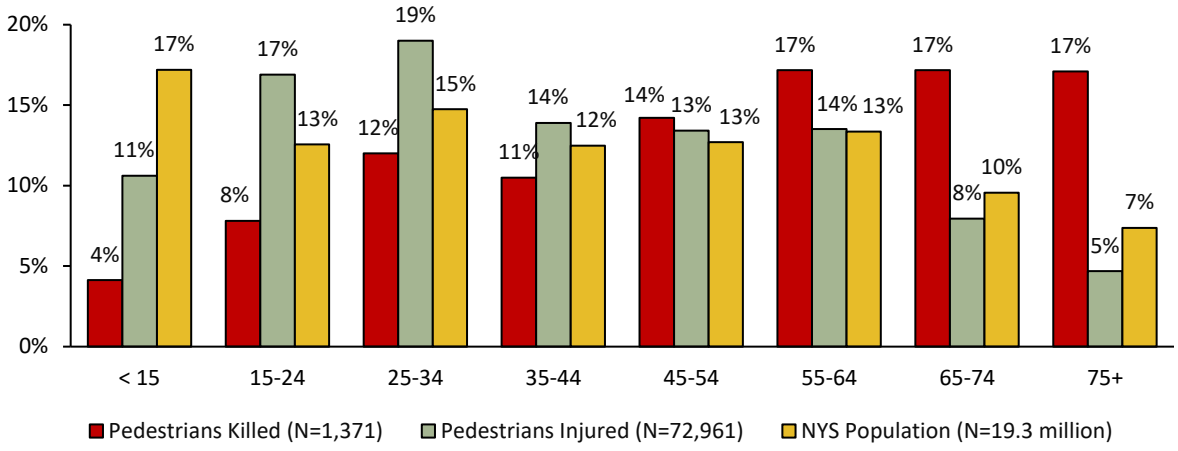
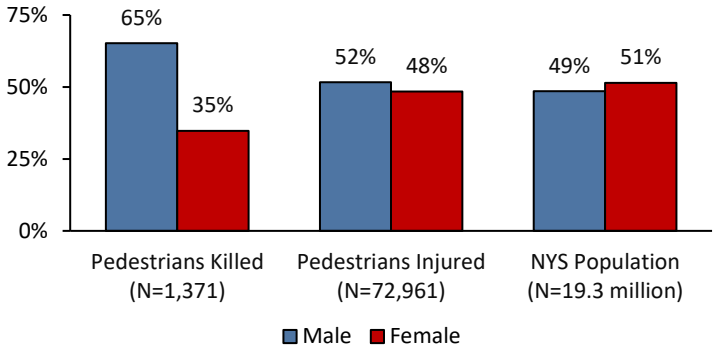


Figure 8 Pedestrians Killed and Injured by Gender, 2016-2020



As indicated in Figure 8, 65% of the pedestrians killed and 52% of those injured in motor vehicle crashes from 2016 to 2020 were male, compared to 49% of males in the population of New York State.

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 2016 to 2020. This proportion remained stable over the five-year period, averaging 3.4%.

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

	2016	2017	2018	2019	2020
Fatal and Personal Injury Pedestrian Crashes	15,039	15,161	15,416	15,264	10,518
Alcohol-Related F & PI Pedestrian Crashes	495	534	555	475	345
% of F & PI Pedestrian Crashes	*3.3%*	*3.5%*	*3.6%*	*3.1%*	*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 because 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 23% of the pedestrians killed in 2020, up slightly from 21% in 2016. The proportion of pedestrians injured for whom alcohol involvement was reported remained constant at 2% in each of the five years.

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

	2016	2017	2018	2019	2020
Pedestrians Killed	**320**	**252**	**272**	**286**	**241**
Alcohol Involvement Reported	67	60	71	56	56
% of Pedestrians Killed	*20.9%*	*23.8%*	*26.1%*	*19.6%*	*23.2%*
Pedestrians Injured	**15,346**	**15,581**	**15,767**	**15,600**	**10,667**
Alcohol Involvement Reported	284	344	339	301	201
% of Pedestrians Injured	*1.9%*	*2.2%*	*2.2%*	*1.9%*	*1.9%*

CRASH CONTRIBUTING FACTORS AND PEDESTRIAN ACTIONS

Because 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 2020, 32% of the crashes had Driver Inattention/Distraction reported as a contributing factor, 31% had Failure to Yield Right-of-Way reported and 21% had Pedestrian/Bicyclist Error/Confusion reported.

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

F & PI Pedestrian Crashes	**2016** N=14,576	**2017** N=14,792	**2018** N=14,952	**2019** N=14,839	**2020** N=10,261
Contributing Factors					
Driver Inattention/Distraction	25.5%	29.4%	31.6%	32.4%	31.9%
Failure to Yield Right-of-Way	24.3%	31.0%	33.1%	32.9%	30.8%
Pedestrian/Bicyclist Error/Confusion	23.4%	25.6%	23.0%	21.2%	21.3%
Traffic Control Device Disregarded	3.4%	4.6%	4.7%	4.4%	5.3%
Backing Unsafely	5.5%	5.9%	5.7%	5.5%	5.2%
Unsafe Speed	2.5%	2.7%	2.4%	2.6%	3.8%
Alcohol Involvement	3.0%	3.2%	3.4%	2.8%	2.8%

- In each year, the most frequent police-reported pedestrian action for pedestrians killed or injured in crashes was crossing with a traffic signal (28%-33%) (Table 5). The second most frequently reported pedestrian action was crossing at a place where there was no traffic signal or crosswalk (20%-22%).

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

Pedestrians Killed or Injured	**2016** N=15,191	**2017** N=15,460	**2018** N=15,572	**2019** N=15,456	**2020** N=10,648
Pedestrian Actions					
Crossing, With Signal	28.2%	31.0%	32.5%	31.0%	27.7%
Crossing, No Signal or Crosswalk	21.7%	20.9%	21.5%	21.2%	20.1%
Crossing, No Signal, Marked Crosswalk	8.8%	8.6%	9.1%	9.8%	8.3%
Crossing, Against Signal	7.8%	7.9%	7.4%	6.5%	6.1%

MANNER OF COLLISION AND VEHICLE TYPE

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

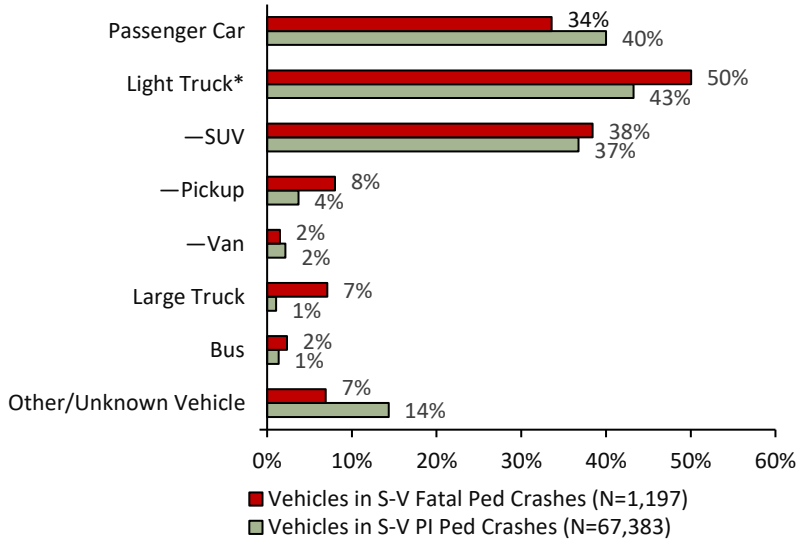
	2016	2017	2018	2019	2020
Total F & PI Pedestrian Crashes	15,039	15,161	15,416	15,264	10,518
Fatal Pedestrian Crashes	316	249	269	283	249
% Involving Single Vehicle	*87.0%*	*91.2%*	*87.4%*	*88.7%*	*83.9%*
Personal Injury Pedestrian Crashes	14,723	14,912	15,147	14,981	10,269
% Involving Single Vehicle	*96.2%*	*96.3%*	*96.5%*	*96.3%*	*95.5%*

The proportion of fatal pedestrian crashes involving a single vehicle fluctuated between 2016 and 2020, ultimately declining to 84% in 2020 (Table 6). In each of the five years, about 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 2016-2020.

- 50% of the vehicles involved in single-vehicle fatal pedestrian crashes from 2016 to 2020 were light trucks, including SUVs, pickups and vans. Another 34% were passenger cars.
- 43% of the vehicles involved in single-vehicle personal injury pedestrian crashes were light trucks, and 40% were passenger cars.

Figure 9 Type of Vehicle Involved in Single-Vehicle Fatal and Personal Injury Pedestrian Crashes, 2016-2020



**Light truck totals include other/unknown light trucks.*

Table 7 shows a decrease in the proportions of passenger cars involved in single-vehicle fatal and personal injury pedestrian crashes over the five-year period, from 43% in 2016 to 36% in 2020. At the same time, the proportions of SUVs involved in these crashes increased by 5 percentage points, from 33% in 2016 to 38% in 2020.

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	**2016** N=14,432	**2017** N=14,594	**2018** N=14,859	**2019** N=14,681	**2020** N=10,014
Vehicle Type					
Passenger Car	43.0%	41.2%	39.5%	38.4%	36.4%
Light Truck*	38.7%	42.9%	44.8%	45.5%	45.5%
—SUV	*32.5%*	*36.5%*	*38.3%*	*38.8%*	*38.3%*
—Pickup	*3.4%*	*3.7%*	*3.8%*	*3.9%*	*4.3%*
—Van	*2.3%*	*2.2%*	*2.1%*	*2.1%*	*2.1%*
Large Truck	1.1%	1.2%	1.1%	1.1%	1.3%
Bus	1.4%	1.3%	1.3%	1.5%	1.3%
Other/Unknown Vehicle	15.7%	13.4%	13.3%	13.5%	15.6%

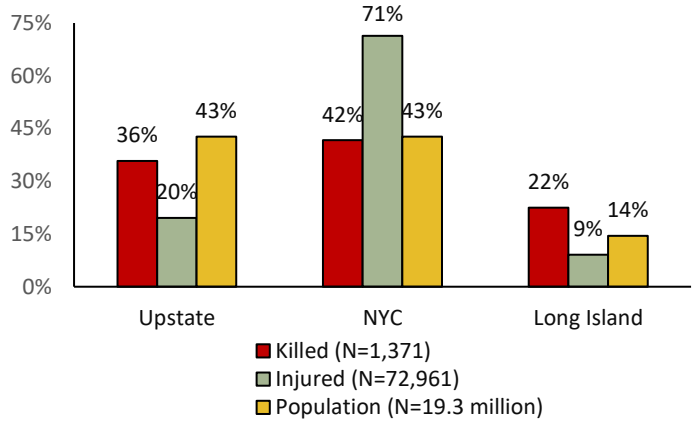
**Light truck totals include other/unknown light trucks.*

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 2016-2020, New York City accounted for 42% of the state's pedestrian fatalities and 71% of the pedestrians injured in motor vehicle crashes, but 43% of the state's population (Figure 10). In comparison, 36% of the pedestrians were killed and 20% were injured in the Upstate region, where another 43% of the state's population lived. The remaining 22% of the pedestrians were killed and 9% were injured on Long Island, which had 14% of the population. New York City, therefore, was overrepresented with respect to pedestrians injured, and Long Island with respect to fatalities.

Figure 10 Pedestrians Killed and Injured Compared to Population by Region, 2016-2020



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 62% of the pedestrians killed and 77% of those injured in 2020. Bronx County was overrepresented in terms of pedestrian fatalities and injuries. Kings, Queens and New York were overrepresented in terms of pedestrians injured. Nassau and Suffolk were overrepresented with respect to pedestrian fatalities.

Figure 11 Pedestrians Killed and Injured Compared to Population by County, Top 6 Counties, 2020

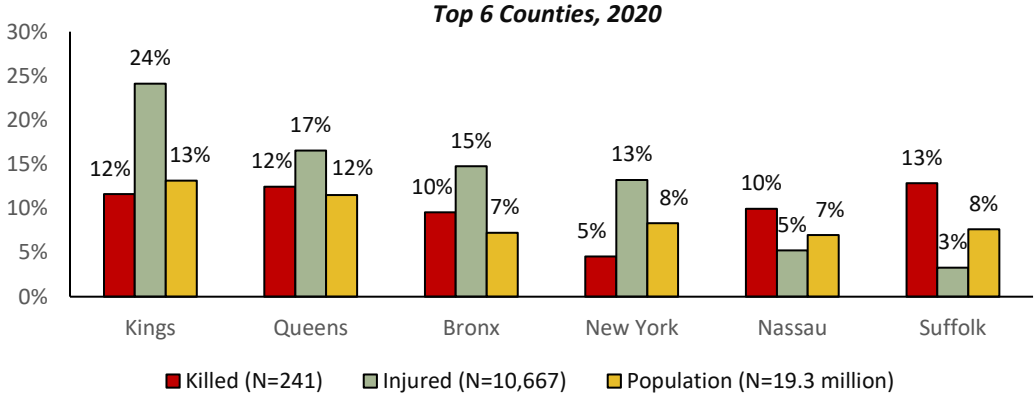
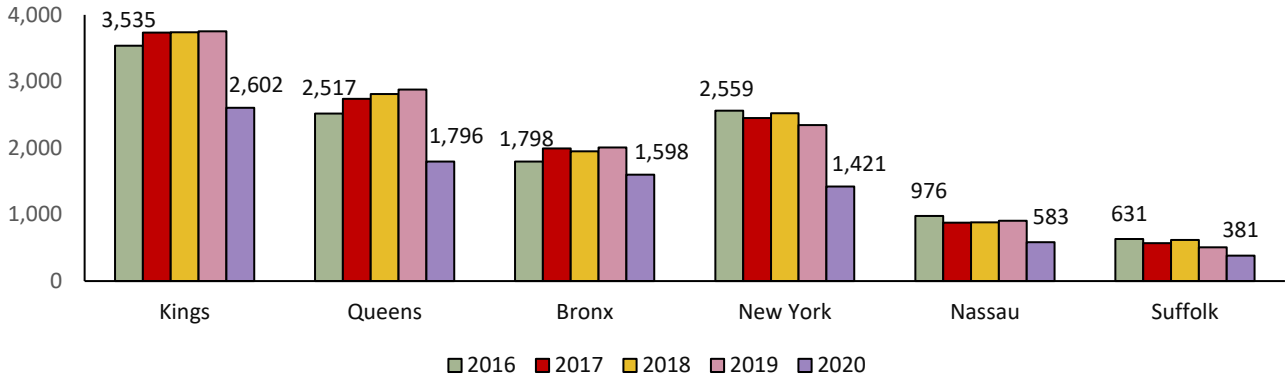


Figure 12 illustrates the up and down pattern in the numbers of pedestrians killed or injured in each of these top six counties over the five-year period 2016-2020. Compared to 2016, New York County experienced the greatest decrease in the number of pedestrians killed or injured in 2020 (2,559 vs. 1,421, or -45%), while the Bronx experienced the smallest decrease (1,798 vs. 1,598, or -11%).

Figure 12 Pedestrians Killed or Injured by County, Top 6 Counties, 2016-2020



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 2020, 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 10,000 population. In 2020:

- As shown in Figure 12 and Table 8, pedestrian fatalities and injuries were highest in Kings County (2,602), followed by Queens (1,796), Bronx (1,598) and New York (1,421).
- Statewide, 8.7% 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 (19.1%), Kings (14.9%), Bronx (14.2%), Queens (11.1%) and Richmond (10.8%).
- In New York State, 5.64 pedestrians were killed or injured per 10,000 population. Bronx County had the highest county rate (11.40), followed by Kings (10.25), New York (8.82), and Queens (8.07).

Table 8 Persons Killed or Injured in Motor Vehicle Crashes, Pedestrians Killed or Injured, NYS and Top 20 Counties, 2020

	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	19,336,776	125,204	10,908	8.7%	64.75	5.64
COUNTY						
Kings	2,538,934	17,511	2,602	14.9%	68.97	10.25
Queens	2,225,821	16,178	1,796	11.1%	72.68	8.07
Bronx	1,401,142	11,257	1,598	14.2%	80.34	11.40
New York	1,611,989	7,427	1,421	19.1%	46.07	8.82
Nassau	1,351,334	11,168	583	5.2%	82.64	4.31
Suffolk	1,474,273	11,912	381	3.2%	80.80	2.58
Westchester	965,802	5,290	361	6.8%	54.77	3.74
Erie	917,241	7,315	355	4.9%	79.75	3.87
Richmond	475,327	2,405	260	10.8%	50.60	5.47
Monroe	740,900	4,553	219	4.8%	61.45	2.96
Onondaga	459,214	2,740	171	6.2%	59.67	3.72
Albany	303,654	2,000	136	6.8%	65.86	4.48
Rockland	326,225	2,034	107	5.3%	62.35	3.28
Orange	385,234	2,645	97	3.7%	68.66	2.52
Niagara	208,396	1,277	73	5.7%	61.28	3.50
Dutchess	293,293	1,732	70	4.0%	59.05	2.39
Oneida	227,346	1,178	54	4.6%	51.82	2.38
Schenectady	155,358	940	50	5.3%	60.51	3.22
Broome	189,420	958	45	4.7%	50.58	2.38
Saratoga	230,298	1,044	42	4.0%	45.33	1.82

CONCLUSION

This Research Note contains information about motor vehicle crashes, fatalities and injuries involving pedestrians on New York roadways. Compared to 2016, the numbers of pedestrians killed on New York roadways in 2020 declined sharply. In 2016, 320 pedestrians were killed, compared to 241 in 2020. The numbers of pedestrians injured decreased by about 31%, from 15,346 in 2016 to 10,667 in 2020. In 2020, pedestrian fatalities accounted for 23% of total fatalities, down from 31% in 2016. The analyses also indicate that New York City remains the area of greatest concern, accounting for 42% of the pedestrian fatalities and 71% of the pedestrians injured during the five-year period 2016-2020. 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.

[1]National Center for Statistics and Analysis (2021, May). *Quick Facts 2019.* (Traffic Safety Facts. Report No. DOT HS 813 124). Washington, DC: National Highway Traffic Safety Administration.

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