U.S. Department of Transportation

National Highway Traffic Safety Administration

TRAFFIC SAFETY FACTS
Crash • Stats

NHTSA

DOT HS 813 363   A Brief Statistical Summary   February 2023 (Revised)

Non-Traffic Surveillance: Fatality and Injury Statistics in Non-Traffic Crashes, 2016 to 2020 (Revised)[1]

Summary

Based on the Non-Traffic Surveillance (NTS) system, an estimated average of 2,449 people were killed each year in non-traffic motor vehicle crashes during the 5-year period from 2016 to 2020. About a third (35%) of those people killed were nonoccupants such as pedestrians and bicyclists. Additionally, on average, an estimated 86,920 people were injured in these crashes each year, again of which about a third (33%) were nonoccupants. In this 5-year period, 2020 has the lowest number of people injured in non-traffic crashes and the highest number of people killed in non-traffic crashes – a phenomenon also observed in other National Highway Traffic Safety Administration traffic crash data systems, the Fatality Analysis Reporting System (FARS) and the Crash Report Sampling System (CRSS), possibly because of the COVID-19 pandemic and its related lockdown.

Introduction

Non-traffic motor vehicle crashes are a class of crashes that occur off the public trafficways. These are mostly single-vehicle crashes on private roads, two-vehicle crashes in parking facilities, or collisions with pedestrians in driveways. In addition, there are "non-traffic incidents" such as a vehicle falling on a person underneath the vehicle or an unintentional carbon monoxide poisoning inside a vehicle. Both non-traffic crashes and non-traffic incidents can cause fatalities or injuries. Nevertheless, the information on either of these types of incidents was not available until 2007, when Congress tasked NHTSA to start collecting and maintaining information pertinent to these events. Complying with the directive, NHTSA designed and implemented a virtual data collection system, Non-Traffic Surveillance (NTS), previously called Not-in-Traffic Surveillance, to provide counts and details of fatalities and injuries to people involved in non-traffic crashes and non-traffic incidents. This issue of Crash•Stats focuses only on non-traffic crashes and presents some salient statistics about the estimated number of occupants and nonoccupants killed and injured in such crashes from 2016 to 2020.

The statistics in this summary are based on NTS data from 2016 to 2020. Since a complete record of all non-traffic crash fatalities and injuries from States and police jurisdictions is not available, adjusted weights have been used to obtain national estimates. The background and details about collection of NTS data and the calculation of weights are provided in the appendix.

People Killed in Non-Traffic Crashes From 2016 to 2020

NTS data show that during the 5-year period from 2016 to 2020, an estimated 12,247 people were killed in non-traffic crashes (Table 2), an average of 2,449 people each year. Of these, 35 percent were nonoccupants such as pedestrians and bicyclists, and 65 percent were occupants. Among nonoccupants, 46 percent were struck by vehicles moving forward, 31 percent were stuck by vehicles backing up, and 17 percent were struck by rollaway vehicles that were unattended with no driver in control. The majority (95% on average) of the 8,021 occupants killed during this period were victims of single-vehicle non-traffic crashes and the remaining 5 percent of occupants, on average, were killed in multi-vehicle non-traffic crashes.

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[1] This Research Note was originally published in September 2022. NHTSA corrected the estimated number of injured nonoccupants in Tables 3 and 4 due to a programming error. Also, all tables were modified to report "Unknown vehicle movement" as a separate category that was previously combined with the "other" category for vehicle movement. All subtotals and totals remain the same.

Table 1. Nonoccupants and Occupants Killed in Non-Traffic Crashes From 2016 to 2018

Occupant Status	Killed By	2016		2017		2018	
		Number	Percent	Number	Percent	Number	Percent
Nonoccupants	Forward-Moving Vehicles	240	37%	390	47%	393	53%
	Backing Vehicles	240	37%	327	40%	192	26%
	Rollaway Vehicles (unattended with no driver in control)	112	17%	84	10%	134	18%
	Other (stopped, disabled, or parked vehicles)	32	5%	0	0%	10	1%
	Unknown Vehicle Movement	32	5%	21	3%	10	1%
	Subtotal	**657**	**100%**	**822**	**100%**	**738**	**100%**
Occupants	Single-Vehicle Crashes	1,095	94%	1,397	97%	1,426	88%
	Multi-Vehicle Crashes	68	6%	41	3%	198	12%
	Subtotal	**1,163**	**100%**	**1,438**	**100%**	**1,624**	**100%**
Total		**1,820**	**100%**	**2,260**	**100%**	**2,362**	**100%**

Source: NTS 2016 – 2018
Note: Totals and percentages may not add up due to independent rounding.

Table 2. Nonoccupants and Occupants Killed in Non-Traffic Crashes From 2019 to 2020, 5-Year (2016-2020) Totals and Averages

Occupant Status	Killed By	2019		2020		5-Year Total	5-Year Average	
		Number	Percent	Number	Percent		Number	Percent
Nonoccupants	Forward-Moving Vehicles	382	42%	526	48%	1,931	386	46%
	Backing Vehicles	305	33%	256	23%	1,320	264	31%
	Rollaway Vehicles (unattended with no driver in control)	172	19%	216	20%	718	144	17%
	Other (stopped, disabled, or parked vehicles)	19	2%	40	4%	101	20	2%
	Unknown Vehicle Movement	38	4%	54	5%	155	31	4%
	Subtotal (35%)	**916**	**100%**	**1,093**	**100%**	**4,226**	**845**	**100%**
Occupants	Single-Vehicle Crashes	1,732	100%	1,964	95%	7,614	1,523	95%
	Multi-Vehicle Crashes	0	0%	100	5%	407	81	5%
	Subtotal (65%)	**1,732**	**100%**	**2,064**	**100%**	**8,021**	**1,604**	**100%**
Total (100%)		**2,648**	**100%**	**3,157**	**100%**	**12,247**	**2,449**	**100%**

Source: NTS 2016 – 2020
Note: Totals and percentages may not add up due to independent rounding.

People Injured in Non-Traffic Crashes From 2016 to 2020

The statistics in Table 4 show that over the 5-year period 2016 to 2020, an estimated 434,599 people were injured in non-traffic crashes, an average of 86,920 people injured each year. Of these, on average, 33 percent were nonoccupants – 49 percent of whom were injured by vehicles moving forward and 40 percent by vehicles backing up. On average, rollaway vehicles injured about 1,911 nonoccupants each year, about 7 percent of the injured nonoccupants. Most occupants (54% on average) injured in non-traffic crashes were involved in single-vehicle crashes and the remaining 46 percent of injured occupants were involved in multi-vehicle crashes.

Table 3. Nonoccupants and Occupants Injured in Non-Traffic Crashes From 2016 to 2018

Occupant Status	Injured By	2016		2017		2018	
		Number	Percent	Number	Percent	Number	Percent
Nonoccupants	Forward-Moving Vehicles	18,694	49%	13,992	47%	13,643	49%
	Backing Vehicles	14,736	39%	13,362	45%	11,019	39%
	Rollaway Vehicles (unattended with no driver in control)	3,262	9%	1,428	5%	1,872	7%
	Other (stopped, disabled, or parked vehicles)	612	2%	289	1%	662	2%
	Unknown Vehicle Movement	761	2%	703	2%	725	3%
	Subtotal	**38,065**	**100%**	**29,774**	**100%**	**27,921**	**100%**
Occupants	Single-Vehicle Crashes	33,262	49%	34,981	56%	32,259	57%
	Multi-Vehicle Crashes	34,962	51%	27,482	44%	24,560	43%
	Subtotal	**68,223**	**100%**	**62,463**	**100%**	**56,818**	**100%**
Total		**106,288**	**100%**	**92,237**	**100%**	**84,739**	**100%**

Source: NTS 2016 – 2018
Note: Totals and percentages may not add up due to independent rounding.

Table 4. Nonoccupants and Occupants Injured in Non-Traffic Crashes From 2019 to 2020, 5-Year (2016-2020) Totals and Averages

Occupant Status	Injured By	2019		2020		5-Year Total	5-Year Average	
		Number	Percent	Number	Percent		Number	Percent
Nonoccupants	Forward-Moving Vehicles	14,774	51%	10,114	50%	71,217	14,243	49%
	Backing Vehicles	10,825	38%	8,019	40%	57,961	11,592	40%
	Rollaway Vehicles (unattended with no driver in control)	2,023	7%	969	5%	9,554	1,911	7%
	Other (stopped, disabled, or parked vehicles)	454	2%	377	2%	2,394	479	2%
	Unknown Vehicle Movement	726	3%	769	4%	3,684	737	3%
	Subtotal (33%)	**28,802**	**100%**	**20,248**	**100%**	**144,810**	**28,962**	**100%**
Occupants	Single-Vehicle Crashes	30,596	55%	25,829	56%	156,927	31,385	54%
	Multi-Vehicle Crashes	25,511	45%	20,349	44%	132,864	26,573	46%
	Subtotal (67%)	**56,107**	**100%**	**46,178**	**100%**	**289,789**	**57,958**	**100%**
Total (100%)		**84,909**	**100%**	**66,426**	**100%**	**434,599**	**86,920**	**100%**

Source: NTS 2016 – 2020
Note: Totals and percentages may not add up due to independent rounding.

Appendix: NTS Background, Data Collection, and Adjustment Factors

In 2007 Congress tasked NHTSA to begin collecting and maintaining information about fatalities and injuries to people in non-traffic crashes, the crashes that occur off the public trafficways, as well as in non-traffic incidents such as vehicles falling on someone underneath or unintentional carbon monoxide poisoning. This was the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), and was under the Cameron Gulbransen Kids Transportation Safety Act of 2007. To comply, NHTSA designed and implemented the Not-in-Traffic Surveillance system, now called the Non-Traffic Surveillance system. This is a virtual data collection system designed to provide counts and details regarding fatalities and injuries that occur to people in non-traffic crashes and non-traffic incidents.

NHTSA uses several sources to collect the information relevant to non-traffic crashes and non-traffic incidents. FARS is the census of fatal motor vehicle traffic crashes. In addition to FARS data collection efforts, FARS

analysts may also identify non-traffic crash reports and forward the potential crashes for NTS qualification and subsequent coding. CRSS is a probability-based sampling system of police-reported crashes. During the CRSS sampling activities conducted within the sampled police jurisdictions, if non-traffic crashes are identified, they are also collected for NTS qualification and coding. NTS non-traffic crash injury and fatality estimates are made from the "Person" records of FARS non-traffic crashes and the "Person" records of CRSS non-traffic injury crashes. Weights of 1 are assigned to the Person records of FARS non-traffic crashes, and CRSS base weights are assigned to the Person records of CRSS non-traffic injury crashes as the NTS base weights. Additionally, NTS base weights are calibrated to better estimates obtained from external auxiliary information such as the National Vital Statistics System (NVSS) and NHTSA's State Data System (SDS). NVSS is the national birth-and-death data system at the Centers for Disease Control and Prevention. NVSS provides the most complete data on births and deaths in the United States, including total traffic and non-traffic crash fatalities. NHTSA's SDS is a collection of computer data files coded from police crash reports obtained from more than 30 States. Specifically, the injuries and fatalities of FARS non-traffic crashes and CRSS non-traffic injury crashes are divided into four adjustment cells formed by Person type (occupant or nonoccupant) and injury severity (injured or killed). For a fatal adjustment cell, the adjustment factor is the ratio of the number of non-traffic crash fatalities estimated using NVSS and FARS to the number of non-traffic crash fatalities estimated from NTS. The numerator is calculated from the difference between NVSS crash-related fatalities (traffic or non-traffic) and FARS traffic crash fatalities. The denominator is the estimate of NTS non-traffic crash fatalities. For an injury adjustment cell, the adjustment factor is the ratio of two estimated numbers of non-traffic injured people. The denominator is the number of injured people in non-traffic crashes estimated from NTS using the base weight. The numerator is the number of injured people in non-traffic crashes estimated using SDS and CRSS. SDS is used to calculate the median ratio of the number of injured people in non-traffic crashes to the number of injured people in traffic crashes in 5 States: Indiana, Kentucky, Nebraska, New Jersey, and North Carolina. CRSS data is used to estimate the number of injured people in traffic crashes. The product of the median ratio and the number of injured people in traffic crashes estimated from CRSS is considered a better estimate of the number of injured people in non-traffic crashes. See Table 5 for the adjustment factors by the four adjustment cells.

Table 5. 2016 – 2020 Adjustment Factors for NTS Weights

Cell	Adjustment Factor				
	2016	2017	2018	2019	2020
Occupant Fatalities	34.21	41.09	39.61	43.30	33.29
Nonoccupant Fatalities	16.02	10.54	9.58	19.08	13.49
Occupant Injuries	6.25	5.06	5.20	4.18	3.63
Nonoccupant Injuries	4.54	2.78	2.88	2.75	2.43

The adjustment factors are then multiplied by the injured or killed person's base weights to obtain the adjusted weights that can be used to make national estimates related to non-traffic crash injuries and fatalities. The adjusted weights are compiled into the NTS database along with matching variables for the years 2016 to 2020. This database is available in SAS and CSV formats. Additional information about the definitions and attributes of the NTS variables and the adjustment factors are available in the NTS Analytical User's Manual 2016–2020.

Note: In 2007 the coding for non-traffic crashes under NTS was done based on a small set of variables. Starting in 2008 the coding began using data elements similar to those used in the National Automotive Sampling System—General Estimates System (NASS GES). For this reason, the estimates presented in this Crash•Stats may not be compared with the similar estimates reported in 2007. Regarding backovers (backing-vehicle crashes), although the same definition was used in NTS 2016–2020 as in 2007, different attributes were used in 2016–2020 to determine backing maneuvers.

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