



Non-Traffic Surveillance: Fatality and Injury Statistics in Non-Traffic Crashes in 2021

Summary

Based on the Non-Traffic Surveillance (NTS) system, an estimated 3,990 people were killed in non-traffic motor vehicle crashes during 2021, an increase of 26 percent compared to 3,157 people killed in 2020. About a fourth (26%) of those people killed were nonoccupants such as pedestrians and bicyclists. Additionally, an estimated 64,838 people were injured in these crashes during 2021, a decrease of 2 percent compared to 66,426 people injured in 2020. About a third (30%) of people injured were nonoccupants.

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 events 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 data collection system, Not-in-Transport Surveillance (later changed to Non-Traffic Surveillance [NTS]), 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 during 2021.

The statistics in this summary are based on NTS data from 2021. 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.

Note: Crashes that resulted in nonoccupants being killed or injured by forward-moving vehicles should not be equated to frontover crashes. Frontover crashes are a subset of forward moving vehicle crashes caused by a lack of visibility directly in front of the vehicle. Frontover crashes cannot be identified from the 2021 NTS data.

People Killed in Non-Traffic Crashes in 2021

NTS data show that during 2021 an estimated 3,990 people were killed in non-traffic crashes (Table 2). Of these, 26 percent were nonoccupants such as pedestrians and bicyclists, and 74 percent were occupants. Among nonoccupants, 53 percent were struck by vehicles moving forward, 23 percent were struck by vehicles backing up, and 20 percent were struck by rollaway vehicles that were unattended with no driver in control. The majority (98%) of the 2,966 occupants killed in 2021 were victims of single-vehicle non-traffic crashes and the remaining 2 percent of occupants were killed in multi-vehicle non-traffic crashes. Tables 1 and 2 show the estimated number of nonoccupants and occupants killed in non-traffic crashes over a five-year period.

Table 1. Nonoccupants and Occupants Killed in Non-Traffic Crashes From 2017 to 2019

Occupant Status	Killed By	2017		2018		2019	
		Number	Percent	Number	Percent	Number	Percent
Nonoccupants	Forward-Moving Vehicles	390	47%	393	53%	382	42%
	Backing Vehicles	327	40%	192	26%	305	33%
	Rollaway Vehicles (unattended with no driver in control)	84	10%	134	18%	172	19%
	Other (stopped, disabled, or parked vehicles)	0	0%	10	1%	19	2%
	Unknown Vehicle Movement	21	3%	10	1%	38	4%
	Subtotal	822	100%	738	100%	916	100%
Occupants	Single-Vehicle Crashes	1,397	97%	1,426	88%	1,732	100%
	Multi-Vehicle Crashes	41	3%	198	12%	0	0%
	Subtotal	1,438	100%	1,624	100%	1,732	100%
Total	2,260	100%	2,362	100%	2,648	100%	

Source: NTS 2017 – 2019

Note: Totals and percentages may not add up due to independent rounding.

Table 2. Nonoccupants and Occupants Killed in Non-Traffic Crashes From 2020 to 2021, Five-Year (2017–2021) Totals and Averages

Occupant Status	Killed By	2020		2021		5-Year Total	5-Year Average	
		Number	Percent	Number	Percent		Number	Percent
Nonoccupants	Forward-Moving Vehicles	526	48%	543	53%	2,234	447	49%
	Backing Vehicles	256	23%	234	23%	1,314	263	29%
	Rollaway Vehicles (unattended with no driver in control)	216	20%	210	20%	816	163	18%
	Other (stopped, disabled, or parked vehicles)	40	4%	0	0%	69	14	2%
	Unknown Vehicle Movement	54	5%	37	4%	160	32	3%
	Subtotal (26%)	1,093	100%	1,024	100%	4,593	919	100%
Occupants	Single-Vehicle Crashes	1,964	95%	2,905	98%	9,424	1,885	96%
	Multi-Vehicle Crashes	100	5%	61	2%	400	80	4%
	Subtotal (74%)	2,064	100%	2,966	100%	9,824	1,965	100%
Total (100%)	3,157	100%	3,990	100%	14,417	2,883	100%	

Source: NTS 2017 – 2021

Note: Totals and percentages may not add up due to independent rounding.

People Injured in Non-Traffic Crashes in 2021

The statistics in Table 4 show that during 2021, an estimated 64,838 people were injured in non-traffic crashes. Of these, 30 percent were nonoccupants—53 percent of whom were injured by vehicles moving forward and 37 percent by vehicles backing up.

Rollaway vehicles injured about 1,435 nonoccupants, about seven percent of the injured nonoccupants. Most occupants (54%) 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. Tables 3 and 4 show the estimated number of nonoccupants and occupants injured in non-traffic crashes over a five-year period.

Table 3. Nonoccupants and Occupants Injured in Non-Traffic Crashes From 2017 to 2019

Occupant Status	Injured By	2017		2018		2019	
		Number	Percent	Number	Percent	Number	Percent
Nonoccupants	Forward-Moving Vehicles	13,992	47%	13,643	49%	14,774	51%
	Backing Vehicles	13,362	45%	11,019	39%	10,825	38%
	Rollaway Vehicles (unattended with no driver in control)	1,428	5%	1,872	7%	2,023	7%
	Other (stopped, disabled, or parked vehicles)	289	1%	662	2%	454	2%
	Unknown Vehicle Movement	703	2%	725	3%	726	3%
	Subtotal	29,774	100%	27,921	100%	28,802	100%
Occupants	Single-Vehicle Crashes	34,981	56%	32,259	57%	30,596	55%
	Multi-Vehicle Crashes	27,482	44%	24,560	43%	25,511	45%
	Subtotal	62,463	100%	56,818	100%	56,107	100%
Total	92,237	100%	84,739	100%	84,909	100%	

Source: NTS 2017 – 2019

Note: Totals and percentages may not add up due to independent rounding.

Table 4. Nonoccupants and Occupants Injured in Non-Traffic Crashes From 2020 to 2021, Five-Year (2017–2021) Totals and Averages

Occupant Status	Injured By	2020		2021		5-Year Total	5-Year Average	
		Number	Percent	Number	Percent		Number	Percent
Nonoccupants	Forward-Moving Vehicles	10,114	50%	10,348	53%	62,871	12,574	50%
	Backing Vehicles	8,019	40%	7,157	37%	50,382	10,076	40%
	Rollaway Vehicles (unattended with no driver in control)	969	5%	1,435	7%	7,727	1,545	6%
	Other (stopped, disabled, or parked vehicles)	377	2%	252	1%	2,034	407	2%
	Unknown Vehicle Movement	769	4%	363	2%	3,286	657	3%
	Subtotal (30%)	20,248	100%	19,554	100%	126,299	25,260	100%
Occupants	Single-Vehicle Crashes	25,829	56%	24,474	54%	148,139	29,628	56%
	Multi-Vehicle Crashes	20,349	44%	20,810	46%	118,712	23,742	44%
	Subtotal (70%)	46,178	100%	45,284	100%	266,850	53,370	100%
Total (100%)	66,426	100%	64,838	100%	393,149	78,630	100%	

Source: NTS 2017 – 2021

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 with the directives, NHTSA designed and implemented the Not-in-Transport Surveillance system, now called the Non-Traffic Surveillance system.

This is a 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 one 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 five 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. 2021 Adjustment Factors for NTS Weights

Cell	Adjustment Factor
	2021
Occupant Fatalities	30.27
Nonoccupant Fatalities	12.34
Occupant Injuries	3.71
Nonoccupant Injuries	2.01

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. 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 2016–2021.

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 backing-vehicle crashes, although the same definition was used in NTS 2021 as in 2007, different attributes were used in 2021 to determine backing maneuvers.

In 2021 NHTSA began using vPIC Body Class as the source for vehicle classification. As such, starting in 2021, vPIC Body Class is used in the calculation of the NTS adjustment factors.

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