

Animal-related Crashes, Injuries, and Deaths in the United States, 2020–2024

The purpose of this study is to provide current national statistics on crashes, injuries, and deaths in which vehicles strike or are struck by animals or crash after attempting to avoid animals. National crash databases were used to estimate overall numbers of animal-related crashes, injuries, and deaths in 2020–2024. Crash data from three states were examined to analyze the circumstances of animal-related crashes in greater depth. Results show that there were an estimated 353,800 reported animal-related crashes resulting in approximately 49,725 injuries and 277 deaths each year over the study period. True numbers of non-fatal crashes and injuries are likely higher due to underreporting. Crashes were by far the most likely to involve animals in the Midwest; the Northeast had a substantial share of animal-related crashes as well. Animal-related crashes were most prevalent in the fall and peaked in November. When people inside of vehicles were killed in animal-related crashes, striking the animal was rarely the most injurious event; most involved events such as striking other vehicles or roadside objects (e.g., trees), or rolling over. In-depth examination of data from North Carolina, Ohio, and Pennsylvania revealed many commonalities in the circumstances of animal-related crashes. These included crashes in rural areas, in darkness, in the fall, and on roads with speed limits of 45 to 60 miles per hour. Results also highlight the vulnerability of motorcyclists to severe injury or death in the event of a crash with an animal. While not necessarily generalizable to every crash, results suggest that in many instances, people inside of vehicles are more likely to be injured or killed when trying to avoid an animal rather than striking it. The national crash databases do not identify the type of animal involved in a crash; however, other research suggests that most animal-related crashes involve deer. Thus, results may not be generalizable to situations where motorists encounter larger animals such as moose, elk, or bison. This Research Brief provides more detailed data on animal-related crashes and discusses opportunities to mitigate or prevent them.

METHODS

The purpose of the current study was to provide current national estimates of the prevalence of animal-related crashes and their associated injuries and deaths, as well as to identify the types of environments and situations where they most often occur. Prevalences of police-reported animal-related crashes, injuries, and deaths were estimated using national-level crash databases. Data from

three large states—North Carolina, Ohio, and Pennsylvania—were examined to identify the most common animal-related crash scenarios.

Analysis of National Crash Data

Two databases from the National Highway Traffic Safety Administration (NHTSA) were used to quantify the overall prevalence of police-reported animal-related crashes, injuries, and

deaths. The Crash Report Sampling System (CRSS) was used to quantify animal-related crashes and injuries. CRSS includes data on a geographically stratified sample of all police-reported crashes in the United States (U.S.) regardless of severity. Statistics derived from CRSS analysis were weighted to account for all police-reported crashes nationwide (National Center for Statistics and Analysis [NCSA], 2026a). The Fatality Analysis Reporting System (FARS) was used to quantify fatalities in animal-related crashes. FARS contains information about all crashes that occur on public roadways in the U.S., involve a motor vehicle, and result in a death within 30 days of the crash (NCSA, 2026b). Fatalities in CRSS were excluded to avoid double-counting. Both databases are available to the public in the form of downloadable databases designed for statistical analysis. Data from years 2020 through 2024 were examined, as these were the five most recent years for which data was available at the time of the study. Data from prior years were not included as the purpose of the study was to provide current estimates.

For the purpose of the current study, a crash was considered to have been animal-related if a vehicle struck or was struck by an animal, or if a vehicle crashed after attempting to avoid an animal. Crashes in FARS and CRSS were classified as animal-related if any of the following were reported:

- Critical pre-crash event = “animal in road,” “animal approaching road,” or “animal—unknown location”
- Crash sequence of events included “animal” in or before first impact
- Crash maneuver = “maneuvered to avoid live animal”
- Crash type = “forward impact with pedestrian/animal” (and no pedestrian involved)
- First harmful event or most harmful events = “live animal”

FARS and CRSS do not indicate the type of animal involved in a crash; however, note that crashes involving animal-drawn conveyances (e.g., a carriage being pulled by a horse) were considered out of scope.

For the purpose of analysis, the most harmful event—defined as the crash event that resulted in the most severe injury to the occupants of a particular vehicle if applicable, or else the most severe property damage—were collapsed into five categories for further analysis:

- Impact with the animal
- Impact with another vehicle
- Impact with object (e.g., a tree)
- Rolling over
- Other

The prevalence of animal-related crashes was found to vary substantially by region. For the purpose of the current study, national data were examined at the level of the U.S. Census Region because the CRSS database does not include any geographic information below the level of region. States included in each Census Region are as follows (NCSA, 2026a):

- Northeast: CT, MA, ME, NH, PA, NJ, NY, RI, VT
- Midwest: IA, IL, IN, KS, MI, MN, MO, ND, NE, OH, SD, WI
- South: AL, AR, DC, DE, FL, GA, KY, LA, MD, MS, NC, SC, OK, TN, TX, VA, WV
- West: AK, AZ, CA, CO, HI, ID, MT, NM, NV, OR, UT, WA, WY

Examination of State Crash Databases

For state-specific analyses, North Carolina (NC), Ohio (OH), and Pennsylvania (PA) were selected. Crash data for NC and OH were obtained from the Highway Safety Information System (HSIS) (Federal Highway Administration [FHWA], n.d.), and PA crash data was obtained from the state department of transportation (Pennsylvania Department of Transportation, n.d.). Note that these states were selected mainly due to

the availability of variables indicating animal involvement in crashes as well as their overall size and not necessarily because of high prevalence of animal-related crashes specifically. The NC and PA datasets included crashes from 2020 to 2024 whereas the OH dataset covered 2021 to 2024.

To capture all potential animal-related crashes, multiple variables describing collision type, crash involvement, or sequence of events were used to identify eligible records. Because the available variables differed across states, state-specific filtering criteria were developed. For example, in NC and OH, crashes were identified using accident type, most harmful event, and sequence-of-events variables. In PA, animal-related crashes were identified using the deer-related, hit deer, and sudden deer indicators, which capture both direct collisions with deer and crashes involving deer present on or near the roadway. These state-specific procedures were applied to maximize the inclusion of animal-related crashes while accounting for differences in database structure.

The level of detail available for animal types also varies across states. In NC, all collisions involving animals are recorded under a single “animal” category. PA records deer-related crashes only, whereas OH distinguishes among farm animals, deer, and other animals. These differences likely reflect variations in local characteristics of animal-related crashes as well as differences in the scope of the respective data systems themselves.

Frequent itemset mining was used to characterize animal-related crash scenarios. This approach identifies the most common combinations of factors associated with animal-related crashes. Variables describing the crash, roadway environment, and resulting injuries were incorporated into the analysis. The top several most common combinations of factors in each state are reported, as well as the proportions of these crashes that resulted in injuries.

Frequent itemset mining identified the prevalence of crash scenarios, defined as the percentage of animal-related crashes sharing the same combination of factors. To ensure that the extracted scenarios were comparable with a consistent level of information, each scenario within a state was defined using the same number of factors. The top crash scenarios, accounting for approximately 50% of animal-related crashes, were extracted and ranked by prevalence. For each scenario, the injury rate, defined as the percentage of occupants in that scenario who sustained at least a minor injury, was also calculated.

The factors included in the analysis varied across states because of differences in data availability but were selected based on the common principle that they represent characteristics that are readily observable or perceivable by drivers before or during a trip. These factors included season (quarter), lighting condition, roadway environment, and roadway characteristics, depending on the variables available in each state’s database.

RESULTS

Table 1 shows the annual number of roadway crashes, injuries, and fatalities involving animals from 2020 through 2024. More than 1.7 million police-reported crashes in 2020–2024, amounting to 6% of all police-reported crashes nationwide, involved an animal. These crashes resulted in more than 248,000 injuries (2% of all crash injuries) and 1,383 deaths (0.7% of all crash fatalities). Annualized, these represent approximately 353,800 reported animal-related crashes resulting in approximately 49,725 injuries and 277 deaths each year.

Figure 1 illustrates the monthly distribution of animal-related crashes compared to all police-reported crashes nationwide. While numbers of crashes overall are relatively consistent over the course of the year, animal-related crashes exhibit a pronounced peak in the months of October and November, which together account for nearly one-third of all animal-related crashes (32%) despite comprising only 18% of all reported crashes.

Table 1. Total Animal-Related Crashes, Injuries, and Fatalities by Year, United States, 2020–2024

	Animal-Related Crashes		Animal-Related Injuries		Animal-Related Fatalities	
	Number	% of All Reported Crashes	Number	% of All Crash Injuries	Number	% of All Crash Fatalities
2020	303,303	5.8%	51,489	2.3%	293	0.8%
2021	333,759	5.5%	44,903	1.8%	241	0.6%
2022	348,785	5.9%	51,507	2.2%	260	0.6%
2023	382,105	6.2%	59,239	2.4%	299	0.7%
2024	400,948	6.5%	41,487	1.7%	290	0.7%
Total	1,768,900	6.0%	248,625	2.1%	1,383	0.7%

Figure 1. Monthly Distribution of Animal-Related Crashes, United States, 2020–2024



Figure 2 shows animal-related crashes as a percentage of total crashes by region and month. As a percentage of all police-reported crashes, animal-related crashes are by far the most prevalent in the Midwest, where animal-related crashes accounted for 15% of all police-reported crashes over the entire study period, 29% of all crashes in November, and 10% of crashes even in their lowest month (August). The Northeast region had a lower but still substantial prevalence of animal-related crashes overall, with 8% of all crashes over the study period and 18% in November being animal-related. Animal-related crashes accounted for a far smaller proportion of all crashes in the South (3% of crashes) and West (2% of crashes).

Table 2 displays environmental characteristics of animal-related crashes, injuries, and fatalities. The Midwest region accounts for fully half of all animal-related crashes and injuries, as well as one-third of all animal-related crash fatalities. A state-by-state breakdown of animal-related crash fatalities over the study period is provided in the Appendix.

As noted previously with respect to animal-related crashes overall, the months of October and November also accounted for a high proportion of all animal-related crash injuries (31%). When

examining fatalities involving animals by month, 24% occurred in the months of October and November, whereas June and July accounted for slightly more (25%). As discussed in greater detail subsequently, additional analysis revealed that the higher proportion of fatalities occurring during the summer months is largely due to the high proportion of motorcyclists among those who died in animal-related crashes, and this summer peak roughly aligns with a similar summer peak in motorcycle crashes overall.

Animal-related crashes, injuries, and fatalities were all more likely to occur in rural environments than urban ones, with approximately two-thirds of animal-related crashes and injuries, and more than 80% of animal-related crash fatalities occurring in rural areas. Approximately 70% of all animal-related crash fatalities occurring in rural areas. Approximately 70% of all animal-related crashes, injuries, and fatalities occurred in dark, dawn, or dusk conditions. More than three in four animal-related crash fatalities occurred on roads with speed limits of 50 miles per hour or higher. The speed limit was not reported in a substantial proportion of non-fatal animal-related crashes, thus the data on speed limits for animal-related crashes and injuries should be viewed with caution.

Figure 2. Animal-Related Crashes as a Percentage of All Police-Reported Crashes, by Region and Month, United States, 2020–2024

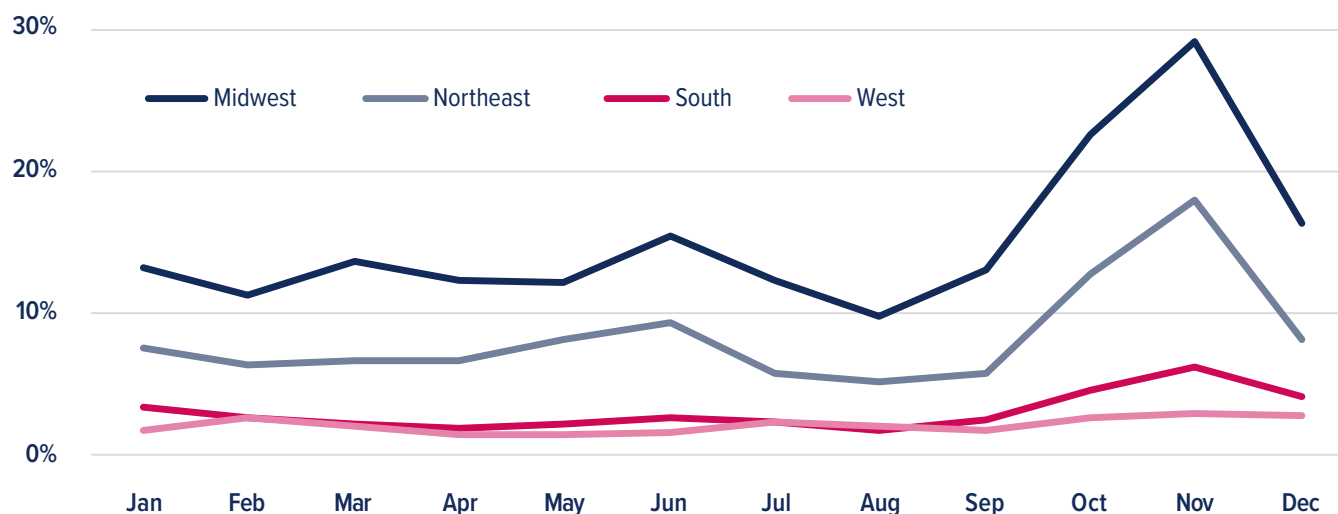


Table 2. Characteristics of Animal-Related Crashes, Injuries, and Fatalities, United States, 2020–2024

	Animal-Related Crashes		Animal-Related Injuries		Animal-Related Fatalities	
	Number	%	Number	%	Number	%
Region Region						
Midwest	884,229	50.0%	124,119	49.9%	462	33.4%
Northeast	318,196	18.0%	31,860	12.8%	171	12.4%
South	476,087	26.9%	77,485	31.2%	524	37.9%
West	90,388	5.1%	15,161	6.1%	226	16.3%
Month						
January	143,084	8.1%	12,817	5.2%	61	4.4%
February	110,772	6.3%	12,007	4.8%	57	4.1%
March	114,456	6.5%	15,912	6.4%	52	3.8%
April	93,654	5.3%	13,901	5.6%	78	5.6%
May	113,863	6.4%	19,102	7.7%	115	8.3%
June	139,986	7.9%	23,860	9.6%	172	12.4%
July	110,007	6.2%	16,432	6.6%	172	12.4%
August	89,346	5.1%	17,545	7.1%	114	8.2%
September	117,483	6.6%	18,651	7.5%	161	11.6%
October	249,661	14.1%	36,740	14.8%	173	12.5%
November	316,676	17.9%	39,899	16.0%	155	11.2%
December	169,913	9.6%	21,758	8.8%	73	5.3%
Speed Limit^a						
45 MPH and Under	430,836	24.4%	65,373	26.4%	333	24.1%
50–60 MPH	664,711	37.6%	73,020	29.5%	710	51.3%
65 MPH and Over	190,204	10.8%	32,244	13.0%	301	21.8%
Urbanicity^b						
Urban	671,905	38.0%	80,429	32.3%	260	18.8%
Rural	1,096,995	62.0%	168,195	67.7%	1,119	80.9%
Lighting Condition^c						
Daylight	461,478	26.1%	71,438	28.7%	413	29.9%
Dark	1,074,149	60.7%	146,669	59.0%	826	59.7%
Dawn/Dusk	176,694	10.0%	22,248	9.4%	135	9.8%

^a Excludes 438,148 crashes, 76,868 injuries, and 39 fatalities with unknown speed limit.

^b Excludes 4 fatalities with unknown urbanicity.

^c Excludes 56,578 crashes, 7,270 injuries, and 9 fatalities with unknown lighting condition.

Table 3 shows the distribution of age and sex among people injured and killed in animal-related crashes overall and by the role of the person injured or killed. Notably, while 92% of people injured in crashes with animals were vehicle occupants, a plurality of those killed in animal-related crashes were motorcyclists (47%).

Vehicle occupants injured in animal-related crashes were evenly divided by sex and spanned the entire age distribution. Occupants who died were slightly more likely to be male and older. Approximately 85% of motorcyclists injured and killed were males, with older motorcyclists represented more heavily among the fatalities.

Table 3. Animal-Related Injuries and Fatalities by Person Type, Age, and Sex, United States, 2020–2024

	Vehicle Occupant		Motorcyclist		Other/Unknown		Total	
	Number	%	Number	%	Number	%	Number	%
Injuries								
Total	227,859	91.6%	19,431	7.8%	1,334	0.5%	248,625	100.0%
Age								
<18	17,545	7.7%	250	1.3%	740	55.5%	18,535	7.5%
18–24	42,131	18.5%	2,722	14.0%	57	4.3%	44,910	18.1%
25–34	44,026	19.3%	3,537	18.2%	232	17.4%	47,794	19.2%
35–44	40,508	17.8%	3,821	19.7%	132	9.9%	44,461	17.9%
45–54	35,001	15.4%	3,900	20.1%	50	3.7%	38,951	15.7%
55–64	27,351	12.0%	3,475	17.9%	—	—	30,826	12.4%
65+	21,297	9.3%	1,727	8.9%	124	9.3%	23,148	9.3%
Sex								
Male	113,914	50.0%	16,790	86.4%	803	60.2%	131,507	52.9%
Female	113,945	50.0%	2,642	13.6%	531	39.8%	117,117	47.1%
Fatalities								
Total	614	44.4%	655	47.4%	114	8.2%	1,383	100.0%
Age*								
<18	62	10.1%	3	0.5%	13	11.4%	78	5.6%
18–24	88	14.3%	32	4.9%	15	13.2%	135	9.8%
25–34	100	16.3%	68	10.4%	14	12.3%	182	13.2%
35–44	98	16.0%	99	15.1%	22	19.3%	219	15.8%
45–54	72	11.7%	159	24.3%	19	16.7%	250	18.1%
55–64	89	14.5%	176	26.9%	18	15.8%	283	20.5%
65+	104	16.9%	118	18.0%	13	11.4%	235	17.0%
Sex*								
Male	400	65.1%	559	85.3%	85	74.6%	1,044	75.5%
Female	214	34.9%	95	14.5%	29	25.4%	338	24.4%

*Includes 1 vehicle occupant of unknown age and 1 motorcyclist of unknown sex.

Given the large proportion of motorcyclists among animal-related crash fatalities, additional analyses were conducted in relation to vehicle type. Figure 3 compares the monthly distribution of animal-related crashes by vehicle type. As noted previously, numbers and proportions of animal-related crashes and injuries are by far the highest in October and November, whereas the total numbers of fatalities were slightly higher in the summer months. As Figure 3 shows, the

distribution of passenger vehicle and large truck involvement in animal-related crashes is very similar to the distribution of overall animal-related crashes shown in Figure 1. In contrast, motorcycle involvement in animal-related crashes peaked in July and was far less prevalent in October and November. This is generally consistent with patterns of motorcycle crashes overall, which also peak in the summer months.

Figure 3. Monthly Distribution of Animal-Related Crashes by Vehicle Type, United States, 2020–2024

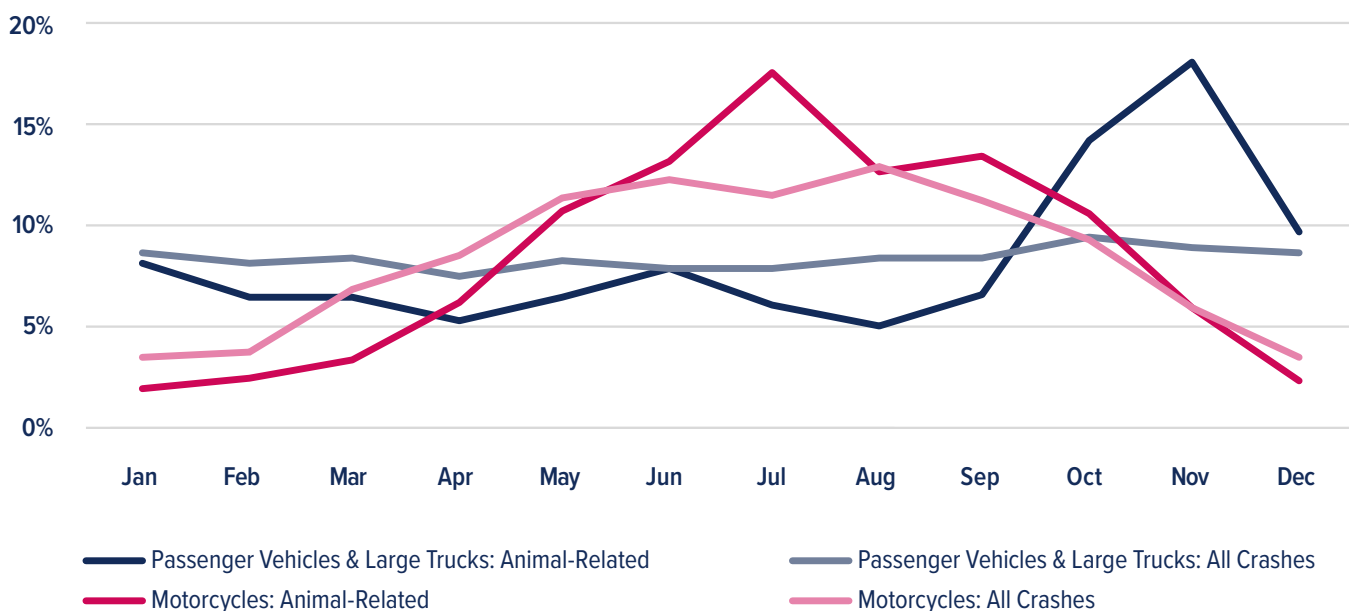
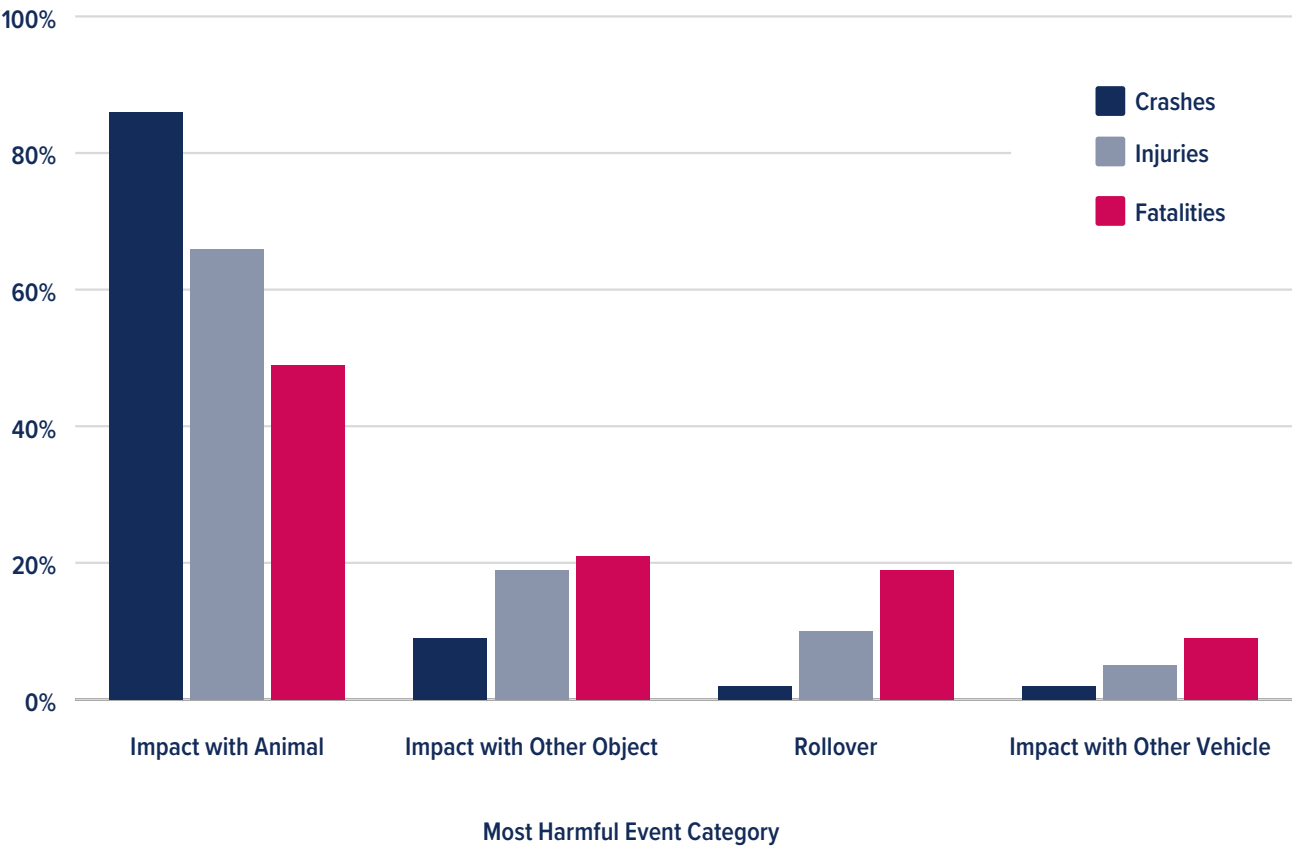


Figure 4 shows animal-related crashes, injuries, and fatalities in relation to the most harmful event in the crash. Because the underlying variable in the crash databases includes a large number of categories, the most harmful event was collapsed into five categories for ease of interpretation: striking or being struck by the animal, striking or being struck by another vehicle, striking another object (e.g., a tree), rolling over, and other. The distribution of the most harmful event differed markedly between crashes and fatalities (with the distribution of

injuries falling in between the two). Among animal-related crashes overall, striking the animal was the most harmful event in the vast majority of cases (86%). Few involved impact with a second vehicle, and very few involved impact with another object or rolling over. In contrast, striking the animal was the most harmful event in less than half of all animal-related fatalities (49%). Striking another object was the most harmful event in 21% of fatalities, followed by rolling over (19%) and striking another vehicle (9%).

Figure 4. Animal-Related Crashes, Injuries, and Fatalities by Most Harmful Event Categories, United States, 2020–2024



Note: Excludes category "other" (<1% of crashes and injuries; 2% of fatalities)

Table 4 shows the distribution of most harmful event separately for vehicle occupants and for motorcyclists. For all animal-related crashes collectively, impact with the animal was the most harmful event in 77% of motorcycle crashes with animals and 86% of vehicle crashes with animals. For motorcyclists, impact with the animal was the most harmful event in a similarly high proportion of injuries and deaths. However, among vehicle occupants, impact with the animal

was the most harmful event in a slightly lower 65% of injuries but only 19% of fatalities. Among vehicle occupant fatalities, striking another object (33%) and rolling over (28%) were both much more prevalent as the most harmful event, compared with the impact with the animal itself (19%). Impact with a second vehicle (17%) was the most harmful event in nearly as many occupant fatalities as impact with the animal.

Table 4. Crashes, Injuries, and Fatalities Involving Animals by Most Harmful Event Categories and Vehicle Type, United States, 2020–2024

	Passenger Vehicles & Large Trucks		Motorcycles	
	Number	%	Number	%
Crashes				
Impact with Animal	1,508,161	86.4%	15,659	77.2%
Rollover	37,644	2.2%	2,709	13.4%
Impact with Other Vehicle	29,097	1.7%	104	0.5%
Impact with Other Object	163,339	9.4%	1,524	7.5%
Other Harmful Event	7,329	0.4%	285	1.4%
Total	1,745,571	100.0%	20,281	100.0%
Injuries				
Impact with Animal	147,948	65.0%	14,666	76.7%
Rollover	20,684	9.1%	2,623	13.7%
Impact with Other Vehicle	11,494	5.0%	205	1.1%
Impact with Other Object	45,784	20.1%	1,135	5.9%
Other Harmful Event	1,759	0.8%	490	2.6%
Total	227,669	100.0%	19,118	100.0%
Fatalities				
Impact with Animal	117	19.1%	518	79.1%
Rollover	171	27.9%	41	6.3%
Impact with Other Vehicle	105	17.1%	20	3.1%
Impact with Other Object	200	32.6%	71	10.8%
Other Harmful Event	21	3.4%	5	0.8%
Total	614	100.0%	655	100.0%

**In-Depth Examination of Crash
Scenarios in State Crash Databases**

State crash data from North Carolina, Ohio, and Pennsylvania were examined to gain additional insight into common scenarios of crashes involving animals. Table 5 shows the average monthly number of animal-

related crashes in each of these three states. Despite differences in data elements and reporting systems, all three states exhibited similar seasonal patterns. Approximately 45–50% of annual animal-related crashes occurred in October–December, with 20–23% occurring in November alone.

Table 5. Monthly Distribution of Animal-Related Crashes by State

	North Carolina ^a		Ohio ^b		Pennsylvania ^a	
	#	(%)	#	(%)	#	(%)
January	1,924	(8.4)	1,467	(7.0)	301	(5.2)
February	1,446	(6.3)	1,268	(6.1)	231	(4.0)
March	1,339	(5.8)	1,290	(6.2)	239	(4.1)
April	1,033	(4.5)	1,123	(5.4)	266	(4.6)
May	1,158	(5.1)	1,632	(7.8)	473	(8.2)
June	1,442	(6.3)	1,470	(7.0)	506	(8.8)
July	1,097	(4.8)	1,010	(4.8)	319	(5.5)
August	946	(4.1)	841	(4.0)	279	(4.8)
September	1,195	(5.2)	1,156	(5.5)	354	(6.1)
October	3,232	(14.1)	3,164	(15.1)	1,080	(18.7)
November	5,172	(22.6)	4,312	(20.6)	1,263	(21.9)
December	2,945	(12.9)	2,170	(10.4)	466	(8.1)
Total	22,928	(100.0)	20,901	(100.0)	5,777	(100.0)

Notes: ^a2020–2024; ^b2021–2024.

North Carolina

In North Carolina, animal-related crashes predominantly occurred in rural areas (85%), under dark lighting conditions (68%), on roads with posted speed limits of 45–60 miles per hour (MPH) (83%), on straight and level roadways (81%), and on non-divided two-way roads (79%). These characteristics were consistently reflected in the most prevalent crash scenarios (Table 6).

The three most prevalent scenarios accounted for 28% of all animal-related crashes. These scenarios shared the same roadway and environmental characteristics, differing only by time of year. The most common scenario involved a dark, rural, non-divided, two-way roadway with straight and level alignment and a posted speed limit of 45–60 MPH. Across these crash types, the proportion resulting in injuries ranged from 2.3% to 2.7%.

Table 6. Top Scenario Combinations for Animal-Related Crashes, North Carolina, 2020–2024

Scenario	Prevalence (%)	Injury Rate (%)	Quarter of Year	Lighting Condition	Roadway Characteristic	Speed Limit (MPH)	Urbanicity	Road Alignment
1	15.9	2.7	4	Dark	Non-divided two-way road	45–60	Rural	Straight & level
2	7.7	2.3	1					
3	4.7	2.5	2					
4	4.3	2.8	4	Daylight				
5	4.2	2.8	3	Dark	Positive median divided two-way road	65+	Mixed	
6	2.6	2.6	4					
7	2.6	4.9						
8	2.3	2.3	2	Daylight	Non-divided two-way road	45–60	Rural	
9	2.2	2.1	3					
10	2.1	4.1	4	Dark	Unprotected divided two-way road			
11	2.0	2.6	1	Daylight	Non-divided two-way road			

Ohio

In Ohio, animal-related crashes predominantly occurred in rural areas (66%), under dark lighting conditions (67%), and on roads with posted speed limits of 45–60 MPH (73%). Regarding road type, crashes most frequently occurred on collectors (36%) followed by arterials (30%). The most common crash scenarios are shown in Table 7.

Prevalent crash scenarios were less concentrated than those in North Carolina, with the three most prevalent scenarios accounting for approximately 20% of all animal-related crashes. The dominant environmental characteristics were dark and rural roadways with posted speed limits of 45–60 MPH. However, the road type varied across all scenarios, where local roads, collectors, arterials, and interstates and freeways were all represented in the top 50% of crashes. Notably, scenarios involving Interstates and freeways with speed limits of at least 65 MPH exhibited higher injury rates (5.8%–8.1%) than the other scenarios on lower speed limit roads (2.5%–4.5%), suggesting that roadways with higher speeds may be associated with an increased likelihood of injury.

Table 7. Top Scenario Combinations for Animal-Related Crashes, Ohio, 2021–2024

Scenario	Prevalence (%)	Injury Rate (%)	Road Type	Quarter of Year	Urbanicity	Speed Limit (MPH)	Lighting Condition		
1	9.6	3.5	Collector	4	Rural	45–60	Dark		
2	6.2	4.5	Arterial						
3	4.6	2.5	Collector	1					
4	3.3	8.1	Interstate & freeway	4	Urban	65+		Dark	
5	3.3	7.8			Rural				
6	3.1	2.9	Local		Urban	45–60			
7	3.0	4.0	Arterial						
8	2.6	3.7	Collector	2	Rural				45–60
9	2.4	3.6	Arterial	1					
10	2.2	4.5	Collector	3					
11	1.9	4.2		4	Urban	65+			
12	1.8	3.0							
13	1.6	5.8	Interstate & freeway	2	Urban		65+	Dark	
14	1.5	5.8			Rural	45–60			
15	1.5	3.7	Arterial						
16	1.5	3.0	Local	1					

Pennsylvania

In Pennsylvania, animal-related crashes predominantly occurred in rural areas (70%), under dark lighting conditions (64%), and on state highways (67%) and interstates (16%). In terms of posted speed limits, the most frequent crashes were on roads with speed limits of 45–60 MPH (53%) followed by roads with speed limits of 40 MPH or below (26%), and 65 MPH or above (21%). The most prevalent crash scenarios are shown in Table 8.

The three most prevalent scenarios accounted for approximately 22% of animal-related crashes. These scenarios commonly occur during the fourth quarter of the year, on highways or interstates, and under dark lighting conditions. Unlike Ohio, scenarios on higher speed limit roadways did not exhibit higher injury rates. Instead, almost all the prevalent scenarios in Pennsylvania showed injury rates exceeding 10%, higher than those observed in North Carolina and Ohio. (Note that as discussed below, this may reflect differences in police reporting requirements across the states and not necessarily differences in the severity distribution of all animal-related crashes across the three states.)

Table 8. Top Scenario Combinations for Animal-Related Crashes, Pennsylvania, 2020–2024

Scenario	Prevalence (%)	Injury Rate (%)	Quarter of Year	Lighting Condition	Urbanicity	Speed Limit (MPH)	Road Type
1	12.1	11.7	4	Dark	Rural	45–60	State highway
2	5.2	11.2			Urban		
3	4.6	10.0			Rural	65+	Interstate
4	4.4	13.0		Light		45–60	State highway
5	3.6	13.0	1	Dark			
6	3.3	16.7	2	Light			
7	2.9	16.7	3	Dark			
8	2.7	15.2	2				
9	2.7	17.8	3	Light			
10	2.6	17.8	4	Dark		Up to 40	
11	2.4	16.2		Urban			
12	2.1	12.6	2	Light	Rural	65+	Interstate
13	1.9	9.7	4	Dark			State highway

DISCUSSION

This research sought to estimate the numbers of animal-related crashes in the U.S. in recent years, the numbers of injuries and deaths resulting from those crashes, and common animal-related crash scenarios. Results indicated that there were approximately 353,800 police-reported animal-related crashes annually in the years 2020–2024, resulting in approximately 49,725 injuries and 277 deaths each year.

Note that these estimates are effectively a lower bound for the prevalence of animal-related crashes and non-fatal injuries. NHTSA estimates that nearly one-third of crashes resulting in non-fatal injuries and nearly 60% of crashes not resulting in any injuries to people went unreported to law enforcement agencies (Blincoe et al., 2023). A study of unreported deer crashes in Iowa estimated that about 40% of such crashes went unreported to law enforcement (Shaw et al., 2023). A study of automobile insurance claims for animal-related crashes reported that there were over 400,000 animal-related insurance claims annually in 2018–2022 (Highway Loss Data Institute [HLDI], 2023), however, the true toll of animal-related crashes is likely still higher as not all drivers carry coverage relevant to animal-related crashes, and some may prefer to avoid making an insurance claim. A previous FHWA report that examined national crash databases, insurance data, and interviewed drivers estimated that there were approximately 300,000 police-reported animal-related crashes annually in 2001–2005, but concluded based on other sources that there were likely roughly 1 million to 2 million animal-related crashes each year in total including the many unreported crashes (Huijser et al., 2008).

The prevalence of animal-related crashes varies greatly across the country as well as over the course of the year. Animal-related crashes were found to be by far the most prevalent in the Midwest, where they accounted for more than one in seven reported crashes year-round and

nearly one in three crashes in November. A non-trivial share of all crashes in the Northeast were found to involve animals as well. In contrast, the prevalence of animal-related crashes was much lower in southern and western states. These temporal and geographic patterns align well with findings from a study of automobile insurance claims for animal-related crashes (HLDI, 2023).

In contrast to the general trends in crashes and injuries, animal-related crash fatalities were found to peak in the months of June and July. Although initially unexpected, additionally analysis revealed this to be due in large part to the substantial proportion of victims who were motorcyclists and corresponded to the months when overall motorcycle crashes (regardless of animal involvement) were most prevalent. Whereas more than nine in ten vehicles involved in animal-related crashes were passenger vehicles or trucks, nearly half of those who died were people riding motorcycles. Also illustrating the great vulnerability of motorcyclists in such crashes, almost all motorcyclists involved in animal-related crashes were injured or killed, whereas only approximately one in eight animal-related vehicle crashes resulted in injuries to any occupants.

In-depth examination of data from three diverse states revealed substantial consistency in the most common scenarios in which animal-related crashes occur. The vast majority of common crash scenarios identified featured rural roads with speed limits of 45 miles per hour or higher, with most occurring in darkness.

Examination of animal-related crashes, injuries, and deaths suggest that for occupants of passenger vehicles and large trucks, attempting to avoid striking an animal may often be riskier than striking the animal. While impact with the animal itself was the most harmful event in roughly seven in eight animal-related vehicle crashes overall, it was the most harmful event in fewer than one in five animal-related crash fatalities of

vehicle occupants. Among occupant fatalities in animal-related crashes, striking objects such as trees and rolling over were both more common as the most harmful event than the impact with the animal itself, and striking another vehicle was nearly as common, suggestive of higher risk of taking sudden evasive action in attempt to avoid striking an animal. In contrast, the impact with the animal was coded as the most harmful event for most motorcyclist fatalities. This is most likely attributable in large part to the absence of impact-absorbing structures on motorcycles (e.g., an animal that would have impacted the bumper/hood/windshield of a car or truck would impact a motorcyclist's body directly). It may also be difficult for a law enforcement officer investigating a collision to determine the relative harm attributable to impact with an animal versus falling or being thrown from the motorcycle in the event of a fatal motorcycle-animal collision.

It should be noted that the type of animal involved in any specific crash in the current study was unknown. The national crash databases provide no indication of the type of animal involved. Among the states whose data were examined, Pennsylvania's data only includes deer, North Carolina provides no information about type of animal, and Ohio identifies deer, farm animals, and other unspecified animals. (In the Ohio data examined for the current study, 95% were deer.) Previous studies and other data sources would generally suggest that the vast majority involve deer. Huijser et al. (2008) examined data on wildlife-vehicle crashes in several states and found that while percentages varied between states, deer consistently were the most prevalent type of animal involved. A study of wildlife-involved collisions in Maine in 2020–2024 reported that 93% involved deer, 4% involved moose, and all other animal types combined accounted for only 3% of crashes (Maine Department of Transportation, n.d.). However, in some instances, the type of animal may be relevant. As noted previously, in aggregate, animal-related crashes are far more likely to be

fatal when the vehicle involved impacts another object or rolls over, likely in attempt to avoid the animal, rather than when striking the animal. However, this may not apply in every instance. The Maine DOT reports that 16% of crashes with moose resulted in injury and 0.25% were fatal, compared with only 3% of deer crashes resulting in injury and 0.01% in fatality.

There is a need to develop and evaluate countermeasures that seek to prevent or mitigate animal-related crashes. One study of deer-vehicle crash countermeasures found that few were supported by high-quality evidence (Knapp, 2005). Multiple studies have found little evidence of effectiveness for traditional wildlife warning signs (e.g., Khalilikhah & Heaslip, 2017, Ahmed & Ahmed, 2022). More recent studies have found evidence of effectiveness of countermeasures such as crossing structures (e.g., overpasses or underpasses) to allow animals to cross roadways, as well as fencing and animal detection systems (e.g., Wilkins et al., 2019).

Finally, limitations regarding state data should also be acknowledged. First, though a common analytical framework was applied across states, the available variables differed in the state's crash databases, particularly roadway characteristics. In addition, the severity distribution of reported animal-related crashes varied greatly between states; however, this may not reflect actual differences in crash severity. For example, while Pennsylvania exhibited fewer reported animal-related crashes and a higher injury rate than North Carolina and Ohio, Pennsylvania had lower proportion of non-injury crashes overall (i.e., not limited to animal-related crashes). This is likely due to differences in crash reporting practices between states rather than differences in the actual severity of all crashes that occur. Blincoe et al. (2023) discuss differences in state reporting requirements and note that Pennsylvania has a higher threshold than many other states for when a crash must be reported.

Implications

Animal-related crashes result in at least 353,800 police-reported crashes, 49,725 injuries, and 277 deaths each year. True numbers of non-fatal crashes and injuries are likely higher. Crashes were by far the most likely to involve animals in the Midwest; the Northeast had a substantial share of animal-related crashes as well. Animal-related crashes were most prevalent in the fall and peaked in November. The vast majority of animal-related crashes that lead to the death of a vehicle occupant involve other events more severe than striking the animal, such as impact with a tree or another vehicle, or rolling over, suggesting that in many instances taking sudden evasive action to attempt to avoid striking an animal may be riskier than striking

it. However, the current study was not able to determine the types of animals involved in crashes. While a large majority are suspected to involve deer, a recommendation against taking evasive action may not be generalizable to every situation, particularly with respect to encounters with larger animals such as moose, elk, or bison. Results also highlight the vulnerability of motorcyclists to severe injury or death in the event of a crash with an animal. Most animal-related crashes occur on rural areas, often in darkness, and on roads with speed limits of 45 miles per hour or higher. Results highlight the importance of motorists maintaining safe speeds, so that in the event of an unexpected situation such as an animal entering the road, they have more time to identify the hazard and respond safely.

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Appendix. Deaths in Animal-Related Crashes by State, United States, 2020–2024

	2020	2021	2022	2023	2024	Total
Alabama	7	3	4	8	3	25
Alaska	0	2	4	1	2	9
Arizona	2	5	5	6	6	24
Arkansas	4	3	4	2	1	14
California	6	8	9	14	9	46
Colorado	5	4	6	3	3	21
Connecticut	1	2	0	3	1	7
Delaware	0	0	1	0	0	1
District of Columbia	1	0	0	0	0	1
Florida	11	9	9	6	4	39
Georgia	14	8	7	5	9	43
Idaho	0	1	3	2	3	9
Illinois	18	6	6	11	9	50
Indiana	7	4	9	12	7	39
Iowa	4	7	6	8	5	30
Kansas	7	4	7	7	5	30
Kentucky	11	12	6	4	12	45
Louisiana	4	1	2	2	5	14
Maine	5	0	0	0	3	8
Maryland	3	0	3	3	6	15
Massachusetts	1	0	6	0	0	7
Michigan	7	13	14	19	16	69
Minnesota	5	5	9	7	10	36
Mississippi	3	3	3	2	7	18
Missouri	11	5	11	7	7	41
Montana	12	7	2	6	2	29
Nebraska	3	2	1	2	1	9
Nevada	1	2	1	2	2	8
New Hampshire	3	1	0	1	0	5
New Jersey	0	8	4	0	3	15
New Mexico	4	3	3	3	3	16
New York	8	4	3	11	11	37
North Carolina	3	7	3	5	12	30
North Dakota	2	0	1	1	4	8
Ohio	4	15	11	17	12	59
Oklahoma	4	6	9	7	9	35
Oregon	5	5	1	4	5	20
Pennsylvania	19	14	9	26	20	88
Rhode Island	0	0	1	0	0	1
South Carolina	3	6	6	7	8	30
South Dakota	6	2	2	2	2	14
Tennessee	3	1	7	6	10	27
Texas	30	26	26	27	28	137
Utah	6	0	4	5	2	17
Vermont	1	1	1	0	0	3
Virginia	7	8	9	5	1	30
Washington	8	0	5	4	2	19
West Virginia	3	2	5	7	3	20
Wisconsin	19	15	9	19	15	77
Wyoming	2	1	3	0	2	8
Total	293	241	260	299	290	1,383