U.S. Department of Transportation
National Highway Traffic Safety Administration
NHTSA

Traffic Safety Facts
RESEARCH NOTE

DOT HS 813 667 December 2024

Overview of the 2023 Crash Investigation Sampling System

Summary

Data from the 2023 Crash Investigation Sampling System (CISS) shows there were an estimated 2,555,023 police-reported motor vehicle traffic crashes nationwide where at least one passenger vehicle (i.e., passenger car, light truck, or van[1] less than 10,000 lb) was towed from the crash scene, which resulted in an estimated 1,043,485 injured occupants of in-transport towed passenger vehicles. Among these crashes, 2.6 percent (67,042) were crashes with the highest injury levels of serious or above, 21.2 percent (540,690) were crashes with moderate or minor injury levels, and 59.5 percent (1,520,405) were crashes with no injury. In 2023 CISS selected 4,636 police-reported crashes. Of the 4,636 selected crashes, 3,997 were eligible for investigation.

Introduction

The National Highway Traffic Safety Administration is releasing the seventh year of data from the modernized CISS – a replacement of the National Automotive Sampling System Crashworthiness Data System (NASS CDS). NHTSA designed the CISS to select a more efficient and flexible sample compared to CDS, using updated traffic and demographic information, and optimizing the sample to better meet data users' needs. For more information, see *Crash Investigation Sampling System: Sample Design and Weighting* (Zhang et al., 2019a). In 2023 motor vehicle traffic crashes that involved at least one passenger vehicle towed from the scene of the crash were sampled, investigated, and coded at 32 selected sites across the Nation. Statistical weighting procedures generated nationally representative estimates of relevant crashes. This research note presents a summary of key estimates of crashes in 2023.[2] For a more detailed explanation of the sample design, estimation protocols, and guidance on how to analyze the data, please refer to *Crash Investigation Sampling System: Design Overview, Analytic Guidance and FAQs* (Zhang et al., 2019b; Revised 2024). In addition to sample design and weighting enhancements, several improvements were made to information technology infrastructure and operational protocols of CISS to gather more relevant, accurate, and nationally representative data.

Results

Crashes

For the 2023 CISS there were 3,997 sampled police-reported crashes investigated where at least one passenger vehicle was towed from the scene. This represents an estimated 2,555,023 police-reported crashes in the population. Table 1 and Figure 1 show the estimates by the maximum Abbreviated Injury Scale[3] (AIS) in the crash which is the most severe injury level among the occupants of towed in-transport passenger vehicles

[1] Light trucks or vans include pickups, vans, and SUVs.

[2] This research note does not include comparisons to the 2022 CISS. For more information about the 2022 CISS refer to:

National Center for Statistics and Analysis. (2023, November). *Overview of the 2022 Crash Investigation Sampling System* (Traffic Safety Facts Research Note. Report No. DOT HS 813 526). National Highway Traffic Safety Administration. https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/813526

[3] For more information on AIS, see www.aaam.org/abbreviated-injury-scale-ais/

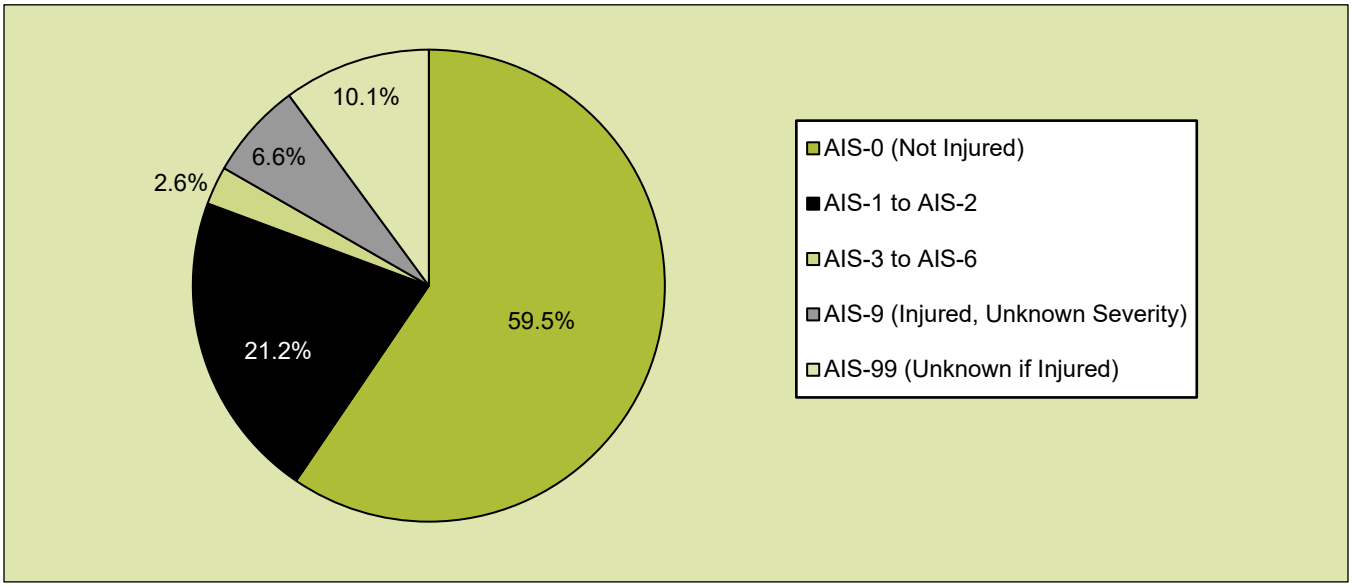
involved in a crash as captured in the variable called CAIS. There were an estimated 67,042 (49,904 serious; 6,393 severe; 6,927 critical; 3,819 maximum) crashes with injury levels of serious or above. An estimated 540,690 crashes resulted in minor or moderate injury levels, and an estimated 1,520,405 crashes resulted in no injury.

Table 1. CISS-Applicable Police-Reported Motor Vehicle Crashes in 2023, by Maximum AIS in the Crash

Maximum AIS in the Crash	Estimates (Standard Error)	Percent of Total Crashes
0-Not Injured	**1,520,405 (65,749)**	**59.5%**
1-Minor	451,555 (35,848)	17.7%
2-Moderate	89,135 (7,975)	3.5%
Subtotal (AIS-1 to AIS-2)	**540,690 (39,896)**	**21.2%**
3-Serious	49,904 (6,303)	2.0%
4-Severe	6,393 (1,228)	0.3%
5-Critical	6,927 (1,357)	0.3%
6-Maximum (Untreatable)	3,819 (1,088)	0.1%
Subtotal (AIS-3 to AIS-6)	**67,042 (7,622)**	**2.6%**
9-Injured, Unknown Severity	169,209 (22,452)	6.6%
Subtotal (AIS-1 to AIS-9)	**776,942 (47,410)**	**30.4%**
99-Unknown If Injured	257,676 (42,934)	10.1%
Total	**2,555,023 (114,944)**	**100.0%**

Source: 2023 CISS. Note: Some components may not add to subtotals or totals due to independent rounding.

Figure 1. CISS-Applicable Police-Reported Motor Vehicle Crashes in 2023, by Maximum AIS in the Crash



Source: 2023 CISS

Vehicles Involved

The 3,997 sampled police-reported crashes where at least one passenger vehicle was towed in 2023 involved 7,037 vehicles. This represents an estimated 4,646,404 vehicles in the population. Table 2 shows among the estimated 4,646,404 vehicles, 4,407,688 (94.9%) were passenger vehicles[4] that included 2,030,839 passenger cars (43.7%) and 2,333,187 light trucks or vans (50.2%).

Table 2. Vehicles in CISS Crashes in 2023, by Vehicle Type

Vehicle Type	Estimates (Standard Error)	Percent of Total Vehicles
Passenger Cars	2,030,839 (213,806)	43.7%
Light Trucks or Vans (SUVs, Vans, and Pickup Trucks)	2,333,187 (110,842)	50.2%
Unknown Type of Passenger Vehicles*	43,662 (11,106)	0.9%
Subtotal	**4,407,688 (225,245)**	**94.9%**
Total**	**4,646,404 (237,028)**	**100.0%**

Source: 2023 CISS. Note: Some components may not add to subtotals or totals due to independent rounding.
*These vehicles were identified as light passenger vehicles, but the vehicle type is unknown based on vPIC.
**Total includes large trucks, motorcycles, buses, other, and unknown vehicle types. The estimated number of non-passenger vehicles are not displayed because CISS collects minimal information for those vehicles.

Occupants Involved

In 2023 there were 7,833 occupants of towed in-transport passenger vehicles in sampled CISS crashes. This represents an estimated 4,501,664 occupants in the population. Table 3 shows the maximum AIS of those occupants. Of the estimated 4,501,664 occupants, 3,884 (0.1%) had a maximum (untreatable) injury; 7,005 (0.2%) had a critical injury; 8,445 (0.2%) had a severe injury; 56,357 (1.3%) had a serious injury; 104,977 (2.3%) had a moderate injury; 604,481 (13.4%) had a minor injury; and 3,053,245 (67.8%) had no injury.

Table 3. Occupants of Towed In-Transport Passenger Vehicles Involved in CISS Crashes in 2023, by Maximum AIS of the Occupant

Maximum AIS of the Occupant	Estimates (Standard Error)	Percent of Total Occupants
0-Not Injured	**3,053,245 (136,853)**	**67.8%**
1-Minor	604,481 (56,177)	13.4%
2-Moderate	104,977 (8,681)	2.3%
Subtotal (AIS-1 to AIS-2)	**709,458 (60,367)**	**15.8%**
3-Serious	56,357 (6,153)	1.3%
4-Severe	8,445 (1,769)	0.2%
5-Critical	7,005 (1,375)	0.2%
6-Maximum (Untreatable)	3,884 (1,098)	0.1%
Subtotal (AIS-3 to AIS-6)	**75,691 (7,341)**	**1.7%**
9-Injured, Unknown Severity	258,337 (35,969)	5.7%
Subtotal (AIS-1 to AIS-9)	**1,043,485 (76,844)**	**23.2%**
99-Unknown If Injured	404,933 (56,444)	9.0%
Total	**4,501,664 (205,352)**	**100.0%**

Source: 2023 CISS. Note: Some components may not add to subtotals or totals due to independent rounding.

[4] In 2021, NHTSA began using vPIC Body Class as the source for vehicle classification. However, passenger vehicles are identified using Body Type. For more information about vPIC, refer to: National Center for Statistics and Analysis. (2024, April). *Product information catalog and vehicle listing (vPIC) analytical user's manual, 2022* (Report No. DOT HS 813 547). National Highway Traffic Safety Administration. https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/813547

Table 4 shows the mortality of occupants of towed in-transport passenger vehicles and the injury status of non-fatal occupants.[5] Of the estimated 4,501,664 occupants, 17,174 (0.4%) died within 30 days of the motor vehicle crash, and 1,025,940 (22.8%) were non-fatally injured.

Table 4. Occupants of Towed In-Transport Passenger Vehicles Involved in CISS Crashes in 2023, by Mortality and Injured Status

Mortality	Injured Status	Estimates (Standard Error)	Percent of Total Occupants
Fatal		17,174 (1,893)	0.4%
Non-Fatal	Not Injured	3,053,172 (136,840)	67.8%
	Injured*	1,025,940 (76,612)	22.8%
	Unknown if Injured	404,933 (56,444)	9.0%
	Subtotal (Non-Fatal)	**4,484,046 (204,702)**	**99.6%**
Total**		**4,501,664 (205,352)**	**100.0%**

Source: 2023 CISS. Note: Some components may not add to subtotals or totals due to independent rounding.
*Includes Injured, detail unknown.
**Includes Fatal – ruled disease

Table 5 shows the percentage of injured occupants of towed in-transport passenger vehicles in CISS crashes by age group and the maximum AIS of the occupant. For injured occupants under age 16, some 81 percent had a minor or moderate injury and 2 percent had a serious injury or above. Sixty-three percent of injured occupants 16 to 24 years old had a minor or moderate injury, and 5 percent had a serious injury or above. For injured occupants 25 to 44 years old, some 70 percent had a minor or moderate injury and 7 percent had a serious injury or above. Seventy-one percent of injured occupants 45 to 64 years old had a minor or moderate injury, and 9 percent had a serious injury or above. For occupants older than 65, some 69 percent had a minor or moderate injury and 12 percent had a serious injury or above.

Table 5. Injured Occupants of Towed In-Transport Passenger Vehicles in CISS Crashes in 2023, by Age Group and Maximum AIS of the Occupant

Maximum AIS of the Occupant	Age Group					
	Percentage (Standard Error)					
	<16	16-24	25-44	45-64	65+	Total*
AIS-1 to AIS-2 (Minor or Moderate Injury)	81.2% (10.2%)	62.6% (5.7%)	69.9% (2.9%)	71.0% (3.0%)	69.1% (4.9%)	68.0% (2.9%)
AIS-3 to AIS-6 (Serious Injury to Maximum (Untreatable) Injury)	1.9% (0.7%)	5.3% (1.0%)	7.1% (1.2%)	9.1% (1.8%)	11.9% (3.1%)	7.3% (0.5%)
AIS-9 (Injured, Unknown Severity)	16.8% (10.3%)	32.0% (6.3%)	23.0% (2.5%)	19.9% (2.9%)	18.9% (3.9%)	24.8% (2.9%)
Total	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

Source: 2023 CISS. Note: Some components may not add to subtotals or totals due to independent rounding.
*Includes unknown age.

Table 6 shows injured occupants of towed in-transport passenger vehicles with maximum AIS-3 or above in CISS crashes by sex and the maximum AIS of the occupant. Of the estimated 75,691 occupants with maximum AIS-3 or above, 44,721 (59.1%) were males and 30,970 (40.9%) were females. For males, 31,802 (71.1%) had serious injury; 5,351 (12.0%) had severe injury; 4,890 (10.9%) had critical injury; and 2,679 (6.0%) had maximum (untreatable) injury. For females, 24,555 (79.3%) had serious injury; 3,095 (10.0%) had severe injury; 2,115 (6.8%) had critical injury; and 1,205 (3.9%) had maximum (untreatable) injury.

[5] It is important to note the fatal estimate presented in Table 5 is different from the Fatality Analysis Reporting System (FARS). FARS includes all passenger vehicle occupants (regardless of tow status), other vehicle occupants, and nonoccupant fatalities.

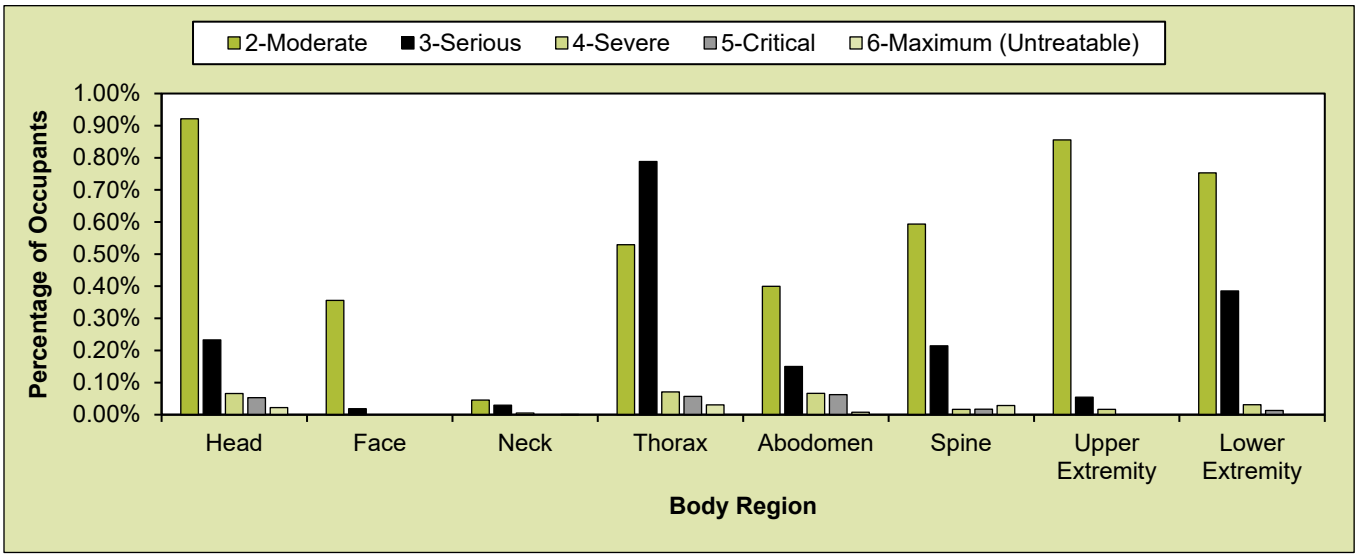
Table 6. Seriously Injured Occupants of Towed In-Transport Passenger Vehicles Involved in CISS Crashes in 2023, by Sex and Maximum AIS of the Occupant

Maximum AIS of the Occupant	Sex					
	Male		Female		Total*	
	Estimates (Standard Error)	Percent of Injured Occupants	Estimates (Standard Error)	Percent of Injured Occupants	Estimates (Standard Error)	Percent of Injured Occupants
3-Serious	31,802 (4,384)	71.1%	24,555 (3,877)	79.3%	56,357 (6,153)	74.5%
4-Severe	5,351 (1,192)	12.0%	3,095 (873)	10.0%	8,445 (1,769)	11.2%
5-Critical	4,890 (1,672)	10.9%	2,115 (627)	6.8%	7,005 (1,375)	9.3%
6-Maximum (Untreatable)	2,679 (1,011)	6.0%	1,205 (445)	3.9%	3,884 (1,098)	5.1%
Total	**44,721 (5,213)**	**100.0%**	**30,970 (3,997)**	**100.0%**	**75,691 (7,341)**	**100.0%**

Source: 2023 CISS. Note: Some components may not add to subtotals or totals due to independent rounding.
*Total includes unknown sex.

Figure 2 shows the percentage of occupants with injury of AIS-2 or above by body region and AIS. The body regions that most frequently sustained injury of AIS-2 or higher (AIS-2 to AIS-6) were the thorax, head, lower extremities, and upper extremities. Thorax, lower extremities, and head most frequently sustained injury of AIS-3 or higher (AIS-3 to AIS-6).

Figure 2. Percentage of Occupants in CISS Crashes With AIS-2 or Above by Body Region and AIS



Source: 2023 CISS. Note: The results shown are not mutually exclusive between each body region.

Drivers Involved

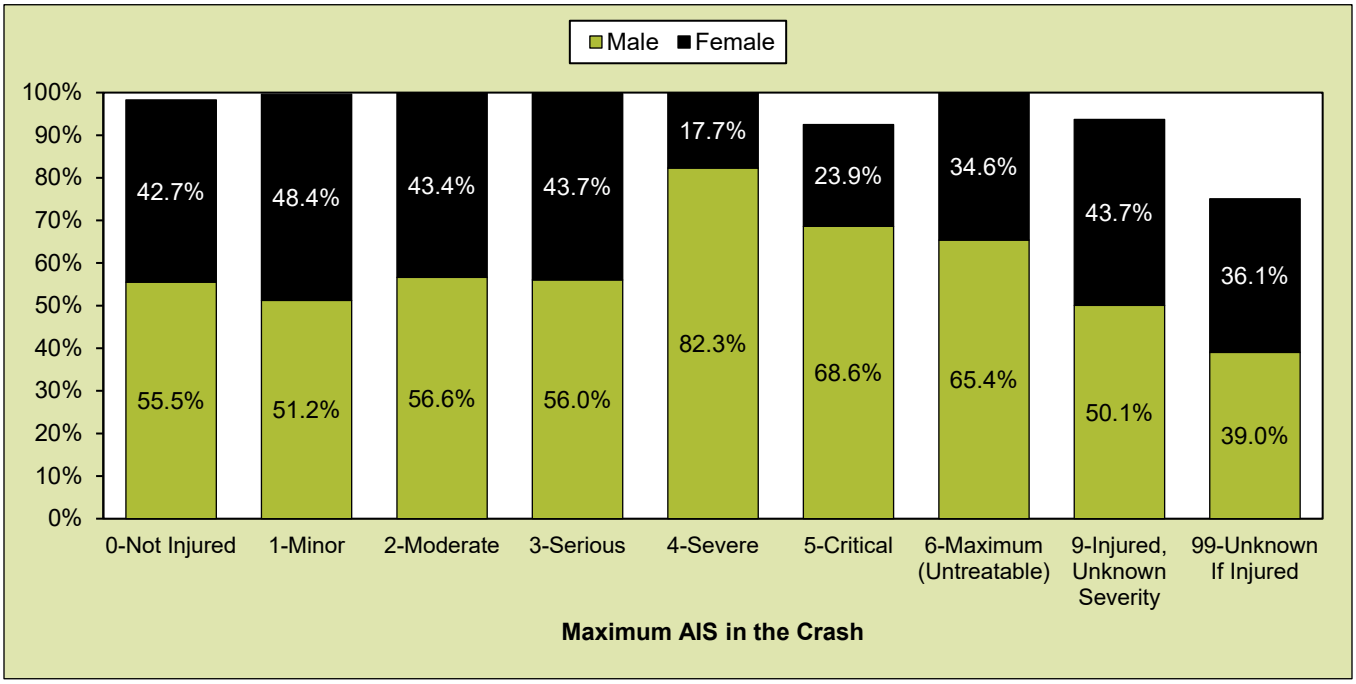
As shown in Table 7, among the estimated 3,353,337 drivers 16 and older of towed in-transport passenger vehicles involved in CISS crashes, 1,768,598 (52.7%) were male and 1,449,507 (43.2%) were female. The corresponding estimates of drivers were 1,008,403 (55.5%) male and 776,476 (42.7%) female in no-injury crashes; and 628,370 (52.4%) male and 551,237 (46.0%) female in injury crashes. Crashes with maximum injury levels of serious or above (AIS-3 to AIS-6) involved 63,626 (60.1%) male drivers of towed in-transport passenger vehicles compared to 41,329 (39.0%) female drivers. Figure 3 shows that the percentage of male drivers is highest in crashes where the maximum AIS is severe (82.3%) followed by crashes where the maximum AIS is critical (68.6%).

Table 7. Drivers (≥ 16 years old) of Towed In-Transport Passenger Vehicles Involved in CISS Crashes in 2023, By Sex and Maximum AIS in the Crash

Maximum AIS in the Crash	Sex		
	Male	Female	Total*
	Estimates (Standard Error)	Estimates (Standard Error)	Estimates (Standard Error)
0-Not Injured	**1,008,403 (73,690)**	**776,476 (65,324)**	**1,816,399 (95,168)**
1-Minor	356,466 (27,465)	336,864 (32,695)	695,908 (54,219)
2-Moderate	80,335 (10,817)	61,476 (6,926)	141,811 (15,326)
Subtotal (AIS-1 to AIS-2)	**436,801 (32,736)**	**398,340 (36,326)**	**837,720 (63,301)**
3-Serious	45,239 (7,995)	35,280 (5,914)	80,715 (12,708)
4-Severe	7,783 (1,562)	1,676 (471)	9,459 (1,873)
5-Critical	6,857 (1,959)	2,388 (773)	9,995 (2,144)
6-Maximum (Untreatable)	3,747 (1,460)	1,984 (953)	5,731 (2,202)
Subtotal (AIS-3 to AIS-6)	**63,626 (9,419)**	**41,329 (6,360)**	**105,900 (14,564)**
9-Injured, Unknown Severity	127,942 (21,168)	111,568 (21,724)	255,558 (41,009)
Subtotal (AIS-1 to AIS-9)	**628,370 (43,093)**	**551,237 (44,593)**	**1,199,178 (80,649)**
99-Unknown If Injured	131,826 (33,545)	121,794 (18,086)	337,760 (59,874)
Total	**1,768,598 (114,138)**	**1,449,507 (91,328)**	**3,353,337 (183,348)**

Source: 2023 CISS. Note: Some components may not add to subtotals or totals due to independent rounding.
*Total includes unknown sex.

Figure 3. Drivers (≥ 16 years old) of Towed In-Transport Passenger Vehicles Involved in CISS Crashes in 2023, by Sex and Maximum AIS in the Crash



Source: CISS 2023. Note: Percentages may not add to 100 percent due to unknown sex.

Comparisons of CISS with CDS, FARS, and CRSS

Comparisons of CISS estimates with CDS estimates should be performed with caution because they are two completely independent sample surveys designed more than 30 years apart. CISS and CDS have slightly different target populations. The CISS target population represents crashes where at least one passenger vehicle is towed from the scene (for any reason), whereas the CDS target population represents crashes where at least one passenger vehicle is towed *due to disabling damage*. Since CDS's target population is a sub-population of CISS's target population, it is possible to combine both data systems. For more information about combining CDS data

and CISS data, refer to *Crash Investigation Sampling System: Design Overview, Analytic Guidance and FAQs* (Zhang et al., 2019b; Revised 2024).

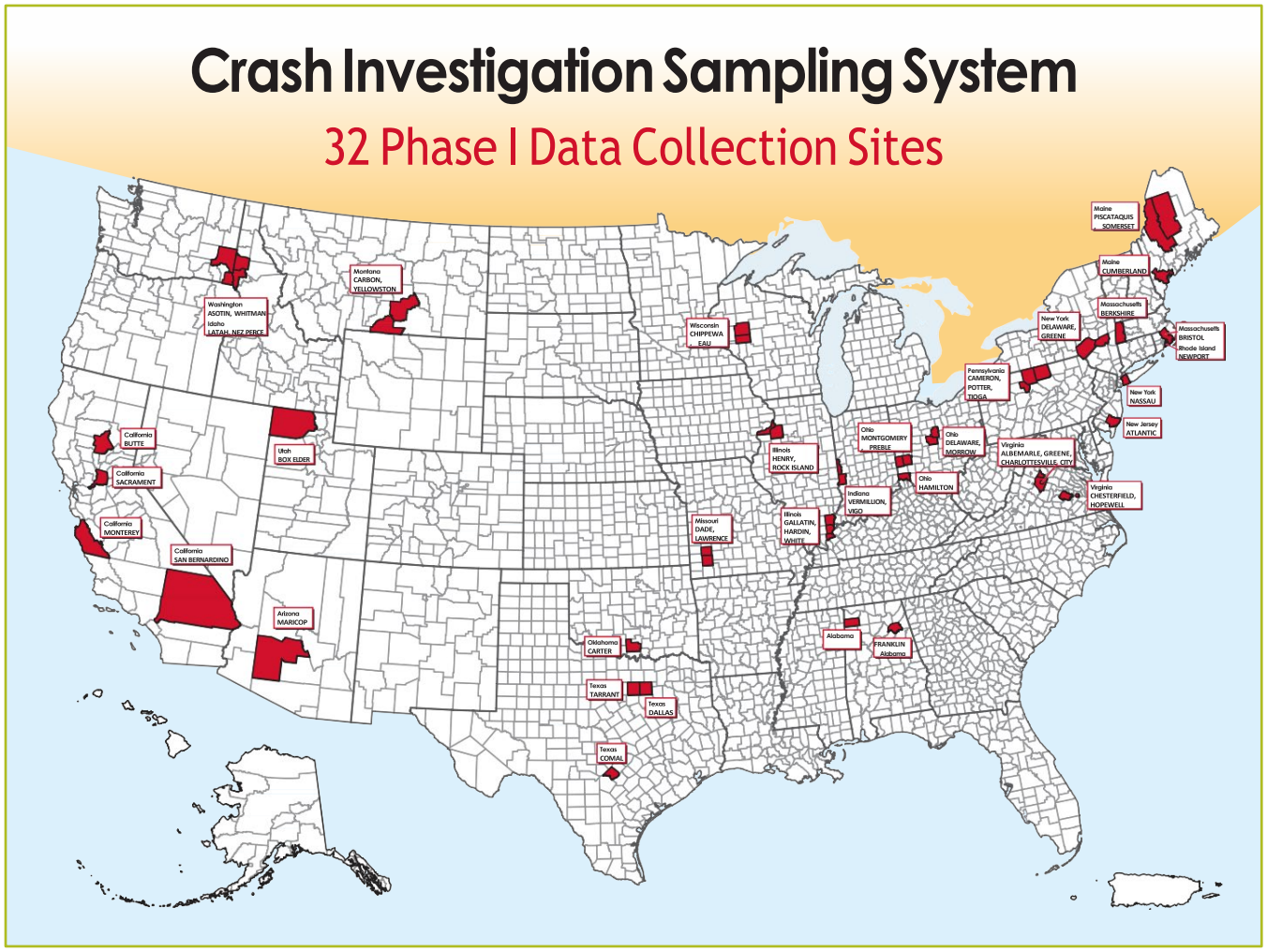
Additionally, the CISS target population is a sub-population of the Crash Report Sampling System (CRSS) target population. CRSS targets police-reported crashes on trafficways in the United States. Past estimates of total crashes from CISS are like the estimates of total crashes from the corresponding CRSS sub-population.

The Fatality Analysis Reporting System (FARS) is a national census of fatal crashes. CISS in-scope fatal crashes are also a sub-population of FARS. However, CISS data is normally collected 1 to 2 weeks after the crash, while FARS has much more time to identify and collect fatal crash data. Due to the nature of serious crashes and injury outcomes, CISS fatal crash estimates and FARS counts may not be comparable.

The 2023 CISS Sample

The map below shows the 32 data collection sites selected for 2023 CISS. In accordance with the Bipartisan Infrastructure Law, NHTSA has increased the number of data collection sites from 32 sites to 40 sites beginning with the 2024 CISS data collection. Concurrently, NHTSA has expanded the scope of data collection and is investigating non-motorist crashes in 2024 CISS, results from which will be reported with the release of the 2024 CISS data.

Figure 4. CISS Data Collection Sites



In 2023 CISS selected 4,636 police-reported crashes from 227 police jurisdictions in 32 sites across the country. Each police-reported crash is categorized into 10 analysis domains that were created based on internal and external data needs. Table 8 shows the target percentage of sample allocation for each analysis domain compared to the percentage of actual sampled cases for the 2023 CISS. The distribution of the 2023 CISS sampled cases is consistent with the target sample allocation distribution. Among the 4,636 crashes, 3,997 crashes[6] were eligible to be investigated and included in the final analytic files for estimation.

Table 8. Target Percentage of CISS Sample Allocation Versus Percentage of 2023 CISS Sampled Cases

CISS Analysis Domains	Description	Target Percentage of Sample Allocation	2023 Percentage of Sampled Cases
1	At least one occupant of towed passenger vehicle is killed	4.5%	4.7%
2	Crashes not in Domain 1 involving: A recent model year passenger vehicle in which at least one occupant is incapacitated	8.0%	7.1%
3	Crashes not in Domain 1 or 2 involving: A recent model year passenger vehicle in which at least one occupant is non-incapacitated, possibly injured, or injured but severity is unknown	22.0%	21.2%
4	Crashes not in Domain 1-3 involving: A recent model year passenger vehicle in which all occupants are not injured	15.5%	15.7%
5	Crashes not in Domain 1-4 involving: A mid-model year passenger vehicle in which at least one occupant is incapacitated	6.0%	5.7%
6	Crashes not in Domain 1-5 involving: A mid-model year passenger vehicle in which at least one occupant is non-incapacitated, possibly injured or injured but severity is unknown	12.0%	12.1%
7	Crashes not in Domain 1-6 involving: A mid-model year passenger vehicle in which all occupants are not injured	10.0%	10.6%
8	Crashes not in Domain 1-7 involving: An older model year passenger vehicle in which at least one occupant is incapacitated	6.0%	6.0%
9	Crashes not in Domain 1-8 involving: An older model year passenger vehicle in which at least one occupant is non-incapacitated, possibly injured or injured but severity is unknown	10.0%	10.2%
10	Crashes not in Domain 1-9 involving: An older model year passenger vehicle in which all occupants are not injured	6.0%	6.7%
Total		**100%**	**100%**

Source: 2023 CISS. Note: Components may not add to 100 percent due to independent rounding.
Recent model year (or late model year): vehicles that are 4 years old or newer (i.e., any model year of 2019-2024)
Mid-model year: 5- to 9-year-old vehicles (i.e., any model year of 2014-2018)
Older model year: vehicles that are 10 years old or older (i.e., any model year up to 2013)

[6] Out-of-scope cases and replaced non-responding cases are not investigated or included in the final analytic files.

Downloading and Analyzing 2023 CISS Data

The 2023 CISS data[7] can be downloaded from www.nhtsa.gov/file-downloads?p=nhtsa/downloads/CISS/2023/.

The analytic user's manual can be found at https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/813664.

The CISS coding and editing manual can be found at https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/813614.

The CISS crash viewer can be found at https://crashviewer.nhtsa.dot.gov/CISS/SearchIndex.

Crash Investigation Sampling System: Design Overview, Analytic Guidance, and FAQs can be found at https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/812801.

Crash Investigation Sampling System: Sample Design and Weighting can be found at https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/812804.

The DataBook application provides weighted and unweighted univariate distributions of the variables in CISS. It can be found at https://cdan.dot.gov/DataBook/DataBook.htm.

References

Zhang, F., Noh, E. Y., Subramanian, R., & Chen, C.-L. (2019a, September). *Crash Investigation Sampling System: Sample design and weighting* (Report No. DOT HS 812 804). National Highway Traffic Safety Administration. https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/812804

Zhang, F., Subramanian, R., Chen, C.-L., & Young Noh, E. Y. (2019b, September; Revised 2024, October). *Crash Investigation Sampling System: Design overview, analytic guidance, and FAQs* (Report No. DOT HS 812 801). National Highway Traffic Safety Administration. https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/812801

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[7] Prior CISS data can be downloaded from www.nhtsa.gov/file-downloads?p=nhtsa/downloads/CISS/.

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This research note and other general information on highway traffic safety may be found at: https://crashstats.nhtsa.dot.gov/.