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

Traffic Safety Facts
RESEARCH NOTE

DOT HS 813 634 September 2024

Motorcycle Helmet Use in 2023 – Overall Results

Use of DOT-compliant motorcycle helmets was 73.8 percent[1] in 2023, not statistically different at the 0.05 level from 66.5 percent in 2022. The 2023 estimate is the highest ever recorded. This result is from the National Occupant Protection Use Survey (NOPUS), the only survey that provides nationwide, probability-based, observed data on motorcycle helmet use in the United States. NHTSA's National Center for Statistics and Analysis conducts the NOPUS every year. Throughout this Research Note the term *helmet use* refers to the use of DOT-compliant motorcycle helmets unless otherwise stated.

The 2023 data collection occurred during the usual timeframe of early June, immediately following the *Click It or Ticket* campaign. There were 945 motorcyclists observed in the 2023 survey, a 1-percent increase from 934 motorcyclists in 2022 Table 3.

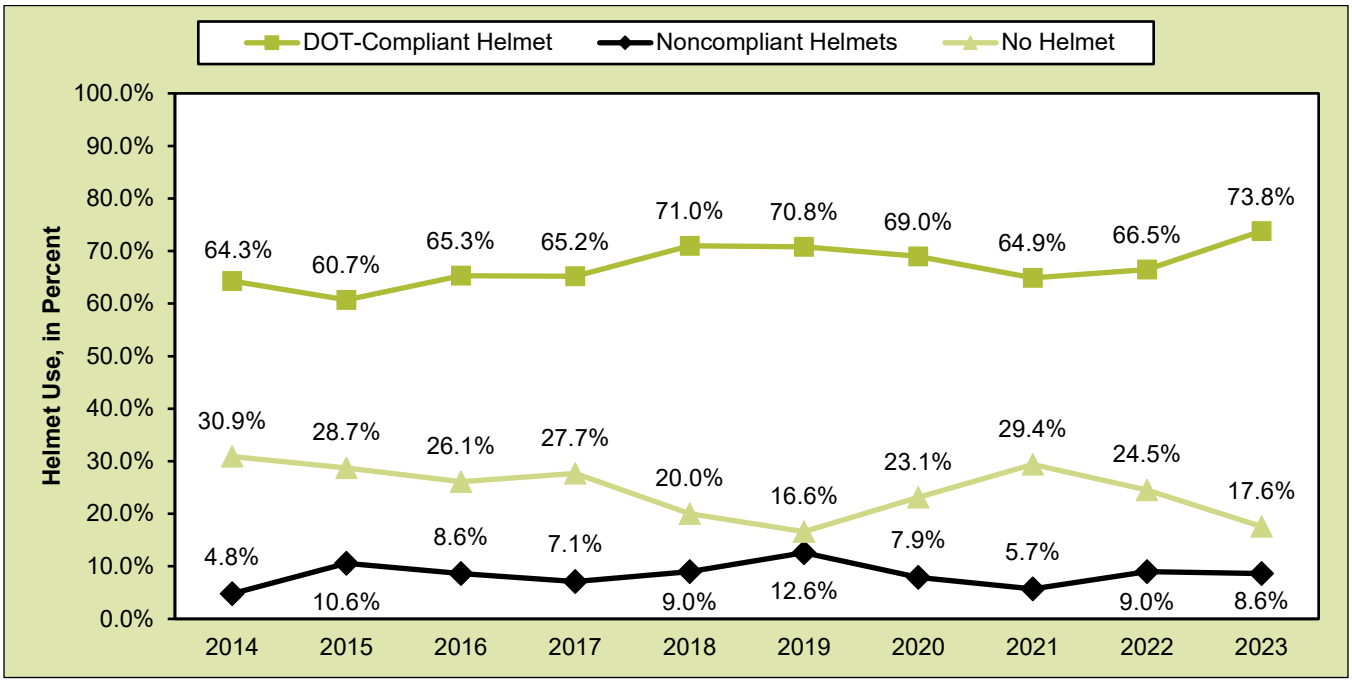
Figure 1 shows the motorcycle helmet use trends by DOT-compliant, noncompliant, and no helmet use since 2014. Figure 2 compares helmet use in States that require all motorcyclists to be helmeted compared to States that do not require helmets.

There are three subcategories with significant year-to-year changes in helmet use.

- DOT-compliant helmet use among motorcyclists traveling in light traffic increased significantly from 35.5 percent in 2022 to 66.0 percent in 2023 (Table 1).
- Use of noncompliant motorcycle helmets among motorcyclists traveling in slow traffic decreased significantly from 16.9 percent in 2022 to 7.7 percent in 2023 (Table 2).
- Use of noncompliant motorcycle helmets among motorcyclists traveling in light traffic decreased significantly from 21.1 percent in 2022 to 7.8 percent in 2023 (Table 2).

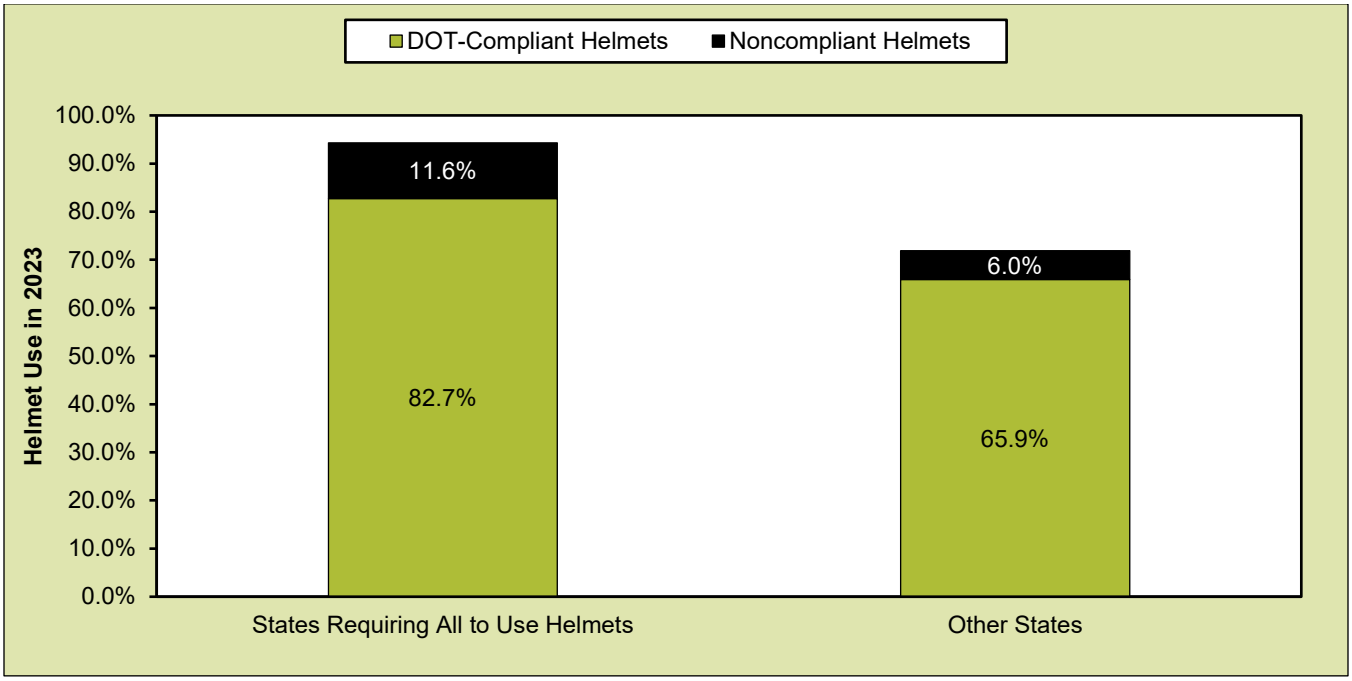
[1] The estimates in this research note reflect helmet use during an average daylight moment.

Figure 1. Motorcycle Helmet Use by Compliant, Noncompliant, and No Use, 2014-2023



Source: NOPUS

Figure 2. Motorcycle Helmet Use in 2023, by State Law and Helmet Type



Source: NOPUS

Table 1. Use of Helmets Compliant With Federal Safety Regulations by Major Motorcyclist Characteristics

Motorcyclist Group	2022		2023		2022-2023 Change		
	Helmet Use[1]	95% Confidence Interval[2]	Helmet Use[1]	95% Confidence Interval[2]	Change, in Percentage Points[6]	95% Confidence Interval[3]	*P*-value[4]
All Motorcyclists	66.5%	(56.7, 75.1)	73.8%	(66.3, 80.1)	7.2	(-3.3, 17.8)	0.17
Riders	67.5%	(59.8, 74.2)	73.5%	(67.1, 79.0)	6.0	(-2.7, 14.8)	0.17
Passengers	61.1%	(34.8, 82.2)	75.4%	(57.9, 87.3)	14.4	(-12.8, 41.5)	0.29
Motorcyclists in States Where[5]							
Use Is Required for All Motorcyclists	81.5%	(70.5, 89.1)	82.7%	(75.0, 88.4)	1.2	(-5.3, 7.8)	0.70
Other States	56.2%	(41.2, 70.0)	65.9%	(51.7, 77.7)	9.7	(-7.2, 26.6)	0.25
Motorcyclists on							
Expressways	83.1%	(72.6, 90.1)	85.8%	(67.1, 94.7)	2.7	(-12.7, 18.0)	0.73
Surface Streets	58.8%	(47.2, 69.5)	68.5%	(62.2, 74.2)	9.7	(-3.1, 22.4)	0.13
Motorcyclists Traveling in							
Fast Traffic	75.6%	(66.5, 82.8)	81.1%	(67.7, 89.8)	5.5	(-5.7, 16.8)	0.32
Medium-Speed Traffic	70.9%	(61.6, 78.7)	73.7%	(69.6, 77.5)	2.8	(-7.0, 12.6)	0.56
Slow Traffic	48.5%	(31.0, 66.3)	64.3%	(48.9, 77.3)	15.8	(-6.2, 37.9)	0.15
Motorcyclists Traveling in							
Heavy Traffic	73.6%	(63.8, 81.5)	79.2%	(71.8, 85.0)	5.5	(-2.2, 13.2)	0.15
Moderately Dense Traffic	73.2%	(59.6, 83.5)	68.9%	(53.3, 81.2)	-4.3	(-22.6, 14.0)	0.64
Light Traffic	**35.5%**	**(18.7, 57.0)**	**66.0%**	**(54.1, 76.2)**	**30.4**	**(8.7, 52.2)**	**0.01**
Motorcyclists in							
Not Clear Weather Conditions	79.6%	(40.2, 95.8)	NA	NA	NA	NA	NA
Clear Weather Conditions	66.0%	(55.8, 74.8)	73.2%	(65.4, 79.8)	7.3	(-3.6, 18.2)	0.18
Motorcycle Riders When							
They Are the Sole Riders	69.3%	(63.1, 74.8)	73.8%	(67.7, 79.0)	4.5	(-3.8, 12.8)	0.27
They Have Passengers	58.3%	(31.3, 81.1)	72.3%	(55.9, 84.3)	14.0	(-12.4, 40.3)	0.29
Motorcyclists in the							
Northeast	66.9%	(54.5, 77.3)	74.3%	(61.8, 83.8)	7.5	(-10.9, 25.8)	0.41
Midwest	49.0%	(34.7, 63.4)	57.7%	(49.4, 65.6)	8.7	(-6.8, 24.3)	0.26
South	64.2%	(44.5, 80.1)	72.6%	(60.0, 82.5)	8.4	(-13.6, 30.4)	0.44
West	94.4%	(85.7, 987.0)	91.7%	(82.9, 96.2)	-2.7	(-6.9, 1.4)	0.19
Motorcyclists in							
Urban Areas	62.7%	(48.9, 74.7)	72.0%	(64.0, 78.8)	9.3	(-5.4, 24.0)	0.20
Rural Areas	71.9%	(61.2, 80.6)	75.8%	(63.1, 85.1)	3.9	(-9.1, 16.8)	0.55
Motorcyclists Traveling During							
Weekdays	68.6%	(54.9, 79.7)	74.6%	(63.5, 83.3)	6.1	(-8.0, 20.1)	0.38
Weekday Rush Hours	72.8%	(63.2, 80.6)	77.0%	(65.3, 85.6)	4.2	(-5.2, 13.6)	0.37
Weekday Non-Rush Hours	66.4%	(48.0, 80.9)	72.9%	(56.3, 84.9)	6.5	(13.7, 26.7)	0.51
Weekends	62.8%	(52.7, 72.0)	72.8%	(61.8, 81.6)	10.0	(-3.8, 23.7)	0.15

Motorcyclist Group	2022		2023		2022-2023 Change		
	Helmet Use[1]	95% Confidence Interval[2]	Helmet Use[1]	95% Confidence Interval[2]	Change, in Percentage Points[6]	95% Confidence Interval[3]	*P*-value[4]
Motorcycle Riders Who							
Are Riding Alone	69.3%	(63.1, 74.8)	73.8%	(97.7, 79.0)	4.5	(-3.8, 12.8)	0.27
Have Passengers Using DOT-Compliant Helmets	89.7%	(73.8, 96.5)	92.1%	(81.8, 96.8)	2.4	(-8.4, 13.2)	0.65
Have Passengers Using Noncompliant Helmets	NA	NA	NA	NA	NA	NA	NA
Have Unhelmeted Passengers	NA	NA	NA	NA	NA	NA	NA
Passengers on Motorcycles on Which							
Riders Are Using DOT-Compliant Helmets	94.0%	(83.2, 98.0)	96.2%	(86.1, 99.0)	2.2	(-6.0, 10.3)	0.59
Riders Are Using Noncompliant Helmets	NA	NA	NA	NA	NA	NA	NA
Riders Are Unhelmeted	NA	NA	NA	NA	NA	NA	NA

[1] Use of helmets meeting the safety requirements of Federal Motor Vehicle Safety Standard 218, observed between 7 a.m. and 6 p.m. among motorcycle riders and passengers.

[2] The Wilson confidence interval has the form: $\left\{(2n_{EFF}p + t^2) \pm t\sqrt{(t^2 + 4n_{EFF}pq)}\right\}/2(n_{EFF} + t^2)$, where p is the estimated percentage of Helmet Use, $n_{EFF} = n/DEFF$ is the effective sample size (where n is the sample size and $DEFF$ is the design effect), $t \equiv t_{1-\alpha/2}(df)$, is a multiplier from the *t*-distribution with df degrees of freedom, and $q = 1 - p$. For percentages, these endpoints are multiplied by 100.

[3] The regular symmetric interval was used for the estimated change in percentage point, which is in the form: $p \pm t_{1-\frac{\alpha}{2}}(df)\sqrt{v(p)}$, where $p$is the estimated change in percentage point, $v(p)$ is its estimated variance, and $t_{1-\alpha/2}(df)$ is a multiplier from the *t*-distribution with df degrees of freedom. The degrees of freedom used in 2023 is different from that used in 2022.

[4] A *p*-value of 0.05 or less indicate that there is a statistically significant difference (at the alpha = 0.05 level) between the 2022 and 2023 estimates for the group in question, indicated with boldface type.

5 Use rates reflect the laws in effect at the time data was collected.

6 The "Change in Percentage Points" column was computed using unrounded estimates and may not equal the difference between the percentages displayed in the table which are rounded to the nearest tenth.

NA: Data not sufficient to produce a reliable estimate.

Source: NOPUS

Table 2. Use of Noncompliant Helmets by Major Motorcyclist Characteristics

Motorcyclist Group	2002		2023		2022-2023 Change		
	Helmet Use[1]	95% Confidence Interval[2]	Helmet Use[1]	95% Confidence Interval[2]	Change, in Percentage Points[6]	95% Confidence Interval[3]	*P*-value[4]
All Motorcyclists	9.0%	(6.4, 12.4)	8.6%	(5.8, 12.6)	-0.4	(-5.1, 4.4)	0.87
Riders	8.5%	(6.1, 11.8)	8.7%	(6.1, 12.4)	0.2	(-4.0, 4.4)	0.92
Passengers	11.8%	(4.9, 25.7)	7.9%	(3.3, 17.9)	-3.9	(-17.5, 9.7)	0.56
Motorcyclists in States Where[5]							
Use Is Required for All Motorcyclists	11.3%	(7.3, 17.2)	11.6%	(7.4, 17.5)	0.2	(-5.7, 6.1)	0.94
Other States	7.4%	(3.9, 13.4)	6.0%	(2.8, 12.3)	-1.4	(-8.2, 5.4)	0.69
Motorcyclists on							
Expressways	4.9%	(2.1, 10.8)	8.1%	(3.5, 17.4)	3.2	(-4.7, 11.1)	0.41
Surface Streets	10.9%	(7.7, 15.1)	8.8%	(5.7, 13.4)	-2.1	(-7.8, 3.7)	0.47
Motorcyclists Traveling in							
Fast Traffic	5.5%	(3.0, 9.9)	7.8%	(3.9, 14.7)	2.2	(-4.1, 8.5)	0.48
Medium-Speed Traffic	6.2%	(3.4, 11.1)	10.9%	(6.7, 17.2)	4.7	(-0.6, 9.9)	0.08
Slow Traffic	**16.9%**	**(11.3, 24.6)**	**7.7%**	**(4.5. 13.1)**	**-9.2**	**(-17.3, -1.1)**	**0.03**
Motorcyclists Traveling in							
Heavy Traffic	6.8%	(4.0, 11.3)	9.8%	(6.0, 15.5)	3.0	(-3.2, 9.1)	0.33
Moderately Dense Traffic	5.4%	(2.7, 10.6)	6.9%	(3.5, 13.3)	1.6	(-4.6, 7.7)	0.61
Light Traffic	**21.1%**	**(13.9, 30.7)**	**7.8%**	**(3.3, 17.0)**	**-13.3**	**(-23.9, -2.7)**	**0.02**
Motorcyclists in							
Not Clear Weather Conditions	NA	NA	NA	NA	NA	NA	NA
Clear Weather Conditions	9.4%	(6.7, 12.9)	8.9%	(6.0, 13.1)	-0.4	(-5.3, 4.4)	0.86
Motorcycle Riders When							
They Are the Sole Motorcyclists	8.4%	(5.6, 12.4)	8.9%	(6.0, 12.9)	0.5	(-4.2, 5.2)	0.84
They Have Passengers	9.1%	(4.4, 17.9)	8.0%	(3.6, 16.9)	-1.0	(-9.3, 7.3)	0.80
Motorcyclists in the							
Northeast	15.8%	(12.5, 19.8)	13.5%	(4.4, 34.9)	-2.3	(-15.7, 11.2)	0.73
Midwest	3.0%	(1.0, 8.4)	3.4%	(0.9, 12.0)	0.5	(-6.4, 7.4)	0.89
South	12.5%	(7.6, 19.9)	11.0%	(6.6, 17.7)	-1.6	(-9.9, 6.8)	0.70
West	2.4%	(1.4, 4.0)	4.9%	(2.5, 9.5)	2.5	(-1.0, 6.0)	0.16
Motorcyclists in							
Urban Areas	11.5%	(7.9, 16.3)	10.8%	(6.0, 18.7)	-0.6	(-9.2, 8.0)	0.88
Rural Areas	5.6%	(2.9, 10.3)	6.2%	(3.2, 11.7)	0.6	(-3.9, 5.1)	0.79
Motorcyclists Traveling During							
Weekdays	9.5%	(6.0, 14.6)	6.3%	(4.2, 9.2)	-3.2	(-8.1, 1.6)	0.18
Weekday Rush Hours	5.8%	(3.2, 10.1)	6.5%	(3.5, 12.0)	0.7	(-3.8, 5.3)	0.74
Weekday Non-Rush Hours	11.4%	(6.8, 18.7)	6.1%	(3.7, 9.9)	-5.4	(-11.7, 1.0)	0.09
Weekends	8.0%	(4.8, 13.1)	11.3%	(6.5, 19.1)	3.3	(-5.6, 12.2)	0.45

Motorcyclist Group	2002		2023		2022-2023 Change		
	Helmet Use[1]	95% Confidence Interval[2]	Helmet Use[1]	95% Confidence Interval[2]	Change, in Percentage Points[6]	95% Confidence Interval[3]	*P*-value[4]
Motorcycle Riders Who							
Are Riding Alone	8.4%	(5.6, 12.4)	8.9%	(6.0, 12.9)	0.5	(-4.2, 5.2)	0.84
Have Passengers Using DOT-Compliant Helmets	6.0%	(1.9, 17.4)	NA	NA	NA	NA	NA
Have Passengers Using Noncompliant Helmets	NA	NA	NA	NA	NA	NA	NA
Have Unhelmeted Passengers	NA	NA	NA	NA	NA	NA	NA
Passengers on Motorcycles on Which							
Riders Are Using DOT-Compliant Helmets	NA	NA	NA	NA	NA	NA	NA
Riders Are Using Noncompliant Helmets	NA	NA	NA	NA	NA	NA	NA
Riders Are Unhelmeted	NA	NA	NA	NA	NA	NA	NA

[1] Use of helmets that do NOT meet the safety requirements of Federal Motor Vehicle Safety Standard 218, observed from 7 a.m. to 6 p.m. among motorcycle riders and passengers.

[2] The Wilson confidence interval has the form: $\left\{(2n_{EFF}p + t^2) \pm t\sqrt{(t^2 + 4n_{EFF}pq)}\right\}/2(n_{EFF} + t^2)$, where p is the estimated percentage of Helmet Use, $n_{EFF} = n/DEFF$ is the effective sample size (where n is the sample size and $DEFF$ is the design effect), $t \equiv t_{1-\alpha/2}(df)$, is a multiplier from the *t*-distribution with df degrees of freedom, and $q = 1 - p$. For percentages, these endpoints are multiplied by 100.

[3] The regular symmetric interval was used for the estimated change in percentage point, which is in the form: $p \pm t_{1-\frac{\alpha}{2}}(df)\sqrt{v(p)}$, where $p$is the estimated change in percentage point, $v(p)$ is its estimated variance, and $t_{1-\alpha/2}(df)$ is a multiplier from the *t*-distribution with df degrees of freedom. The degrees of freedom used in 2023 is different from that used in 2022.

[4] A *p*-value of 0.05 or less indicate that there is a statistically significant difference (at the alpha = 0.05 level) between the 2022 and 2023 estimates for the group in question, indicated with boldface type.

[5] Use rates reflect the laws in effect at the time data was collected.

[6] The "Change in Percentage Points" column was computed using unrounded estimates and may not equal the difference between the percentages displayed in the table which are rounded to the nearest tenth.

NA: Data not sufficient to produce a reliable estimate.

Source: NOPUS

Survey Methodology

NOPUS is the only survey that provides nationwide probability-based observed data on motorcycle helmet use in the United States. The survey observes helmet use as it occurs at randomly selected roadway sites to provide the best tracking of helmet use in this country.

The survey data is collected by sending observers to probabilistically sampled roadways to observe motorcyclists between 7 a.m. and 6 p.m. Observations are made either while standing at the roadside or, in the case of expressways, while riding in a vehicle in traffic. To capture the true behavior of motorcyclists, NOPUS observers do not stop motorcycles or interview motorcyclists. The 2023 NOPUS data was collected from June 5 to June 24, 2023, while the 2022 NOPUS data was collected from June 6 to June 24, 2022.

Table 3. Sites, Motorcycles, and Motorcyclists Observed

Numbers of	2022	2023	Percentage Change
Sites Observed*	1,865	1,869	0.2%
Motorcycles Observed	818	814	-0.5%
Motorcyclists Observed	939	945	1.2%

* The number of sites observed reflects the number of sites in the sample frame minus those sites unavailable due to restricted access, traffic problems, or safety issues.

The NOPUS uses a complex multistage probability sample, statistical data editing, imputation of unknown values, and complex estimation procedures. Table 3 shows the number of sites at which data were collected during the 2023 NOPUS Moving Traffic Survey. A total of 945 motorcyclists were observed on the 814 motorcycles, which are respectively 1.2 percent more and 0.5 percent less than the 2022 sample.

Because NOPUS selects the sites probabilistically, we can test the statistical significance of its results. Statistically significant changes in helmet use between 2022 and 2023 are identified in Table 1 and Table 2 by a *p*-value that is 0.05 or less in the table's far-right column. In Table 1, there was one significant change observed between 2022 and 2023. While there were two significant changes observed in Table 2.

Data collection, estimation, and variance estimation for the NOPUS are conducted by Westat, Inc., under the direction of the NCSA under Federal contract number 693JJ918D000001. Bowhead Mission Solutions, LLC, contributed to the production of this research note.

Definitions

NHTSA established standards for motorcycle helmets to ensure a certain degree of protection in a crash in Federal Motor Vehicle Safety Standard 218 (Code of Federal Register, Title 49, Volume 5, Part 571, Section 218, October 2003). DOT-compliant helmets are helmets that meet this safety standard, while noncompliant helmets are helmets that do not.

DOT-compliant helmets are marked with an identifying sticker on the backs of the helmets. However, because of the prevalence of counterfeit stickers, NOPUS data collectors categorize DOT-compliant helmets as helmets that cover the motorcyclists' ears, are at least 1 inch thick, have hefty chin straps, and do not have protrusions longer than two-tenths of an inch.

NHTSA defines helmet use as the use of DOT-compliant helmets.

At the time of the 2023 survey 18 States and the District of Columbia required all motorcyclists to wear helmets. These states are listed below. Twenty-nine States required only a subset of riders or motorcycle passengers to use helmets (such as those under age 17, 18, or 21). Illinois, Iowa, and New Hampshire had no motorcycle helmet requirement (Highway Loss Data Institute, 2023).

States and the District of Columbia with laws requiring helmet use for all motorcyclists as of May 31, 2023:

Alabama, California, District of Columbia, Georgia, Louisiana, Maryland, Massachusetts, Mississippi, Nebraska, Nevada, New Jersey, New York, North Carolina, Oregon, Tennessee, Vermont, Virginia, Washington, and West Virginia

"Expressways" are defined as roadways with limited access, while "surface streets" comprise all other roadways.

A roadway is defined to have "fast traffic" if during the observation period the average speed of passenger vehicles that pass the observer exceeds 50 mph, with "medium-speed traffic" defined as 31 to 50 mph, and "slow traffic" defined as 30 mph or slower.

A roadway is defined to have "heavy traffic" if the average number of vehicles on the roadway during the observation period is greater than 5 per lane per mile, with "moderately dense traffic" defined as greater than 1 but less than or equal to 5 vehicles per lane per mile, and "light traffic" as less than or equal to 1 vehicle per lane per mile.

As of 2018, "Not Clear Weather Conditions" includes sites where light precipitation or light fog is present.

The survey uses the following definitions of geographic regions, defined by the States below.

Northeast: CT, MA, ME, NH, NJ, NY, PA, RI, VT

Midwest: IA, KS, IL, IN, MI, MN, MO, ND, NE, OH, SD, WI

South: AL, AR, DC, DE, FL, GA, KY, LA, MD, MS, NC, OK, SC, TN, TX, VA, WV

West: AK, AZ, CA, CO, HI, ID, MT, NM, NV, OR, UT, WA, WY

Urban and Rural area classifications are based on the U.S. Census's 2010 urban area classification. Urban areas are comprised of urban (Census-identified Urbanized Areas of 50,000 or more people) or suburban (Census-identified Urban Clusters of at least 2,500 and less than 50,000 people) areas. Rural areas are not designated as Urban Areas or Urban Clusters.

"Weekday Rush hours" are defined as 7 a.m. to 9:30 a.m. and 3:30 to 6 p.m. on weekdays, while "Weekday Non-Rush Hours" comprise all other weekday hours (9:30 a.m. to 3:30 p.m.).

Please note that NHTSA uses the following data-reporting guidelines for NOPUS publications:

An estimate whose numerator is based on fewer than five observations in the sample, and/or whose denominator is based on fewer than 30 observations in the sample is reported as "NA" in publications, including any related estimates.

References

Deutermann, W. (2004). *Motorcycle helmet effectiveness revisited* (Report No. DOT HS 809 715). National Highway Traffic Safety Administration. https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/809715

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National Center for Statistics and Analysis. (2019, March). *Lives saved in 2017 by restraint use and minimum-drinking-age laws* (Traffic Safety Facts Crash*Stats. Report No. DOT HS 812 683). National Highway Traffic Safety Administration. https://crashstats.nhtsa.dot.gov/Api/Public/Publication/812683

For More Information

For questions regarding the information presented in this report, contact the National Center for Statistics and Analysis at 800-934-8517 or by email at ncsarequests@dot.gov. Additional data and information on the survey design and analysis procedures will be available in upcoming publications to be posted at https://crashstats.nhtsa.dot.gov.

Helmets are estimated to be 37-percent effective in preventing fatal injuries to motorcycle riders and 41-percent effective for motorcycle passengers (Deutermann, 2004, 2005).

NHTSA estimates that helmets saved the lives of 1,872 motorcyclists in 2017 (NCSA, 2019). For more information on the campaign by NHTSA and the States to raise helmet use, visit www.nhtsa.gov/road-safety/motorcycles.

The NOPUS also observes other types of restraints, such as seat belts and child restraints, and observes driver electronic device use. This publication is part of a series that presents overall results from the survey on these topics. Please see publications in the series, such as *Seat Belt Use in 2023 – Overall Results*, at https://crashstats.nhtsa.dot.gov for the latest data on these topics.

Suggested APA format citation for this document:

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

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