TRAFFIC SAFETY FACTS
Research Note

Motorcycle Helmet Use in 2021—Overall Results

Use of DOT-compliant motorcycle helmets was 64.9 percent[1] in 2021, not statistically different at the 0.05 level from 69.0 percent in 2020. 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 2021 data collection occurred during the usual timeframe of early June, immediately following the *Click It or Ticket* campaign. Due to the coronavirus pandemic the 2020 data collection occurred in August, which is 2 months later than usual, and without the *Click It or Ticket* campaign preceding it. The number of motorcyclists observed in 2021 survey rebounded by 21 percent following the decline in 2020 (Table 3).

Figure 1 shows the motorcycle helmet use trend since 2011. Figure 2 shows the percentages of motorcyclists using DOT-compliant helmets, noncompliant helmets, and no helmet in 2020 and 2021. Figure 3 shows helmet use in States that require all motorcyclists to be helmeted compared to States that do not require helmets.
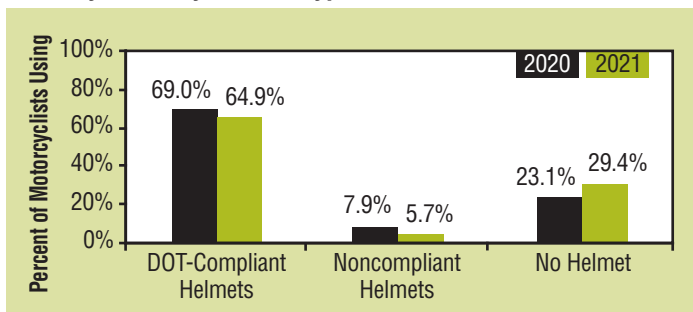
The only subcategory with a significant year-to-year change in helmet use was riders with passengers wearing DOT-compliant helmets. Helmet use for this group increased significantly from 76.9 percent in 2020 to 92.1 percent in 2021 (Table 1).

Figure 1
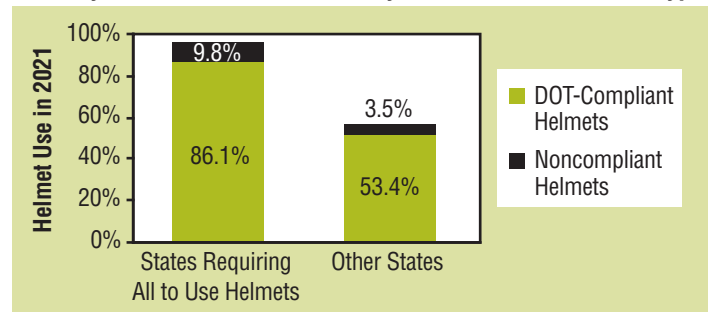**Motorcycle Helmet Use, 2011–2021**
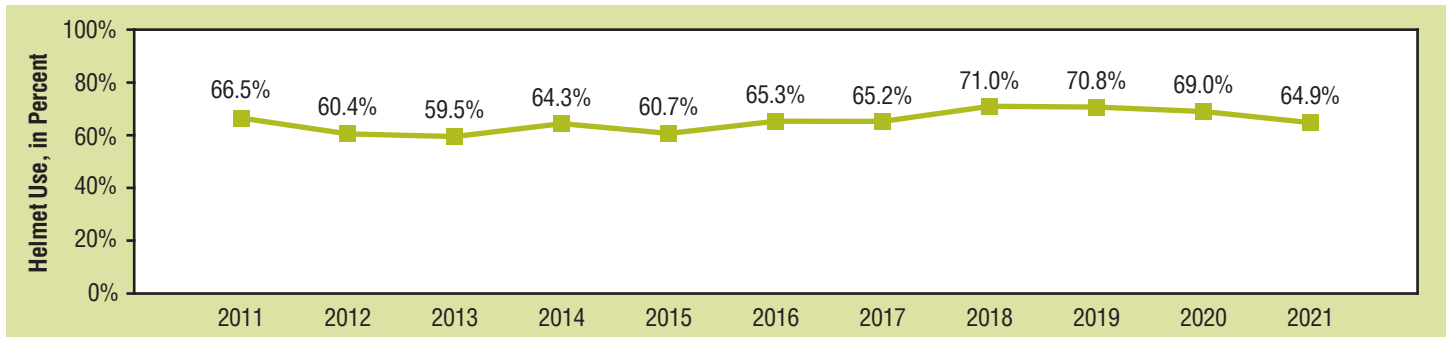
Source: NOPUS

Figure 2
Motorcyclists, by Helmet Type

Source: NOPUS

Figure 3
Motorcycle Helmet Use in 2021, by State Law and Helmet Type

Source: NOPUS

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[1] The estimates presented in this research note are reflective of helmet use during an average daylight moment.

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

Motorcyclist Group	2020		2021		2020–2021 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	69.0%	(58.8, 77.6)	64.9%	(56.9, 72.0)	-4.1	(-11.6, 3.3)	0.26
Riders	68.6%	(57.0, 78.3)	67.1%	(60.0, 73.5)	-1.5	(-9.6, 6.6)	0.71
Passengers	71.5%	(57.7, 82.1)	51.5%	(33.4, 69.3)	-19.9	(-44.1, 4.2)	0.10
Motorcyclists in States Where[5]							
Use Is Required for All Motorcyclists	84.0%	(75.9, 89.8)	86.1%	(78.3, 91.4)	2.1	(-7.4, 11.6)	0.66
Other States	54.4%	(40.7, 67.4)	53.4%	(44.4, 62.3)	-0.9	(-11.6, 9.8)	0.86
Motorcyclists on							
Expressways	72.9%	(57.6, 84.2)	69.5%	(47.6, 85.1)	-3.4	(-16.8, 9.9)	0.60
Surface Streets	67.2%	(57.0, 75.9)	62.7%	(55.6, 69.3)	-4.4	(-13.8, 4.9)	0.34
Motorcyclists Traveling in							
Fast Traffic	70.3%	(57.5, 80.6)	67.5%	(49.1, 81.7)	-2.9	(-15.9, 10.2)	0.66
Medium-Speed Traffic	76.8%	(67.1, 84.3)	66.3%	(57.0, 74.4)	-10.6	(-23.3, 2.2)	0.10
Slow Traffic	55.4%	(37.9, 71.7)	60.2%	(46.0, 72.9)	4.8	(-16.0, 25.5)	0.64
Motorcyclists Traveling in							
Heavy Traffic	77.0%	(66.6, 84.9)	67.1%	(51.0, 79.9)	-9.9	(-27.4, 7.6)	0.25
Moderately Dense Traffic	61.2%	(44.2, 75.8)	65.1%	(55.7, 73.5)	4.0	(-12.3, 20.2)	0.62
Light Traffic	57.4%	(32.7, 78.8)	59.0%	(42.3, 73.8)	1.6	(-25.8, 29.1)	0.90
Motorcyclists in							
Not Clear Weather Conditions	74.3%	(52.1, 88.5)	61.6%	(47.3, 74.2)	-12.7	(-37.2, 11.8)	0.30
Clear Weather Conditions	68.7%	(58.3, 77.6)	65.3%	(55.9, 73.5)	-3.5	(-11.4, 4.4)	0.37
Motorcycle Riders When							
They Are the Sole Rider	69.3%	(56.5, 79.7)	70.1%	(63.0, 76.4)	0.8	(-9.3, 11.0)	0.87
They Have Passengers	65.0%	(53.9, 74.7)	52.1%	(34.1, 69.5)	-13.0	(-32.2, 6.3)	0.18
Motorcyclists in the							
Northeast	77.0%	(66.8, 84.8)	69.6%	(56.6, 80.1)	-7.3	(-18.8, 4.2)	0.20
Midwest	53.7%	(31.4, 74.6)	44.5%	(31.3, 58.6)	-9.1	(-24.3, 6.0)	0.23
South	69.8%	(54.5, 81.7)	70.6%	(61.8, 78.1)	0.9	(-12.8, 14.5)	0.90
West	85.0%	(73.7, 92.0)	87.5%	(71.9, 95.0)	2.5	(-9.2, 14.1)	0.67
Motorcyclists in							
Urban Areas	67.4%	(55.3, 77.6)	64.7%	(53.8, 74.3)	-2.7	(-15.0, 9.6)	0.65
Rural Areas	71.0%	(54.5, 83.4)	65.0%	(54.4, 74.3)	-6.0	(-17.7, 5.6)	0.30
Motorcyclists Traveling During							
Weekdays	68.4%	(57.1, 77.8)	65.2%	(52.6, 76.0)	-3.2	(-11.8, 5.5)	0.46
Weekday Rush Hours	73.5%	(63.9, 81.2)	71.0%	(60.5, 79.6)	-2.5	(-13.8, 8.8)	0.66
Weekday Non-Rush Hours	64.4%	(46.8, 78.8)	61.5%	(44.9, 75.8)	-2.9	(-17.0, 11.2)	0.68
Weekends	69.8%	(54.8, 81.6)	64.5%	(54.8, 73.2)	-5.3	(-20.1, 9.5)	0.47
Motorcycle Riders Who							
Are Riding Alone	69.3%	(56.5, 79.7)	70.1%	(63.0, 76.4)	0.8	(-9.3, 11.0)	0.87
Have Passengers Using DOT-Compliant Helmets	**76.9%**	**(59.4, 88.4)**	**92.1%**	**(78.0, 97.4)**	**15.2**	**(2.7, 27.6)**	**0.02**
Have Passengers Using Noncompliant Helmets	NA	NA	NA	NA	NA	NA	NA
Have Unhelmeted Passengers	NA	NA	5.8%	(2.2, 14.6)	NA	NA	NA
Passengers on Motorcycles on Which							
Riders Are Using DOT-Compliant Helmets	84.5%	(71.3, 92.3)	91.1%	(79.4, 96.5)	6.6	(-6.9, 20.0)	0.33
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: $\{(2n_{EFF}p + t^2) \pm t\sqrt{(t^2 + 4n_{EFF}pq)}\}/2(n_{EFF} + t^2)$, 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), $t = t_{1-\alpha/2}(df)$, 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: $p \pm t_{1-\alpha/2}(df)\sqrt{v(p)}$, 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 2021 is different from that used in 2020.

[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 2020 and 2021 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: National Occupant Protection Use Survey, NCSA.

Table 2
Use of Noncompliant Helmets by Major Motorcyclist Characteristics

Motorcyclist Group	2020		2021		2020–2021 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	7.9%	(4.9, 12.3)	5.7%	(3.7, 8.5)	-2.2	(-6.1, 1.7)	0.27
Riders	7.5%	(4.5, 12.2)	6.0%	(4.0, 9.0)	-1.5	(-5.4, 2.4)	0.43
Passengers	10.1%	(4.7, 20.3)	3.8%	(1.5, 9.6)	-6.2	(-14.5, 2.1)	0.14
Motorcyclists in States Where[5]							
Use Is Required for All Motorcyclists	10.3%	(5.9, 17.6)	9.8%	(6.6, 14.4)	-0.5	(-6.4, 5.3)	0.85
Other States	5.4%	(1.9, 14.8)	3.5%	(1.8, 6.7)	-2.0	(-9.0, 5.0)	0.57
Motorcyclists on							
Expressways	11.1%	(5.0, 23.0)	4.8%	(1.8, 12.2)	-6.3	(-16.5, 3.9)	0.21
Surface Streets	6.3%	(4.0, 9.7)	6.1%	(4.6, 8.1)	-0.2	(-2.6, 2.2)	0.86
Motorcyclists Traveling in							
Fast Traffic	9.2%	(4.6, 17.5)	5.0%	(2.0, 12.1)	-4.2	(-12.0, 3.6)	0.28
Medium Speed Traffic	7.3%	(4.0, 13.0)	6.7%	(3.9, 11.2)	-0.6	(-4.8, 3.5)	0.75
Slow Traffic	6.0%	(3.0, 11.6)	5.9%	(3.9, 9.0)	-0.1	(-4.5, 4.3)	0.96
Motorcyclists Traveling in							
Heavy Traffic	9.0%	(4.9, 16.1)	5.1%	(2.9, 9.0)	-3.9	(-10.1, 2.3)	0.21
Moderately Dense Traffic	5.5%	(2.2, 13.2)	6.5%	(3.6, 11.5)	1.0	(-4.6, 6.6)	0.71
Light Traffic	8.2%	(4.1, 15.8)	5.3%	(3.0, 9.3)	-2.8	(-9.0, 3.3)	0.35
Motorcyclists in							
Not Clear Weather Conditions	NA	NA	NA	NA	NA	NA	NA
Clear Weather Conditions	7.6%	(4.6, 12.3)	5.7%	(3.6, 8.9)	-1.9	(-6.0, 2.2)	0.35
Motorcycle Riders When							
They Are the Sole Motorcyclists	7.8%	(4.4, 13.3)	5.1%	(3.0, 8.4)	-2.7	(-6.9, 1.5)	0.20
They Have Passengers	6.1%	(3.0, 12.3)	10.4%	(5.2, 19.9)	4.3	(-5.3, 13.9)	0.37
Motorcyclists in the							
Northeast	7.4%	(2.0, 24.0)	6.5%	(3.0, 13.8)	-0.8	(-7.5, 5.9)	0.80
Midwest	4.5%	(1.3, 14.1)	3.0%	(0.6, 13.1)	-1.4	(-8.9, 6.1)	0.70
South	12.9%	(7.6, 21.3)	8.9%	(5.7, 13.6)	-4.1	(-11.6, 3.5)	0.28
West	6.5%	(2.2, 17.8)	3.6%	(2.3, 5.6)	-3.0	(-9.0, 3.1)	0.33
Motorcyclists in							
Urban Areas	10.0%	(6.0, 16.3)	5.2%	(3.2, 8.5)	-4.8	(-9.8, 0.2)	0.06
Rural Areas	5.1%	(2.7, 9.4)	6.1%	(3.4, 10.7)	1.0	(-3.7, 5.7)	0.67
Motorcyclists Traveling During							
Weekdays	5.6%	(3.3, 9.5)	6.1%	(3.9, 9.3)	0.4	(-3.7, 4.6)	0.83
Weekday Rush Hours	6.5%	(2.9, 14.0)	7.6%	(5.0, 11.4)	1.1	(-5.4, 7.5)	0.74
Weekday Non-Rush Hours	4.9%	(2.5, 9.4)	5.1%	(2.6, 9.6)	0.2	(-4.5, 4.9)	0.94
Weekends	10.8%	(5.0, 21.7)	5.3%	(2.8, 9.9)	-5.5	(-13.4, 2.4)	0.17
Motorcycle Riders Who							
Are Riding Alone	7.8%	(4.4, 13.3)	5.1%	(3.0, 8.4)	-2.7	(-6.9, 1.5)	0.20
Have Passengers Using DOT-Compliant Helmets	7.0%	(3.3, 14.4)	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	7.6%	(3.3, 16.7)	3.9%	(1.0, 14.1)	-3.7	(-11.4, 4.0)	0.33
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 between 7 a.m. and 6 p.m. among motorcycle riders and passengers.
[2] The Wilson Confidence Interval has the form: $\{(2n_{EFF}p + t^2) \pm t\sqrt{(t^2 + 4n_{EFF}pq)}\}/2(n_{EFF} + t^2)$, 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), $t = t_{1-\alpha/2}(df)$, 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: $p \pm t_{1-\alpha/2}(df)\sqrt{v(p)}$, 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 2021 is different from that used in 2020.
[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 2020 and 2021 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: National Occupant Protection Use Survey, NCSA.

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 actually 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. In order to capture the true behavior of motorcyclists, NOPUS observers do not stop motorcycles or interview motorcyclists. The 2021 NOPUS data was collected from June 7 to June 25, 2021. The 2020 NOPUS data was collected from July 27 to August 16, 2020, which is 2 months later than the usual time frame due to the coronavirus pandemic. Another consequence of the pandemic was the absence of the *Click It or Ticket* campaign that typically precedes the NOPUS data collection.

NOPUS uses a complex multistage probability sample, statistical data editing, imputation of unknown values, and complex estimation procedures. Table 3 shows the sample sizes of the 2021 NOPUS Moving Traffic Survey. A total of 871 motorcyclists were observed on the 756 motorcycles, which are respectively 21 percent and 22 percent more than the 2020 sample due to reduced traffic volume from the pandemic.

Table 3
Sites, Motorcycles, and Motorcyclists Observed

Numbers of	2020	2021	Percentage Change
Sites Observed*	1,875	1,873	-0.1%
Motorcycles Observed	620	756	21.9%
Motorcyclists Observed	719	871	21.1%

*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.

Because NOPUS selects the sites probabilistically, we can test the statistical significance of its results. Statistically significant changes in helmet use between 2020 and 2021 are identified in Tables 1 and 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 2020 and 2021. However, there were no 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.

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 2021 survey, 18 States and the District of Columbia required all motorcyclists to wear helmets. Table 4 lists States with motorcycle helmet laws in effect for all motorcyclists. 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, 2021).

Table 4
States With Laws* Requiring Helmet Use for All Motorcyclists

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

*States and the District of Columbia with laws in effect as of May 31, 2021

"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 Census's 2010 urban area classification.[2] 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). Rural areas are not designated as Urban Areas or Urban Clusters.

"Weekday Rush hours" are defined to be 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.

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[2] www.census.gov/geo/reference/ua/urban-rural-2010.html

References

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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 CrashStats. Report No. DOT HS 812 683). National Highway Traffic Safety Administration. https://crashstats.nhtsa.dot.gov/Api/Public/Publication/812683

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 2021 – Overall Results,* at https://crashstats.nhtsa.dot.gov for the latest data on these topics.

The suggested APA format citation for this report is:

National Center for Statistics and Analysis. (2022, March). Motorcycle helmet use in 2021 – Overall results. (Traffic Safety Facts Research Note. Report No. DOT HS 813 270). National Highway Traffic Safety Administration.

U.S. Department of Transportation

National Highway Traffic Safety Administration

This research note and other general information on highway traffic safety may be accessed at: www-nrd.nhtsa.dot.gov/CATS/index.aspx