TRAFFIC SAFETY FACTS
## Research Note

Motorcycle Helmet Use in 2018—Overall Results

Use of DOT-compliant motorcycle helmets was 71.0 percent[1] in 2018, not statistically different at the 0.05 level from 65.2 percent in 2017. 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.

Figure 1 shows the motorcycle helmet use trend since 2000. Figure 2 shows the percentages of motorcyclists using DOT-compliant helmets, non-compliant helmets, and no helmet in 2017 and 2018. Figure 3 shows helmet use in States that require all motorcyclists to be helmeted and States that do not.

The 2018 survey also found the following:

- Helmet use among motorcyclists on surface streets increased significantly to 70.1 percent in 2018, up from 55.0 percent in 2017 (Table 1).

- Helmet use among motorcyclists traveling in slow traffic increased significantly to 69.1 percent in 2018, up from 44.2 percent in 2017 (Table 1).

- Helmet use among motorcyclists when they have passengers riding with them increased significantly to 73.8 percent in 2018, up from 51.3 percent in 2017 (Table 1).

- Use of noncompliant motorcycle helmets among motorcyclists traveling in light traffic increased significantly to 11.8 percent in 2018, up from 3.0 percent in 2017 (Table 2).

Figure 1
Motorcycle Helmet Use, 2000 – 2018
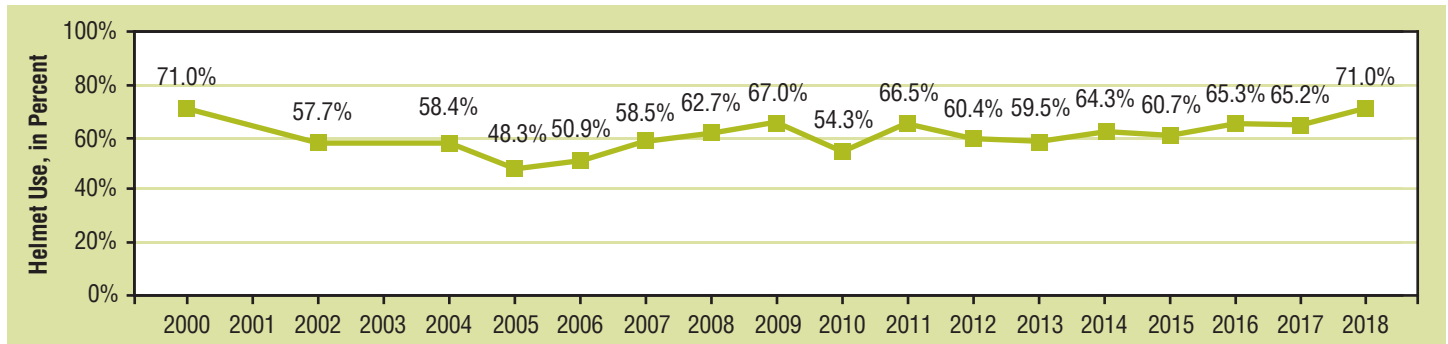
Source: NOPUS (Prior to 2004, motorcycle helmet use data was collected every other year since the NOPUS began in 1994. Data on motorcycle helmet use was not collected in 2001 or 2003.)

Figure 2
Motorcyclists, by Helmet Type
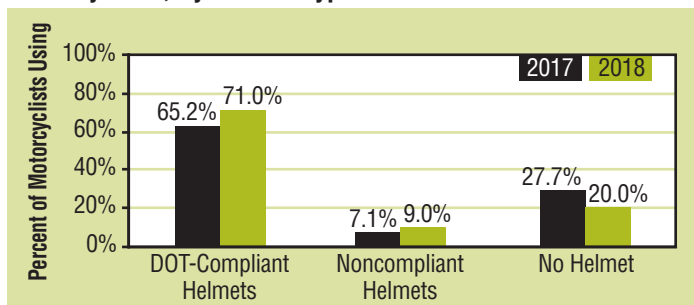
Source: NOPUS

Figure 3
Motorcycle Helmet Use in 2018, by State Law and Helmet Type
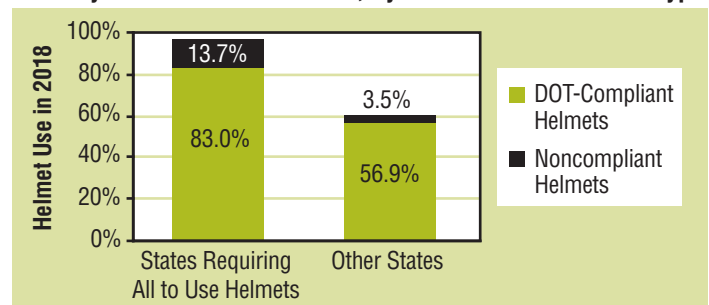
Source: NOPUS

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[1] The percentages provided in this research note are interpreted as the percentage of motorcyclists nationwide at a typical daylight moment.

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

Motorcyclist Group	2017		2018		2017–2018 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	65.2%	(56.6, 72.9)	71.0%	(61.6, 78.9)	5.8	(-5.5, 17.0)	0.30
Riders	68.0%	(60.1, 75.0)	71.4%	(61.7, 79.4)	3.4	(-8.1, 14.9)	0.55
Passengers	51.1%	(37.0, 65.1)	68.8%	(50.8, 82.5)	17.7	(-0.7, 36.2)	0.06
Motorcyclists in[5]							
States Where Use Is Required for All Motorcyclists	87.0%	(79.4, 92.0)	83.0%	(71.8, 90.3)	-4.0	(-14.3, 6.3)	0.43
Other States	43.7%	(33.2, 54.9)	56.9%	(45.2, 67.8)	13.1	(-1.5, 27.8)	0.08
Motorcyclists on							
Expressways	88.9%	(81.2, 93.7)	74.1%	(58.9, 85.0)	-14.8	(-30.5, 0.9)	0.06
Surface Streets	**55.0%**	**(46.7, 63.0)**	**70.1%**	**(59.8, 78.7)**	**15.1**	**(3.2, 27.0)**	**0.01**
Motorcyclists Traveling in							
Fast Traffic	80.1%	(72.6, 86.0)	76.3%	(65.3, 84.6)	-3.8	(-14.4, 6.8)	0.47
Medium-Speed Traffic	56.8%	(44.1, 68.7)	67.0%	(55.0, 77.2)	10.2	(-6.6, 26.9)	0.22
Slow Traffic	**44.2%**	**(35.8, 52.9)**	**69.1%**	**(54.0, 81.0)**	**24.9**	**(9.1, 40.8)**	**< 0.01**
Motorcyclists Traveling in							
Heavy Traffic	78.5%	(69.3, 85.5)	73.3%	(61.7, 82.4)	-5.2	(-16.8, 6.5)	0.37
Moderately Dense Traffic	58.4%	(46.0, 69.8)	72.5%	(59.6, 82.5)	14.1	(-1.3, 29.5)	0.07
Light Traffic	47.3%	(31.8, 63.3)	64.1%	(54.1, 73.0)	16.8	(-2.8, 36.4)	0.09
Motorcyclists in							
Not Clear Weather Conditions	60.6%	(41.2, 77.1)	73.5%	(40.0, 92.0)	12.9	(-19.1, 44.9)	0.42
Clear Weather Conditions	65.4%	(56.7, 73.3)	70.8%	(61.7, 78.5)	5.4	(-6.0, 16.8)	0.34
Motorcycle Riders When							
They Are the Sole Rider	72.1%	(64.4, 78.7)	70.9%	(61.0, 79.1)	-1.2	(-13.0, 10.5)	0.83
They Have Passengers	**51.3%**	**(37.3, 65.1)**	**73.8%**	**(56.2, 86.1)**	**22.5**	**(4.3, 40.7)**	**0.02**
Motorcyclists in the							
Northeast	70.6%	(53.7, 83.3)	71.1%	(52.7, 84.4)	0.5	(-15.7, 16.6)	0.95
Midwest	41.0%	(27.9, 55.4)	57.7%	(42.2, 71.7)	16.7	(-5.9, 39.2)	0.14
South	76.7%	(64.3, 85.8)	74.5%	(54.0, 87.9)	-2.2	(-16.8, 12.3)	0.75
West	83.8%	(67.8, 92.7)	84.2%	(68.5, 92.9)	0.4	(-19.1, 20.0)	0.96
Motorcyclists in							
Urban Areas	65.3%	(56.5, 73.1)	69.1%	(58.1, 78.3)	3.8	(-8.6, 16.2)	0.53
Rural Areas	65.2%	(52.1, 76.3)	73.5%	(62.6, 82.1)	8.3	(-6.7, 23.3)	0.27
Motorcyclists Traveling During							
Weekdays	71.7%	(61.9, 79.8)	71.0%	(60.8, 79.4)	-0.7	(-12.4, 11.0)	0.90
Weekday Rush Hours	71.6%	(60.2, 80.7)	71.3%	(60.1, 80.3)	-0.3	(-11.4, 10.8)	0.96
Weekday Non-Rush Hours	71.7%	(60.1, 81.1)	70.8%	(57.7, 81.2)	-0.9	(-17.6, 15.7)	0.91
Weekends	58.8%	(47.9, 68.9)	71.0%	(57.1, 81.8)	12.2	(-1.7, 26.1)	0.08
Motorcycle Riders Who							
Are Riding Alone	72.1%	(64.4, 78.7)	70.9%	(61.0, 79.1)	-1.2	(-13.0, 10.5)	0.83
Have Passengers Using DOT-Compliant Helmets	89.3%	(79.4, 94.8)	83.8%	(62.0, 94.3)	-5.5	(-21.9, 10.8)	0.49
Have Passengers Using Noncompliant Helmets	NA	NA	NA	NA	NA	NA	NA
Have Unhelmeted Passengers	5.3%	(1.9, 14.1)	NA	NA	NA	NA	NA
Passengers on Motorcycles on Which							
Riders Are Using DOT-Compliant Helmets	89.1%	(79.5, 94.5)	78.1%	(54.1, 91.6)	-10.9	(-28.9, 7.0)	0.22
Riders Are Using Noncompliant Helmets	NA	NA	NA	NA	NA	NA	NA
Riders Are Unhelmeted	9.1%	(4.0, 19.3)	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 2018 is different from that used in 2017.

[4] A p-value of 0.05 or less indicates that there is a statistically significant difference (at the alpha=0.05 level) between the 2017 and 2018 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] Belt use rates, 95% Confidence Interval, annual changes have been rounded to the nearest tenth. Annual changes have been computed based on unrounded estimates and may not equal those based on displayed values.

NA: Data not sufficient to produce a reliable estimate.

Source: NOPUS, NCSA

Table 2
Use of Noncompliant Helmets by Major Motorcyclist Characteristics

Motorcyclist Group	2017		2018		2017–2018 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	7.1%	(4.7, 10.6)	9.0%	(5.5, 14.4)	2.0	(-3.2, 7.1)	0.44
Riders	7.1%	(4.5, 11.0)	7.6%	(4.7, 12.1)	0.6	(-4.0, 5.2)	0.80
Passengers	7.1%	(3.8, 13.0)	17.3%	(7.0, 36.8)	10.1	(-5.4, 25.7)	0.19
Motorcyclists in[4]							
States Where Use Is Required for All Motorcyclists	9.9%	(5.7, 16.6)	13.7%	(7.9, 22.8)	3.9	(-4.9, 12.7)	0.38
Other States	4.3%	(2.4, 7.8)	3.5%	(1.4, 8.4)	-0.8	(-5.4, 3.8)	0.73
Motorcyclists on							
Expressways	5.3%	(1.9, 13.7)	8.0%	(3.2, 18.5)	2.7	(-6.3, 11.7)	0.55
Surface Streets	7.8%	(4.9, 12.2)	9.3%	(5.4, 15.8)	1.5	(-5.1, 8.1)	0.64
Motorcyclists Traveling in							
Fast Traffic	5.6%	(3.0, 10.4)	5.7%	(2.6, 11.9)	0.0	(-5.6, 5.7)	0.99
Medium Speed Traffic	7.9%	(4.5, 13.4)	8.3%	(4.3, 15.2)	0.4	(-6.9, 7.6)	0.92
Slow Traffic	9.1%	(4.0, 19.5)	14.9%	(7.5, 27.5)	5.8	(-6.6, 18.2)	0.35
Motorcyclists Traveling in							
Heavy Traffic	7.6%	(4.2, 13.2)	9.6%	(5.7, 15.5)	2.0	(-3.5, 7.5)	0.47
Moderately Dense Traffic	9.1%	(5.2, 15.6)	5.9%	(2.3, 14.3)	-3.2	(-12.1, 5.7)	0.46
Light Traffic	**3.0%**	**(1.2, 7.3)**	**11.8%**	**(5.5, 23.7)**	**8.8**	**(0.4, 17.2)**	**0.04**
Motorcyclists in							
Not Clear Weather Conditions	19.7%	(9.1, 37.6)	NA	NA	NA	NA	NA
Clear Weather Conditions	6.4%	(4.2, 9.8)	8.8%	(5.5, 14.0)	2.4	(-2.7, 7.5)	0.34
Motorcycle Riders When							
They Are the Sole Motorcyclists	7.9%	(5.0, 12.5)	6.7%	(4.1, 10.7)	-1.2	(-6.1, 3.6)	0.61
They Have Passengers	3.5%	(1.2, 9.7)	12.2%	(4.5, 28.8)	8.6	(-4.1, 21.4)	0.18
Motorcyclists in the							
Northeast	17.4%	(7.6, 35.1)	10.7%	(3.6, 27.7)	-6.8	(-21.0, 7.5)	0.34
Midwest	2.4%	(0.7, 7.3)	7.9%	(3.7, 16.0)	5.5	(-1.8, 12.7)	0.13
South	7.6%	(4.9, 11.6)	8.2%	(3.1, 19.8)	0.6	(-9.6, 10.8)	0.91
West	6.0%	(1.6, 19.8)	10.7%	(4.9, 21.8)	4.7	(-6.6, 16.0)	0.40
Motorcyclists in							
Urban Areas	9.2%	(5.0, 16.5)	11.9%	(6.7, 20.2)	2.7	(-5.7, 11.1)	0.52
Rural Areas	5.6%	(3.1, 9.9)	5.3%	(3.0, 9.4)	-0.2	(-5.5, 5.1)	0.93
Motorcyclists Traveling During							
Weekdays	5.5%	(3.6, 8.3)	9.3%	(5.3, 15.7)	3.8	(-1.9, 9.5)	0.18
Weekday Rush Hours	7.3%	(4.0, 13.1)	11.7%	(5.9, 21.7)	4.4	(-5.0, 13.8)	0.35
Weekday Non-Rush Hours	4.2%	(2.4, 7.4)	7.7%	(4.2, 13.9)	3.5	(-1.7, 8.7)	0.18
Weekends	8.7%	(5.1, 14.4)	8.7%	(4.0, 17.9)	0.0	(-7.5, 7.5)	0.99
Motorcycle Riders Who							
Are Riding Alone	7.9%	(5.0, 12.5)	6.7%	(4.1, 10.7)	-1.2	(-6.1, 3.6)	0.61
Have Passengers Using DOT-Compliant Helmets	NA	NA	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	6.6%	(3.0, 13.9)	19.1%	(6.8, 43.5)	12.5	(-5.2, 30.2)	0.16
Riders Are Using Noncompliant Helmets	NA	NA	NA	NA	NA	NA	NA
Riders Are Unhelmeted	3.4%	(0.9, 12.1)	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 2018 is different from that used in 2017.

[4] A p-value of 0.05 or less indicates that there is a statistically significant difference (at the alpha=0.05 level) between the 2017 and 2018 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] Belt use rates, 95% Confidence Interval, annual changes have been rounded to the nearest tenth. Annual changes have been computed based on unrounded estimates and may not equal those based on displayed values.

NA: Data not sufficient to produce a reliable estimate.

Source: NOPUS, NCSA

Survey Methodology

The 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 sample 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 2018 NOPUS data was collected from June 4 to June 20, 2018, while the 2017 data was collected from June 5 to June 19, 2017.

The 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 2018 NOPUS Moving Traffic Survey. A total of 786 motorcyclists riding on 659 motorcycles at the 1,882 data collection sites.

Table 3
Sites, Motorcycles, and Motorcyclists Observed

Numbers of	2017	2018	Percentage Change
Sites Observed*	1,887	1,882	-0.3%
Motorcycles Observed	839	659	-21.5%
Motorcyclists Observed	998	786	-21.2%

*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.

Because the NOPUS selects the sites probabilistically, we can test the statistical significance of its results. Statistically significant changes in helmet use between 2017 and 2018 are identified in Table 1 by a p-value that is 0.05 or less in the table's far-right column

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 or are at least 1 inch thick.

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

At the time of the 2018 survey, 19 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-eight States required only a subset of riders or motorcycle passengers to use helmets (such as those under age 17, 18, or 21). Three States, Illinois, Iowa, and New Hampshire, had no motorcycle helmet requirement.

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

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

*States and the District of Columbia with laws in effect as of May 31, 2018

"Expressways" are defined as roadways with limited access, while "surface streets" comprise all other roadways. "Rush hour" is defined as 7 to 9:30 a.m. and 3:30 to 6 p.m.

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

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.

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 e-mail 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 for motorcycle passengers.[2]

NHTSA estimates that helmets saved the lives of 1,859 motorcyclists in 2016.[3] For more information on the campaign by NHTSA and the States to raise helmet use, visit https://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 2018 – Overall Results,* at https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/812662 for the latest data on these topics.

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[2] Deutermann, W. (2004). *Motorcycle helmet effectiveness revisited* (Report No. DOT HS 809 715), and Deutermann, W. (2005). *Calculating lives saved by motorcycle helmets* (Report No. DOT HS 809 861). Washington, DC: National Highway Traffic Safety Administration. Available at https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/809715 and https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/809861

[3] National Center for Statistics and Analysis. (2017, October). *Lives saved in 2016 by restraint use and minimum-drinking-age laws* (Traffic Safety Facts Crash•Stats. Report No. DOT HS 812 454). Washington, DC: National Highway Traffic Safety Administration. Available at https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/812454

U.S. Department of Transportation

National Highway Traffic Safety Administration

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