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

TRAFFIC SAFETY FACTS
Research Note

NHTSA

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Motorcycle Helmet Use in 2015—Overall Results

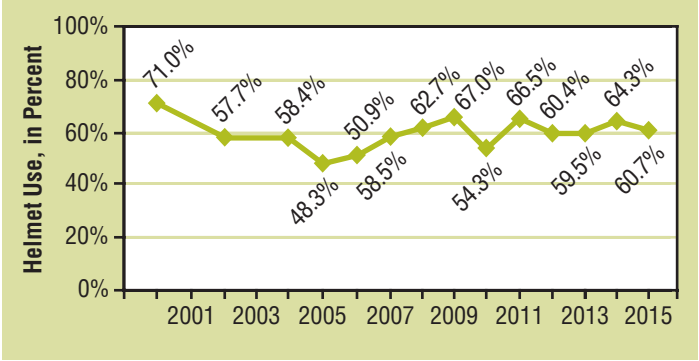
Use of DOT-compliant motorcycle helmets[1] was 60.7* percent in 2015, statistically unchanged from 64.3 percent in 2014. This result is from the National Occupant Protection Use Survey (NOPUS), the only survey that provides nationwide probability-based observed data on motorcycle helmet use in the United States. The NOPUS is conducted by the National Center for Statistics and Analysis of the National Highway Traffic Safety Administration.

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 2014 and 2015.

The 2015 survey also found the following:

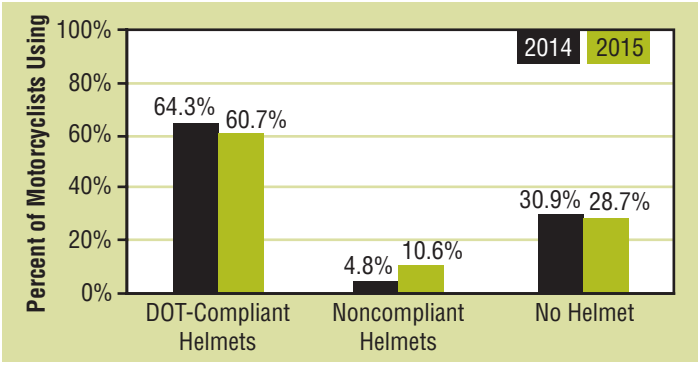
- Helmet use among motorcyclists in the northeastern States increased significantly to 77.2 percent, up from 56.1 percent in 2014. (Table 1)
- Use of non-compliant motorcycle helmets increased significantly to 10.6 percent, up from 4.8 percent in 2014. (Table 2)
- Helmet use continued to be significantly higher in States that require all motorcyclists to be helmeted than in other States (Figure 3).
- Helmet use among motorcyclists traveling in moderately dense traffic decreased significantly to 53.6 percent, from 72.8 percent in 2014 (Table 1).

Figure 1
Motorcycle Helmet Use, 2000–2015



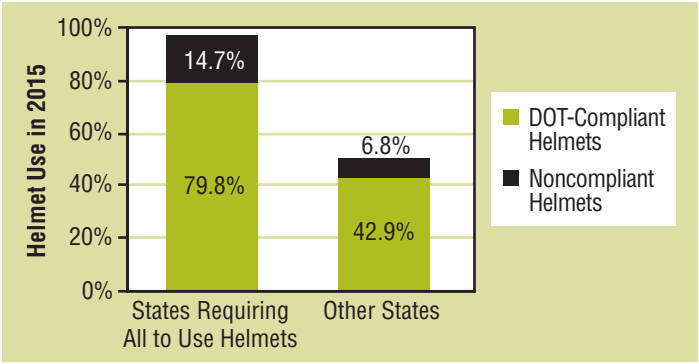
Data Source: NOPUS (In 2004 and prior, motorcycle helmet use data were collected every other year since the NOPUS began in 1994. Data on motorcycle helmet use were not collected in 2001 and 2003.)

Figure 2
Motorcyclists, by Helmet Type



Data Source: NOPUS

Figure 3
Motorcycle Helmet Use in 2015, by State Law and Helmet Type



Data Source: NOPUS

[1] DOT-compliant motorcycle helmets are those helmets meeting the safety requirements of Federal Motor Vehicle Safety Standard 218. Throughout this Research Note the term helmet use refers to the use of DOT-compliant motorcycle helmets unless otherwise stated.

* Please see "The 2015 NOPUS Redesign" section of this Research Note for more information about the change in NOPUS reporting precision.

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

Motorcyclist Group	2014		2015		2014–2015 Change		
	Helmet Use[1]	95% Confidence Interval[2]	Helmet Use[1]	95% Confidence Interval[2]	Change in Percentage Points	95% Confidence Interval[3]	P-Value[4]
All Motorcyclists	64.3%	(53.6, 73.8)	60.7%	(51.1, 69.6)	-3.6	(-15.4, 8.2)	0.54
Riders	66.8%	(56.6, 75.7)	63.9%	(54.1, 72.6)	-2.9	(-14.5, 8.6)	0.61
Passengers	51.3%	(36.0, 66.4)	46.3%	(34.7, 58.4)	-5.0	(-22.2, 12.3)	0.56
Motorcyclists in States Where[5]							
Use Is Required for All Motorcyclists	88.7%	(81.2, 93.5)	79.8%	(71.8, 85.9)	-8.9	(-19.6, 1.7)	0.10
Other States	47.9%	(37.1, 58.9)	42.9%	(34.7, 51.4)	-5.0	(-18.7, 8.7)	0.46
Motorcyclists on							
Expressways	80.7%	(65.7, 90.1)	71.3%	(62.7, 78.6)	-9.4	(-19.9, 1.0)	0.07
Surface Streets	58.5%	(47.5, 68.7)	57.0%	(45.8, 67.6)	-1.5	(-16.1, 13.1)	0.84
Motorcyclists Traveling in							
Fast Traffic	71.9%	(62.9, 79.5)	68.1%	(60.9, 74.7)	-3.8	(-11.6, 3.9)	0.32
Medium-Speed Traffic	56.8%	(38.9, 73.1)	52.3%	(38.5, 65.9)	-4.5	(-24.2, 15.3)	0.65
Slow Traffic	62.2%	(39.4, 80.7)	62.2%	(43.3, 78.0)	-0.0	(-29.1, 29.0)	1.00
Motorcyclists Traveling in							
Heavy Traffic	63.3%	(48.5, 76.0)	68.9%	(59.8, 76.8)	5.6	(-6.1, 17.3)	0.34
Moderately Dense Traffic	**72.8%**	**(58.8, 83.4)**	**53.6%**	**(39.3, 67.2)**	**-19.2**	**(-35.8, -2.7)**	**0.02**
Light Traffic	49.1%	(34.4, 63.9)	54.7%	(37.1, 71.1)	5.6	(-20.3, 31.5)	0.67
Motorcyclists in							
Light Precipitation	55.5%	(35.4, 73.9)	71.8%	(49.5, 86.9)	16.3	(-12.8, 45.5)	0.26
Light Fog	NA	NA	NA	NA	NA	NA	NA
Clear Weather Conditions	64.7%	(53.3, 74.6)	60.6%	(50.5, 69.9)	-4.1	(-16.7, 8.5)	0.52
Motorcycle Riders When							
They Are the Sole Rider	69.8%	(60.4, 77.8)	65.7%	(56.8, 73.6)	-4.1	(-14.6, 6.3)	0.43
They Have a Passenger	54.4%	(36.3, 71.4)	57.4%	(40.8, 72.4)	3.0	(-19.1, 25.1)	0.79
Motorcyclists in the							
Northeast	**56.1%**	**(36.7, 73.9)**	**77.2%**	**(53.5, 90.9)**	**21.1**	**(1.3, 40.8)**	**0.04**
Midwest	47.4%	(32.8, 62.4)	44.3%	(31.9, 57.5)	-3.1	(-22.2, 16.1)	0.75
South	78.2%	(61.4, 89.0)	60.0%	(47.4, 71.3)	-18.2	(-37.0, 0.6)	0.06
West	84.9%	(66.4, 94.2)	74.8%	(60.4, 85.3)	-10.1	(-27.0, 6.8)	0.24
Motorcyclists in							
Urban Areas	62.3%	(38.9, 81.1)	60.6%	(52.8, 68.0)	-1.7	(-22.6, 19.3)	0.87
Rural Areas	51.9%	(21.7, 80.8)	60.8%	(44.6, 75.0)	8.9	(-26.6, 44.5)	0.61
Motorcyclists Traveling During							
Weekdays	64.9%	(55.0, 73.6)	62.1%	(53.5, 70.0)	-2.8	(-14.9, 9.3)	0.64
Weekday Rush Hours	58.9%	(47.6, 69.3)	63.6%	(54.0, 72.3)	4.7	(-10.7, 20.2)	0.54
Weekday Non-Rush Hours	70.5%	(59.1, 79.8)	60.4%	(48.6, 71.2)	-10.1	(-24.7, 4.6)	0.17
Weekends	63.7%	(45.5, 78.7)	59.4%	(45.1, 72.2)	-4.3	(-24.2, 15.6)	0.66
Motorcycle Riders Who							
Are Riding Alone	69.8%	(60.4, 77.8)	65.7%	(56.8, 73.6)	-4.1	(-14.6, 6.3)	0.43
Have a Passenger Using a DOT-Compliant Helmet	85.0%	(65.7, 94.4)	86.9%	(73.5, 94.1)	1.9	(-13.6, 17.3)	0.81
Have a Passenger Using a Noncompliant Helmet	NA	NA	NA	NA	NA	NA	NA
Have an Unhelmeted Passenger	10.2%	(3.7, 25.3)	24.3%	(9.4, 50.0)	14.1	(-6.5, 34.7)	0.17
Passengers on Motorcycles on Which							
The Rider Is Using a DOT-Compliant Helmet	80.2%	(65.5, 89.7)	70.2%	(53.1, 83.1)	-10.0	(-28.9, 8.8)	0.29
The Rider Is Using a Noncompliant Helmet	NA	NA	NA	NA	NA	NA	NA
The Rider Is Unhelmeted	13.9%	(5.0, 33.2)	12.8%	(7.1, 21.8)	-1.1	(-16.2, 13.9)	0.88

[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 is used in the estimated percentages in the motorcyclist group (e.g., motorcyclists in urban areas), which is in 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 2015 is different from that used in 2014.
[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 2014 and 2015 estimates for the group in question, indicated with bold type.
[5] Use rates reflect the laws in effect at the time data was collected.
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	2014		2015		2014–2015 Change		
	Helmet Use[1]	95% Confidence Interval[2]	Helmet Use[1]	95% Confidence Interval[2]	Change in Percentage Points	95% Confidence Interval[3]	P-Value[4]
All Motorcyclists	**4.8%**	**(3.1, 7.3)**	**10.6%**	**(7.6, 14.7)**	**5.8**	**(2.1, 9.7)**	**< 0.01**
Riders	**4.1%**	**(2.6, 6.5)**	**10.7%**	**(7.4, 15.3)**	**6.6**	**(2.4, 10.7)**	**< 0.01**
Passengers	8.1%	(3.6, 17.3)	10.4%	(6.3, 16.8)	2.3	(-6.4, 11.1)	0.59
Motorcyclists in States Where[5]							
Use Is Required for All Motorcyclists	**6.8%**	**(4.0, 11.5)**	**14.7%**	**(9.1, 23.0)**	**7.9**	**(0.4, 15.4)**	**0.04**
Other States	3.4%	(1.7, 6.5)	6.8%	(3.7, 12.0)	3.4	(-0.7, 7.6)	0.10
Motorcyclists on							
Expressways	NA	NA	10.8%	(6.3, 17.8)	NA	NA	NA
Surface Streets	**5.7%**	**(3.5, 9.3)**	**10.6%**	**(7.3, 15.2)**	**4.9**	**(0.3, 9.4)**	**0.04**
Motorcyclists Traveling in							
Heavy Traffic	**4.8%**	**(2.3, 9.5)**	**10.0%**	**(6.7, 14.6)**	**5.2**	**(1.0, 9.5)**	**0.02**
Moderately-Dense Traffic	6.0%	(3.5, 10.3)	11.3%	(6.5, 19.0)	5.3	(-1.5, 12.1)	0.12
Slow Traffic	2.4%	(0.9, 6.6)	10.6%	(4.8, 21.5)	8.2	(-0.4, 16.7)	0.06
Motorcyclists Traveling in							
Heavy Traffic	**4.4%**	**(2.4, 7.9)**	**11.6%**	**(7.0, 18.6)**	**7.2**	**(1.3, 13.1)**	**0.02**
Moderately Dense Traffic	6.4%	(3.0, 13.1)	8.7%	(4.6, 15.7)	2.3	(-4.0, 8.6)	0.46
Light Traffic	NA	NA	13.5%	(6.9, 24.7)	NA	NA	NA
Motorcyclists in							
Light Precipitation	16.5%	(5.8, 38.6)	NA	NA	NA	NA	NA
Light Fog	NA	NA	NA	NA	NA	NA	NA
Clear Weather Conditions	**4.2%**	**(2.7, 6.7)**	**10.3%**	**(7.0, 14.8)**	**6.1**	**(2.0, 10.1)**	**< 0.01**
Motorcycle Riders When							
They Are the Sole Motorcyclist	**4.4%**	**(2.8, 6.8)**	**11.8%**	**(8.2, 16.6)**	**7.4**	**(3.0, 11.7)**	**< 0.01**
They Have a Passenger	2.9%	(1.0, 8.0)	6.7%	(3.4, 13.0)	3.8	(-1.7, 9.4)	0.17
Motorcyclists in the							
Northeast	7.0%	(4.7, 10.3)	9.5%	(3.5, 23.3)	2.5	(-6.9, 11.9)	0.59
Midwest	2.8%	(1.0, 7.6)	4.0%	(2.5, 6.1)	1.2	(-1.9, 4.3)	0.44
South	6.0%	(2.2, 15.1)	15.3%	(8.5, 26.2)	9.3	(-0.5, 19.2)	0.06
West	**4.1%**	**(1.4, 11.7)**	**16.1%**	**(10.7, 23.6)**	**12.0**	**(4.7, 19.4)**	**< 0.01**
Motorcyclists in							
Urban Areas	8.5%	(5.6, 12.7)	11.0%	(7.7, 15.5)	2.5	(-1.8, 6.8)	0.24
Rural Areas	NA	NA	10.3%	(6.3, 16.4)	NA	NA	NA
Motorcyclists Traveling During							
Weekdays	**5.5%**	**(3.4, 9.0)**	**10.5%**	**(7.6, 14.4)**	**5.0**	**(1.3, 8.7)**	**0.01**
Weekday Rush Hours	6.4%	(3.0, 13.1)	10.3%	(5.8, 17.5)	3.9	(-2.8, 10.6)	0.25
Weekday Non-Rush Hours	**4.8%**	**(2.3, 9.4)**	**10.8%**	**(7.8, 14.6)**	**6.0**	**(1.6, 10.5)**	**0.01**
Weekends	**3.9%**	**(2.1, 7.0)**	**10.8%**	**(6.1, 18.4)**	**6.9**	**(0.5, 13.3)**	**0.03**
Motorcycle Riders Who							
Are Riding Alone	**4.4%**	**(2.8, 6.8)**	**11.8%**	**(8.2, 16.6)**	**7.4**	**(3.0, 11.7)**	**< 0.01**
Have a Passenger Using a DOT-Compliant Helmet	NA	NA	3.2%	(0.9, 10.6)	NA	NA	NA
Have a Passenger Using a Noncompliant Helmet	NA	NA	NA	NA	NA	NA	NA
Have an Unhelmeted Passenger	NA	NA	NA	NA	NA	NA	NA
Passengers on Motorcycles on Which							
The Rider Is Using a DOT-Compliant Helmet	12.1%	(4.9, 27.0)	11.5%	(5.3, 22.9)	-0.6	(-14.3, 13.0)	0.92
The Rider Is Using a Noncompliant Helmet	NA	NA	NA	NA	NA	NA	NA
The Rider Is 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 is used in the estimated percentages in the motorcyclist group (e.g., motorcyclists in urban areas), which is in 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), $t \equiv t_{1-\alpha/2}(df)$, 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: $p \pm t_{1-\alpha/2}(df)\sqrt{v(p)}$, 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 2015 is different from that used in 2014.
[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 2014 and 2015 estimates for the group in question, indicated with bold type.
[5] Use rates reflect the laws in effect at the time data was collected.
NA: Data not sufficient to produce a reliable estimate.
Source: National Occupant Protection Use Survey, 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, and thus provides the best tracking of helmet use in this country.

The survey data is collected by sending observers to probabilistically sampled roadways, who 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 2015 NOPUS data was collected between June 1 and June 27, 2015, while the 2014 data was collected between June 2 and June 27, 2014.

The NOPUS uses a complex multistage probability sample, statistical data editing, imputation of unknown values, and complex estimation procedures. The sample sites for the 2015 NOPUS were entirely from the 2015 NOPUS sample redesign. Table 3 shows the observed sample sizes of the 2015 NOPUS Moving Traffic Survey. A total of 1,019 motorcyclists were observed on the 851 motorcycles at the 1,901 data collection sites.

Table 3
Sites, Motorcycles, and Motorcyclists Observed

Numbers of	2014	2015	Percentage Change
Sites Observed*	1,581	1,901	20.2%
Motorcycles Observed	684	851	24.4%
Motorcyclists Observed	806	1,019	26.4%

*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 sites are selected probabilistically, we can analyze the statistical significance of its results. Statistically significant changes in helmet use between 2014 and 2015 are identified in Table 1 and Table 2 by having a P-Value that is 0.05 or less in column 8 of these tables. The statistical confidence intervals that use in a given motorcyclist group, e.g., motorcyclists in the Midwest are provided in columns 3, 5, and 7 of Table 1 and Table 2.

Data collection, estimation, and variance estimation for the NOPUS are conducted by Westat, Inc., under the direction of the National Center for Statistics and Analysis in NHTSA under Federal contract number DTNH22-13-D-00284.

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 back 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 the 2015 survey was conducted, 19 States and the District of Columbia required all motorcyclists to be helmeted. Table 4 provides a list of States with laws requiring helmet use 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 20). 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, 2015

"Expressways" are defined to be 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.

The survey uses the following definitions of geographic regions, which are defined in terms of the States contained in the region 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 employs the following data reporting guidelines for the NOPUS publications:

Estimates 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, or that are not statistically different from zero percent are reported as "NA" in publications, including any related estimates.

The 2015 NOPUS Redesign

The NOPUS sample was redesigned in 2015 and implemented to conduct the 2015 survey. NHTSA initiated the redesign to make NOPUS more efficient, accurate and representative. Also, beginning with the 2015 NOPUS, the reporting precision has been increased to be consistent with generally recommended Federal practices for reporting survey estimates. In addition, the new design incorporates scalability and flexibility in its design to accommodate changing resources. A sample of 57 primary sampling units (PSUs) was selected from a frame of 1,588 PSUs.

The redesigned NOPUS sample was selected using a stratified two-stage design. The first stage of selection was the county, referred to as the PSU within the design framework. The PSUs were targeted for selection based on their measure of size (MOS). The second stage of selection or secondary sampling unit (SSU), within the selected PSUs, is the road segment. At the road segment level, the NOPUS data collectors are then positioned so that they can efficiently observe seat belt use, motorcycle helmet use, and driver electronic device use.

Frame Formation: The NOPUS sample frame of PSUs excluded Puerto Rico and other U.S. Territories due to data collection cost constraints. All other counties in the U.S. were included in the sampling frame with the exception of 37 counties and three areas in Alaska; these locations were excluded on the basis of low traffic volume measured in terms of vehicle miles traveled (VMT) or because they were geographically isolated. The sample frame of SSUs excluded segments along unnamed roads, culs-de-sac, private roads, and a variety of other road types that have traditionally had very low traffic volume measured by VMT.

The PSUs consist of individual counties or groups of counties that were formed to minimize the distance that data collectors might have to travel within a particular PSU, while maintaining road segments that reflected a minimum number of annual vehicle miles traveled for each PSU. All PSUs for the sample frame are contained within their states; a PSU cannot be in more than one state if it is comprised of multiple counties. The measure of size is the 2012 VMT obtained from the Federal Highway Administration.

Stratification: One PSU was sampled with certainty because of its large VMT, and the remaining PSUs were first grouped into eight major strata based on the four U.S. Census designated regions (Northeast, Mideast, South, and West) and the two urbanicity classes (Urban and Rural). Within each major stratum, the PSUs were ordered by their predicted seat belt use rates, from lowest to highest. Then the PSUs were further stratified through cut points of the predicted seat belt use rate, resulting in strata with approximately equal total MOS. The restraint use rates were predicted by a linear regression model that used primary seat belt law enforcement, the county-level ratio of fatal crashes to VMT, and other county-level demographic data.

Sample Selection: A sample of 57 PSUs was selected using a Sequential Poisson method (Ohlsson, 1998) with probability approximately proportional to the MOS (VMT). The new NOPUS sample was selected to maximize PSU overlap with the old sample, thus maintaining comparability of the estimates from the current and previous samples. A SSU sample of road segments within each PSU is selected based upon the types of roads and urban/rural status with specified sampling rates.

The sample size of the PSUs and SSUs were determined to minimize the overall variance (increasing the efficiency) of restraint use and the costs necessary to con-

duct the NOPUS. As described before, the stratification employed in the redesign clusters the sampling units so that the PSUs within each stratum are very similar in terms of their predicted seat belt use rates, resulting in increased efficiency (smaller variance) at the PSU-level than that generated from previous NOPUS sample. To minimize variance within the PSUs, NHTSA used updated cost and road segment information to revise the road segment stratum sampling rates in order to achieve more efficiency from the survey.

Changes and Improvements: Using estimated seat belt use rates to form PSU strata provides a stratification that allows flexibility if resources for the survey change. It is straightforward to collapse strata (reducing the number of PSUs in the sample) with this method by combining adjacent strata or to increase PSU sample sizes by sampling additional PSUs per stratum.

Data collection protocols remain largely the same in the redesigned NOPUS; however NHTSA has made some minor adjustments to streamline data collection. In order to provide an estimate based on all vehicles affected by seat belt laws in relevant jurisdictions, data collectors observe and record seat belt use for all passenger vehicles observed at the data collection sites. In previous NOPUS surveys, government, emergency, and commercially-marked vehicles were excluded from observation.

NOPUS is based on a probability sample, and this survey continues to use standard survey sampling methods for constructing sampling weights for estimating national seat belt use rates, and to use replication methods to calculate standard errors of these estimates.

Prior to 2015, NHTSA's NOPUS publications reported integer percentage values for seat belt use point estimates. Along with updating the survey design, NHTSA has revised its NOPUS reporting format to be consistent with statistical best practices across the Federal Government. The new reporting format presents percentage point estimates with one decimal place. Along with this change, 95 percent confidence intervals and p-values accompany the point estimates.

References

Ohlsson, E. (1998). Sequential Poisson sampling. *Journal of Official Statistics,* 14, 149–162.

For More Information

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Additional data and information on the survey design and analysis procedures will be available in upcoming publications to be posted at the website www-nrd.nhtsa.dot.gov/cats/index.aspx in 2016.

Helmets are estimated to be 37-percent effective in preventing fatal injuries to motorcycle riders and 41-percent effective for motorcycle passengers (Deutermann, W. [2004] *Motorcycle Helmet Effectiveness Revisited* [Report No. DOT HS 809 715] Washington, DC: National Highway Traffic Safety Administration). NHTSA estimates that helmets saved the lives of 1,669 motorcyclists in 2014 (Traffic Safety Facts: 2014 Data, Report No. DOT HS 812 218). For more information on the campaign by NHTSA and the States to raise helmet use, see www.nhtsa.gov.

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 2015 – Overall Results," for the latest data on these topics.

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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