



TRAFFIC SAFETY FACTS

Research Note

DOT HS 811 759

May 2013

Motorcycle Helmet Use in 2012—Overall Results

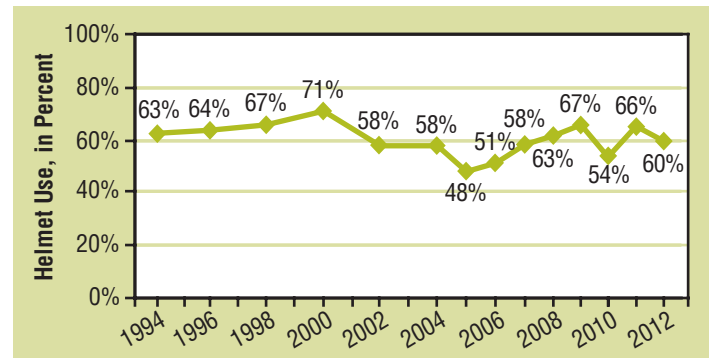
Use of DOT-compliant motorcycle helmets¹ decreased to 60 percent in 2012 from 66 percent in 2011, but the decrease is not statically significant. This result is from the National Occupant Protection Use Survey (NOPUS), the only survey that provides nationwide probability-based observed data on helmet use in the United States. The NOPUS is conducted by the National Center for Statistics and Analysis of the National Highway Traffic Safety Administration.

The motorcycle helmet use trend has been relatively flat over the last five years, as shown in Figure 1. Figure 2 shows the percentages of motorcyclists who were using DOT-compliant helmets, noncompliant helmets, and no helmet in 2011 and 2012.

The 2012 survey also found the following:

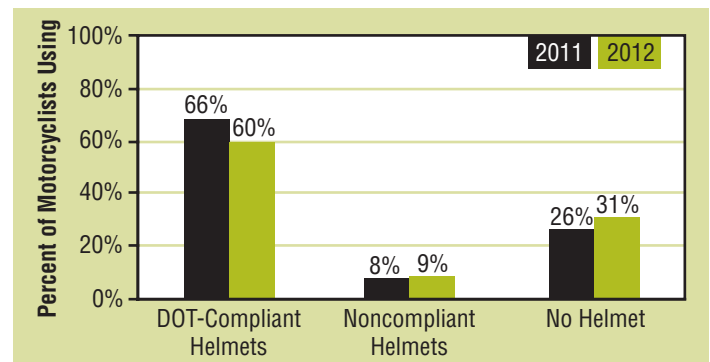
- Helmet use among motorcycle passengers decreased significantly to 46 percent in 2012 from 64 percent in 2011. (Table 1)
- Helmet use continued to be significantly higher in States that require all motorcyclists to be helmeted than in other States (Figure 3).

Figure 1
Motorcycle Helmet Use, 1994–2012



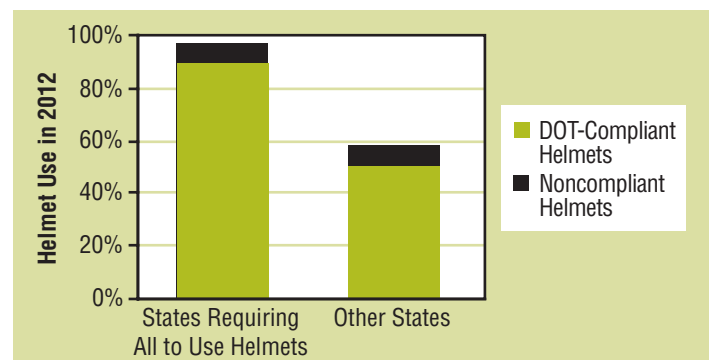
Data Source: NOPUS

Figure 2
Motorcyclists, by Helmet Type



Data Source: NOPUS

Figure 3
Motorcycle Helmet Use in 2012, 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.

Table 1

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

Motorcyclist Group	2011		2012		2011–2012 Change	
	Helmet Use ¹	Confidence That Use Is High or Low in Group ²	Helmet Use ¹	Confidence That Use Is High or Low in Group ²	Change in Percentage Points	Confidence in a Change in Use ³
All Motorcyclists	66%		60%		-6	88%
Riders	67%	70%	63%	100%	-4	78%
Passengers	64%	70%	46%	100%	-18	90%
Motorcyclists in States Where ⁴						
Use Is Required for All Motorcyclists	84%	100%	89%	100%	5	62%
Other States	50%	100%	49%	100%	-1	43%
Motorcyclists on						
Expressways	77%	97%	75%	100%	-2	23%
Surface Streets	63%	97%	53%	100%	-10	96%
Motorcyclists Traveling in						
Fast Traffic	67%	59%	67%	99%	0	4%
Medium-Speed Traffic	61%	94%	58%	74%	-3	34%
Slow Traffic	73%	80%	44%	100%	-29	99%
Motorcyclists Traveling in						
Heavy Traffic	65%	68%	63%	80%	-2	31%
Moderately Dense Traffic	71%	89%	56%	85%	-15	95%
Light Traffic	60%	81%	62%	59%	2	18%
Motorcyclists in						
Light Precipitation	NA	NA	NA	NA	NA	NA
Light Fog	NA	NA	NA	NA	NA	NA
Clear Weather Conditions	66%	96%	60%	52%	-6	82%
Motorcycle Riders When						
They Are the Sole Motorcyclist	67%	53%	65%	91%	-2	57%
They Have a Passenger	67%	53%	56%	91%	-11	81%
Motorcyclists in the						
Northeast	66%	52%	60%	55%	-6	60%
Midwest	53%	99%	49%	100%	-4	55%
South	70%	65%	61%	52%	-9	57%
West	81%	100%	82%	100%	1	7%
Motorcyclists in						
Urban Areas	61%	79%	51%	78%	-10	55%
Suburban Areas	67%	61%	58%	82%	-9	92%
Rural Areas	67%	51%	65%	96%	-2	15%
Motorcyclists Traveling During						
Weekdays	63%	91%	60%	54%	-3	45%
Weekday Rush Hours	57%	93%	58%	64%	1	11%
Weekday Non-Rush Hours	66%	93%	61%	64%	-5	65%
Weekends	72%	91%	61%	54%	-11	89%
Motorcycle Riders Who						
Are Riding Alone	67%	53%	65%	91%	-2	57%
Have a Passenger Using a DOT-Compliant Helmet	88%	100%	93%	100%	5	53%
Have a Passenger Using a Noncompliant Helmet	NA	NA	NA	NA	NA	NA
Have an Unhelmeted Passenger	21%	100%	20%	100%	-1	9%
Passengers on Motorcycles on Which						
The Rider Is Using a DOT-Compliant Helmet	83%	100%	78%	100%	-5	32%
The Rider Is Using a Noncompliant Helmet	NA	NA	NA	NA	NA	NA
The Rider Is Unhelmeted	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 statistical confidence that use in the motorcyclist group (e.g., motorcyclists in urban areas) is higher or lower than use in the corresponding complementary motorcyclist group (e.g., combined motorcyclists in suburban and rural areas). Confidences that meet or exceed 90% are formatted in boldface type. Confidences are rounded to the nearest percentage point, and so confidences reported as "100%" are between 99.5% and 100.0%.

³ The degree of statistical confidence that the 2012 use rate is different from the 2011 rate. Confidences that meet or exceed 90% are formatted in boldface type.

⁴ 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, National Highway Traffic Safety Administration, National Center for Statistics and Analysis

Table 2

Use of Noncompliant Helmets by Major Motorcyclist Characteristics

Motorcyclist Group	2011		2012		2011–2012 Change	
	Helmet Use ¹	Confidence That Use Is High or Low in Group ²	Helmet Use ¹	Confidence That Use Is High or Low in Group ²	Change in Percentage Points	Confidence in a Change in Use ³
All Motorcyclists	8%		9%		1	14%
Riders	9%	75%	8%	97%	-1	33%
Passengers	7%	75%	15%	97%	8	89%
Motorcyclists in States Where ⁴						
Use Is Required for All Motorcyclists	12%	98%	8%	63%	-4	72%
Other States	5%	98%	9%	63%	4	84%
Motorcyclists on						
Expressways	9%	63%	10%	63%	1	10%
Surface Streets	8%	63%	8%	63%	0	2%
Motorcyclists Traveling in						
Fast Traffic	7%	75%	10%	66%	3	47%
Medium-Speed Traffic	10%	83%	8%	63%	-2	40%
Slow Traffic	8%	60%	8%	63%	0	2%
Motorcyclists Traveling in ⁵						
Heavy Traffic	9%	69%	8%	62%	-1	34%
Moderately Dense Traffic	10%	85%	11%	73%	1	15%
Light Traffic	3%	100%	6%	79%	3	64%
Motorcyclists in						
Light Precipitation	NA	NA	NA	NA	NA	NA
Light Fog	NA	NA	NA	NA	NA	NA
Clear Weather Conditions	9%	100%	9%	61%	0	7%
Motorcycle Riders When						
They Are the Sole Motorcyclist	9%	58%	7%	78%	-2	60%
They Have a Passenger	8%	58%	10%	78%	2	23%
Motorcyclists in the						
Northeast	12%	91%	6%	81%	-6	94%
Midwest	6%	87%	9%	54%	3	75%
South	6%	85%	16%	83%	10	72%
West	11%	84%	4%	97%	-7	99%
Motorcyclists in						
Urban Areas	7%	66%	7%	71%	0	4%
Suburban Areas	9%	73%	10%	77%	1	24%
Rural Areas	8%	63%	8%	73%	0	10%
Motorcyclists Traveling During						
Weekdays	10%	95%	11%	84%	1	23%
Weekday Rush Hours	10%	56%	15%	77%	5	47%
Weekday Non-Rush Hours	10%	56%	9%	77%	-1	37%
Weekends	6%	95%	7%	84%	1	21%
Motorcycle Riders Who						
Are Riding Alone	9%	58%	7%	78%	-2	60%
Have a Passenger Using a DOT-Compliant Helmet	NA	NA	NA	NA	NA	NA
Have a Passenger Using a Noncompliant Helmet	NA	NA	NA	NA	NA	NA
Have an Unhelmeted Passenger	NA	NA	NA	NA	NA	NA
Passengers on Motorcycles on Which						
The Rider Is Using a DOT-Compliant Helmet	7%	58%	9%	93%	2	22%
The Rider Is Using a Noncompliant Helmet	NA	NA	NA	NA	NA	NA
The Rider Is Unhelmeted	NA	NA	NA	NA	NA	NA

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

² The statistical confidence that use in the motorcyclist group (e.g., motorcyclists in urban areas) is higher or lower than use in the corresponding complementary motorcyclist group (e.g., combined motorcyclists in suburban and rural areas). Confidences that meet or exceed 90% are formatted in boldface type. Confidences are rounded to the nearest percentage point, and so confidences reported as “100%” are between 99.5% and 100.0%.

³ The degree of statistical confidence that the 2012 use rate is different from the 2011 rate. Confidences that meet or exceed 90% are formatted in boldface type.

⁴ 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, National Highway Traffic Safety Administration, National Center for Statistics and Analysis

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 the hours of 7a.m. and 6p.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 2012 NOPUS data was collected between June 4 and June 17, 2012 while the 2011 data was collected between June 6 and June 17, 2011.

The NOPUS uses a complex multistage probability sample, statistical data editing, imputation of unknown values, and complex estimation procedures. The sample sites for the 2012 NOPUS were entirely from the 2006 NOPUS sample redesign without incorporating any sites from the old design. During the transitional years between 2006 and 2010, sample sites were chosen both from the new design and the old design. Prior to 2006, sample sites were from the old design only. Table 3 shows the observed sample sizes of the 2012 NOPUS Moving Traffic Survey. A total of 871 motorcyclists were observed on the 747 motorcycles at the 1,700 data collection sites.

Table 3
Sites, Motorcycles, and Motorcyclists Observed

Numbers of	2011	2012	Percentage Change
Sites Observed	1,700	1,700	0%
Motorcycles Observed	787	747	-5%
Motorcyclists Observed	916	871	-5%

Because the NOPUS sites are selected probabilistically, we can analyze the statistical significance of its results. Statistically significant increases in helmet use between 2011 and 2012 are identified in Table 1 and Table 2 by having a result that is 90 percent or greater in column 7 of these tables. Statistical confidences that use in a given motorcyclist group, e.g., motorcyclists in the Midwest, is higher or lower than the complementary motorcyclist group, e.g., motorcyclists in the Northeast, South,

and West, are provided in columns 3 and 5 of the two tables. Such comparisons are made within categories, such as road type, delineated by changes in row shading in the tables. The exception to this is the grouping "Motorcyclists Traveling During ...," in which weekdays are compared to weekends, and weekday rush hour to weekday non-rush hour.

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 DTNH22-07-D-00057.

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 estimates helmet use as the use of DOT-compliant helmets.

At the time the 2012 survey was conducted, 19 States and the District of Columbia required all motorcyclists to be helmeted. Effective April 12, 2012, Michigan weakened its law and no longer required all motorcyclists to be helmeted. Table 4 provides a list of States with laws requiring helmet use for all motorcyclists. Other States

Table 4
States With Laws¹ 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	

¹States and the District of Columbia with laws in effect as of May 31, 2012

either required only a subset of riders or motorcycle passengers to use helmets (such as those under age 18), or had no helmet requirement.

“Expressways” are defined to be roadways with limited access, while “surface streets” comprise all other roadways. “Rush hour” is defined to comprise the time periods 7 – 9:30 a.m. and 3:30 – 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(s) exceeds 50 mph, with “medium-speed traffic” defined as 31 - 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

For More Information

This Research Note was written by Timothy M. Pickrell, a mathematical statistician in the Mathematical Analysis Division, National Center for Statistics and Analysis, NHTSA, and by Tony Jianqiang Ye, a statistician employed by Bowhead Systems Management Inc., working with NHTSA. For questions regarding the information presented in this document, please contact ncsaweb@dot.gov.

Additional data and information on the survey design and analysis procedures will be available in upcoming publications to be posted at the Web site <http://www-nrd.nhtsa.dot.gov/cats/index.aspx> in 2012.

Helmets are estimated to be 37-percent effective in preventing fatal injuries to motorcycle riders and 41-percent for motorcycle passengers. NHTSA estimates that helmets saved the lives of 1,550 motorcyclists in 2010. (Traffic Safety Facts: 2010 Data, NHTSA, DOT HS 811 639) For more information on the campaign by NHTSA and the States to raise helmet use, see www.nhtsa.gov.

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 2012—Overall Results,” for the latest data on these topics.

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