Spotlight on Highway Safety

GHSA®
Governors Highway Safety Association
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Washington, DC 20001

Motorcyclist Traffic Fatalities by State

2013 PRELIMINARY DATA

Prepared for
Governors Highway Safety Association

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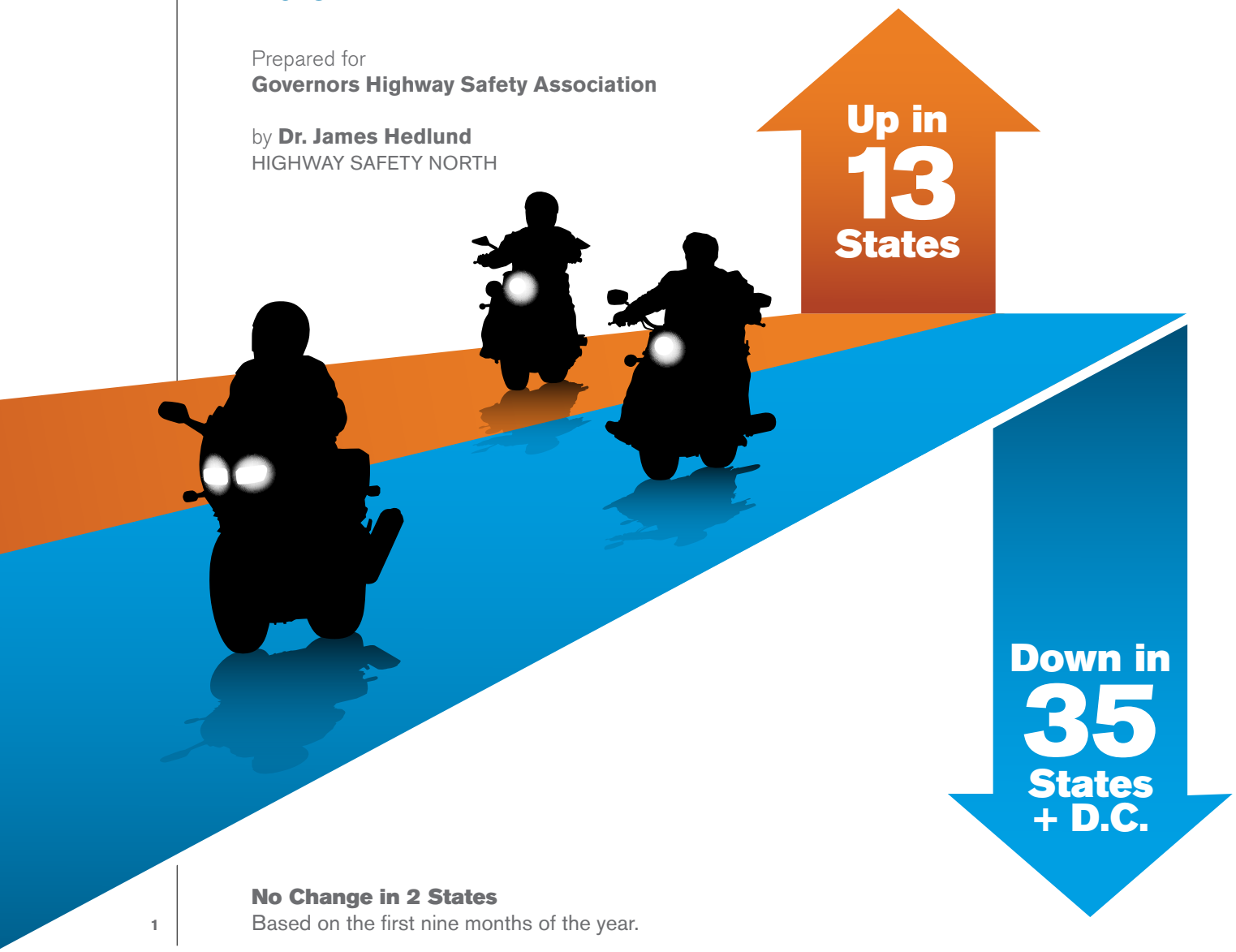
HIGHWAY SAFETY NORTH



No Change in 2 States
Based on the first nine months of the year.

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Acknowledgements

Dr. James Hedlund conducted the analysis and researched and wrote the report.

Pam Fischer, Principal, Pam Fischer Consulting, and **Troy Costales**, Governor's Representative and Administrator, Oregon Transportation Safety Division, reviewed and edited the report.

Jonathan Adkins, Executive Director, GHSA, and **Kara Macek**, Communications Director, GHSA, oversaw the report.

Creative by **Tony Frye Design**.

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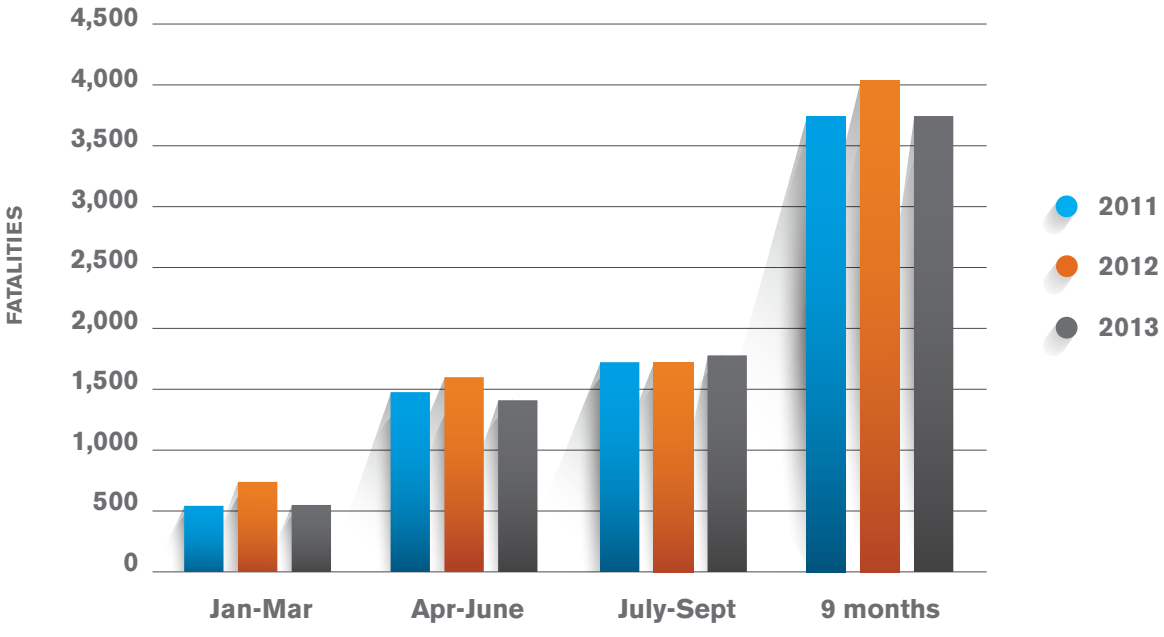
Summary

Motorcyclist traffic fatalities in the United States decreased about 7% in 2013 compared to 2012, based on preliminary data supplied to the Governors Highway Safety Association (GHSA) by all 50 states and the District of Columbia. This will be only the second year since 1997 that motorcyclist fatalities decreased.

In the preliminary data, motorcyclist fatalities decreased by 10.1% during the first nine months of 2013. The decrease will be less in the final data because some fatalities that occurred during these months are not yet included in state data files. GHSA expects the underreporting to be about 3.2%, based on its experience from the past three years. GHSA estimates that the final motorcyclist fatality total for 2013 will be approximately 7% less than the 4,957 recorded in 2012, or about 4,610.

Motorcyclist fatalities in 2013 will have dropped to about the same level as 2011, as shown in Figure S-1.

Figure S-1. Motorcyclist Fatalities by Quarter



Source: State Highway Safety Offices

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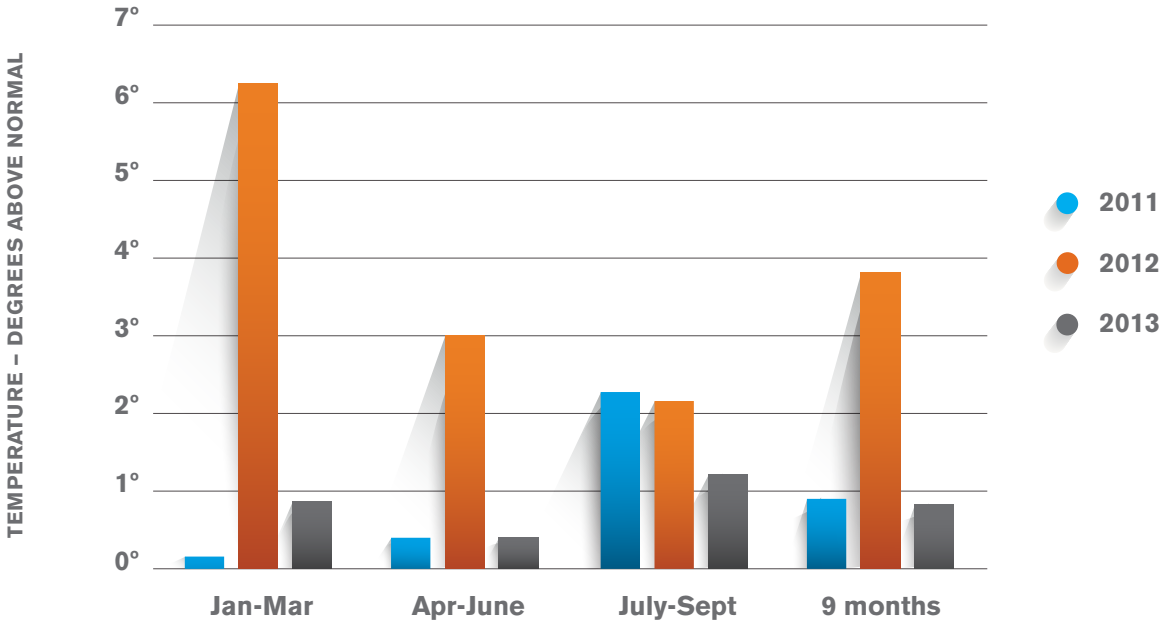
Motorcyclist fatalities increased in 2012 because of the weather. The first six months of 2012 were unusually warm and dry in much of the nation. This increased motorcycle travel and motorcyclist fatalities substantially compared to 2011. The weather in the first six months of 2013 was generally cooler and wetter, similar to 2011, and motorcyclist fatalities in many states dropped back to 2011 levels. Figure S-2 shows average degrees above normal by quarter for the three years.

Figure S-2. Average Degrees Above Normal by Quarter



Source: National Climatic Data Center

Motorcyclist fatalities in 2013 remained at the same level as in 2011. Motorcycles are dangerous for their riders and passengers. In 2011, motorcycles produced six times more occupant fatalities per registration than passenger vehicles. Passenger vehicle occupants were twice as safe in 2011 as in 1997, measured by fatalities per registered vehicle. But motorcyclist safety, by the same measure, has not changed in fifteen years. In particular, motorcycle helmet use has not increased: it was 64% in 1996 and 60% in 2012.

Motorcyclist fatalities can be reduced by consistent and long-term use of proven countermeasures. States should adopt strategies to increase helmet use, reduce alcohol impairment and speeding, train all motorcycle operators and ensure they are properly licensed, and educate other drivers to share the road with motorcyclists. The most effective strategy by far is to enact universal helmet use laws in the 31 states that lack them.

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Introduction

Motorcyclist fatalities in the United States more than doubled from 1997 to 2008 (Figure 1). A substantial decrease in 2009 brought momentary hope that this deadly trend had ended. But motorcyclist fatalities increased again in 2010, 2011 and 2012. In comparison, passenger vehicle fatalities decreased by 1% in these three years. Motorcyclists accounted for 15% of all traffic fatalities in 2012, compared to 5% in 1997 (NHTSA, 2013a and Figure 2).

Figure 1. United States Motorcyclist Fatalities, 1975-2012

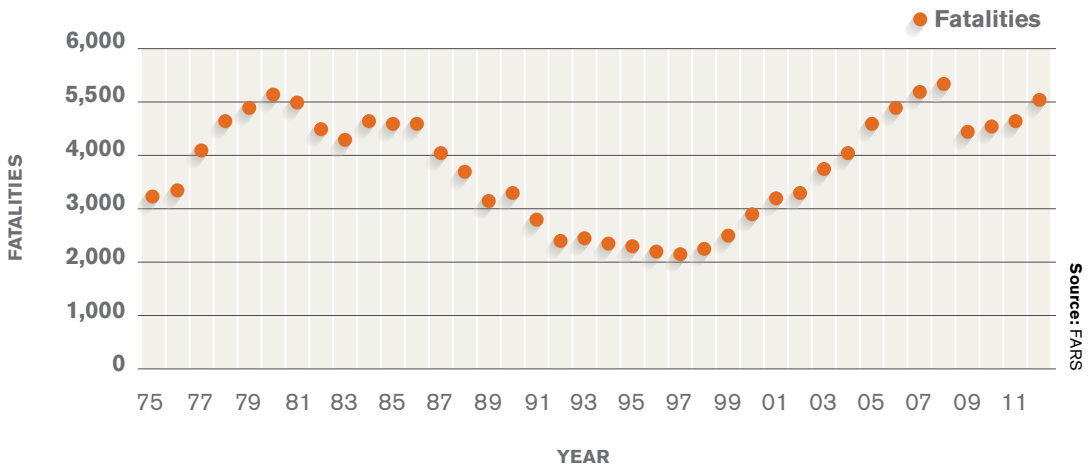
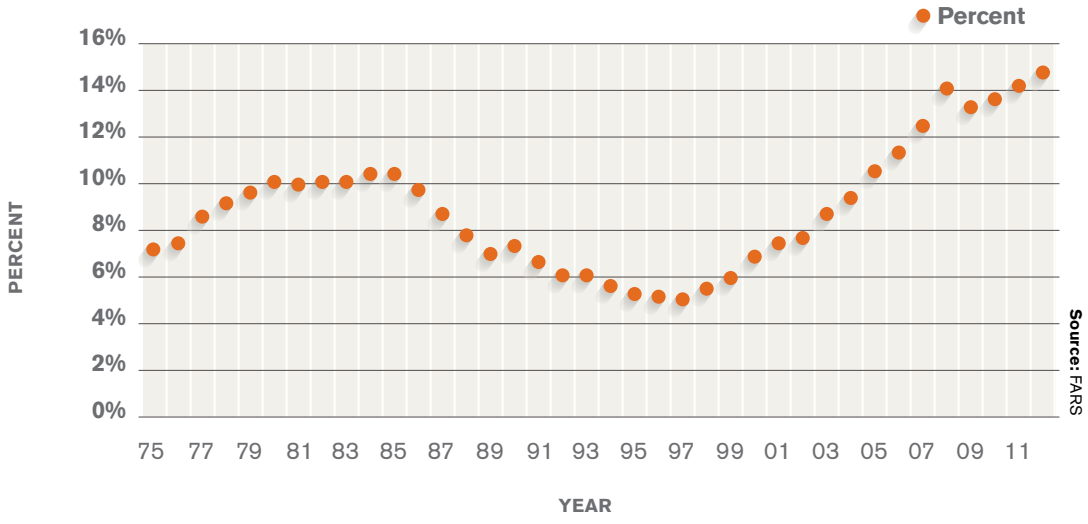


Figure 2. Motorcyclist Fatalities as Percent of Total Traffic Fatalities, 1975-2012



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In 1997, the year with the fewest motorcyclist fatalities since 1975, there were 3,826,373 registered motorcycles and 2,116 motorcyclist fatalities, or 5.53 fatalities per 10,000 registrations. By 2011, fatalities increased to 4,612 while registrations increased to 8,437,502, so that fatalities per registration remained relatively unchanged at 5.46. In contrast, passenger vehicle occupant fatalities per 10,000 registrations decreased nearly 50% over this period, from 1.70 in 1997 to 0.89 in 2011 (NHTSA, 2013e). In 2011, motorcycles accounted for six times more occupant fatalities per registration than passenger vehicles. Passenger vehicle occupants were twice as safe in 2011 as compared to 1997, but motorcyclist safety did not improve.

In January 2014 the Governors Highway Safety Association (GHSA) asked its State Highway Safety Office (SHSO) members to provide preliminary motorcyclist fatality counts for 2013, as they did at the same time in the previous four years. All 50 states, the District of Columbia, American Samoa, Guam, the Northern Mariana Islands, and Puerto Rico supplied data. Many jurisdictions also provided their views on why their motorcyclist fatalities increased or decreased.

This report summarizes the information received. It should be read with three important considerations in mind.

1. All 2013 data are preliminary, especially for the last few months. This report presents data through September because these counts are reasonably complete.
2. Data reported by the states are from state traffic record systems. State motorcyclist fatality counts may differ slightly from the counts recorded in NHTSA's Fatality Analysis Reporting System (FARS).
3. The states' views on why motorcyclist fatalities increased or decreased are based on their experience and best judgment, not scientific analyses.

In this report, a motorcyclist is any person operating or riding as a passenger on a motorcycle, motor scooter, or other two-wheeled motorized vehicle. The three exceptions are Florida, which did not report motorcycle passenger fatalities, and Iowa and Michigan, which did not report moped fatalities.

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Motorcyclist fatalities in 2012 and 2013

Table 1 compares 2012 and 2013 motorcyclist fatality counts in three-month intervals through September 2013. See Table 4 for data for each state.

Table 1. Motorcyclist Fatalities by Quarter, 2012 and 2013, Preliminary Data for 2013

	Jan – Mar	Apr – June	Jul – Sept	Nine Month Total Jan – Sept
2012 final	719	1,598	1,729	4,046
2013 preliminary	539	1,373	1,726	3,638
Change from 2012	- 180	- 225	- 3	- 408
Percent change	- 25%	- 14.1%	- 0.2%	- 10.1%
States that increased	9	8 + D.C.	25	13
States unchanged	6	3	0	2
States that decreased	35 + D.C.	39	25 + D.C.	35 + D.C.

Data reported to GHSA by the states and the District of Columbia in January through March 2014; some 2013 data preliminary. Passenger fatalities in Florida and moped fatalities in Iowa and Michigan are not included.

In the first quarter of 2013, motorcyclist fatalities nationwide decreased by 25%. At the state level, fatalities decreased in 35 states and the District of Columbia, were unchanged in six, and increased in nine. Fatalities in four states decreased by more than 10.

The second quarter produced substantially more motorcyclist fatalities as the riding season began in earnest. The first quarter's pattern moderated somewhat with an overall decrease of 14.1%. Fatalities decreased compared to 2012 in 39 states, were unchanged in three, and increased in eight states and the District of Columbia. Nine of the decreases were by 10 or more fatalities.

Fatalities in the third quarter were essentially unchanged from 2012, with a reported decrease of three in the preliminary data. Fatalities decreased in 25 states and the District of Columbia and increased in 25 states. Six of the decreases and six of the increases were by 10 or more fatalities.

In the nine months from January through September, fatalities decreased by 408 in the preliminary data, or 10.1%, with more than two-thirds of the states reporting decreases.

It's important to keep in mind that the 2013 data are preliminary and that the fatality counts will rise. As California noted, "for 2012, our preliminary numbers for January through June increased by 3% by the time they were final."

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Experience from previous surveys suggests how much fatalities may increase in the final data. The final motorcyclist fatality total for the first nine months of 2012, reported by the states in the 2013 GHSA survey, was 3.2% higher than the preliminary total for these same months reported by the states in February and March 2013 and presented in last year's *Spotlight* (GHSA, 2013). Underreporting was 4.2% in the first quarter, 1.8% in the second quarter and 4% in the third quarter. Underreporting was slightly greater in 2011, at 4.7%, and in 2010, at 4.5% (ibid).

Table 2 adjusts for underreporting by increasing each quarter's count in the 2013 preliminary fatality data by 3.2%. After that adjustment, fatalities for the first nine months of 2013 are estimated to have decreased by 7.2% from 2012.

Table 2. Motorcyclist Fatalities by Quarter, 2012 and 2013, Preliminary Data for 2013, Adjusted for Underreporting

	Jan – Mar	Apr – June	Jul – Sept	Nine Month Total Jan – Sept
2012 final	719	1,598	1,729	4,046
2013 unadjusted preliminary	539	1,373	1,726	3,638
2013 adjusted preliminary	556	1,416	1,781	3,753
Change from 2012	- 163	- 182	52	- 293
Percent change	- 22.7%	- 11.4%	3%	- 7.2%

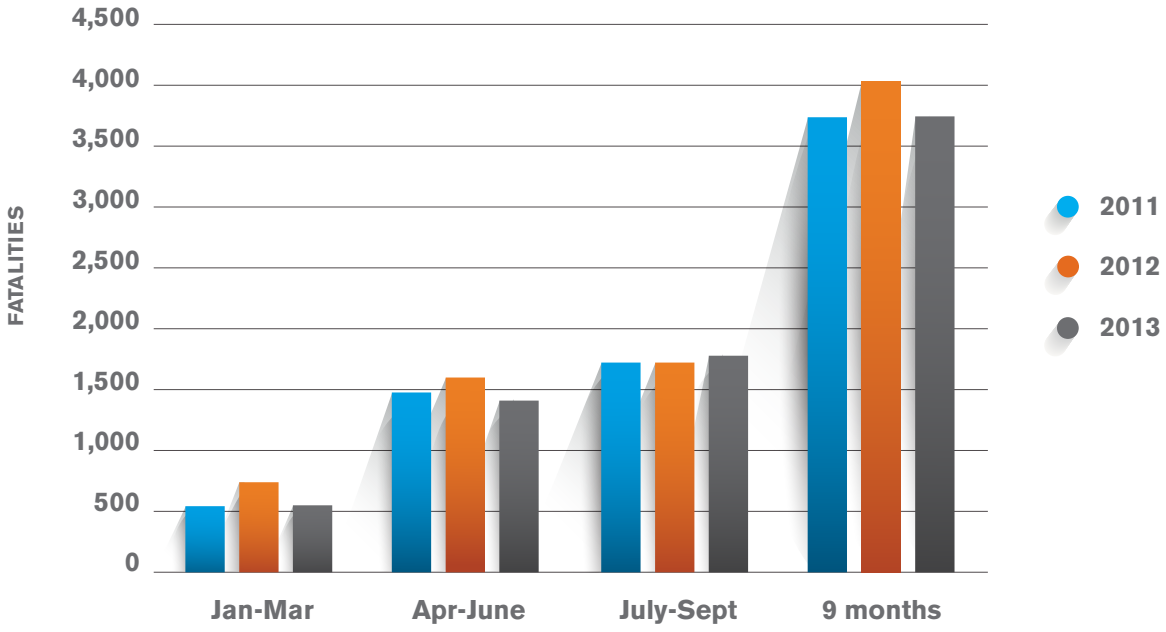
Data reported to GHSA by the states and the District of Columbia in January through March 2014; some 2013 data preliminary. Passenger fatalities in Florida and moped fatalities in Iowa and Michigan are not included.

A 7% decrease in motorcyclist fatalities in 2013 would be greater than the total traffic fatality decrease of 3% estimated by the National Safety Council (NSC, 2014) and the 3.7% decrease for the first nine months of 2013 estimated by NHTSA (2014a).

Three-year comparisons

Figure 3 compares the 2013 adjusted fatalities to 2011 and 2012 for the first three quarters and for the first nine months. The figure shows how fatality totals for 2011 and 2013 are very similar for each quarter and for the full nine months. Fatalities in 2012 are greater for the first two quarters. It is reasonable to conclude that motorcyclist fatalities in 2013 returned to 2011 levels, while fatalities in 2012 were unusually high for transitory reasons.

Figure 3. Motorcyclist Fatalities by Quarter, 2011 - 2013, Adjusted Preliminary Data for 2013



Source: State Highway Safety Offices

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Table 3 provides the data, including both the unadjusted and adjusted preliminary data for 2013. Table 4 compares the final totals from 2012 with preliminary data from 2013 for each state.

Table 3. Motorcyclist Fatalities by Quarter, 2011 - 2013, Preliminary Data for 2013

	Jan – Mar	Apr – June	Jul – Sept	Nine Month Total Jan – Sept
2011 final	555	1,476	1,729	3,760
2012 final	719	1,598	1,729	4,046
2013 unadjusted preliminary	539	1,373	1,726	3,638
2013 adjusted preliminary	556	1,416	1,781	3,753

Data reported to GHSA by the states and the District of Columbia in January through March 2013 and 2014; some 2013 data preliminary. Passenger fatalities in Florida and moped fatalities in Iowa and Michigan are not included.

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Table 4
Cumulative Motorcyclist Traffic Fatalities by State, 2013 Preliminary Data

Data reported to GHSA by all 50 states, the District of Columbia, American Samoa, Guam, the Northern Mariana Islands, and Puerto Rico; some 2013 data preliminary. Passenger fatalities in Florida and moped fatalities in Iowa and Michigan are not included.

American Samoa reported no motorcyclist fatalities in either year.

Guam reported three motorcyclist fatalities in the first nine months of 2012 and two in 2013.

The Northern Mariana Islands reported no motorcyclist fatalities in the first nine months of 2012 and one in 2013.

Puerto Rico reported 35 motorcyclist fatalities in the first nine months of 2012 and 36 in 2013.

	6 MONTH TOTAL				9 MONTH TOTAL			
State	2012	2013	Change	Percent	2012	2013	Change	Percent
AK	2	4	2	100%	8	9	1	13%
AL	45	36	-9	-20%	73	57	-16	-22%
AR	44	25	-19	-43%	59	46	-13	-22%
AZ	73	83	10	14%	108	121	13	12%
CA	209	185	-24	-11%	345	299	-46	-13%
CO	34	25	-9	-26%	68	72	4	6%
CT	18	14	-4	-22%	42	39	-3	-7%
DC	2	2	0	0%	4	3	-1	-25%
DE	8	6	-2	-25%	15	16	1	7%
FL	222	207	-15	-7%	326	303	-23	-7%
GA	74	55	-19	-26%	111	97	-14	-13%
HI	22	16	-6	-27%	35	22	-13	-37%
IA	27	13	-14	-52%	49	40	-9	-18%
ID	8	7	-1	-13%	21	21	0	0%
IL	75	56	-19	-25%	133	142	9	7%
IN	66	37	-29	-44%	132	100	-32	-24%
KS	21	13	-8	-38%	43	29	-14	-33%
KY	52	44	-8	-15%	86	71	-15	-17%
LA	38	43	5	13%	56	64	8	14%
MA	20	9	-11	-55%	46	28	-18	-39%
MD	34	23	-11	-32%	69	54	-15	-22%
ME	9	9	0	0%	21	13	-8	-38%
MI	56	42	-14	-25%	121	118	-3	-2%
MN	23	22	-1	-4%	52	60	8	15%
MO	50	35	-15	-30%	90	62	-28	-31%
MS	22	16	-6	-27%	31	26	-5	-16%
MT	9	8	-1	-11%	30	32	2	7%
NC	84	72	-12	-14%	139	131	-8	-6%
ND	8	5	-3	-38%	16	9	-7	-44%
NE	12	5	-7	-58%	22	12	-10	-45%
NH	11	9	-2	-18%	25	20	-5	-20%
NJ	43	20	-23	-53%	65	44	-21	-32%
NM	26	17	-9	-35%	51	31	-20	-39%
NV	20	19	-1	-5%	33	41	8	24%
NY	90	64	-26	-29%	156	146	-10	-6%
OH	73	51	-22	-30%	140	113	-27	-19%
OK	40	35	-5	-13%	67	74	7	10%
OR	14	16	2	14%	44	30	-14	-32%
PA	113	81	-32	-28%	185	158	-27	-15%
RI	2	3	1	50%	7	9	2	29%
SC	70	62	-8	-11%	114	120	6	5%
SD	5	4	-1	-20%	24	21	-3	-13%
TN	68	60	-8	-12%	114	114	0	0%
TX	217	230	13	6%	339	361	22	6%
UT	13	14	1	8%	28	26	-2	-7%
VA	39	34	-5	-13%	71	60	-11	-15%
VT	6	1	-5	-83%	11	7	-4	-36%
WA	33	28	-5	-15%	80	63	-17	-21%
WI	46	30	-16	-35%	101	75	-26	-26%
WV	17	13	-4	-24%	30	20	-10	-33%
WY	4	4	0	0%	10	9	-1	-10%
TOTAL	**2,317**	**1,912**	**-405**	**-17.5%**	**4,046**	**3,638**	**-408**	**-10.1%**

Reasons for changes in motorcyclist fatalities

Motorcyclist fatalities depend on the amount of motorcycle travel and the safety of that travel. While accurate state-level motorcycle travel data are not available, the amount of travel is influenced by the weather, the economy, gasoline prices, and motorcycle registrations. The safety of motorcyclist travel is influenced by the operator's knowledge and skill and by safety programs affecting both motorcyclists and other drivers who interact with motorcyclists. This section examines each of these influences.

Weather

In the 2012 *Spotlight* (GHSA, 2013), many states commented that the first six months of 2012 were unusually warm and dry, which encouraged more motorcycle travel and led to more motorcycle crashes and motorcyclist fatalities. Data from the National Climatic Data Center (NCDC) supported these observations. The lower 48 states recorded the warmest average temperature on record by a full two degrees for March through May 2012, while rainfall was slightly below normal.

Again in 2013, many states explicitly noted the weather's influence on motorcyclist fatalities, this time to explain why fatalities dropped. Indiana state highway safety officials commented in detail:

> *In 2011, Indiana had 118 motorcycle fatalities. In 2012 fatalities spiked to 152, then returned to 115 in 2013. We theorized that an unusually warm spring (we had 80 degree days during much of March) extended the riding season, and a summer drought (people don't like to ride in the rain) contributed to create substantially higher exposure through more people riding more days over a longer than usual riding season as the main reason for the increased number of motorcycle fatalities in 2012. … We asked if other states had seen unusual increases in motorcycle fatalities for 2012. Several states replied that they did have unusually high motorcycle fatalities in 2012 and most also noted an unusually warm year with an extended riding season. We feel that 2012 was not only an anomaly for Indiana, but for much of the country as well, as much of the country in 2012 had early, warm spring seasons, exceptionally dry summers, and an overall much longer riding season than normal.*

Other states, including Colorado, Maine, Maryland, Michigan, Missouri, New Jersey, North Carolina, North Dakota, South Carolina, and Vermont, suggested that weather played a role in the decrease in motorcyclist fatalities in 2013. Comments included "our summer was particularly rainy," "winter weather conditions up through the second week of May," and "the riding season was very short in 2013."

In other states, however, the weather in 2013 was cited as a reason for an increase in motorcyclist fatalities. Illinois noted that "some of the increase in miles driven may be due to mild weather in 2013" and Tennessee officials suggested that "the relatively mild winter the last couple of years may have played a role in increased fatalities." Connecticut noted the impacts of weather in both 2012 and 2013: "2012 had a very wet spring, riding was held at a minimum for this reason, when July rolled around riders took to the road and this can be seen reflected in the jump from six [fatalities] in June to 12 in July. 2013 saw the hottest July on record…riding was not enjoyable in the sweltering temperatures. When the heat finally broke at the beginning of August the riders came out in force [resulting in a] high number of fatalities."

Data from NCDC support the states' observations. Table 5 presents average temperature and precipitation data by quarter for the lower 48 states (NCDC, 2014a).

Table 5. Average Temperature and Precipitation by Quarter, 2011 - 2013

		TEMPERATURE		PRECIPITATION	
QUARTER	YEAR	Average	Change from norm	Average	Change from norm
Jan-March	2011	35.27°	0.12°	6.54"	-0.42"
	2012	41.35°	6.20°	6.81"	-0.15"
	2013	35.98°	0.83°	6.11"	-0.85"
April-June	2011	60.30°	0.39°	9.43"	1.08"
	2012	62.89°	2.98°	6.97"	-1.38"
	2013	60.31°	0.40°	9.59"	1.24"
July-Sept	2011	72.41°	2.22°	7.26"	-0.62"
	2012	72.29°	2.10°	7.32"	-0.56"
	2013	71.39°	1.20°	8.88"	1.00"

Source: NCDC (2014a). Climate at a Glance.

For both temperature and precipitation, change from norm measures the difference from the 1901-2000 base period average.

The first quarters of 2011 and 2013 had similar temperature and precipitation, while the first quarter of 2012 was warmer by more than five degrees, making it the warmest first quarter in the past century. The temperature and precipitation in the second quarters of 2011 and 2013 again were similar, while the second quarter of 2012 was warmer by more than 2.5 degrees and dryer by almost 2.5 inches. The weather during the third quarters of 2012 and 2011 was similar, while it was a little cooler and wetter in 2013.

Based solely on these national weather data, and on the general observation that motorcyclist travel and fatalities increase in warmer and dryer weather, one would expect:

- similar motorcyclist fatality totals in 2011 and 2013 and increased fatalities in 2012 for the first and second quarters;
- similar fatality totals in 2011 and 2012 and decreased fatalities in 2013 for the third quarters.

These predictions are generally consistent with the fatality results presented in Table 3.

State-level climatic data are needed to analyze state-level motorcycle travel and motorcyclist fatality changes. Figure 4 shows average temperatures in the lower 48 states for the first six months of 2011, 2012 and 2013. The similar temperatures in 2011 and 2013 and the considerably warmer 2012 are immediately obvious. The maps also can be used to help understand state-level motorcyclist fatality fluctuations.

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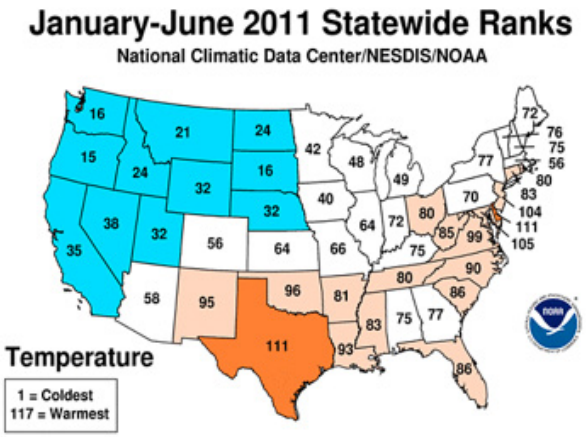
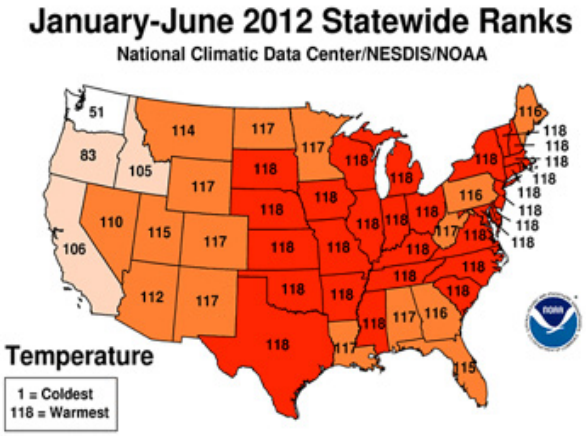
Figure 4. Temperatures by State, January-June 2011, 2012, and 2013

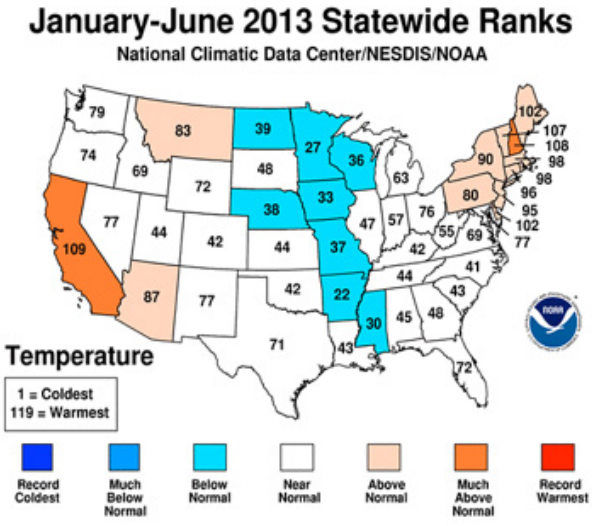
Source: NCDC (2014b). National Temperature and Precipitation Maps.



2011: Normal or slightly cooler in the Northwest, normal or slightly warmer in the Southeast. Only Texas was much above normal; no state was much below normal.



2012: All states much above normal except for California, Idaho, Oregon, and Washington. Record warm temperatures in many states. All states warmer in 2012 than in 2011.



2013: Normal or cooler in all states except Arizona, Montana, and the Northeast. Only California and New Hampshire are much above normal. All states except California were cooler in 2013 than in 2012.

The economy and gasoline prices

An improving economy produces more discretionary income to buy and ride motorcycles. A poor economy has the opposite effect.

The U.S. economy grew slowly in 2013. The Gross Domestic Product (GDP) increased 1.9% in 2013, compared to 2.8% in 2012. The price index for gross domestic purchases increased 1.2% in 2013, compared to 1.7% in 2012 (BEA, 2014). The consumer price index (CPI) increased 1.5% (BLS, 2014a).

The continued slow economic recovery from the recent downturn likely had little effect on motorcycling. Only one state, Oklahoma, suggested that an improved economy may have been one reason why motorcyclist fatalities increased slightly in 2013.

High gasoline prices may encourage riders to use their fuel-efficient motorcycles rather than automobiles for commuting and other everyday travel. Several states commented in last year's *Spotlight* that high prices in 2012 may have influenced motorcyclist fatality increases.

Nationwide, the average gasoline price in 2013 was $3.566, a slight drop from $3.644 in 2012. This small decrease probably had little influence on motorcycling. Only two jurisdictions suggested that gasoline prices influenced motorcycle registrations and fatalities. "With the rise in gas prices [in 2012] there was a significant spike in motorcycle sales and registrations … In 2013, the gas prices began to stabilize and then drop," said Hawaii SHSO officials. "The number of motorcycles and mopeds registered [in the Northern Marina Islands] increased for the past five years due to gas price increases."

Motorcycle registrations and motorcyclist training

National motorcycle registration data are not yet available for 2013. While SHSO officials in California, New Mexico and South Carolina reported increases in motorcycle sales and registrations, most states did not.

Several states noted either increases or decreases in their motorcycle training enrollments. "People taking motorcycle basic training in Colorado through CDOT-approved vendors… increased 28% over the last four years." Hawaii "expanded motorcycle safety courses to … the islands of Maui and Kauai. …By the end of 2012, the classes…were consistently full." Oregon has "a mandatory training law that is being phased in over a five year period based on age. In 2013 all new riders under the age of 51 were required to take motorcycle training."

Maine, on the other hand, experienced "a 21% decrease in enrollment from 2012 to 2013 in [two motorcycle training] courses, which amounts to approximately 1,000 [fewer] participants." Maryland reported that "there are fewer new riders. Our motorcycle training numbers ... were down from 2012 which include the number of classes conducted, students enrolled and licenses/certificates issued." South Carolina reported "increased motorcycle registrations without corresponding increases in rider training."

Safety programs

Several states suggested that specific motorcycle safety programs may have played a role in decreasing or limiting the increase in motorcyclist fatalities. Increased enforcement was noted by Guam, Kansas, Nebraska, Puerto Rico, and Wyoming. Education and publicity, including *Share the Road* campaigns, were noted by California, Florida, Kansas, Maryland, Missouri, North Carolina, Northern Mariana Islands, Ohio, Pennsylvania, Puerto Rico, Wisconsin, and Wyoming.

Special situations

In some states, motorcyclist travel and fatalities were affected by unique situations. New Jersey's SHSO officials noted that "Superstorm Sandy had an impact on the number of riders visiting shore communities during the busy summer season. Reduced travel to these usually favorite destinations resulted in a 38% decrease in fatalities [from] May through August 2013" as compared to the same time period in 2012.

South Dakota hosts the Sturgis Motorcycle Rally, one of the largest in the nation. Held in August, the rally, according to SHSO officials, "generally accounts for an unknown statistical factor in South Dakota motorcycle fatality counts each year."

Discussion

Motorcyclist fatalities in 2013 returned to about the same level as 2011 as temperatures and precipitation returned to normal after 2012's unusually warm and dry winter and spring. The good news is that motorcyclist fatalities did not increase in two years; the bad news is that they did not decrease. Long-term improvements in motorcyclist safety will not come from consistently bad weather but from long-term and consistent use of proven countermeasures.

Effective strategies to prevent motorcyclist crashes, injuries and fatalities are well-known. They are identified in the Government Accountability Office (GAO) review of motorcycle crashes and countermeasures (GAO, 2012, pp. 16-21). As the GAO recommends, states should conduct a comprehensive motorcycle safety program that employs all the effective strategies, not just the motorcyclist training and *Share the Road* campaign programs authorized for funding under MAP-21.

Increase helmet use

Helmets are by far the single most effective strategy to prevent motorcyclist fatalities and serious injuries in a crash. Helmets are 37% effective in preventing fatal injuries to motorcycle operators and 41% effective for passengers. NHTSA estimates that helmets saved the lives of 1,617 motorcyclists in 2011. If all motorcyclists had worn helmets, an additional 703 lives could have been saved (NHTSA, 2013b).

More than 30 years of experience confirms that state motorcycle helmet use laws are the single most effective method to increase helmet use. In 2012, helmet use among all motorcyclists was 89% in states with laws requiring helmet use by all motorcyclists (universal helmet laws) and 49% in other states. Nationwide, helmet use dropped to 60% in 2012, down from 66% in 2011. Helmet use has hovered around 60% since 1994 (NHTSA, 2013c).

A universal helmet law is the only motorcycle safety strategy whose effectiveness is rated as five-star ("demonstrated to be effective by several high-quality evaluations with consistent results") in *Countermeasures That Work* (CMTW), NHTSA's guide for states (NHTSA, 2013d, Section 5). Similarly, increasing the use of helmets is the only motorcycle safety strategy rated as proven in the American Association of State Highway and Transportation Officials (AASHTO) *Guide for Addressing Collisions Involving Motorcycles* (Potts et al., 2008, Strategy 11.1E1) and the only strategy rated "scientifically proven" in the Centers for Disease Control and Prevention's publication, *Motorcycle Safety* (CDC, 2011). Most recently, GAO reviewed nine high-quality studies, all of which concluded that universal helmet laws significantly decrease motorcyclist fatalities. GAO concluded that "laws requiring all motorcyclists to wear helmets are the only strategy proven to be effective in reducing fatalities" (GAO, 2012, p. 16).

Unfortunately, only 19 states and the District of Columbia have universal helmet laws. Another 28 states require helmets for motorcyclists younger than age 18 or 21, and three states have no helmet requirement (IIHS, 2014). Most recently, Michigan repealed its universal helmet law as of April 12, 2012. Two recent studies document the results. Barrette et al. (2014) compared Michigan crash data from April 13 through December 31 of 2011 and 2012. They concluded that helmet use among crash-involved motorcyclists dropped from 94% to 72% while incapacitating injuries and fatalities both increased by 11%. Chapman et al. (2014) compared motorcyclists admitted to a level-1 trauma center in West Michigan during seven-month periods before and after the repeal. They concluded that the proportion of non-helmeted motorcyclists rose from 7% to 29%. Intensive care unit length of stay and patient costs were higher for non-helmeted motorcyclists.

Bills were introduced in 2013 in seven universal helmet law states to restrict helmet use requirements to motorcyclists younger than a specified age or to eliminate helmet requirements completely. These bills all failed to pass. Bills also were introduced in two states to require helmet use by some or all motorcyclists, but these bills also failed to pass (Teigen and Shinkle, 2014). No state has enacted a universal helmet law since Louisiana in 2004.

NHTSA contrasted motorcyclist fatalities in states with and without universal helmet laws:

> *There were 10 times as many unhelmeted motorcyclist fatalities in States without universal helmet laws (1,858 unhelmeted fatalities) as in States with universal helmet laws (178 unhelmeted fatalities) in 2012. These States were nearly equivalent with respect to total resident populations (NHTSA, 2013a).*

Enacting a universal helmet law in the 31 states that lack one is the most effective method to increase helmet use and reduce motorcyclist head injuries and fatalities. Colorado, Guam, Kansas, New Mexico, and South Carolina all noted that lack of a universal helmet law hindered their efforts to reduce motorcyclist fatalities.

Reduce alcohol impairment

In 2011, 29% of fatally injured motorcycle riders had a blood alcohol concentration above the legal limit of .08 (NHTSA, 2013b). States should include motorcyclists in their impaired driving program activities. For example, CMTW recommends highly publicized enforcement, using officers trained in identifying impaired motorcyclists as well as other vehicle drivers, combined with offender sanctions including vehicle impoundment or forfeiture (NHTSA, 2013d, Strategy 5.2.1). The AASHTO Guide recommends a combination of education, prevention, and enforcement programs (Potts et al., 2008, Strategies 11.1B1-3).

Reduce speeding

In 2010, 35% of motorcycle riders involved in fatal crashes were speeding, compared to 23% for passenger car drivers and 19% for light truck drivers (NHTSA, 2012). Almost half of all motorcycle fatal crashes did not involve another vehicle, and speeding likely was a contributing factor.

Provide motorcycle operator training to all who need or seek it

All beginning riders should be trained in basic motorcycle operating skills and safe riding practices. Refresher training can be useful for many riders who are returning to motorcycling after not riding for several years. All states currently conduct operator training courses, but they may not provide enough course openings at places and times when riders can attend. Both CMTW (NHTSA, 2013d, Strategy 5.3.2) and AASHTO (Potts et al., 2008 Strategies 11.1C1-3) endorse rider training.

Three states explicitly noted the role of strong training programs in reducing motorcyclist fatalities. SHSO officials in Delaware reported that "only two or three of the riders [in Delaware's fatal motorcycle crashes] had taken a safety training course." In Mississippi, safety officials pointed out that "no standardized rider training programs [are] required to be completed by the rider prior to receiving the motorcycle endorsement license."

Assure that motorcyclists are properly licensed

In 2011, 22% of motorcycle riders involved in fatal crashes did not have a valid motorcycle license, while only 12% of passenger vehicle drivers involved in fatal crashes were not properly licensed (NHTSA, 2013b). Motorcycle license tests prompt many beginning riders to complete a training course. By enforcing licensing requirements, states encourage training. SHSO officials in Washington indicated that "many riders involved in fatal crashes lacked certified training or a legal endorsement."

Encourage all drivers to share the road with motorcyclists

When motorcycles crash with other vehicles, the other vehicle driver usually violates the motorcyclist's right-of-way (NHTSA, 2013d). Motorcycles and motorcyclists are smaller visual targets than cars or trucks, and drivers may not expect to see motorcycles on the road. Many states conduct public outreach campaigns to increase car and truck drivers' awareness of motorcyclists. Typical themes are *Share the Road* or *Watch for Motorcyclists*. NHTSA provides marketing materials to promote sharing the road with motorcyclists and has designated May as Motorcycle Safety Awareness Month (NHTSA, 2014b).

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