

Helmet Use By Motorcyclists: Florida Observational Survey Results

By:

**Patricia A. Turner
Senior Research Associate
Center for Urban Transportation Research
College of Engineering – University of South Florida
4202 E. Fowler Avenue, CUT 100, Tampa, FL – 33620
Ph: (813) 974-3276 Fax: (813) 974-5168
Email: turner@cutr.eng.usf.edu**

&

**Christopher A. Hagelin
Research Associate
Center for Urban Transportation Research
College of Engineering – University of South Florida
4202 E. Fowler Avenue, CUT 100, Tampa, FL – 33620
Ph: (813) 974-9799 Fax: (813) 974-5168
Email: hagelin@cutr.eng.usf.edu**

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ABSTRACT

Each year, motorcycle crashes claim thousands of lives and several thousand more suffer incapacitating injuries. Many of the deaths and serious disabilities associated with motorcycle crashes result from head trauma. According to the National Highway Traffic Safety Administration (NHTSA), protective headgear reduces a motorcyclist's overall risk of death in a crash by 29 percent and the risk of brain injury by 67 percent.

The Center for Urban Transportation Research (CUTR) at the University of South Florida (USF) completed the second statewide observational helmet-use survey for the Florida Department of Transportation (FDOT) Safety Office in 1998 to document motorcycle helmet-compliance rates on Florida roadways. Because of concerns that illegal helmet use may be on the rise, data were also collected to estimate the level of novelty helmet use. The objectives of this research were to determine motorcycle helmet use rates on Florida roadways, and second, to estimate the level of novelty helmet use by motorcycle occupants.

A total of 2,498 motorcyclists in 13 Florida counties were observed over a two-month period. Data were collected on helmet use and type, motorcycle type, gender, and use of other safety equipment. Almost all motorcycle occupants wore some type of helmet as the observed state-level usage rate was 99.5 percent. However, a significant number of these helmets were novelty helmets. The type of helmet motorcyclists choose to wear may be related to the type of motorcycle driven and the gender of the driver and passenger. Overall, novelty helmet use was higher for passengers than for drivers, and the majority of observed novelty helmets were on motorcycle occupants riding cruiser-type motorcycles. Moreover, females exhibit lower rates of compliance than male counterparts, especially when associated with cruiser-type motorcycles. Although the survey did not collect information about the reasons for the increase in novelty helmet use, possible explanations may be more readily available lower cost novelty helmets and an overall perceived lack of enforcement of the motorcycle helmet use law.

Keywords: motorcycle, helmet use, novelty helmet, illegal helmet, bogus helmet, observational survey

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INTRODUCTION

Over the past 20 years, motorcycle crash trends in Florida have reflected the changing popularity of the activity. Motorcycle registrations nearly doubled from the early 1970s to the mid-1980s, along with fatal crashes. Considering that motorcycle-riding season in Florida is year around, motorcycles are involved in a large proportion of the state's fatal and incapacitating crashes. Last year, more motorcyclists died in Florida than in any other state except California.

Many of the deaths and serious disabilities associated with motorcycle crashes result from head trauma. According to the National Highway Traffic Safety Administration (NHTSA), the use of helmets reduces a motorcyclist's overall risk of death in a crash by 29 percent and the risk of brain injury by 67 percent. Although Florida law requires all motorcyclists to wear helmets, statistics reported on the Florida Traffic Crash Report show that 16 percent of all drivers and 30 percent of passengers killed in motorcycle crashes were not wearing helmets (1). Moreover, in crashes resulting in incapacitating injuries, 20 percent of all motorcycle drivers and passengers were not wearing helmets.

At first glance, these numbers may appear alarming. However, law enforcement officers report whether motorcyclists are wearing helmets *after* the crash occurs. Thus, in crashes where helmets become detached at some point *during* the crash, there is no way to know if motorcyclists were wearing helmets *before* the crash. Thus, these data may not be sufficient in monitoring statewide compliance with the motorcycle helmet law.

In states with universal helmet laws, some motorcycle riders protest by wearing illegal headgear² and it appears that the production and use of illegal helmets may be on the rise. According to a 1996 *Traffic Safety* article, the majority of riders wearing illegal headgear reside in California and Florida (2). Although novelty helmet use among

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²A "DOT-compliant" motorcycle helmet is a helmet certified by a manufacturer as meeting or exceeding Federal Motor Vehicle Safety Standard (FMVSS) No. 218 and is affixed with a "DOT" label on the back of the helmet. Helmets meeting DOT criteria have an inner lining of firm polystyrene foam, usually about an inch thick. A "non-compliant," "illegal," "fake," "bogus," or "novelty" helmet does not meet the DOT standard, lacks the "DOT" sticker or has an unofficial one, and are typically smaller in diameter, lighter, and thinner than legal headgear. Novelty helmets typically have an inner lining of soft foam or no lining at all.

California motorcyclists was estimated at 10 percent in 1992, a more recent California study of 2,600 motorcyclists suggests that novelty helmet usage could be as high as 30 percent (3). And even though Florida law requires all motorcycle riders to wear helmets that comply with the Department of Transportation (DOT) standards, a 1993 study found that 15 percent of all motorcycle riders in Florida wore novelty or non-compliant helmets (4). Because Florida crash data do not differentiate between DOT compliant and novelty helmet use, it is not possible to determine if the use of novelty helmets among motorcyclists has increased or decreased in recent years.

RESEARCH OBJECTIVES

The Center for Urban Transportation Research conducted a second statewide observational helmet-use survey for the Florida Department of Transportation (FDOT) Safety Office to document motorcycle helmet-compliance rates on Florida roadways. Because of concerns that illegal helmet use may be on the rise, data were also collected to estimate the level of novelty helmet use. Data on motorcycle type, gender, and use of other safety equipment such as protective eyewear, jackets, gloves, pants, and shoes were collected as well.

The study findings allow the FDOT to monitor statewide compliance with Florida's helmet law and compare use rates to previous as well as future results. This is particularly important given strong efforts to repeal the State's motorcycle helmet law in recent Legislative sessions. The research results also provide insight to the FDOT for use in developing public information and education programs that promote safe motorcycling in Florida.

SURVEY METHOD

A multi-stage, stratified sampling design was used to determine which counties would be surveyed, the number of observational sites in each county, the specific location of these sites, and the observation schedule. The sampling design, based on the NHTSA guidelines for state observational surveys of safety belt and motorcycle helmet use, (5) incorporated:

Stratification. To increase the precision of sample estimates for a given sample size according to population, number of registered motorcycles, daily vehicle miles traveled (DVMT), and functional classification of roadways; and,

Clustering. To achieve cost effectiveness and efficiency by grouping together sites within designated timeframes.

The multi-stage process is described next.

Step One: Determine counties to be surveyed

All 67 counties in Florida were ranked according to 1997 population estimates and the percentage that each county contributes to the overall state population was calculated. The cumulative percentages were calculated and those counties that did not fall within the 85th percentile were removed from the sample population. Thus, the remaining 23 counties comprised 85 percent of the total state population.

The 23 counties were ranked according to the number of registered motorcycles based on 1996 DHSMV data. Four counties, initially omitted due to their position outside of the 85th percentile, had significantly high numbers of registered motorcycles and were added to the sample population.

The 27 counties were ranked according to the number of registered motorcycles and cumulative percentages calculated. NHTSA guidelines dictate that 18 counties should be sampled in states with at least 70 counties. A random number generator technique was used to select a total of 13 counties, 5 of which were to be double sampled. Counties selected for double sampling included: Broward, Dade, Duval, Hillsborough, and Volusia. Alachua, Brevard, Collier, Orange, Palm Beach, Pasco, Pinellas, and Monroe were selected for single sampling.

Step Two: Determine the number of observational sites for each county

According to NHTSA guidelines, the average number of road segments in each county determine the number of observational sites per county. Florida has three major roadway types that carry 90 percent of the state's daily vehicle miles of travel (DVMT). Thus, potential observational sites were selected from roadways classified as urban principle arterials (UPA), urban minor arterials (UMA), and rural principle arterials (RPA)³. According to the FDOT Statistical Database, there are approximately 30,000 such road segments among these three roadway classifications across the state. Thus, each county averaged a total of 447 road segments.

Based on NHTSA guidelines, 27 observation sites per county was the minimum established threshold for a statistically valid sample for counties averaging 400 to 500 road segments. For counties selected for doubled sampling, that number was doubled. Thus, for all 13 counties in the sample population, the number of observation sites totaled 486.

³These three types of functional road classes were chosen because 1) RPAs account for 86.2% of all DVMTs for the four classes of rural roads in Florida and 2) UPAs and UMAs account for 98.9% of all DVMTs for the three classes of urban roads.

Step Three: Determine specific observation sites for each county

The data files used to select observation sites in each county were obtained from the FDOT Transportation Statistics Office in the form of an ArcInfo coverage of the Florida State Highway System and its connections.

Several criteria were applied to generate a list of observation sites within each county from the data file. First, only intersections located on named public roads or streets with named cross streets were eligible for sampling. Second, only intersections on roads or streets with certain functional classifications were eligible for sampling. Next, because the sampling reflected each roadway type's contribution to DVMT for each county, only roadways with reported ADT figures (from which segment DVMT could be calculated) were selected. These criteria were applied to each county to select the final observation sites.

Final site selections in each county were closely representative of the ratio that each roadway classification contributed to the overall DVMT. For the counties to be single-sampled, 27 sites and 6 alternatives were randomly selected. For double-sampled counties, 54 sites and 12 alternatives were randomly selected. Alternatives were selected in case observation sites could not be located, recent road construction had altered roadways, or if selected sites were dangerous in any manner.

Step Four: Determine days and times for data collection and schedule

According to NHSTA guidelines, all days of the week and all daylight hours should be included in the random selection process. However, to increase cost-effectiveness and project efficiency, clustering was acceptable. Therefore, data collection sessions in counties that required travel and overnight stays were clustered between Thursday and Sunday. This included the following counties: Alachua, Brevard, Collier, Orange, and Monroe. In every case, all daylight hours, between 7am and 8pm, were available for random selection. For counties not requiring overnight travel, all days of the week and all hours between 7am and 8pm were included in random selection process.

Observers were assigned to counties based on availability. Initially, two observers were assigned to each site. However, after observations in Hillsborough and Pinellas counties, it became apparent that observations could be made by a single observer. This, in turn, further reduced project costs without sacrificing the quality of data collected.

Observational Survey Instrument

In addition to helmet-use, the survey gathered information about four general categories: the observation site session, rider demographics, motorcycle type, and rider safety measures (see Appendix A for example of survey form). Data collected about each survey session were location (county and street), road classification, rider travel direction, observer name, observation start and end times, date, day of the week, and weather.

Rider demographics observed were gender and age group. Motorcycle classifications included sport, cruiser, touring, standard, and on/off road. A small chart was included on the observation form to provide observers with visual identifiers to determine motorcycle types.

Data collected about rider safety measures focused on protective gear and type of helmet worn by each rider and headlight use. Protective gear observed included: jackets, pants, shoes, gloves, and eye protection. Helmet types observed were full face, open face, motocross, novelty (non DOT-compliant), unknown, and none. A visual example of each motorcycle helmet type was provided on the observation form as a quick reference guide for observers.

Observer Training

Student observers attended a training session to learn about helmet types and safety gear, observational survey and data collection techniques, and sampling plan and site selection procedures.

The training session focused on identifying different types of helmets, and specifically, the differences between helmets meeting DOT standards and novelty helmets. Two videotapes were shown to provide an in-depth look into the different types of novelty helmets and how they could be accurately identified.

Trainees learned the appropriate steps in recording helmet type and safety equipment used by motorcyclists. Because individual observations would last only a few seconds, observers were instructed to record the helmet and motorcycle data first and then proceed in collecting the remaining demographic and safety equipment data. If observers encountered a large group of motorcyclists, observers were instructed to collect data on every other one with helmet type having the highest priority.

Instructions were also given regarding behavior at the field data collection sites. Observers were instructed to arrive on time at the intersection and remain for a one-hour period. The observation schedule was set up so that observers had a half hour between observation times in order to get to the next site. Observers were instructed to position their vehicles in a safe location near the intersection to minimize the impact on traffic flow and maximize

the amount of traffic directions that could be observed. Also for security purposes, observers were advised to remain in their vehicles while conducting observations and carry few personal belongings. If their right to conduct the survey was challenged, observers were asked to very calmly explain the purpose of the survey and provide copies of authorization letters.

Finally, each item on the observational survey instrument to be collected was explained in to help ensure data quality. For example, motorcyclists wear many different types of footwear, but which will be considered appropriate safety gear for this survey?

Following the training session, observers were divided into teams of two and assigned to intersections to become acquainted with the survey form, practice observational procedures, and determine inter-observer reliability. During the sample observations, inter-observer reliability was determined to be virtually 100 percent. The observational teams reconvened after an hour to provide feedback about the survey instrument and refine data collection techniques. This resulted in some minor changes to the survey instrument to improve the recording and quality of data.

SURVEY RESULTS

A combination of descriptive and inferential statistics was used to analyze the survey data. Standard frequency distributions were computed for each item collected on the survey instrument. Bivariate analyses were conducted using SPSS, yielding the appropriate tests of statistical significance.

The survey findings are presented in three major categories. These categories include motorcycle observations, helmet usage, and safety equipment usage. Results are presented first on motorcycle occupants (drivers and passengers combined), followed by analyses conducted on drivers and passengers separately⁴.

Motorcycle Observations

In May-June, 1998, data collectors observed motorcyclists at 486 observation sites throughout 13 counties. Overall, data collectors recorded at least one observation during the one-hour observation period at 92 percent of the sampled sites. Over the two-month period, a total of 2,498 motorcyclists were observed. Among those observed, 2,037 were motorcycle drivers and 461 were passengers (see Table 1).

⁴The term "motorcycle occupants" describe the person operating the motorcycle, or the driver, and the person riding on the back or the passenger. For clarity purposes, the term "driver" is used instead of "rider" to differentiate between the person operating the motorcycle and the person riding on the back of the motorcycle.

Table 1. Florida Motorcycle Helmet-use Survey Sample Observations by County, 1998

County	Observation sites	# Sites w/at least 1 observation	Drivers Observed	Passengers Observed	Total Observed	% of Total
Dade*	54	48	122	20	142	5.7
Broward*	54	51	153	25	178	7.1
Volusia*	54	52	313	66	379	15.2
Pinellas	27	26	150	13	163	6.5
Palm Beach	27	25	71	11	82	3.3
Orange	27	26	171	64	235	9.4
Hillsborough*	54	51	312	63	375	15.0
Duval*	54	52	267	103	370	14.8
Brevard	27	26	43	7	50	2.0
Monroe	27	24	145	35	180	7.2
Pasco	27	26	126	13	139	5.6
Alachua	27	23	95	9	104	4.2
Collier	27	24	69	32	101	4.0
Total	486	447	2,037	461	2,498	100%

Note: *Indicates county was double-sampled.

Source: 1998 Florida Motorcycle Helmet Observational Survey conducted by the Center for Urban Transportation Research, University of South Florida, Tampa, May – June, 1998.

Typically, doubled-sampled counties comprised about 15 percent of all observations while single-sampled counties contributed between 2 to 9 percent of the total observations. However, in Dade and Broward counties, there were significantly lower numbers of recorded observations compared to other double-sampled counties. One explanation for the low number of recorded observations may be related to the higher traffic volumes on roadways where the observations were scheduled. For example, in Dade County, almost 90 percent of the observation sites were located on urban principle arterials. Moreover, a large percentage of sites with no recorded observations in Dade County were scheduled during peak AM and PM commute hours. Thus, it may be that motorcyclists travel on less congested roadways during peak travel times in these counties.

Data collectors recorded several items about the observation session on the survey instrument such as day and time, roadway classification, and prevailing weather conditions. The majority (68 percent) of motorcycle helmet observations took place Thursday through Sunday with almost one fifth of the observations conducted on Saturday (20 percent). A large number of observations occurred during the midday (25 percent) and in the peak PM travel hours (40 percent) on urban principle arterials. Because the survey was conducted in May and June, almost all observations took place on sunny (81 percent) and partly cloudy days (18 percent).

Other data recorded during the observations included information about the age and gender of drivers and passengers, type of motorcycle driven, headlight use, type of helmet worn, and use of other safety equipment such as eye gear, jackets, gloves, pants, and shoes.

Data collected on driver and passenger age were omitted from the analysis due to the high degree of difficulty in estimating the age of motorcycle occupants. As expected, three out of every four motorcycle occupants observed were male drivers. Almost one-half of the 2,307 riders (46 percent) observed drove cruiser-type motorcycles. Other popular motorcycle styles observed include touring bikes (21 percent), sportbikes (21 percent), and standard-type motorcycles (11 percent). Further, 14 percent of all riders were driving without headlights, in spite of the fact that the law requires motorcyclists to drive with the headlights on at all times.

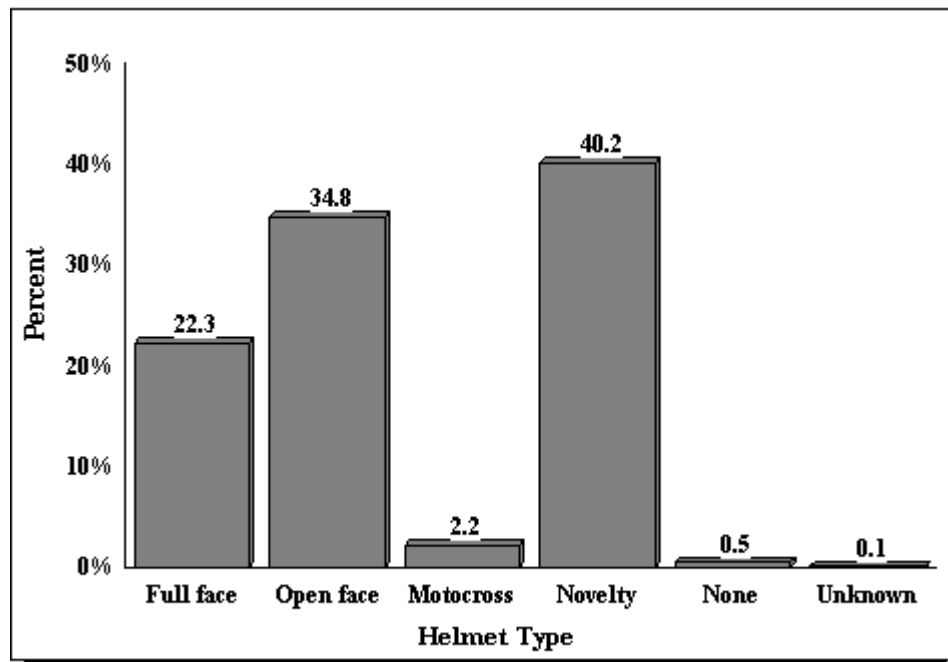
Motorcycle Helmet Usage

Almost all motorcycle occupants wore some type of helmet protection as the state-level observed usage rate for drivers and passengers is 99.5 percent. This figure remains the same as the 1993 observed state-level helmet usage rate.

An examination of the data on the type of helmet worn provides some interesting findings (see Figure 1). Results indicate that 40 percent of motorcycle occupants observed wore novelty helmets. This figure represents a 63 percent increase in novelty helmet use over a five-year period (reported as 15 percent in 1993). Among motorcyclists wearing DOT-compliant helmets, over one-third of the occupants (35 percent) wore open face helmets while about one-fifth of all drivers and passengers (22 percent) wore full-face helmets.

Weighted estimates were calculated for the use of helmets and other protective gear. The weighted state level estimate for novelty helmet use was 35 percent. This percent is significantly less than the observed rate (40 percent) because the highest-weighted county, Dade, had one of the lowest reported uses of novelty helmets (20 percent).

Overall helmet-usage rates showed little variance across counties. However, observed incidence rates for novelty helmet use varied significantly by county from as low as 15 percent in Alachua to as high as 61 percent in Duval County. Other counties with higher than average (40 percent) novelty helmet usage rates were: Volusia (54 percent), Pasco (43 percent), Orange (41 percent), and Collier (41 percent).

Figure 1. Distribution of Motorcycle Helmets Observed

Source: Florida Observational Motorcycle Helmet Use Survey, Center for Urban Transportation Research, University of South Florida, Tampa, conducted May - June, 1998.

Although the survey findings cannot explain why there is such a difference between counties, the low rate of compliance in Volusia County may be associated with Daytona's Bike Week and the trends set by the motorcycle culture at the event. Another reason for the differences may be related to motorcyclist's perceived risk in congested traffic. For example, the low rate of novelty helmet use in Dade County may be associated with its high volume of traffic, urbanization, and an increased need for motorcycle safety. Also, differences in the way in which police enforce motorcycle helmet laws in the various counties may be another influential factor.

A comparison of the same six counties observed in 1993 and 1998 show significant increases in novelty-helmet usage rates (see Table 2). All counties experienced overall increases in the proportion of novelty helmets observed except for Dade County, which showed a 13 percent reduction. The highest percent increases were in Duval (84 percent) and Palm Beach (82 percent).

Table 2. Observed Novelty Helmet Use by County, 1993 and 1998

County	Novelty helmet use 1993	Novelty helmet use 1998	Percent Change
Dade	23.1	20.4	-13.2
Broward	15.8	32.0	50.6
Pinellas	16.1	33.1	51.4

Palm Beach	5.9	32.9	82.1
Hillsborough	16.1	31.5	48.9
Duval	9.5	60.8	84.4

Source: 1998 Florida Motorcycle Helmet Observational Survey conducted by the Center for Urban Transportation Research, University of South Florida, Tampa, May – June, 1998.

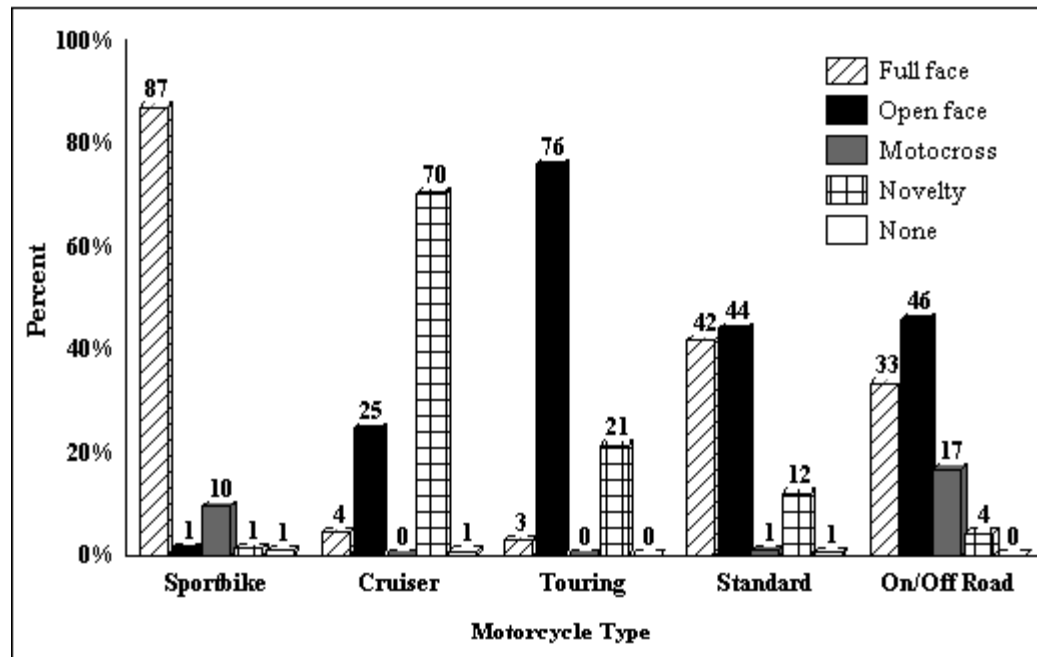
When driver and passenger data were analyzed separately, the rate for novelty helmet use is higher among passengers than drivers (47 percent versus 39 percent, respectively). One possible explanation for this difference is that the second helmet carried by motorcyclists may be a less expensive helmet which may or may not be a novelty helmet. It should be noted, however, that the researchers did observe an increase in availability of novelty helmets and decrease in price (from \$40.00 to \$20.00) while attending Bike Week in Daytona, Florida, during the project period. Another reason for higher novelty helmet use among passengers may be related to motorcycle type and gender.

Helmet Use by Motorcycle Type

The type of helmet motorcyclists choose to wear may be related to the type of motorcycle they ride. As shown in Figure 2, almost 90 percent of the motorcycle occupants on sportbikes wore full-face helmets. Motorcyclists riding touring style bikes tend to wear open face helmets (76 percent) while those that ride standard bikes wear both full face and open face helmets (42 percent and 44 percent respectively.)

Survey results indicate that novelty helmet use is typically associated with cruiser style motorcycles. (Harley Davidson manufactured the majority of cruiser-style motorcycles observed). The use of DOT-compliant helmets by motorcycle occupants on cruisers was only 29 percent, compared to 98 percent compliance for sportbike riders, 96 percent compliance for on/off road motorcycle riders, 87 percent compliance for standard motorcycle riders, and 79 percent compliance for riders of touring motorcycles.

Of all novelty helmets observed, 84 percent were associated with drivers of cruiser-type motorcycles. Moreover, almost three-fourths of all passengers (74 percent) wearing novelty helmets were riding on the back of cruiser-type motorcycles. Because there is such a high rate of novelty helmet use among occupants of cruiser-type motorcycles (71 percent), further studies may be warranted to determine why compliance rates are considerably lower compared to riders of other motorcycle types.

Figure 2. Motorcycle Type By Helmet Type Observed: All Motorcycle Occupants

Source: Florida Observational Motorcycle Helmet Use Survey, Center for Urban Transportation Research, University of South Florida, Tampa, conducted May - June, 1998.

Helmet Use by Gender

Some interesting survey findings involved the relationship between gender and novelty helmet use. Although some may assume that female motorcyclists are more safety conscious and, thus, more likely to wear DOT-compliant helmets, among drivers observed, females were almost twice as likely as males to wear novelty helmets (65 percent compared to 36 percent). Furthermore, among females using novelty helmets, most were observed riding cruiser-type motorcycles (91 percent). Female passengers exhibited similar trends. Almost one-half of all female passengers (48 percent) wore novelty helmets. Among those female passengers wearing novelty helmets, 74 percent were passengers on cruiser-type motorcycles.

The reason for lower helmet compliance rates among female drivers, especially when associated with cruiser-type motorcycles, is not clear. Again, because the survey did not examine motivations for novelty helmet use among male and female riders, perhaps these findings warrant further investigation.

Safety Equipment Use

There were few changes regarding the use of other protective safety gear when compared to the 1993 survey findings. Although the use of protective eye gear is mandatory in Florida, observed rates of use fell from 97 percent

in 1993 to 93 percent in 1998. Glove use also dropped from 19 percent to 16 percent. More motorcyclists were observed wearing long pants (77 percent compared to 73 percent in 1993) and the use of appropriate footwear remained the same. Jacket use could not be compared because the 1993 survey design included long-sleeve shirts in this category.

Among motorcycle drivers and passengers, the greatest variance in the use of other protective gear was observed in glove and pant use. Drivers are much more likely to wear long pants compared to passengers (89 percent vs. 32 percent) as well as gloves (19 percent vs. 2 percent). As with helmet use, the use of other protective safety gear may be related to gender as 92 percent of all passengers were female.

CONCLUSIONS

The observational motorcycle helmet-use survey produced many significant findings concerning helmet use in Florida (see Table 3). Overall, 99.5 percent of all motorcyclists wore helmets, however, the last five years have seen a dramatic increase in the use of non DOT-compliant, or novelty helmets. The projected state-level weighted compliance rate is 65 percent with a standard error of +/- 1.6 percent. Although almost all motorcyclists wear some type of protective headgear, over one-third (35 percent) of the helmets worn on Florida roadways are novelty helmets.

Table 3. Summary of Florida Motorcycle Helmet-use Survey Findings, 1998

Observation type	No. observed		Sample percentage		Weighted percentage	
	1993	1998	1993	1998	1993*	1998
Wearing helmets	1,551	2,486	99.5	99.5%	99.5	99.5%
Wearing approved helmets	1,317	1,480	84.5	59.2%	NA	64.6%
Wearing novelty helmets	234	1,003	15.0	40.2%	NA	34.8%
Wearing eye protection	1,515	2,324	97.2	93.0%	NA	94.2%
Wearing shoes	1,444	2,325	92.6	93.1%	NA	94.5%
Wearing long pants	1,152	1,929	72.9	77.2%	NA	74.2%
Wearing jackets	392**	235	25.1	9.4%	NA	7.7%
Wearing gloves	298	402	19.1	16.1%	NA	12.2%
Total	1,559	2,498				

Notes: *Weighted estimates were only calculated for helmet use. **Jacket use included wearing long sleeve shirts.

Source: 1998 Florida Motorcycle Helmet Observational Survey conducted by the Center for Urban Transportation Research, University of South Florida, Tampa, May – June, 1998.

Because the purpose of a mandatory helmet law is to reduce motorcycle injuries and fatalities as well as the cost of treating head injuries, the increase in novelty helmet use is alarming. Further studies are necessary in order to estimate the impact of the novelty helmet use on head-injuries and medical costs and to determine what factors may have contributed to the increased usage.

A significant survey finding is that the type of helmet used may be related to the type of motorcycle and the gender of drivers and passengers. This study found that novelty helmet use was higher for passengers than for drivers. This may be related to the cost of purchasing a second DOT-compliant helmet. Although the survey did not collect information about the reasons for the increase in novelty helmet use, possible explanations include the increased availability of novelty helmets, the reduction in cost of novelty helmets, the relatively high price of DOT-compliant helmets, and the perceived lack of helmet law enforcement.

The study also found that drivers and passengers riding on cruiser-type motorcycles wore most of the novelty helmets observed. A large percentage of females wearing novelty helmets were also riding cruiser-type motorcycles. Further, among female passengers wearing novelty helmets, most were passengers riding cruiser-type motorcycles. Because there is a high rate of novelty helmet use among this population group, further studies should be conducted to determine why compliance rates differ from riders driving different types of motorcycles.

In addition, there are probably many reasons why females exhibit lower rates of compliance than male counterparts, especially when associated with cruisers. Thus, further investigation may be warranted to determine the role that gender plays in helmet use as well as the use of other protective safety equipment. It may also be beneficial to investigate why passengers and drivers exhibit different behaviors regarding safety equipment use while riding motorcycles so that safety messages can be properly targeted.

Compliance rates among counties varied significantly. Although the survey findings cannot explain why there is such a difference between counties, differences may be related to perceived risks by motorcyclists in counties with higher traffic volumes and urbanization, the prevailing motorcycle culture, and differences in helmet law enforcement policies. Perhaps further investigation of how and if the motorcycle helmet law is enforced by local, county and state law enforcement agencies would be beneficial in determining why some counties have higher observed rates of novelty helmet use.

Finally, in terms of other safety equipment, there were no major changes when compared to the 1993 findings. The use of eye protection dropped slightly, along with the use of gloves. Overall, pant use increased as well as the

use of appropriate footwear. The study found differences related to gender and occupant type and safety equipment use. Drivers were more likely to wear long pants and gloves compared to passengers (the majority of passengers were female). To better understand the relationship between safety equipment use and gender, further analysis should be conducted. However, to answer these questions, surveys are not the only means of data collection. Individual and group interviews conducted by social scientists are also needed to attain the necessary qualitative data.

Authors Notes:

On July 1, 2000, the Florida Motorcycle Helmet Exemption Law went into effect. Essentially, this law states that Florida motorcyclists who are 1) 21 years of age and older, and 2) covered by an insurance policy providing at least \$10,000 in medical benefits are not required to wear a DOT-approved motorcycle helmet. In a state in which approximately 40% of motorcyclists violated the law by using of novelty helmets, the passing of the Motorcycle Helmet Exemption Law is bound to have far reaching impacts.

In order to measure the impact of the exemption law, four main topics will need to be addressed: 1) monitoring of helmet use trends; 2) examination of crash, injury and fatality trends; 3) measurement of public health costs; and 4) investigation of law enforcement efforts.

In terms of helmet use trends, there are several key questions that need to be answered. For example, how will the high rate of novelty helmet use translate into no helmet use? What percentage of motorcyclists who wore regulation helmets prior to the passing of the exemption law will now choose to ride without a helmet? What factors influence the choice to ride with or without a helmet? In regard to crash, injury and fatality trends, researchers will need to monitor whether or not an increase in helmet-less riders will increase or decrease the number of crashes. The severity of injuries will also need to be investigated. And, of course, the primary question is whether or not the fatality rate will increase or decrease as more riders remove their helmets. In examining the public health costs, it will have to be determined if the \$10,000 insurance coverage is adequate to cover the cost of treatment for injured motorcyclists, especially those with head injuries. For the Florida law enforcement agencies, the helmet exemption law is considered a secondary enforcement issue. This means that a motorcyclist without a helmet should not be stopped simply to check for adequate insurance coverage, unless the officer has reasonable suspicion that the operator is under 21 years of age.

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