



Riding SMART!

A Publication of the **Skilled Motorcyclist Association-Responsible, Trained & Educated Riders, Inc.** · Vol. 12, No. 1 · Jan/Feb 2018

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President's News & Views

Welcome to 2018. I wish each of you an enjoyable and healthy year.

This special edition of our newsletter summarizes the major research and literature reviews which address countermeasures in motorcyclist safety.

Countermeasures are the things we do to try to reach our goals. Interventions, efforts and program components are other descriptive terms describing what we do. A main mission of SMARTER is to gather and make motorcyclist safety research easily accessible. This special issue is designed to provide a quick reference summary of the research regarding countermeasures that work, or have no evidence of working.

It is our observation that many state motorcyclist safety programs do not include components that the research indicates might produce positive results and instead repeat traditional countermeasures which have little or no evidence of any impact on reaching the expressed goals. It seems that in the world of motorcyclist safety we do the same things over and over and expect better or different results.

The summary of the countermeasures research studies is introduced via a brief article outlining the generally accepted goals of comprehensive motorcyclist safety programs. We use the word comprehensive in a traditional meaning - covering many things or including everything so as to be complete. Inclusive, complete, wide-ranging and broad are other words with similar meaning. Incomplete, partial or sketchy are antonyms.

We end this special edition with an opinion article recommending how we believe policy makers should use the research available to them.

Take care,
Dan

**SPECIAL
EDITION**

**Countermeasures
that work:
What the research
tells us**

Riding Smart Preview

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Goals of a Comprehensive Motorcyclist Safety Program

Motorcyclist safety efforts are often aimed at the limited goal of reducing the number of crashes. While reducing the number of crashes must be ONE of the goals of comprehensive efforts as long as crashes still occur, preventing deaths and injuries in the event of a crash and lessening the severity of injuries in the event of a crash, must be included as additional goals of comprehensive motorcyclist safety efforts.

Three Goals of Comprehensive Motorcyclist Safety Programs:

1. Reduce the number of crashes
2. Prevent deaths and injuries in the event of a crash
3. Lessen the severity of injury in the event of a crash

We encourage you to keep the goals in mind as you read the research summaries.

The research evidence: What works, what might work, what has no evidence of working?

All of the below referenced documents are available at the research/overviews section of our website.
<http://smarter-usa.org/research/overviews/>

2017 – “Powered Two- and Three-wheeler Safety. A Road Safety Manual for Decision-makers and Practitioners”

This manual, published by the World Health Organization, provides information for use in developing and implementing comprehensive measures to improve powered two and three-wheeler (PTW) safety. It examines the extent of PTW related fatalities and injuries, and the importance of addressing the key risk factors of PTW crashes. The steps outlined for conducting a situational assessment aim to help prioritize interventions, prepare a related plan of action and help implement and evaluate PTW safety measures.



Section three, which begins on page 49, addresses interventions to address powered two- and three-wheeler safety and is divided into two sections:

- Specific interventions to improve PTW safety
- General road safety interventions that could improve PTW safety

Interventions are rated as proven, promising or insufficient evidence. Of the thirty (30) identified specific interventions to improve PTW safety, only seven (7) are assessed as proven, while twelve are identified as insufficient evidence.

There are effective proven and promising interventions that are specific for improving PTW safety, as well as general interventions effective for other road safety issues that are of equal benefit to PTW safety.

2017—Continued from page 2.

A summary of these are presented on page 76 and include:

- A strong government role in setting legislation and policy enforcement, and in licensing PTW operators and registering vehicles.
- Separation of PTWs from other traffic, mainly where at least 20–30% of road users are PTWs.
- Advanced braking systems, such as antilock braking systems (ABS)
- Legislation and enforcement related to alcohol use, speeding, helmet and protective clothing use
- Instituting a graduated licensing program
- Increased conspicuity of PTWs
- Improving post-crash response

The list of interventions for PTW-related injuries with insufficient or weak evidence is found on page 69. The list includes interventions that may in the future be found effective such as motorcycle stability control systems and airbags, as well as traditional interventions often advocated and funded such as advanced rider training. This report can be found at: <http://smarter-usa.org/wp-content/uploads/2017/10/2017-Powered-Two-and-Three-Wheeler-Safety-A-Road-Safety-Manual.pdf>

2015 – “Countermeasures That Work: A Highway Safety Countermeasure Guide for State Highway Safety Offices, Eighth Edition, 2015, Chapter 5, Motorcycles”

This is one chapter of a National Highway Traffic Safety Administration document. Chapter 5 is 33 pages including references that provide easy to read summaries of the research related to nine strategies in four categories. Each strategy is rated on effectiveness, cost, and use and time to implement. Of the nine (9) identified strategies, seven (7) are assessed as having “limited or no high-quality evaluation evidence” of effectiveness. Universal coverage state motorcycle helmet use laws are assessed as “demonstrated to be effective by several high-quality evaluations with consistent results” and alcohol impairment: detection, enforcement, and sanctions is assessed as “likely to be effective based on balance of evidence from high-quality evaluations or other sources.” Available at: <http://smarter-usa.org/wp-content/uploads/2017/06/1.-Countermeasures-That-Work-8th-2015-NHTSA-Chapter-5-2015.pdf>



2013 – “Effective Targeting of Motorcycle Safety Countermeasures in New Zealand”

The specific aims of this 93 page report were to summarize current knowledge on the effectiveness of the full range of motorcyclist safety countermeasures and to estimate the potential crash reduction and injury benefits that could be expected from applying identified effective motorcyclist safety countermeasures. The summary of this literature review begins on page 65 and identifies countermeasures related to the motorcycle, other road users, roads and roadsides and the rider (road user) in two categories (1) countermeasures with demonstrated crash and or injury reductions and (2) countermeasures with potential for crash and or injury reductions.



It is interesting to note that the two most widely used countermeasures in the U.S., training and motorist awareness, are summarized as follows:

Continued on page 4.

2013—Continued from page 3.

- **Training:** *Although training is encouraged and is compulsory in most jurisdictions, its efficacy in achieving crash reductions has not been well established for motorcycle riders. However, it is likely that some form of training is necessary to teach motorcyclists basic vehicle handling skills and to ride a motorcycle safely.*
- **Road Safety Publicity:** *The review identified very little research on the effectiveness of motorcycle safety publicity on crash and injury outcomes despite widespread use of the countermeasure.*

Below is a sampling of interventions, the quantity of studies reviewed and the assessed benefit of the intervention.

- Anti-lock brakes – multiple studies – high
- Air bags – one study – impacts few crashes low
- Traction/stability control – couple studies – impacts few crashes
- Alcohol interlocks – one study but high impact
- Vehicle testing – one study – high effect but few vehicles
- Daytime running lights – multiple studies – impact varies with low effect for all crashes but high for fatal or serious
- Black spot fixes – couple of studies – high
- Good surface condition – one study – high
- Road side barriers – couple studies – hitting guard rails more serious than hitting ground
- Protective gear – multiple studies – high
- Graduated licensing – couple studies – low to medium
- Penalties and enforcement – several studies – low to high
- Road safety publicity – very little research with no identifiable result

This literature review is available at: <http://smarter-usa.org/wp-content/uploads/2017/06/2.-effective-targeting-of-motorcycle-safety-countermeasures-in-new-zealand-report-2013.pdf>

2012 – “Motorcycle Safety: How to Save Lives and Save Money”

This is a publication of the National Center for Injury Prevention and Control Division of Unintentional Injury Prevention. The document provides a chart (page 10) rating nine typical motorcyclist safety efforts as unknown, uncertain, likely, and scientifically proven. The ratings are defined as follows:



- Unknown: limited or no high-quality evidence.
- Likely: Likely to be effective based on balance of evidence from high-quality evaluations.
- Effective in Certain Situations: Demonstrated to be effective in certain situations.
- Scientifically Proven: Demonstrated to be effective in several scientific evaluations with consistent results.

Only one countermeasure - state motorcycle helmet laws – is identified as scientifically proven. The document presents an argument for this countermeasure. The remaining eight are as follows:

- Motorcycle rider training – Unknown
- Motorcycle rider licensing – Unknown
- Helmet use promotion programs – Unknown
- Helmet law enforcement, noncompliant helmets – Unknown

Continued on page 5.

2012—Continued from page 4.

- Alcohol impairment: detection, enforcement and sanction – Likely
- Alcohol impairment communications – Unknown
- Conspicuity and protective clothing – Unknown
- Other driver awareness of motorcycles – Unknown

In addition, the report summary notes “A few recent studies have shown that mechanical improvements, such as antilock brakes, can reduce the severity of crashes, and this may affect injuries and deaths. Other motorcycle safety efforts include improving road conditions, reducing cultural support for rider-group alcohol use, and improving clothing and motorcycle visibility through bright or reflective colors. But again, no consistent evidence shows that any of these measures reduce the number of motorcycle crashes or deaths.”

Access this report at: <http://smarter-usa.org/wp-content/uploads/2017/06/3.-Motorcycle-Safety-How-to-Save-Lives-and-Save-Money-CDC-2012.pdf>



2010 – “The Potential of Different Countermeasures in Reducing Motorcycle Fatal Crashes: What In-Depth Studies Tell Us”

This document is a 10 page summary of a 2010 study that used in-depth studies of 182 fatal motorcycle crashes that occurred in Sweden during the period 2005-2008. Every fatal crash was analyzed and critical events throughout the chain of events leading to the crash were identified. An assessment was then made of whether certain countermeasures could have prevented the crash or mitigated the injury outcome.



The countermeasures are divided into three (3) categories; the vehicles, the infrastructure and the users. The potential of each countermeasures, or intervention areas, in reducing motorcycle fatal crashes is rated as:

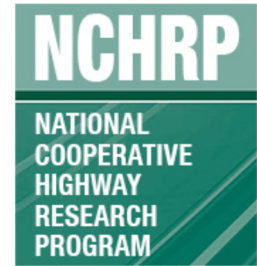
- Certain potential: relationship is known or the assessment was certain
- Somewhat uncertain potential: relationship is missing or the assessment was somewhat uncertain
- Uncertain potential: further research is needed

More than 30 countermeasures are addressed and rated, each with a short paragraph summarizing potential effectiveness. Among all analyzed countermeasures or intervention areas, anti-lock brakes (ABS) on motorcycles were estimated to have the largest effect in terms of saved lives per year.

This report is available at: <http://smarter-usa.org/wp-content/uploads/2017/06/4.-the-potential-of-different-counter-measures-what-indepth-study-tells-us-sweden-2011.pdf>

2008 – “A Guide for Addressing Collisions Involving Motorcycles, NCHRP Report 500, Vol 22”

This is a 177 page guide plus extensive references published by the National Cooperative Highway Research Program. The guide identifies eight motorcyclist safety objectives, along with strategies associated with each objective. Also provided are summaries of research relevant to each strategy, estimates of implementation timeframe, cost and expected effectiveness. Each strategy is identified as proven, tried or experimental. This guide includes tactics intended to reduce the number and severity of motorcycle crashes. Strategies include not only operation of the motorcycle, but also ways of improving both the traveled way and roadside to be more ‘motorcycle-friendly.’



The objectives for improving motorcycle safety and increasing the awareness of the unique characteristics of motorcycles identified in this document are:

- A. Incorporate motorcycle-friendly roadway design, traffic control, construction, and maintenance policies and practices
- B. Reduce the number of motorcycle crashes due to rider impairment
- C. Reduce the number of motorcycle crashes due to unlicensed or untrained motorcycle riders
- D. Increase the visibility of motorcyclists
- E. Reduce the severity of motorcycle crashes
- F. Increase motorcycle rider safety awareness
- G. Increase safety enhancements for motorcyclists
- H. Improve motorcycle safety research, data and analysis

A number of strategies are listed for each objective. Some of the strategies are widely used, while others are used at a state or even a local level. Some have been subjected to well-designed evaluations to prove their effectiveness, while others, including some that are widely used, have not been adequately evaluated. To help the reader, the strategies have been classified into three types, each identified by a letter:

- Proven (P): Those strategies which have been used in one or more locations, and for which properly designed evaluations have been conducted that show it to be effective.
- Tried (T): Those strategies that have been implemented in a number of locations, and may even be accepted as standards or standard approaches, but for which there have not been found valid evaluations.
- Experimental (E): Those strategies that are ideas that have been suggested and at least one agency has considered, sufficiently promising to try them on a small scale in at least one location.

A total of twenty-six (26) strategies are identified and spread across the eight (8) objectives. Only one strategy associated with objective “E” “Reduce the Severity of Motorcycle Crashes is classified as “proven.” That strategy is “Increase the Use of FMVSS 218 Compliant Helmets.” The remaining strategies are all classified as either tried or experimental, except the strategies associated with objective H, improve motorcycle safety research, data and analysis. These three strategies are classified as N/A.

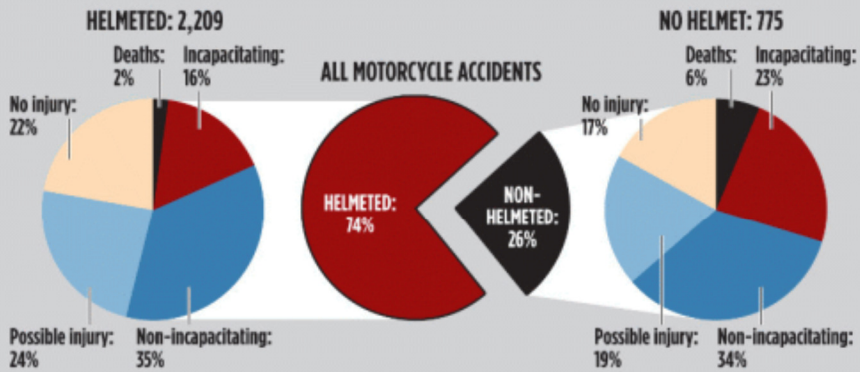
This report is available at: <http://smarter-usa.org/wp-content/uploads/2017/06/5.-NCHRP-Vol-22-Report-500-Guidelines-for-Addressing-Collisions-Involving-Motorcycles-II.pdf>

- For each category, current research relating to countermeasures is reviewed, the success or failure of existing applications is documented, the relevance to Australia is assessed, and recommendations and directions for future research are noted. This research is available at: <http://smarter-usa.org/wp-content/uploads/2017/06/6.-Motorcycle-Safety-Research-Literature-Review-1987-to-1991-1992.pdf>

Motorcyclist safety lives in the political world. For example, motorcyclist safety professionals involved in rider training may lobby strongly for advance rider training. Rights organizations may advocate for motorist awareness and oppose helmet laws. These advocates may be highly respected and have extensive backgrounds in motorcyclist safety, but their advocacy is often based on their personal beliefs or biased because of their organizations mission. It is not necessary, however, for any policy decision maker to blindly accept the word of any advocate for any specific countermeasure. The available research should be the guide. Discretionary monies *should not* be allocated to implement countermeasures with little or no evidence of effectiveness. Discretionary monies *should* be allocated to support countermeasures with strong or scientifically proven effectiveness. And at every level, monies should be allocated to data collection, analysis and quality research.

Helmet versus non-helmet injuries

Nearly 75 percent of motorcycle riders involved in accidents continued to wear helmets, crash records show. Those who did not were more likely to be seriously injured or killed.



Incapacitating injury: Any non-fatal injury which prevents normal activities and generally requires hospitalization.
Non-incapacitating: Any injury not incapacitating but evident to others at the scene.
Possible: No visible injury but complaint of pain or momentary unconsciousness.

NOTE: Reports filed as of Nov. 19 for the six months from April 13 to Oct. 13, where helmet use is known. Percentages do not equal 100 percent due to rounding.
 SOURCES: MLive Media Group analysis; Michigan State Police Traffic Crash Reporting Section

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Chicago Motorcycle Show

February 09 - 11, 2018

Donald E. Stephens Convention Center

<http://www.motorcycleshows.com/city/chicago-il-0>



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