

ROADWAY SAFETY INSTITUTE

Human-centered solutions to advanced roadway safety



Factors Influencing Policy and Political Leadership in Improving Roadway Safety

> Matthew P. Schmit Lee W. Munnich, Jr.

Humphrey School of Public Affairs University of Minnesota

Final Report



CTS 18-07

UNIVERSITY OF MINNESOTA Driven to Discover[™]









WESTERN MICHIGAN UNIVERSITY

Technical Report Documentation Page

1. Report No. CTS 18-07	2.	3. Recipients Accession No.	0			
4. Title and Subtitle		5. Report Date				
Factors Influencing Policy and Polic	itical Leadership in Improving	March 2018				
Roadway Safety		6.				
7. Author(s)		8. Performing Organization Report No.				
Schmit, Matthew P., & Munnich, L	₋ee W., Jr.					
9. Performing Organization Name and Address		10. Project/Task/Work Unit No.				
Humphrey School of Public Attairs		#2015027				
201 10 th Avenue South		II. CONTRACT (C) OF GRANT (G) NO.				
Minneenelie MAL 55455		DTRT13-G-UTC35				
Minneapolis, Min 55455						
12. Sponsoring Organization Name and Addres	S	13. Type of Report and Period Covered				
Roadway Safety Institute		Final Report				
Center for Transportation Studies		14. Sponsoring Agency Code				
University of Minnesota						
200 Transportation and Safety Bu	ilding					
511 Washington Ave. SE						
Minneapolis, MN 55455						
15. Supplementary Notes						
nttp://www.roadwaysatety.umn.e	edu/publications/					
16. Abstract (Limit: 250 words)		1				
This study built on recent work to	examine further the factors inf	iuencing policy and po	litical leadership in			
adopting evidence-based policy co	ountermeasures and integrated	performance-based a	pproaches such as Toward			
zero Death (12D) to reduce road i	atalities and serious injuries. Sp	torost group influence	at the state and level level			
understanding of the policy context for safety and now special interest group influence at the state and local level						
Illingis Indiana Michigan Minnesota Obio and Wisconsin, and ongaged logislators, state agency officials and						
innois, indiana, ivicingan, ivinnesola, Onio, and Wisconsin – and engaged legislators, state agency officials, and						
through public policy. The study expanded on an assessment tool applied to quantifying policy countermoasure						
adoption in each of the six study states and created a similar tool for gauging special interest group activity						
adoption in each of the six study states and created a similar tool for gauging special interest group attivity.						
17. Document Analysis/Descriptors		18. Availability Statement				
Safety, Highway Safety, Transport	ation policy, Governance	No restrictions. Document available from:				
		National Technical Information Services,				
		Alexandria, Virginia 22312				
		· •				
19. Security Class (this report)	20. Security Class (this page)	21. No. of Pages	22. Price			
Unclassified	Unclassified	28				

Factors Influencing Policy and Political Leadership in Improving Roadway Safety

FINAL REPORT

Prepared by:

Matthew P. Schmit Humphrey School of Public Affairs University of Minnesota

Lee W. Munnich, Jr. Humphrey School of Public Affairs University of Minnesota

March 2018

Published by:

Roadway Safety Institute Center for Transportation Studies University of Minnesota 200 Transportation and Safety Building 511 Washington Ave. SE Minneapolis, MN 55455

The contents of this report reflect the views of the authors, who are responsible for the facts and the accuracy of the information presented herein. The contents do not necessarily represent the views or policies of the United States Department of Transportation (USDOT) or the [author's organization]. This document is disseminated under the sponsorship of the USDOT's University Transportation Centers Program, in the interest of information exchange. The U.S. Government assumes no liability for the contents or use thereof.

The authors, the USDOT, and the [author's organization] do not endorse products or manufacturers. Trade or manufacturers' names appear herein solely because they are considered essential to this report.

ACKNOWLEDGMENTS

The funding for this project was provided by the United States Department of Transportation's Office of the Assistant Secretary for Research and Technology for the Roadway Safety Institute, the University Transportation Center for USDOT Region 5 under the Moving Ahead for Progress in the 21st Century Act (MAP-21) federal transportation bill passed in 2012.

TABLE OF CONTENTS

CHAPTER 1: Introduction	1
CHAPTER 2: Methodology	3
CHAPTER 3: State Results	5
CHAPTER 4: Special Interest influence	16
CHAPTER 5: Legislator views on factors influencing policy countermeasure adoption	18
CHAPTER 6: Conclusion	20
REFERENCES	22

LIST OF TABLES

Table 3.1 Implementation of Roadway Safety Policy Countermeasures	5
Table 4.1 Special Interest Group Activity and Focus	16
Table 5.1 Implementation of Roadway Safety Policy Countermeasures	19

EXECUTIVE SUMMARY

The roadway safety policy and leadership study built on previous review of evidence-based policy countermeasures for reducing road fatalities and serious injuries – and how legislators and policy leaders are addressing these issues through adoption of certain evidence-based policy countermeasures. The research is premised on the anticipated correlation of policy countermeasure adoption with measurable and significant reductions in roadway fatalities and serious injuries.

As a second phase to a broader review of roadway safety policy and leadership focused on review of Strategic Highway Safety Plans and Toward Zero Death programs, this research sought to engage state legislators, agency officials, and various special interest groups to gain a better understanding of experience with and influence over adoption of related road safety policy countermeasures – and the various factors influencing legislative (in)action. Prior study revealed the importance of political culture and external influences in certain policy countermeasure adoption. In particular, state legislators and agency officials pointed to the influence of special interest groups in contributing to countermeasure adoption or lack thereof.

This study sought to increase understanding of the policy and political context for safety and engaged state-level officials and institutions in applying these approaches. Specifically, it focused on the six University Transportation Center (UTC) states in USDOT Midwest Region 5, Illinois, Indiana, Michigan, Minnesota, Ohio and Wisconsin; expanded on an assessment tool gauging policy countermeasure adoption; developed a separate assessment tool for measuring special interest group influence in each state; and engaged legislators, safety policy leaders, and special interest groups to understand better the challenges and opportunities for improving roadway safety through policy countermeasure adoption.

The study added measurement of distracted and drugged driving enforcement to a set of six previously studied, evidence-based policy countermeasures for reducing road fatalities and serious injuries. It gauged adoption of these eight policy countermeasures with qualitative feedback from legislators, policy leaders, and special interest groups alike. Despite a general increase in 2016 traffic fatalities thought attributable to lower fuel prices and higher traffic volumes, the record within these states and others held that policy countermeasure adoption is correlated with measureable and significant reductions in roadway fatalities and serious injuries.

However, it must be acknowledged that other factors – such as vehicle safety improvements, more safety-conscious roadway engineering, or advanced approaches to emergency medical services (EMS) delivery – may all contribute to reductions in roadway fatalities and serious injuries.

As anticipated, the study revealed considerable variation among the six UTC Midwest states in terms of policy countermeasure adoption. While no state scored high for all policy countermeasures, each state had at least one strength, and leadership on specific countermeasure adoption tended to vary from state to state. As a contributing factor, special interest groups influenced policy countermeasure adoption in each state, such as with relaxation of past – and aversion to new -- law mandating helmet use for motorcyclists.

CHAPTER 1: INTRODUCTION

This study is the second in a two-phase review of state roadway safety policy countermeasure adoption. The first study, *Roadway Safety Policy and Leadership: A Case Study of Six Midwest States* (1), entailed a close review of Strategic Highway Safety Plans and Toward Zero Death programs to establish a policy leadership context for measurement of six evidence-based policy countermeasures in the six UTC Midwest states, Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin.

This study, comprising the second phase, revisited previous analysis of six evidence-based policy countermeasure for reducing road fatalities and serious injuries and how legislators and policy leaders address these issues through countermeasure adoption. Based on prior feedback from transportation officials in the six study states, research expanded to include two additional policy countermeasures. As with the first-phase study, research was premised on the anticipated correlation between policy countermeasure adoption with measurable and significant reductions in roadway fatalities and serious injuries.

The first-phase study revealed wide variation among the six UTC Midwest states in terms of policy countermeasure adoption and policy leadership attributes driving progress in each state. Likewise, the states exhibited variation in certain policy leadership characteristics, which could be explained in part by varying political or cultural norms. However, this explanation didn't tell the entire story for policy countermeasure adoption; in each state, current statute or court precedent served to limit progress on at least one policy countermeasure or another.

Based on feedback from study participants, interviewees, and roundtable attendees, there was consistent and considerable interest in learning more about 1) special interest group activity and influence over policy countermeasure adoption and 2) additional policy countermeasures to address *distracted driving* and *drugged driving*. State legislators and agency officials alike reported facing increasing challenges related to these behaviors and expressed an interest in learning more about what other states were doing in response.

As research for the second-phase study concluded, authors learned of a similar study undertaken during the same approximate timeframe. A Comparative Analysis of State Traffic Safety Countermeasures and Implications for Progress "Toward Zero Deaths" in the United States was published by the National Highway Transportation Safety Administration (NHTSA) in April 2017.

Since 2001, at least 40 U.S. states have adopted programs to reduce traffic fatalities to zero with names such as Toward Zero Deaths (TZD), Vision Zero, or Target Zero. TZD is now being promoted as a national strategy by a coalition of transportation and safety groups led by the American Association of State Highway and Transportation Officials (AASHTO) and the Governors Highway Safety Association (GHSA). (2).

While many of the 30 state TZD programs identified by AASHTO are relatively new and emerging, four state programs – in Idaho, Minnesota, Utah, and Washington – have been in place long enough to provide sufficient before and after annual crash data to evaluate the impacts of the programs. Statistical tests on these four programs support the conclusion that implementing TZD programs accelerates the reduction of fatality rates (3).

The two-phase roadway safety policy and leadership study examined factors influencing adoption of certain evidence-based policy countermeasures and integrated performance-based approaches such as

TZD programs to reduce road fatalities and serious injuries. The study sought to increase understanding of the policy and political context for safety and engaged state-level officials and institutions in applying these approaches. Specifically, it focused on the six UTC states in the Midwest region, USDOT Region 5; developed and tested an assessment tool of TZD and roadway safety programs for each state; and engaged legislators and safety policy leaders to better understand the challenges and opportunities for improving roadway safety through public policy adoption, including the influence of special interest group activity over policy countermeasure adoption.

The policy countermeasures were utilized to develop an assessment tool allowing for comparison of policy adoption among the states. If these policy countermeasures were adopted more broadly by state legislatures, one could anticipate measureable and significant reductions in roadway fatalities and serious injuries. In addition, the study included qualitative analysis of special interest group activity in each of the study states.

CHAPTER 2: METHODOLOGY

This study continued recent review of TZD programs and countermeasure adoption in each of the six UTC Midwest states by examining the role special interest groups plan in framing and influencing debate around policy countermeasure adoption. The study engaged state legislators, agency staff, and special interest groups through interviews and a round of state roadway safety policy roundtables to garner additional insight on factors contributing to policy countermeasure adoption.

The study began with a review of Strategic Highway Safety Plans (SHSPs) and TZD programs through establishment of an informal technical advisory group. The purpose of this task was to confirm the status of TZD-type programs in each state. Six evidence-based countermeasures which involve state policy action were identified in previous University of Minnesota research as having the greatest potential for reducing fatalities in rural areas. These are 1) primary enforcement of seat belt use, 2) universal motorcycle helmet use, 3) regular application of sobriety checkpoints, 4) graduated driver licensing program upgrades, 5) mandatory ignition interlock implementation, and 6) automated speed enforcement (4) (5) (6).

Based on feedback and interest expressed during previous stakeholder engagement in the study states, two additional policy countermeasures were added to the state-by-state review: *distracting driving enforcement*; and *drugged driving enforcement*.

Twelve state legislators (six Democrats and six Republicans) and approximately 25 state agency officials in the six states in the Midwest UTC region were interviewed to confirm initial study findings, identify detail and context around the assessment tool components, and refine brief case studies for each of these states. In addition, officials from various special interest groups were interviewed to gauge interest in and activity around various policy countermeasure adoption.

Following review of SHSPs and TZD programs, researchers followed up with key points-of-contact within each of the six states. These contacts were obtained via review of state agency websites, and typically involved the respective state highway safety engineer and/or TZD director. Email contact was initiated with key contacts from the respective state's Department of Public Safety and/or Department of Transportation and study overview materials were shared electronically.

An interview script was utilized for each interview and participants were asked to confirm the state's progress in implementing the eight roadway safety countermeasures and to offer any additional information or context as to why certain countermeasures have or have not been successfully implemented.

The study engaged a variety of agency stakeholders through a series of state roadway safety policy roundtables. The roundtables allowed researchers to garner additional insight on factors contributing to policy adoption, as well as specific feedback, important context, and detail.

Following these discussions, participant responses were compared with one another and with tangible status of state adoption of the eight roadway safety countermeasures to assess the state's overall standing on the study's countermeasure adoption scale. States were given a score of 0 to 5 points whereby no countermeasure adoption (0 points) and full countermeasure adoption (5 points) served as bookends to a sliding scale weighing partial countermeasure adoption among the states.

Researchers developed specific scoring criteria for rating each state on safety countermeasure adoption, and allowed for recognition of alternative policies (supplementary policy implementation) seeking similar ends to one or more of the eight identified countermeasures. The criteria for scoring state-based countermeasure adoption were as follows:

- 5 Full countermeasure adoption
- 4 Partial countermeasure adoption
- 3 Minimal countermeasure adoption or full supplementary policy implementation
- 2 No countermeasure adoption, but partial supplementary policy implementation
- 1 No countermeasure adoption, but minimal supplementary policy implementation
- 0 No countermeasure adoption or supplementary policy implementation

Although scoring did not adhere to strict parameters for awarding points, the comparison of statespecific countermeasure adoption created a fairly clear approach for the authors. However, the methodology could be improved in future study through the use of an objective expert panel given specific instruction on how to award points.

CHAPTER 3: STATE RESULTS

As was the case with the initial review of policy countermeasure adoption in 2015, no state scored high for every policy countermeasure. Rather, each state had at least one strength and these strengths tended to vary from state to state. Table 3.1 includes an updated review of the six evidence-based roadway safety policy countermeasures for each study state. In addition, a review of each state's performance in adopting policies related to distracted and drugged driving are included under new policy countermeasures addressing emerging roadway safety issues.

Table 3.1 Implementation of Roadway Safety Policy Countermeasures

	IL	IN	MI	MN	ОН	WI
Original Evidence-based Roadway Safety Policy Countermeasures						
Primary enforcement of seat belt use	5	5	4	5	1	5
Universal motorcycle helmet use	0	1	2	1	1	1
Regular application of sobriety checkpoints	4	3	2	3	4	1
Graduated driver licensing program upgrades	4	4	4	4	4	4
Mandatory ignition interlock implementation	5	2	4	3	3	4
Automated speed enforcement	3	0	0	0	2	0
New Policy Countermeasures Addressing Emerging Roadway Safety Issues						
Primary enforcement of distracted driving	4	2	3	4	2	2
No tolerance drugged driving enforcement	4	4	4	4	3	3
Total	29	21	23	24	20	20

With the exception of Ohio, all states require seat belt use and consider violation of this statute a primary offense. Likewise, no state mandates that all adult motorcyclists wear helmets. However, in all states but Illinois helmet use is required for motorcyclists aged 17 years and younger – and, in Michigan, the requirement extends to those aged 20 and younger and to those without adequate health insurance. Despite modest efforts to re-impose universal mandatory helmet use from state to state, unyielding special interest pressure opposed to strict helmet use mandates have been successful first in repealing the original mandate and, since then, in discouraging serious discussion of the policy provision at the legislature.

In each state, active local branches of respective statewide ABATE (acronym references vary) chapters wield influence through the subtle, yet unmistakable pressure of local organizing and advocacy. In certain legislative districts, candidates for state legislature are invited to participate in issue-specific forums dominated by discussion of aspects of motorcycle safety including driver education and motorcycle awareness, as well as the importance of personal freedom – namely, rider choice regarding helmet use. These forums can be well attended by motorcycle enthusiasts, whom one might presume are single-issue voters on matters of personal importance.

Due to prohibitive court decisions (in Michigan and Minnesota) or restrictive state statute (in Wisconsin), formal sobriety checkpoints are not implemented in every study state. However, various state patrol or police agencies have adopted an approach modeled after one successfully championed in Anoka County, Minnesota, that focuses on roving task forces and high visibility (saturation patrol) enforcement.

Advances with in-vehicle software makes inter-agency communication and collaboration easier than ever before, which in turn allows for various jurisdictions to contribute patrols throughout a given area of the state. The roving task force approach is predicated on the notion that a saturated enforcement effort targeting minor traffic violations will result in increased impaired-driving arrests and a long-lasting deterrent effect.

Michigan, Minnesota, and Wisconsin rely upon saturation patrols in place of formal sobriety checkpoints (which are fully permitted and utilized in Illinois, Indiana, and Ohio), and these states report increased frequency of annual deployments and a correlated decline in the number of traffic fatalities where applied. As an added benefit, the approach has been found to be more cost effective than full-fledged sobriety checkpoints.

Many of the study states shared a similar approach to graduated drivers licensing, which has expanded in recent years to include three distinct stages applicable to drivers under the age of 18. The first stage, the learner's permit, always requires the presence of a licensed driver. The second stage, provisional licensure, is an intermediate stage that allows unsupervised driving but carries various limitations – particularly on passengers, nighttime driving, and use of electronic devices. The third and final stage, full licensure, typically is granted when a driver reaches 18 years of age.

Although this study and its corresponding review of policy countermeasure adoption may not fully reflect it, study states are grappling with incorporation of new technology with the practice of promoting roadway safety and law enforcement. For instance, new approaches to ignition interlock device use and administration has reinvigorated discussion of this countermeasure at some state legislatures, with competing vendors pushing for one approach over another.

Likewise, use of automated speed enforcement may be more possible than ever before, but longstanding concerns among law enforcement agencies and consumer privacy groups alike have contributed to moderate movement toward policy adoption. At present, only Illinois and Ohio allow automated speed enforcement among study states.

Increasing use of mobile devices has elevated the importance of new policy countermeasure adoption to combat the threat of distracted driving to roadway safety. At the same time, movement toward lawful marijuana use for medical and recreational purposes, not to mention epidemics with opioids and other drugs, require new state statute and policy countermeasure adoption targeting drugged driving. As such, best practices are yet developing related to optimal regulation of drugged and distracted driving.

The following provides an update on policy countermeasure adoption in each of the six study states, with special attention given to issues of note or particular importance therein.

Illinois Case Study

Among Midwest states, Illinois is a leader both in terms of traffic safety improvements and policy adoption. The fatality rate on Illinois highways has dropped by nearly two-thirds since 1982. The state's TZD program, "Driving Zero Fatalities to a Reality," is structured to contribute to and extend that record of improved traffic safety.

Illinois's relatively strong results in implementing the policy countermeasures identified in this study give the state a score of 29 out of a possible 40 points. Illinois has an impressive record of taking important steps to improve highway safety – particularly when it comes to primary seatbelt use (5 points), regular application of sobriety checkpoints (4 points), graduated driver licensing program upgrades (4 points), mandatory ignition interlock implementation (5 points), and automated speed enforcement (3 points). Illinois is a leader in adopting new policy countermeasures addressing the emerging roadway safety issues of distracted (4 points) and drugged driving (4 points), respectively. However, the state legislature has not made similar advances in mandating motorcycle helmet use (0 points), where Illinois is the only state among those studied not to mandate motorcycle helmet use for these aged 17 and younger.

Primary Enforcement of Seat Belt Use

Since 2005, failure to wear a seatbelt has been a primary offense in Illinois.

Regular application of sobriety checkpoints

Illinois is one of three study states that conduct sobriety checkpoints either year round or with significant frequency (at least 15 to 20 times per month) regularly throughout the year. The state is reported to conduct several hundred sobriety checkpoints per year. The practice is upheld under the federal Constitution.

Mandatory ignition interlock implementation

Illinois mandates use of ignition interlock for impaired driving convictions in which the driver is either a convicted repeat offender or has a high blood alcohol content of .20 or greater. First time offenders typically are not required to utilize ignition interlock.

Automated speed enforcement in Illinois

Illinois permits automated speed enforcement in construction zones and along toll roads; however, its use is not permitted on local roads and on state roads an officer must be present and witness the infraction.

Illinois was the first state to authorize use of automated speed enforcement (ASE). The state's 2004 Automated Traffic Control Systems in Highway Construction or Maintenance Zones Act allowed for targeted use of automated speed enforcement in work zones along the state's interstate highway system.

Specifically, the legislation permitted use of speed-radar photo enforcement (SPE), and the approach taken in Illinois utilizes a private vendor and contracted vans equipped with radar and camera technology. The first van measures speeds of approaching vehicles and provides a speed warning allowing drivers to decrease their rate of speed. The second, down-stream van measures speeds and takes photos of the driver and vehicle license plate for those vehicles exceeding a certain speed. Citations are mailed to violators, with a fine issued to first-time offenders and a fine and potential license suspension for repeat offenders. All violations result in a mandatory court appearance.

In Illinois, ASE resulted in an average decrease of three to eight miles per hour among measured vehicles, with the percentage of vehicles speeding at one work zone location decreasing by 54 percent. Since initial authorization, ASE has been permitted for use in the City of Chicago, and use of camera technology has expanded to include statewide red light enforcement.

Distracted Driving Enforcement

Illinois statute bans the use of hand-held devices and texting, as well as hands-free use of cell phones by bus drivers and novice drivers age 18 or younger. Infractions are treated as a primary offense.

Drugged Driving Enforcement

Illinois statute proscribes zero tolerance for certain drugs, including THC and metabolites. Marijuana use is permitted under law for medical purposes, but a zero tolerance policy applies to driving under its influence.

Special Interest Group Influence

Organizations such as the American Automobile Association (AAA), A Brotherhood Aimed Toward Education (ABATE), American Civil Liberties Union (ACLU), Illinois Licensed Beverage Association, and Mothers Against Drinking and Driving (MADD), as well as various product and service providers, all contribute to roadway safety policy discussions in Illinois. The activity of these groups may vary from advertising and media efforts to direct advocacy and lobbying to political campaign activity through a political action committee.

Recent legislative activity regarding expanded mandatory use of ignition interlock devices following impaired driving convictions highlights one way in which special interests can influence policy adoption. Multiple vendors offering proprietary devices participated in public and private discussions regarding how and to what extent Illinois might change its DUI laws to include increased use of ignition interlock. Following significant policy deliberation, in which other interests such as MADD and the state-based

Alliance Against Intoxicated Motorists also participated, Illinois now mandates that all drives convicted of a DUI use an ignition interlock device for the full term of license suspension.

Indiana Case Study

Indiana's work toward implementing the eight policy countermeasures identified in this study give the state a score of 21 out of a possible 40 points. Indiana has a strong record of taking important steps to improve highway safety when it comes to primary enforcement of seat belt use (5 points), graduated driver licensing program upgrades (4 points), and sobriety checkpoints (3 points); however, the state legislature has not made similar advances in the areas of automated speed enforcement (0 points); mandatory ignition interlock implementation (2 points), or universal motorcycle helmet use (1 point). For its part, Indiana has demonstrated mixed results in adopting new policy countermeasures addressing the emerging roadway safety issues of distracted (2 points) and drugged driving (4 points).

Primary Enforcement of Seat Belt Use

Since 2005, failure to wear a seatbelt has been a primary offense in Indiana.

Regular Application of Sobriety Checkpoints

Indiana is one of three study states that conduct sobriety checkpoints either year round or with significant frequency (at least 15 – 20 times per month) regularly throughout the year. The state is reported to conduct several hundred sobriety checkpoints per year. The practice is permitted under the state Constitution.

Mandatory Ignition Interlock Implementation

Use of ignition interlock devices is discretionary in Indiana.

Automated Speed Enforcement

Automated speed enforcement in permitted by local ordinance in Indiana.

Distracted Driving Enforcement

Indiana statute bans texting while driving, as well as all cell phone use by novice drivers age 20 or younger. Infractions are treated as a primary offense. There is no ban for hand-held devices or prohibition of hands-free cell phone use by bus drivers.

Drugged Driving Enforcement

Indiana statute proscribes zero tolerance for certain drugs, including THC and metabolites. Use of marijuana is prohibited for recreation and medical purposes.

Special Interest Group Influence

Organizations such as the American Automobile Association (AAA), American Bikers Aimed Toward Education (ABATE), American Civil Liberties Union (ACLU), Indiana Licensed Beverage Association, and Mothers Against Drinking and Driving (MADD), as well as various product and service providers, all contribute to roadway safety policy discussions in Indiana. The activity of these groups may vary from

advertising and media efforts to direct advocacy and lobbying to political campaign activity through a political action committee.

Michigan Case Study

Since launching its TZD program, Michigan has set out to continue a recent trend in declining trafficrelated fatalities and severe injuries. In the five years prior to adoption of its current SHSP, Michigan saw a 16 percent reduction in traffic-related fatalities and a 24 percent decline in severe injuries. Through implementation of its TZD program, the state hopes to see further reduction in traffic-related fatalities and severe injuries of approximately 15 percent each.

Michigan's results in implementing the six policy countermeasures give the state a score of 23 out of a possible 40 points. Although Michigan has a strong record of taking important steps to improve highway safety – particularly when it comes to primary enforcement of seat belt use (4 points), graduated driver licensing program upgrades (4 points), and mandatory ignition interlock implementation (4 points) – the state legislature has not made similar advances in the areas of universal motorcycle helmet use (2 points), regular application of sobriety checkpoints (2 points), and automated speed enforcement (0 points). Michigan has demonstrated some leadership in adopting new policy countermeasures addressing the emerging roadway safety issues of distracted (3 points) and drugged driving (4 points), though.

Primary Enforcement of Seat Belt Use

Since 2005, failure to wear a seatbelt has been a primary offense in Michigan. However, statute does not require passengers in the back seats to wear belts.

Michigan's universal motorcycle helmet law

In 2012, Michigan repealed its mandatory motorcycle helmet requirement, which had been both state law and a target for repeal by special interests since 1969. Upon repeal, Michigan became the 30th state to give those 21 years of age and older the choice as to whether or not to wear a helmet – and the state also now requires at least \$20,000 in additional first-party medical insurance and either two years of motorcycle endorsement or passage of a motorcycle safety course. The same requirements are applied to motorcycle passengers. In Michigan, the state ABATE chapter and the Michigan Licensed Beverage Association were vocal advocates for repeal of the mandatory helmet law.

Since repeal of its mandatory helmet law, Michigan has seen a dramatic increase in crash fatalities and injury severity. Ten percent of helmetless motorcyclists brought to the hospital died, compared to three percent among those wearing helmets. Of those motorcyclists who died at the scene of the crash, 68 percent were not wearing helmets following repeal of the law versus only 14 percent before. On average, hospital bills for helmetless motorcycle crash victims were \$27,760 compared to \$20,970 for those wearing helmets (7).

Regular Application of Sobriety Checkpoints

Sobriety checkpoints are not permitted under the state Constitution, but the state police have incorporated multi-agency task forces and roving (saturation) patrols as an alternative to formal sobriety checkpoints.

Mandatory ignition interlock implementation

Michigan mandates use of ignition interlock for impaired driving convictions in which the driver is either a convicted repeat offender or has a high blood alcohol content of .17 or greater. First time offenders typically are not required to utilize ignition interlock.

Automated Speed Enforcement

Michigan does not have a state program or reported local use of automated speed enforcement.

Distracted Driving Enforcement

Michigan statute bans texting while driving, as well as all cell phone use by bus drivers and certain novice drivers. Infractions are treated as a primary offense. There is no ban for hand-held devices.

Drugged Driving Enforcement

Michigan statute proscribes zero tolerance for certain drugs, including THC. Marijuana use is permitted under law for medical purposes, but a zero tolerance policy applies to driving under its influence.

Special Interest Group Influence

Organizations such as the American Automobile Association (AAA), American Bikers Aiming Toward Education - A Brotherhood Against Totalitarian Enactments (ABATE), American Civil Liberties Union (ACLU), Michigan Licensed Beverage Association, and Mothers Against Drinking and Driving (MADD), as well as various product and service providers, all contribute to roadway safety policy discussions in Michigan. The activity of these groups may vary from advertising and media efforts to direct advocacy and lobbying to political campaign activity through a political action committee.

Minnesota Case Study

Minnesota launched its TZD program in 2003 through interagency collaboration. Minnesota's implementation of the program was the culmination of a decade-long concerted effort to "find better solutions to the problem of serious injuries and fatal crashes on Minnesota roadways" (8). Minnesota's results in implementing the six policy countermeasures give the state a score of 24 out of a possible 40 points.

Although Minnesota has a strong record of taking important steps to improve highway safety – particularly when it comes to primary enforcement of seat belt use (5 points), graduated driver licensing program upgrades (4 points), and mandatory ignition interlock implementation (3 points) – the state legislature has not made similar advances in the areas of universal motorcycle helmet use (1 point), regular application of sobriety checkpoints (3 points), and automated speed enforcement (0 points). However, Minnesota has demonstrated leadership in adopting new policy countermeasures addressing the emerging roadway safety issues of distracted (4 points) and drugged driving (4 points).

Primary Enforcement of Seat Belt Use

Since 2005, failure to wear a seatbelt has been a primary offense in Minnesota.

Regular application of sobriety checkpoints

Minnesota state courts have ruled sobriety checkpoints unconstitutional. However, Minnesota pioneered an alternative approach to formal sobriety checkpoints for impaired driving enforcement involving the use of multi-agency roving task forces and high visibility (saturation) patrols.

Mandatory ignition interlock implementation

Minnesota does not mandate use of ignition interlock for impaired driving convictions until the third offense within a 10-year period or the fourth overall offense. Although the courts do enjoy some latitude in requiring ignition interlock implementation in other cases, first time offenders typically are not required to utilize ignition interlock.

Automated Speed Enforcement

Minnesota does not have a state program or reported local use of automated speed enforcement.

Distracted Driving Enforcement

Minnesota statute bans texting while driving, as well as all cell phone use by bus drivers and novice drivers age 17 or younger (or those with provisional licenses). Infractions are treated as a primary offense. There is no ban for hand-held devices.

Drugged Driving Enforcement

Minnesota statute proscribes zero tolerance for certain drugs. Marijuana use is permitted under law for medical purposes, and there is no restriction for driving under its influence.

Special Interest Group Influence

Organizations such as the American Automobile Association (AAA), American Bikers for Awareness, Training, and Education (ABATE), American Civil Liberties Union (ACLU), Minnesota Licensed Beverage Association, and Mothers Against Drinking and Driving (MADD), as well as various product and service providers, all contribute to roadway safety policy discussions in Minnesota. The activity of these groups may vary from advertising and media efforts to direct advocacy and lobbying to political campaign activity through a political action committee.

Ohio Case Study

Ohio is a relative newcomer to the TZD approach and its program "Every Move you Make, Be Safe" intends to build on a decade of steadily improving highway safety.

Ohio's results in implementing the six policy countermeasures give the state a score of 20 out of a possible 40 points. Although Ohio has a strong record of taking important steps to improve highway safety – particularly when it comes to regular application of sobriety checkpoints (4 points), graduated driver licensing program upgrades (4 points), and mandatory ignition interlock implementation (3 points), the state legislature has not made similar advances in the areas of automated speed enforcement (2 points), primary seatbelt use (1 point), and motorcycle helmet use (1 point). For its part, Ohio has demonstrated mixed results in adopting new policy countermeasures addressing the emerging roadway safety issues of distracted (2 points) and drugged driving (3 points).

Primary enforcement of seat belt use

Failure to wear a seatbelt remains a secondary offense in Ohio.

Regular application of sobriety checkpoints

Ohio is one of three study states that conduct sobriety checkpoints either year round or with significant frequency (at least 15 – 20 times per month) regularly throughout the year. The state is reported to conduct several hundred sobriety checkpoints per year. The practice is permitted under the state and federal Constitution.

The Ohio State Patrol first utilized sobriety checkpoints in 1989 as a means toward heightened deterrence, education, and awareness of impaired driving and its impacts on traffic safety. Following a Supreme Court challenge, the approach continues in Ohio and a small number of other states – albeit with some limitations. First, the sobriety checkpoints must be located in areas with a history of alcohol-related crashes or impaired driving. Second, proper public notice must be given in order to achieve the desired deterrent effect. Third, the sobriety checkpoint must be administered in a way that does not pose increased traffic safety hazards for motorists.

Mandatory ignition interlock implementation

Ohio mandates the use of ignition interlock devices for repeat offenses.

Automated speed enforcement

Ohio is one of 21 states that permit automated speed enforcement, but an officer must be present at the time of infraction.

Distracted Driving Enforcement

Ohio statute bans texting while driving, as well as all cell phone use by drivers 17 or younger. Infractions are treated as a primary offense. There is no ban for hand-held devices or prohibition of hands-free cell phone use by bus drivers.

Drugged Driving Enforcement

Ohio statute restricts the concentration of certain drugs in a driver's system, including THC. Marijuana use is permitted under law for medical purposes, and restrictions apply to driving under its influence.

Special Interest Group Influence

Organizations such as the American Automobile Association (AAA), American Bikers Aimed Toward Education (ABATE), American Civil Liberties Union (ACLU), Ohio Licensed Beverage Association, and Mothers Against Drinking and Driving (MADD), as well as various product and service providers, all contribute to roadway safety policy discussions in Ohio. The activity of these groups may vary from advertising and media efforts to direct advocacy and lobbying to political campaign activity through a political action committee.

Wisconsin Case Study

The stated vision of Wisconsin's Highway Safety Plan is zero traffic-related fatalities. Since adopting its "Zero in Wisconsin" TZD program, Wisconsin has seen a dramatic decline in these deaths. The current SHSP includes an overall strategic goal: "Wisconsin citizens and state policymakers work toward achieving zero fatalities and incapacitating injuries on our roadways. Our belief is that any death is one too many, and we work toward saving as many lives as possible using the resources available." Between 2008 and 2012, Wisconsin averaged 570 traffic-related fatalities. In 2014, that number was 493 – the lowest annual total since 1943. Unfortunately, though, traffic fatalities rose to 560 in 2015 (*9*).

Wisconsin's results in implementing the six policy countermeasures gives the state a score of 20 out of a possible 40 points. Although Wisconsin has a strong record of taking important steps to improve highway safety – particularly when it comes to primary enforcement of seat belt use (5 points), graduated driver licensing program upgrades (4 points), and mandatory ignition interlock implementation (4 points) – the state legislature has not made similar advances in the areas of universal motorcycle helmet use (1 point), regular application of sobriety checkpoints (1 point), and automated speed enforcement (0 points). For its part, Wisconsin has demonstrated mixed results in adopting new policy countermeasures addressing the emerging roadway safety issues of distracted (2 points) and drugged driving (3 points).

Primary Enforcement of Seat Belt Use

Since 2005, failure to wear a seatbelt has been a primary offense in Wisconsin.

Regular application of sobriety checkpoints

Sobriety checkpoints are prohibited by state statute. However, Wisconsin in one of several states that deploy roving task forces and high visibility (saturation) enforcement as an alternative to formal sobriety checkpoints.

Mandatory ignition interlock implementation

Wisconsin mandates use of ignition interlock devices for repeat and high-BAC offenses, and for impaired driving convictions in which the driver is either a convicted repeat offender or has a high blood alcohol content of .15 or greater. Although the courts do enjoy some latitude in requiring ignition interlock implementation in other cases, first time offenders typically are not required to use ignition interlock.

Automated Speed Enforcement

Wisconsin statute prohibits use of automated speed enforcement.

Distracted Driving Enforcement

Wisconsin statute bans texting while driving, as well as all cell phone use by drivers with a learner or intermediate license. Infractions are treated as a primary offense. There is no ban for hand-held devices or prohibition of hands-free cell phone use by bus drivers.

Drugged Driving Enforcement

Indiana statute proscribes zero tolerance for certain drugs, including THC and metabolites. Use of marijuana is prohibited for recreation and medical purposes.

Special Interest Group Influence

Organizations such as the American Automobile Association (AAA), American Bikers for Awareness, Training, and Education (ABATE), American Civil Liberties Union (ACLU), Wisconsin Licensed Beverage Association, Mothers Against Drinking and Driving (MADD), and Tavern League of Wisconsin, as well as various product and service providers, all contribute to roadway safety policy discussions in Wisconsin. The activity of these groups may vary from advertising and media efforts to direct advocacy and lobbying to political campaign activity through a political action committee.

The Tavern League of Wisconsin is a "non-profit trade association dedicated to serving the needs of the retail beverage alcohol segment of the hospitality industry in the State of Wisconsin." According to state agency officials, the organization has been instrumental in advocating against more restrictive statutes for alcohol impaired driving – so much so that MADD has all but pulled out of the state when it comes to advocating at the legislature.

CHAPTER 4: SPECIAL INTEREST INFLUENCE

Special interest lobbying and advocacy is a sophisticated and influential aspect of policymaking at every state legislature. Although it is difficult to measure the true impact of these efforts, anecdotes abound relating to how organized advocacy campaigns influence perceived or prevailing public opinion, policymaker understanding and opinion, or the outcome of a public discussion or policy debate.

Special interest organizations or lobbyists can influence policy adoption in a variety of ways, often depending upon the nature of the policy issue and relevant policymaking body, the special interest's capacity and resources, and the broader policy and political context under which consideration of the policy issue occurs. Specific special interest lobbying and advocacy can occur in various forms: through fact-based educational efforts or less-factual rhetoric targeting policymakers, media outlets, or the general public (e.g. voters) directly; via stakeholder, organizational, or grassroots organizing to present strength in sheer numbers or coalition-building for or against a policy issue; by influencing the policymaking process by winning support of key stakeholders in the legislature (caucus leaders or committee chairs) or state officials (e.g. governor, transportation or public safety commissioners, etc.); through targeted or broad-based political and campaign finance activity; or any combination of the above.

Table 4.1 compares certain special interest group activity and policy countermeasure focus among the six study states.

	Educate	Organize	Lobby	Donate \$	Priority Policy
					Countermeasure
All States					
American Automobile Association	Х	Х	Х		General roadway safety
ABATE	Х	Х	Х		Opposed to mandatory helmet use
American Civil Liberties Union	Х	Х	Х		Data and personal privacy
Trial Lawyers Association			Х	Х	Ignition interlock
Licensed Beverage Association		Х	Х	Х	Sobriety checkpoints
Mothers Against Drunk Driving	Х	Х	Х		Ignition interlock, sobriety checkpoints
Alliance Against Intoxicated Motorists (Illinois)	Х	Х	Х		Ignition interlock, sobriety checkpoints
Tavern League of Wisconsin	X	Х	х	х	Ignition interlock, sobriety checkpoints

Table 4.1 Special Interest Group Activity and Focus

Although states have made significant progress in developing TZD programs and passing related policy countermeasures aimed at improved roadway safety, legislatures have shown restraint – even in the face of clear evidence to the contrary – regarding adoption of certain evidence-based policy countermeasures such as mandatory motorcycle helmet use laws, automated speed enforcement, or

full "hands free" cell phone use restrictions. While each of these countermeasures has its own set of issues, the lack of clear progress toward countermeasure adoption remains somewhat surprising given the high level of public recognition of their effectiveness as well as support. These are a few possible explanations based upon this study and previous research:

- **Public opinion support does not automatically translate to political action.** Elected officials do not automatically support legislation because a public opinion survey shows support. Quite frequently issues may result in broad indicated support but not strong enough to demand action. While the public is concerned about roadway safety, this issue is not frequently near the top of their list for action by their elected representatives. Furthermore, because reducing fatalities requires a complex set of strategies and investments over a period of time, it is difficult to demonstrate why a particular action is important and requires a significant investment of legislative time and political capital.
- How an issue is framed can make a difference. The questions in the public opinion survey on the six evidence-based policy countermeasures were framed in terms of their effectiveness in improving roadway safety (7). If the questions were framed in a different way, there could be a very different result in terms of public support. For example, if the question about automated speed enforcement were asked in terms of effectiveness in raising revenue, the question about support could be expected to be negative.
- Professional and institutional concerns or opposition can reduce legislative willingness to adopt policy countermeasures. In Minnesota, public safety and law enforcement officials have raised concerns about automated speed enforcement which have hampered efforts to develop a pilot project in construction work zones. Similarly, constitutional limitations or court decisions may limit states in implementing sobriety checkpoints.
- Roadway safety countermeasures that require changing personal behavior can face strong ideological opposition. Political or ideological opposition to interfering with personal choices, even if they are bad choices that could lead to death, may override more broad-based support for these countermeasures.
- Organized opposition groups can prevent evidence-based policy countermeasures from being implemented. This is particularly true of motorcycle helmet laws, where there is a very strong, committed and organized opposition to laws that would require motorcycle helmet use. This is evident, too, in Wisconsin impaired driving laws, where an active lobby, the Tavern League, has been incredibly influential.
- State organizations such as DOTs and public safety agencies are reluctant or prohibited from advocating legislative policy countermeasures that could improve roadway safety. Typically these agencies are represented by a departmental liaison who conveys departmental priorities to legislators. Safety professionals may be consulted or invited to testify on safety legislation but are typically not allowed to advocate legislation apart from the overall departmental agenda.
- Governors have been supportive of state roadway safety efforts such as TZD programs, but do not typically make roadway safety a priority issue for legislative action, and rarely get involved in promoting these evidence-based policy countermeasures. There have been exceptions to this case such as the Michigan governor who consistently vetoed state legislation removing the state's motorcycle helmet requirement until a new governor was elected and signed the legislation.

CHAPTER 5: LEGISLATOR VIEWS ON FACTORS INFLUENCING POLICY COUNTERMEASURE ADOPTION

Although special interest influence can significantly impact the policymaking process, interviews suggest that other factors – such as prevailing political culture – have had far greater impact on adoption of the eight policy countermeasures identified in this study. Conversations with state legislators informed and illuminated this finding, whereby feedback consistently pointed to evidence-based policy taking a back seat to prevailing political culture – that is, ideological preferences regarding the role of government and regulation that, in this case, generally favor privacy and personal liberty over public safety.

The following provides a brief summary of interview feedback related to the primary obstacles preventing policy countermeasure adoption:

Primary enforcement of seat belt use. Although all study states with the exception of Ohio consider failure to wear a seat belt a primary offense, progress among these states was slow and varied due in large part to prevailing political culture among the states. This is particularly true in Ohio, where concerns over personal liberty and objections to perceived federal government overreach are cited as explanation for the state's treatment of failed seat belt use as a secondary offense.

Universal motorcycle helmet use. The history of mandated helmet use for all motorcyclists is not merely a case of legislative inaction, but rather it largely represents relaxation and reversal of oncestandard laws promoting rider safety. Due in large part to concerted and consistent lobbying and special interest influence touting the values of personal liberty, legislatures in the six study states one by one repealed mandatory helmet use laws – and they have shown no interest in reversing course again. None of the study states have demonstrated even modest progress toward mandating motorcycle helmet use of any kind since 1984, with Michigan relaxing its helmet use laws further as recently as 2012.

Regular application of sobriety checkpoints. Although state constitutions and court precedent have prevented formal application of sobriety checkpoints in Michigan and Minnesota, state statute prevents their use in Wisconsin. According to interview feedback, this is a clear example of how special interest influence in Wisconsin has served to limit or prohibit use of certain tools for alcohol impaired driving enforcement.

Graduated driver licensing program upgrades. There is moderate variation among GDL programs in the study states, but these differences are due in large part to other considerations such as best practices or state experience with the program.

Mandatory ignition interlock implementation. According to interview feedback, political culture and ideology plays as strong a role as special interest influence in determining whether a state has adopted ignition interlock requirements – and, if so, to what extent they are applied (for instance, first time offenses versus second and subsequent offenses). However, special interest opposition in Wisconsin was cited as a significant factor for why the state waited until 2017 to enact its current ignition interlock policy.

Automated speed enforcement. State constitutions and court precedent, as well as ideological opposition due to privacy concerns and role of government, have served to limit full adoption of automated speed enforcement approaches among certain study states. Interviews did not indicate special interest influence plays a significant role in adoption of this policy countermeasure.

Primary enforcement of distracted driving. According to interview feedback, ideology related to personal liberty and role of government, in addition to anticipation of best practice development, have served to limit full adoption of distracted driving countermeasures, such as "hands-free" restrictions.

No tolerance drugged driving enforcement. Likewise, in most cases states are waiting for science and best practice standards to emerge as they determine how best to restrict incidence and enforce regulations related to drugged driving. There appears to be no organized special interest activity advocating against policy countermeasure adoption in this regard.

Table 5.1 lists these policy countermeasures and identifies the primary obstacle(s) preventing their adoption. As noted, other considerations such as objective policy differences or still-developing best practices can explain lack of full policy countermeasure adoption.

	Special Interest Influence	Political Culture & Ideology	State Court Precedent	Other Considerations
Primary enforcement of seat belt use		х		
Universal motorcycle helmet use	х			
Regular application of sobriety checkpoints		Х	х	
Graduated driver licensing program upgrades				x
Mandatory ignition interlock implementation	х	Х		
Automated speed enforcement		х	х	
Primary enforcement of distracted driving		Х		х
No tolerance drugged driving enforcement		Х		х

Table 5.1 Implementation of Roadway Safety Policy Countermeasures

CHAPTER 6: CONCLUSION

The two phases of the *Roadway Safety Leadership and Policy Study* provided unique insight into various factors contributing to evidence-based policy countermeasure adoption among the six UTC Midwest states. This study enabled researchers to engage a wide variety of stakeholders, including state legislators, agency officials, and special interest groups, regarding policy countermeasure adoption, institutional policy leadership, and other factors contributing to policy countermeasure adoption.

Initial review of SHSPs and TZD programs, interviews with various stakeholders, and evaluation of policy countermeasure adoption both elevated awareness of policy countermeasures affecting roadway safety within each state and introduced stakeholders to new aspects of the policy and its path to adoption in their state and others. In addition to capturing research findings and offering state-specific case study analysis, the research provided an objective approach for evaluating evidence-based policy countermeasures promoting roadway safety and the various leadership attributes of the programs and agencies supporting the policy.

State legislators and agency officials consistently referenced the influence of political culture and special interest group influence in framing policy discussions and, in some cases, directly advocating for or against policy countermeasure adoption.

Objective evaluation of the underlying factors contributing to policy countermeasure adoption should take into account how and to what extent political culture and special interest group activity influence policy countermeasure adoption. At its core, this study sought to determine why, in the face of otherwise convincing data, certain evidence-based policy countermeasures fall short of adoption or full implementation on a state-by-state basis.

Results suggest that special interest group activity can have clear impacts on policy countermeasure adoption. Experiences in Wisconsin with the Tavern League and alcohol impaired driving regulation or various statewide ABATE chapters and mandatory motorcycle helmet use requirements stand out as particularly illustrative examples.

However, researchers found that prevailing political culture and, in some cases, state court rulings, played a much deeper role in whether or not a state legislature adopted certain policy countermeasures. For instance, widespread ideological opposition rather than special interest activity tends to explain the lack of progress in use of sobriety checkpoints or automated speed enforcement among certain states. Likewise, philosophical differences about how and to what extent the "punishment fits the crime" underlie debate over mandated ignition interlock use following first DUI offenses.

This study did not examine in detail the extent of special interest group membership organizing, media expenditures, campaign contributions, or use of registered lobbyists – all of which to some degree could be measured and compared among states or against competing special interest group activity, where it exists. Nonetheless, qualitative analysis suggests that organized special interest group activity can be a key determinant to roadway safety policy countermeasure adoption.

Those frustrated by slow or impeded progress with policy countermeasure adoption may look to the success of organizations such as MADD and the basic element of special interest group activity – namely, an intentional approach to organizing and deploying people, money, messaging, or other resources in the pursuit of specific policy outcomes.

In addition, continued research and outreach could provide additional insight into this issue, perhaps by engaging a wider array of stakeholders in a new and meaningful way, and in the process, contributing to a deeper understanding of how states can best promote evidence-based policy countermeasures as a means of improving roadway safety and striving ever closer "toward zero deaths."

Also, a more robust 50-state survey of SHSPs and TZD program progress, focusing on specific evidencebased policy countermeasure adoption, could provide a useful resource for state transportation safety officials, elected leaders, and other stakeholders seeking novel approaches to improving roadway safety. In addition, a technical review panel could be convened to provide increased objectivity and standardization of policy countermeasure adoption scoring. Such study could be conducted to establish baseline performance and updated over time to track progress within specific states or regions of the country.

REFERENCES

- Munnich, L, & Schmit, M. 2017. Roadway Safety Policy and Leadership: Case Study of Six Midwest States. In *Transportation Research Record: Journal of the Transportation Research Board*, 2635, 19– 27.
- 2. *Toward Zero Deaths: A National Strategy on Highway Safety.* 2014. Retrieved from http://www.towardzerodeaths.org/wp-content/uploads/TZD_Strategy_12_1_2014.pdf
- 3. Munnich, L, Douma, F, Qin, X, Thorpe, J.D., & Wang, K. 2013. Evaluating the Effectiveness of State Toward Zero Deaths Programs. Presented at 92nd Annual Meeting of the Transportation Research Board, Washington, D.C.
- 4. Knapp, K. 2011. Reducing Crash Fatalities on Rural Roadways: Estimating Impacts of Legislation-Based Safety Improvement Measures. *Transportation Research Record: Journal of the Transportation Research Board, 2213,* 29–36.
- Goodwin, A. H., Hall, W. L., Raborn, J.C., Thomas, L. J., Masten, S. V., & Tucker, M.E. 2008. Countermeasures that Work: A Highway Safety Countermeasure Guide for State Highway Safety Offices, Third Edition. Publication DOT HS 810 891. National Highway Traffic Safety Administration, U.S. Department of Transportation, Washington, D.C.
- 6. Preusser, D. F., Williams, A. F., Nichols, J. L., Tison, J, & Chaudhary, N. K. 2018. *Effectiveness of Behavioral Highway Safety Countermeasures*. National Cooperative Highway Research Program Report 622. Transportation Research Board, Washington, D.C.
- 7. Striker, R, Chapman, A, Titus, R, Davis, A, & Rodriquez, C. 2016. Repeal of the Michigan helmet law: the evolving clinical impact. The American Journal of Surgery. 211 (3), 529-533.
- 8. Minnesota Toward Zero Deaths. 2016. Retrieved from <u>http://www.minnesotatzd.org/whatistzd/mntzd/</u>.
- 9. State of Wisconsin FFY 2015 Highway Safety Plan. 2016. Retrieved from http://wisconsindot.gov/Documents/safety/education/frms-pubs/HSP%202015.pdf.