

Slow Down, Move Over Laws: Investigating Factors Influencing Drivers' Behavior and Compliance

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Title

Slow Down, Move Over Laws: Investigating Factors Influencing Drivers' Behavior and Compliance

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Foreword

Emergency roadside service technicians help stranded motorists by risking their lives. Within the American Automobile Association, they are known as Roadside Heroes. Unfortunately, a Roadside Hero is struck and killed by a passing vehicle approximately every other week. First responders and stranded motorists face similar risks on the roadside as well. *Slow Down, Move Over* laws exist to protect Roadside Heroes, first responders, and the stranded motorists whom they serve. However, as statistics have shown, drivers do not always follow the law, all too often resulting in preventable tragedies.

This report describes research that seeks to understand why drivers do not always follow Slow Down, Move Over laws. It also seeks to identify promising approaches to increase safe driving behavior and compliance with these important laws, for the safety of all road users. This report should be of interest to federal, state, and local transportation agencies, policymakers, law enforcement professionals, first responders, roadside service professionals, driver education providers, and all motorists.

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About the Sponsor

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List of Abbreviations and Acronyms

ANSI	American National Standards Institute
DOT	Department of Transportation
GHSA	Governors Highway Safety Association
NHTSA	National Highway Traffic Safety Administration
ODT	Object Detection and Tracking
PI&E	Public information and education
PSA	Public service announcement
SDMO	Slow Down, Move Over
SHSO	State Highway Safety Office
TMC	Traffic Management Centers
VMS	Variable message signs

Executive Summary

In 2024, a total of 46 emergency responders were killed after being struck by vehicles while working roadway incidents. The fatalities included 26 law enforcement officers, 12 tow truck operators, 4 Department of Transportation safety service patrol workers, 3 fire/EMS personnel, and 1 road service technician (Emergency Responder Safety Institute, 2024). “Slow Down, Move Over” laws, enacted in all 50 states and the District of Columbia, aim to protect these workers, as well as occupants of disabled vehicles, by requiring passing vehicles to change lanes if possible and/or reduce their speed. Despite their widespread adoption, compliance with these laws is inconsistent, and thus people working or stranded on the roadside continue to face great risks.

This study employed a comprehensive, phased, mixed-methods approach. First, the research team documented state Slow Down, Move Over laws and surveyed and interviewed traffic safety stakeholders from State Highway Safety Offices, Departments of Transportation, and law enforcement agencies to gather information about public information and education, and enforcement efforts. Next, the research team conducted focus groups with 135 drivers across 10 states, reflecting a diversity of state laws as well as driver experience and age. Real-world behavior of 12,365 drivers passing 169 unique incident scenes was examined using video from existing traffic cameras located on specific highways in 13 states to quantify the percentage of drivers who changed lanes or reduced their speed as required by law, as well as factors influencing compliance. The findings were then used as a basis for several recommendations for promising strategies for increasing safe behavior and compliance with Slow Down, Move Over laws.

The review of state Slow Down, Move Over laws revealed substantial variability in the types of vehicles protected, specific actions required of motorists when passing the vehicle, and the penalties for noncompliance. Surveys and interviews with stakeholders highlighted frustrations with data limitations, variation in legislative and enforcement practices, and the perceived effectiveness of emotional messaging and outreach strategies.

Focus groups with drivers revealed several key insights. While most reported moving over and/or slowing down when approaching roadside incidents or workers, their responses varied based on roadway cues. In general, drivers tended to focus on the “move over” component of the law but neglected the “slow down” component. Awareness of laws was inconsistent, as many participants were unsure of their state’s requirements or which vehicles were protected. They generally expressed that while they personally move over or slow down when passing roadside incidents or workers, they believed that other drivers were less likely to do so. They cited limited enforcement and low visibility of outreach efforts as key barriers to improving compliance.

Real-world video of drivers passing incident scenes revealed moderate levels of compliance. In aggregate, 64% of the vehicles subject to Slow Down, Move Over laws were observed changing lanes and/or reducing speed, whereas 36% did neither. Notably, changing lanes was much more common than slowing down. In states that required a specific speed reduction (e.g., 20 miles per hour below the posted speed limit), very few drivers reduced their speed to the degree required.

Findings reveal a gap between drivers' self-reported and observed behavior. While most drivers express an intent to slow down and move over, particularly for emergency and law enforcement vehicles, observational data indicates lower actual compliance rates, especially concerning speed reduction. A pervasive lack of detailed public awareness about the details of state Slow Down, Move Over laws, including the types of vehicles protected and the specific actions required, is likely to contribute to this inconsistency. Furthermore, results suggest that the perceived low risk of enforcement, coupled with varying penalties and often ambiguous legal language across jurisdictions, diminishes the deterrent effect of these laws.

To address these critical challenges, the study proposes a set of recommendations across three core areas:

- **Legislation:** Slow Down, Move Over laws should be standardized to ensure protection for all roadside personnel and vehicle types, adopt simplified and consistent language across states, and clarify penalties to be impactful and widely publicized.
- **Public Information and Education:** Stakeholders should employ strategies that focus on developing emotionally compelling and visually clear public service announcements that explicitly state legal requirements and highlight the human impact of noncompliance. These campaigns should leverage multimodal outreach channels, including driver's education, digital platforms (e.g., navigation apps, streaming services), roadway signage (e.g., fixed- and variable-message signs), and traditional media, supported by consistent funding and strategic timing.
- **Enforcement:** Enforcement efforts should emphasize the use of high-visibility enforcement campaigns, utilize routine traffic stops as educational opportunities, and coordinate joint enforcement efforts across agencies. Innovative technologies such as dashcams and automated enforcement systems should be explored and implemented with transparency and an emphasis on education over purely punitive measures.

By addressing these core areas through an integrated approach that combines legislative, educational, and enforcement actions, states can significantly enhance driver awareness, improve compliance with Slow Down, Move Over laws, and ultimately create safer roadside environments for all road users.

Introduction

Background

Emergency response and roadside assistance personnel face substantial dangers when working on the side of the road. Between 2015 and 2021, 123 roadside assistance providers were struck and killed by passing vehicles while working on or along U.S. roads (Tefft et al., 2024). More recently, the Emergency Responder Safety Institute (ERSI) reports that a total of 46 emergency responders were killed after being struck by vehicles while working on the scenes of roadway incidents. The fatalities included 26 law enforcement officers, 12 tow truck operators, 4 Department of Transportation (DOT) safety service patrol workers, 3 fire/emergency medical services (EMS) personnel, and 1 road service technician (ERSI, 2024). These numbers highlight the constant threat that emergency and roadside personnel face.

The nation's first "Slow Down, Move Over" (SDMO) law was enacted in South Carolina in 1996, following a tragic incident where a paramedic was struck and killed while responding to a crash. Since then, all U.S. states and the District of Columbia have enacted some form of SDMO law. While the details differ between states, SDMO laws generally require drivers to take specific actions, including changing lanes and/or reducing speed, when approaching stopped vehicles on the roadside. While originally focused on protecting emergency responders and roadside personnel, many states have expanded coverage to include stopped passenger vehicles as well, with the aim of reducing crash risks and enhancing safety for everyone on or near the roadway.

Although SDMO legislation has been enacted by all 50 states and the District of Columbia, public awareness and adherence to these laws remain inconsistent. A 2017 survey by the National Safety Council found that 23% of drivers nationwide were unaware of the existence of any legal requirements for drivers to take specific actions when passing emergency responders parked on the side of the road with their lights flashing, and 34% were unaware that they were required to move over one lane from the scene if safe to do so (National Safety Council, 2019). This inconsistency is compounded by the lack of uniformity and sometimes confusing language in state SDMO laws. A 2024 report by the U.S. Government Accountability Office (GAO) highlights this variability, noting that the types of vehicles protected under the law differ significantly by state (GAO, 2024). Some laws include only law enforcement vehicles and emergency responders, whereas others extend protection to service vehicles such as waste management trucks. The most comprehensive laws extend protection to ordinary passenger vehicles as well. Moreover, state laws differ in mandated driver actions (e.g., move over or slow down, slow down and move over, slow down to a prescribed speed), how the laws are enforced, and the resulting fines and penalties for noncompliance.

The variability in SDMO laws and significant lack of public awareness underscore the challenges in achieving their intended safety benefits. Traffic safety laws are only effective when the public understands the behaviors expected of them, how those behaviors contribute to traffic safety, and the consequences of noncompliance.

States and jurisdictions that successfully educate the public and rigorously enforce laws promote safer voluntary behavior among drivers (Kirley et al., 2023). However, the overall effectiveness of SDMO laws remains difficult to assess due to a lack of empirical research. Although some studies have begun to examine factors that may influence compliance, such as the type of stopped vehicle (Megat-Johari et al., 2021), use of variable message signs (Megat-Johari et al., 2021, Liu et al., 2023) and various other temporary traffic control devices deployed by emergency responders in the field (Blomberg et al., 2023), comprehensive evidence remains limited. Moreover, beyond those vehicle-specific and responder-specific factors, there is no empirical research on factors influencing drivers' compliance with SDMO laws more generally.

Due to this lack of empirical research, combined with fiscal and practical constraints that many states face, legislators and traffic safety stakeholders are often hesitant to revise or adopt new legislation, safety programs, or campaigns without clear evidence of their effectiveness in changing driver behavior and improving safety. Addressing this research gap is critical for identifying promising ways to enhance motorists' awareness of and compliance with SDMO laws, ultimately improving safety for all road users.

This project aimed to fill this gap using a mixed-methods research design, synthesizing information from various sources, to investigate how driver awareness of and compliance with SDMO laws can be improved, ultimately informing recommendations for future legislation, enforcement, and education efforts.

Objectives

The overarching goal of this study was to identify promising ways to increase motorist compliance with SDMO laws, thereby enhancing the safety of emergency response or roadside service providers. The project objectives were as follows:

- **Analyze driver passing behavior:** Analyze and interpret observed driver behavior when passing stopped emergency response or roadside service vehicles, considering the influence of state-specific SDMO laws, driver awareness of the legal requirements and penalties for noncompliance, perceived social norms, beliefs about enforcement, and other relevant factors.

- **Assess outcomes in relation to state laws:** Assess and document SDMO compliance outcomes both across the full study population and in relation to the specific requirements of SDMO laws in each state.
- **Determine associations of modifiable factors with compliance:** Identify and examine the relationships between factors that can be modified (e.g., awareness, perceptions, beliefs) and observed, or self-reported compliance with SDMO laws, to inform strategies aimed at increasing compliance.
- **Provide insights on intervention potential:** Explore the potential impact of interventions targeting modifiable factors on compliance with SDMO laws, providing insights to inform recommendations for future legislative updates, public information and education (PI&E) campaigns, and enforcement strategies.

Project Overview

This research employed a mixed-methods approach across three phases, integrating both quantitative and qualitative data collection (see Figure 1), to facilitate a comprehensive analysis of SDMO law compliance by examining the issue from multiple perspectives and drawing on a varied set of data sources. The first phase of the study focused on a review of SDMO laws, PI&E, and enforcement efforts. This phase included an environmental scan of state legislation, a survey of stakeholders from all states, and in-depth interviews with stakeholders from a subset of states/agencies. The second phase focused on drivers, exploring their behaviors, knowledge, and perceptions related to SDMO laws. Building on insights from Phase I, states representing a variety of laws and outreach efforts were strategically selected. Within these states, focus groups with drivers were conducted, and observational data using traffic camera footage were collected and analyzed. The final phase of the study focused on developing recommendations to enhance compliance with SDMO laws and engaging key stakeholders to gather feedback and refine the recommendations.

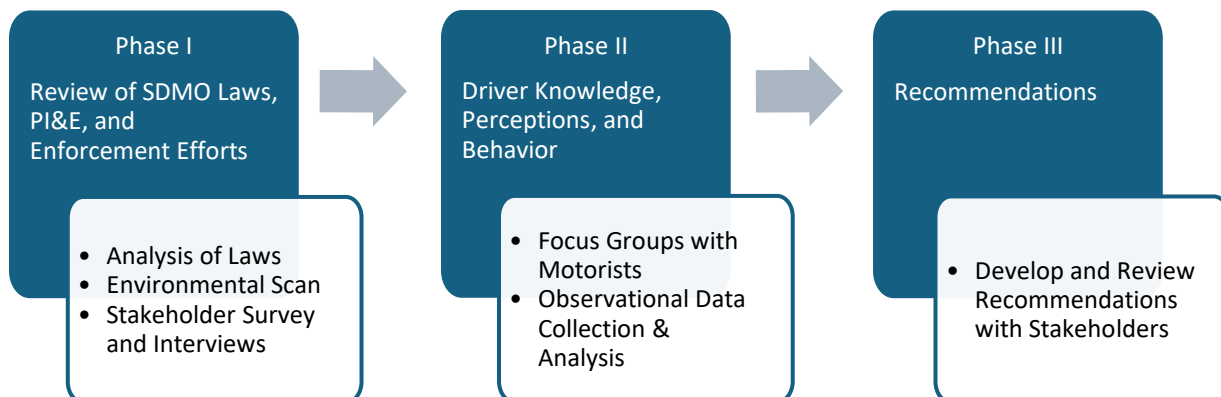


Figure 1. Study Design

The study received approval by the Westat Institutional Review Board, ensuring compliance with Title 49, part 11 of the Code of Federal Regulations concerning the protection of human subjects.

Phase I—Review of SDMO Laws, PI&E, and Enforcement Efforts

Phase I involved four primary tasks: (a) analyzing state SDMO laws, (b) conducting an environmental scan of PI&E and enforcement efforts, (c) surveying state traffic safety officials and law enforcement, and (d) interviewing state traffic safety officials and law enforcement.

Analysis of SDMO Laws

Methods

In November and December 2023, a comprehensive review and assessment of SDMO laws was conducted across all 50 states and the District of Columbia. This review primarily leveraged the AAA SDMO law database, supplemented by an extensive online scan. Additional sources of information included codes of regulations (and state statutes), the National Conference of State Legislatures, departments of motor vehicles (DMVs), state departments of transportation (DOTs), State Highway Safety Offices (SHSOs), and related stakeholder websites identified through Google searches.

Information was systematically gathered to highlight differences and similarities between state laws, including the following:

- **Vehicle types covered:** Such as first responders, tow trucks, or disabled passenger vehicles
- **Required motorist behavior:** Detailing whether drivers must move over, slow down, or both, as well as any specific speed reduction requirements
- **Associated penalties for violations:** Outlining fines, license points, and/or imprisonment
- **Enactment and revision dates:** Documenting when laws were passed or revised

To ensure a comprehensive understanding of the current and anticipated legal landscape, the methodology included a forward-looking scan for proposed and anticipated legislative changes related to SDMO laws in each state and the District of Columbia. A complete list of all data elements collected, and their operational definitions is provided in Table 1.

Table 1. Law Components Documented During the Review of SDMO Laws

Component of the law	Description
Vehicle types covered*	The vehicles protected under the statute of the law. Vehicle classifications included the following: • First responders, including law enforcement, fire trucks, and ambulances • Tow trucks • Other specific vehicles (e.g., municipal, road maintenance, utility) • Stopped/disabled vehicles
Required behavior	The required behavior for the passing driver as it pertains to reducing speed and moving into another lane. Typically, laws require the driver to either of the following: • Move over or slow down • Move over and slow down (meaning the driver is always required to reduce their speed, regardless of whether they move into another lane) In some cases, laws specify an exact amount by which drivers must reduce their speed, such as requiring a decrease of 10 mph below the posted speed limit.
Enacted date	The original date the law went into effect.
Amendment date	The date of the most recent revision to the law.
Planned updates/proposed bills	Information on any publicly available legislative efforts (e.g., bills introduced in the current or upcoming legislative session) or regulatory proposals that would amend, repeal, or introduce new SDMO laws or related provisions. This includes proposed changes to protected vehicles, required behavior, or penalties.
Fine	The fine associated with violating the law: • The dollar amount for the first offense (and second and third offenses if there is an escalating fine) • The dollar amount if the violation results in (a) an injury, (b) a serious injury, or (c) death
Points	Points, if any, assigned to the offender's license: • Number of points • Variation in points assigned depending on whether the offense resulted in a crash, injuries, or fatalities
Imprisonment	Circumstances under which jail time may be imposed.

* Vehicle type classifications varied from state to state.

Findings

The analysis of SDMO laws demonstrated substantial variation across jurisdictions (see Figure 2), with differences present in nearly every component of the law.

Vehicles Protected. During the time period of the initial review, significant diversity was observed in the types of vehicles protected under these laws. Results showed that all states' laws protected first responders (i.e., law enforcement, fire, and EMS). All but the District of Columbia extended protections to roadside assistance provider vehicles (e.g., tow trucks) as well. Beyond first responders and roadside assistance providers, however, there was significant variability between states. As of 2023, seven states' SDMO laws did not extend protection to any other types of vehicles besides first responders and roadside assistance providers. A larger group of 24 states further extends protection to include other specific vehicles such as municipal, road maintenance, or utility vehicles. The most comprehensive SDMO laws protect all stopped vehicles, including disabled passenger vehicles. These more comprehensive laws often include a caveat requiring the disabled passenger vehicle to display hazard lights and, in some cases, additional visible markings like flares or warning triangles. At the time of the original scan, 19 states had comprehensive SDMO laws that included all stopped vehicles. However, given significant legislative activity in this area, the research team conducted a targeted¹ scan in August 2025 which found that nine additional states had extended protections to all stopped or disabled vehicles, bringing the total number of states to 28 (Table 2).

Table 2. Comparison of SDMO Law Coverage in 2023 and 2025

Year	First responders and roadside assistance only	First responders, roadside assistance, and other specific vehicles only	All stopped/disabled vehicles
2023	7	24	19
2025	5	17	28

The existence of more comprehensive laws, reinforced by the states that have amended their SDMO laws in the past 5 years (primarily to expand coverage), reflects a clear trend toward protecting all vehicle types and emphasizing comprehensive roadside safety for all road users. Arguably, such an approach makes the law easier for drivers to

¹ The 2025 scan was specifically designed to track legislative changes related to vehicle types covered under the law. It did not include an exhaustive review of all legislative amendments and therefore does not account for changes in other provisions, such as updated fines, altered penalties, or modified requirements for driver behaviors (e.g., speed reduction, lane-changing mandates).

understand and may increase compliance because it applies the same requirements to drivers approaching any stopped vehicle regardless of the type of vehicle.

Behaviors Required by Motorists. The 2023 scan depicted distinct variations across jurisdictions regarding the required driver behavior when passing stopped vehicles. For instance, in 13 states, the law stipulates drivers must slow down and, if safe to do so, move into another lane. This approach requires drivers to reduce their speed regardless of whether a lane change is executed. In contrast, 36 states required the lane change maneuver, directing drivers to shift into a non-adjacent lane from the stopped vehicle, and required a speed reduction only if the lane change could not be executed. Finally, New York and the District of Columbia do not explicitly require a speed reduction but instruct drivers to move over if possible and otherwise “exercise due care.”

Furthermore, among the 49 states that require a speed reduction (either always or if unable to change lanes), 13 specifically define the speed reduction required. Most laws typically stipulate that the driver reduce their speed by a specific margin below the posted limit (e.g., 10 or 20 mph under the posted speed limit) or to an absolute speed (e.g., reducing speed to 50 mph on all roads with speed limits of 60 mph or greater).

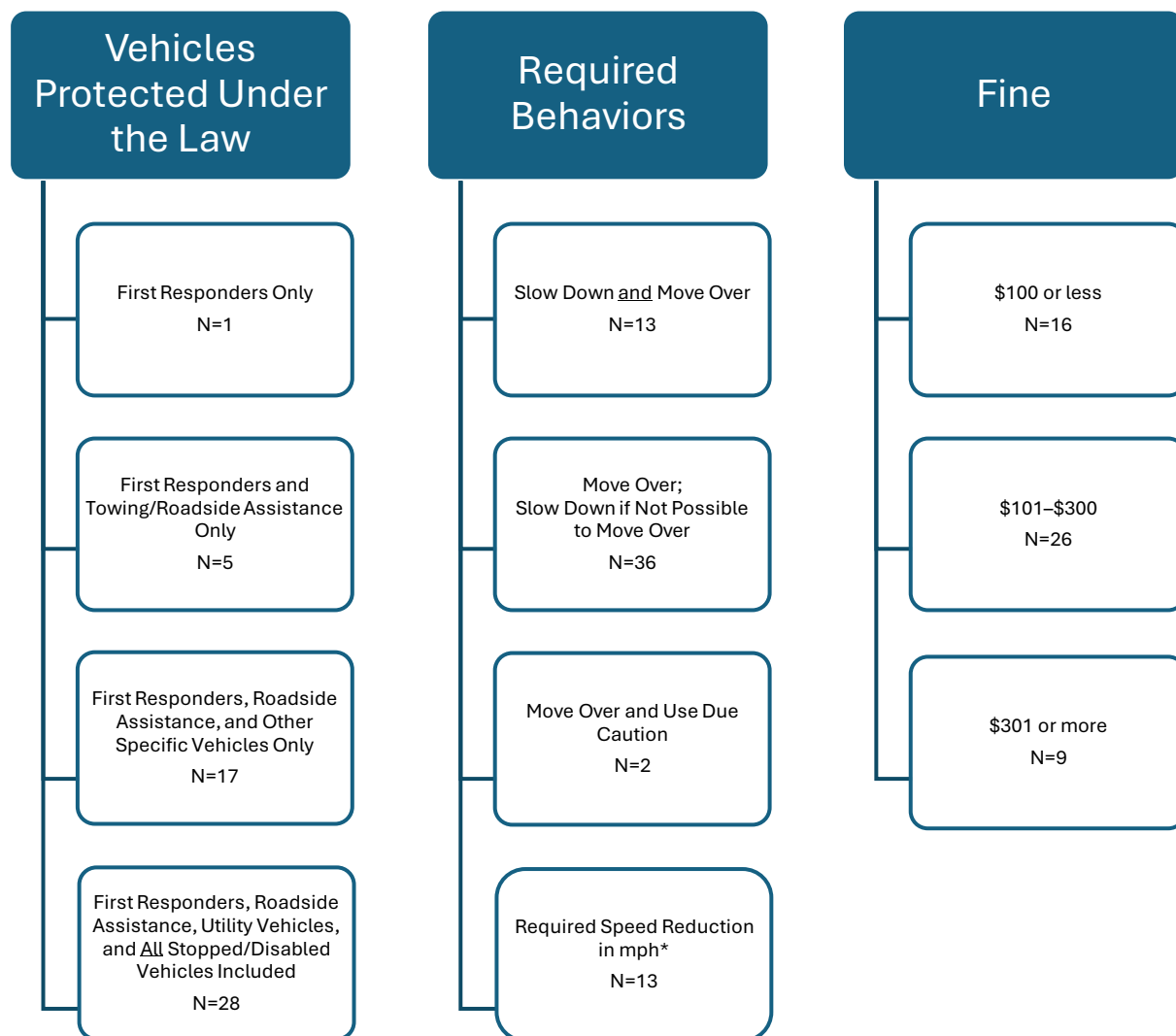
Beyond these core requirements, some state laws include additional specifications or exemptions based on the number of available lanes (e.g., requirements only apply on multilane highways), specific road types (e.g., Interstate highways vs. secondary roads), posted speed limits, prevailing traffic volume, and adverse weather conditions.

Penalties. In 2023, the base fines for a first offense range widely, from \$30 (Florida) up to \$2,500 (Virginia). Nine states and the District of Columbia assign penalty points to a driver’s license for a SDMO violation.

Analysis of the state laws demonstrated that penalties often escalate according to the severity and frequency of the violations. Fourteen states increase the fine for repeated offenses, and 18 states impose significantly higher fines and may add penalties like mandatory driving education, loss of license, and imprisonment when noncompliance results in a crash, injury, or fatality. Additionally, various states stipulate additional fines and penalties if the violation is found to have put an emergency or work zone worker in danger.

Furthermore, some states impose fines that vary depending on the type of vehicle stopped on the side of the road. For instance, in Virginia, violations involving law enforcement, fire, or EMS vehicles are classified as reckless driving, a Class 1 misdemeanor (i.e., a criminal offense) carrying a fine of up to \$2,500 and/or 12 months of imprisonment. Violations involving tow trucks and other protected vehicles incur a traffic infraction (not a criminal offense) with a fine not exceeding \$250. Similarly,

Kansas applies a \$195 fine for emergency vehicles (including tow trucks), a \$105 fine for road maintenance and utility vehicles, and a \$45 fine for municipal vehicles.



* Required speed reduction in mph is an additional requirement for some of the states that require slowing down.

Figure 2. Distribution of Key SDMO Law Components. Information regarding required behaviors is based on a comprehensive review conducted in 2023; information regarding vehicles protected and fines was updated based on a brief scan conducted in 2025.

Environmental Scan

Methods

An environmental scan was conducted to examine PI&E campaigns, enforcement activities, and legislative efforts related to SDMO laws across the United States. The primary objective of the scan was to identify existing initiatives, highlight best practices, and detect any ongoing or proposed efforts to amend SDMO legislation. As a secondary objective, the scan collected background information to inform the design and focus of subsequent research activities, including the stakeholder survey, interviews with stakeholders, and driver focus group discussions.

Information was collected from all 50 states and the District of Columbia, using primary data sources such as official websites for DMVs, state DOTs, and SHSOs. Additional sources were also reviewed, including press releases, public service announcements (PSAs), campaign materials, enforcement reports, and other publicly accessible documentation. When available, materials from local agencies and relevant nonprofit organizations were also reviewed to supplement state-level findings.

The scan compiled specific examples of SDMO law outreach, education, and enforcement activities, which were organized in Excel spreadsheets. These materials included diverse resources such as social media toolkits, PSAs, television and radio ads, infographics, fact sheets, and other outreach resources. For instance, the Maryland Highway Safety Office publishes a monthly social media toolkit that provides shareable content on various road safety issues, with SDMO being one of the topics. These toolkits change monthly and include materials in formats like PNGs, GIFs, and even MP4s. The research team also looked for public-facing websites sharing relevant data. For example, the Florida DOT has an interactive crash and citation data dashboard for SDMO enforcement (Florida Department of Highway Safety and Motor Vehicles, n.d.), and the Illinois State Police provides a map detailing SDMO crashes dating back to 2019 (Illinois State Police, n.d.), with each entry including a brief crash narrative that describes the extent of injuries and fatalities.

Once compiled, the information was analyzed to explore how similarities and differences in SDMO programs might inform outreach activities across jurisdictions, to highlight both common practices and unique or novel approaches. Key areas of interest included the following:

- **Enforcement activities:** When available, this included capturing details such as the types and numbers of citations issued, the use of high-visibility enforcement operations, and the establishment of partnerships with multiple law enforcement agencies to ensure compliance.

- **PI&E efforts:** These included public service campaigns, media outreach strategies (e.g., social media, traditional media), and community engagement initiatives aimed at raising awareness and promoting safe roadside behavior.
- **Key stakeholder roles and responsibilities:** Various entities involved in SDMO law promotion were investigated, including state agencies (e.g., DOTs, DMVs), professional associations, advocacy groups, and first responder organizations.
- **Events or targeted dates:** Specific awareness weeks, memorial events, or other targeted dates used to promote SDMO law awareness and compliance were identified and documented.

Through this comprehensive analytical process, national trends, strengths, and gaps were identified, leading to a deeper understanding of SDMO programs across the United States. Additionally, these findings directly informed the development of the stakeholder survey and interview content, as well as the moderator guides used for subsequent focus group discussions.

Findings

Raising awareness of and improving compliance with SDMO laws requires a coordinated, multifaceted approach that combines education, enforcement, and community engagement. Efforts to increase awareness of and compliance with SDMO laws across the United States involve various strategies and stakeholders working together to reach a common goal. Findings from online scans suggest that outreach initiatives are typically accomplished through strategic partnerships, leveraging the unique strengths of various organizations and stakeholders.

Partners and Stakeholders. SDMO outreach is a collaboration involving governmental and non-governmental organizations, each playing a specific role to ensure drivers are aware of and comply with the law. Government partners typically include SHSOs, who often lead program development and funding; DOTs, who manage signage and roadway communications; and state highway patrol/police, who are critical for enforcement and education through traffic stops. State governors also contribute through official proclamations that reinforce public awareness. Crucial non-governmental support is extended from other first responder organizations, regional AAA clubs, towing companies, insurance providers, utility companies, and road maintenance departments.

Outreach Methods. Most states use a multimodal approach to SDMO outreach, combining various methods that typically include the following:

- **Press and Media Engagement:** Most states issue press releases and hold press conferences to disseminate information and leverage both earned and paid media, often through PSAs on TV and radio.
- **Digital and Social Networks:** All states make extensive use of social media platforms to reach broad audiences, in addition to dedicated websites or web pages that serve as central information hubs.
- **Print Media and Fixed Signage:** A few states distribute pamphlets or handouts, and several also use billboards or fixed signage on roadways, to convey key messages.
- **Variable Message Signs (VMS):** A handful of states use VMS on highways. Though sometimes used for awareness campaigns, this method is also specifically employed to publicize changes in the law.
- **Event-Based Outreach:** Several states organize awareness activities at various public venues, at sporting events and state fairs, providing direct engagement opportunities.
- **Personal Narratives and Proclamations:** Personal stories and the experiences of first responder families are incorporated into PI&E efforts across all states to enhance the emotional impact and urgency of the message. Furthermore, as previously noted, gubernatorial proclamations have been used in several states to elevate awareness of SDMO initiatives.

Timing of Messages. Although various PI&E materials were identified through the scan, their distribution often seemed limited to when a law change occurs or to specific times of the year. Intensive outreach efforts are often initiated during periods of legislative change, whenever a SDMO law is amended or expanded. These efforts aim to inform the public about new provisions and ensure widespread awareness. For example, following Maryland's 2022 update to its SDMO law, the state used VMS to communicate the changes to drivers. Additionally, outreach efforts are often strategically aligned with key periods on states' traffic safety calendars, including state-specific dates of significance. These dates may include commemorative events, such as an anniversary of a first responder's death that inspired the law's enactment. More broadly, outreach efforts often coincide with national awareness events such as National Move Over Day, observed annually on the third Saturday in October. Additional outreach also occurs during National Work Zone Awareness Week because of the strong alignment between safety messages concerning roadside workers.

Funding. Although specific funding details were beyond the immediate scope of this environmental scan, the PI&E efforts observed suggest these campaigns are often supported through a combination of state appropriations, federal highway safety grants, and contributions from partnering organizations. Detailed funding mechanisms for

SDMO outreach were explored further in subsequent project research activities, including the stakeholder survey and interviews with key stakeholders.

Stakeholder Survey

Methods

To supplement the environmental scan, an online survey was administered to state highway safety representatives and law enforcement officials across all 50 U.S. states and the District of Columbia. This survey aimed to gather detailed insights into their PI&E programs and enforcement activities related to their state's SDMO law. The survey instrument is provided in Appendix A.

The Governors Highway Safety Association (GHSA) played a key role in identifying respondents within SHSOs and law enforcement agencies by leveraging its existing contacts with individuals most knowledgeable about their state's SDMO law and related activities. The survey was distributed for a 6-week period from January through February of 2024, with periodic reminder emails to encourage participation. To facilitate broader participation and gather additional insights, respondents were encouraged to forward the survey participation link to other relevant partners. They were also specifically prompted to provide contact information for other stakeholders who could offer valuable perspectives on SDMO initiatives within their state.

Respondents provided detailed information on SDMO law components, any planned legislative changes, and specific details about their PI&E programs and enforcement activities (the stakeholder survey is available in Appendix A).

Specific PI&E topics covered in the survey included the following:

- Strategies employed
- Timing of outreach campaigns
- Modes of communication
- Funding allocated
- Efforts to measure reach/awareness of campaigns

Specific enforcement topics covered in the survey included the following:

- Frequency of enforcement activities
- Types of enforcement strategies used
- Challenges encountered during enforcement

- Available data on SDMO enforcement outcomes

Beyond factual reporting, respondents were also prompted to share their opinions on the effectiveness of their state's current SDMO law and the perceived impact of their PI&E and enforcement efforts.

A total of 34 representatives from 32 states completed the survey. The data gathered in the survey were systematically coded and summarized to support analysis. Note that due to limitations in survey responses and the scope of the online scan, the absence of identified outreach efforts in certain states should not be interpreted as evidence that such efforts do not exist.

Findings

Survey respondents provided information about their state's SDMO law, which largely corresponded with the environmental scan findings.

Appropriateness of Penalties. Representatives from seven states (21.9%) indicated that the existing fines were insufficient. Suggestions were made to increase the base fine and/or add escalating penalties if the violation was a second or subsequent offense or in cases resulting in a crash, injury, or fatality. Within these seven states, the current base fines range from a low of \$50 (two states) to a high of \$750.

Revisions to the Law. State representatives also provided insights into recent or upcoming legislative activities. Twelve states (37.5%) reported that their SDMO law had been revised in 2023. Additionally, six states (18.8%) noted ongoing efforts to revise their current law. These revisions aimed to expand coverage to additional vehicle types, such as disabled passenger vehicles; incorporate more road types, like rural roads; or add new penalties. Only one state expressed challenges in being able to revise the law, stating, "senators do not have 'time' to add the bill this session" as an explanation.

PI&E Efforts and Partnerships. Several states highlighted joint PI&E efforts underway that included collaborations between highway safety, law enforcement or public safety, and transportation departments. For example, since 2014, the California Department of Transportation (Caltrans) has run its "Be Work Zone Alert" campaign. This campaign prominently features children of Caltrans employees to remind motorists that highway workers have families and need them to return home safely. It aims to educate drivers about safe practices when traveling through work zones and raise awareness about the state's SDMO law (which in California applies to roadside workers in work zones). Similarly, the Ohio Department of Transportation spearheaded a campaign emphasizing that roadside workers are individuals with lives and families who deserve protection under the SDMO law. In New York, promotion of the SDMO law typically involves a collaborative approach between the New York State Police and the

New York State Thruway Authority, combining enforcement with public outreach. In Wisconsin, the Wisconsin Department of Transportation (WisDOT) is solely responsible for SDMO law PI&E, regularly sharing messages through WisDOT and Wisconsin DMV social media platforms. Reflecting a common strategy, many state representatives (N=20; 62.5%) reported conducting targeted special PI&E campaigns following the enactment or revision of their SDMO law.

In addition to governmental and interagency efforts, roadside assistance providers and AAA clubs actively promote SDMO laws. Towing associations in Arizona, California, Idaho, New Hampshire, and Vermont play a direct role in SDMO law PI&E. In Idaho, the American Towman Spirit Ride, a one-time national campaign sponsored by American Towman Magazine and B/A Products (a company that designs and develops products for the towing industry), passed through the state with a symbolic casket to honor roadside assistance professionals killed in the line of duty and raise awareness of SDMO laws.

The timing of these PI&E efforts is often strategic and limited, frequently anchored to key dates or events such as National Move Over Day in October, National Crash Responder Safety Week in November, and National Work Zone Awareness Week in April. Additionally, some states designate special dates to commemorate a fallen first responder. In Illinois, Scott's Law Day is observed annually on December 23 to honor Chicago Fire Department Lieutenant Scott P. Gillen, who was struck and killed by a passing vehicle at a crash scene in 2000. Similarly, Minnesota conducts special PI&E efforts each year on August 30, marking the anniversary of Trooper Ted Foss's death in a move-over-related crash.

Only seven states (21.9%) indicated that they had conducted an evaluation of their SDMO law PI&E activities. These evaluations typically involve measures of media impressions, participation in events, sponsorships, and public awareness surveys.

With respect to funding resources, dedicated funding for SDMO PI&E efforts appears limited. Among the responding states, 10 (31%) indicated that SHSOs provide funding for outreach initiatives. However, most respondents indicated that no budget or money is specifically set aside for SDMO education and outreach. It was noted by respondents from several states that all PI&E efforts for various traffic safety initiatives are grouped together, implying these budgets are not explicitly earmarked for SDMO outreach alone. Of the few states that reported having a budget, figures ranged from \$28,000 to \$85,000 for all their traffic safety initiatives. Illinois reported a unique funding mechanism where the Scott's Law Fund serves as a dedicated source. This fund is supported by revenue from traffic convictions and used to produce educational materials and cover overtime enforcement costs. Regarding other funding sources, a few respondents also mentioned financial contributions from National Highway Traffic Safety Administration (NHTSA) grants, DOTs, and AAA clubs.

Enforcement Activities. Most state representatives report that the SDMO law is enforced, with only two responding states indicating challenges with enforcement. However, in many jurisdictions, enforcement primarily occurs during regular patrols when a violation is observed. Only a few states indicated that SDMO law enforcement is integrated into high-visibility enforcement patrols on highways or targeted enforcement operations along select high-crash corridors.

When targeted enforcement efforts do occur, they are conducted under specific conditions. For example, a few states reported concentrated enforcement in work zones where the speed limit is reduced and SDMO laws often apply. The California Highway Patrol and Caltrans, through an interagency agreement, form the basis of the Construction Zone Enhanced Enforcement Program. Under this program, law enforcement assists in managing traffic through construction zones and reminds drivers of the SDMO law. Similarly, Kentucky law enforcement explicitly prioritizes SDMO compliance in areas where construction is active. Moreover, the Utah Department of Transportation supports enforcement and PI&E efforts conducted by the Utah Highway Patrol. A distinctive element of Utah's efforts includes recording real-life move-over violations to enhance both public education and officer training.

Similar to PI&E efforts, targeted enforcement activities are often centered around specific events and national awareness initiatives such as National Move Over Day, National Crash Responder Safety Week, and National Work Zone Awareness Week. In North Carolina, for example, the highway patrol and county and local law enforcement conduct SDMO enforcement activities around a "No Need to Speed" campaign, typically between May and June of each year.

In addition to state-level initiatives, there are examples of intrastate and multi-jurisdictional collaborations to enforce SDMO laws. In Minnesota, law enforcement in all cities and counties, as well as the Minnesota State Patrol, conduct enhanced patrols and high-visibility enforcement events each year on August 30 (the anniversary of Trooper Ted Foss's death) to enforce the SDMO law. Similarly, in NHTSA Region 7, state highway patrol agencies in Arkansas, Iowa, Kansas, Missouri, and Nebraska conducted targeted enforcement of SDMO laws during Mother's Day weekend.

Funding for SDMO enforcement varies across jurisdictions, with several states employing different mechanisms to support these initiatives. In some cases, overtime for enforcement activities is supported through SHSOs using NHTSA funds. Other states receive financial support for enforcement efforts near work zones from their DOT. Illinois has implemented a distinctive funding model. In addition to the base fine on each SDMO citation, the court imposes a conditional fee of \$250. This fee is directed to a dedicated fund specifically used to support SDMO special enforcement details.

Data Tracking. Respondents from 19 states indicated that citation and crash data are monitored in relation to the SDMO law. These data are often managed by law enforcement and/or the judiciary. For example, the Florida Department of Highway Safety and Motor Vehicles tracks data and makes it available to the public using a comprehensive Move Over Crash and Citation Dashboard directly on its agency website, providing public access to enforcement and crash statistics.

Interviews with Stakeholders

To complement the survey findings and obtain a deeper understanding of SDMO laws and programs, in-depth discussions were conducted. Engaging a diverse range of stakeholders in the discussions was considered essential for gaining a well-rounded and meaningful understanding of SDMO initiatives. Stakeholders included representatives from state DOTs, SHSOs, and law enforcement officers. Each stakeholder contributed their own experiences, priorities, and insights, which helped create a more complete understanding. Discussions addressed gaps identified through the environmental scan and survey and helped to gain a better understanding of the unique challenges faced and potential strategies related to PI&E and enforcement of SDMO. Conversations with representatives took place over a 2-month period in early 2025.

Methods

All states and the District of Columbia, were invited via email to participate in the interviews, with follow-up reminders sent to encourage participation. Nineteen stakeholders representing seven states (Illinois, Maryland, Minnesota, North Carolina, Pennsylvania, Virginia, and Washington) responded. Stakeholders from states representing a range of SDMO laws, geographic regions, and PI&E strategies participated in these in-depth discussions. To ensure a more comprehensive understanding, extra efforts were made to recruit jurisdictions identified in the survey and environmental scan as having particularly unique or strong outreach initiatives.

Moderator guides (presented in Appendix B) were developed to direct the discussions. Building on survey data, these in-depth discussions provided further details on state SDMO laws, PI&E, and enforcement, while exploring challenges in raising awareness and enforcing the laws. Stakeholder opinions were also solicited regarding the most effective law components and PI&E campaigns for promoting compliance. Following these discussions, summaries were developed, and the data were compiled and analyzed.

Findings

Profiles of Interview Participants. Interviews were conducted with a varied group of subject matter experts involved in SDMO traffic safety operations. Interviewees included five law enforcement officers from multiple jurisdictions (two state troopers, two county officers, and one city police officer), with an average of 22 years of experience. In addition to law enforcement, a highway safety consultant who frequently collaborates with state patrol agencies participated in a discussion. Eight participants represented state DOTs, serving in roles such as program managers, traffic engineers, and regional traffic management supervisors, and five individuals were from SHSOs. Collectively, these participants brought distinct expertise in enforcement, public education, infrastructure, and traffic safety program implementation.

PI&E Strategies. States employ a range of PI&E strategies to promote awareness of SDMO laws, though approaches vary widely in the structure, scale, and funding of their PI&E campaigns. Most integrate SDMO messaging into broader traffic safety initiatives, often relying on partnerships and existing resources due to limited dedicated funding. Common practices included social media outreach, use of victim-centered messaging, and inclusion in driver education, although coverage is inconsistent. Several states noted challenges with public understanding, often attributing this to differing laws across jurisdictions and limitations of outreach tools such as VMS (i.e., character limits). Despite these efforts, improving public comprehension and consistent engagement remained a persistent concern.

In Illinois, the SDMO campaign is anchored by Scott's Day, observed annually on December 23rd. Around this time, the state promotes the campaign through social media posts, and throughout the year, periodic messages related to SDMO are displayed on VMS.

Similarly, Minnesota conducts PI&E efforts rooted in the memory of Trooper Ted Foss. Media posts and website updates are shared around the anniversary of his death; however, the officer interviewed expressed the opinion that the impact of these messages has diminished over time. More broadly, Minnesota uses designated grant funding to support annual enforcement campaigns, which feature media blitzes and increased enforcement activity. Although jurisdictional participation varies among agencies not covered by these grants, smaller departments often contribute as resources allow. These campaigns are not typically conducted as separate, dedicated enforcement initiatives (e.g., with specific overtime hours). Instead, they are integrated into regular patrol routines, with officers placing a heightened emphasis on SDMO compliance during the designated campaign periods. Minnesota also addresses SDMO through formal driver education, but according to representatives, the curriculum's broad guidance and lack of strict enforcement mean that the degree to which the topic is covered often depends on the individual instructor. The state representative further noted that this variability in

coverage complicates public understanding and compliance, particularly among younger drivers.

Maryland, by contrast, maintains a robust year-round strategy. Awareness of the state's SDMO law is supported by the Maryland SHSO, with funds at times being leveraged from broader traffic safety programs to enhance these efforts. Though historically no funding was dedicated solely to SDMO efforts, a portion of federal highway safety funds is now used for traffic safety awareness campaigns. Maryland's communications team uses these federal funds, and resources from a broader media budget, to support SDMO efforts. Maryland also actively leverages partnerships to further these initiatives. Maryland has partnered with organizations, such as their local AAA club and the Baltimore Orioles Major League Baseball team, to extend the reach of these campaigns by displaying messages at games and providing handouts with information about the law.

Additional PI&E content is shared through various media platforms, including online videos, digital ads on streaming services like Hulu and Roku, and traditional formats such as radio spots, during national campaign weeks. Maryland also uses VMS; however, officials noted that there are challenges to using VMS as an outreach and education tool due to adherence to federal guidelines. This sentiment came up in several interviews with different state participants. Some officials specifically noted that restrictions on character length and message type have limited their perceived effectiveness. Although officials acknowledged the challenges, they recognize that survey results show drivers tend to remember these signs. In Maryland, billboard messages are also used and often kept concise for maximum impact. Additional outreach materials for other traffic safety initiatives are distributed in person at various public events, and officials plan to include SDMO information in future handouts. There is also an initiative underway to place SDMO-related messages on mud flaps of state highway vehicles, an approach already in use on incident management trucks.

Maryland includes SDMO laws in novice driver training, but state representatives noted that the absence of continuing education contributes to public confusion, partly due to multiple revisions of the law. Officials suggested that including brief informational content about traffic laws in vehicle registration mailings could be beneficial, though they were unsure of the potential costs. Despite these varied efforts, Maryland representatives explained that awareness of the SDMO law remains a challenge. They cited issues like driver confusion stemming from differing laws across neighboring states and the evolving nature of Maryland's law over time.

Representatives in North Carolina explained that they do not have a dedicated SDMO budget. Instead, the state strategically leverages funding from broader traffic safety campaigns—like those addressing speeding and distracted driving—to integrate SDMO messaging and address related safety concerns. For example, messaging may

highlight how speeding and being distracted while driving can directly influence compliance with SDMO laws. They believe this approach allows them to maximize existing resources and broaden the reach of their safety messages, essentially “doing more with less” by stretching available funding and efforts.

One example of this approach is the Safety City exhibit hosted by the North Carolina GHSA at the annual state fair, consisting of booths where partners come together to share traffic safety messages. North Carolina also engages in grassroots community outreach and partners with Safe Kids and NC Senior Driver to disseminate SDMO messaging alongside other safety education topics such as seat belt usage, child passenger safety, and vehicle positioning. One representative explained that incorporating SDMO PI&E into programs focused on other safety topics is particularly effective because it does not require significant manpower or specialized funding.

Regarding communication, agencies and traffic safety partners in North Carolina rely heavily on social media platforms, including Facebook and X (formerly Twitter), although the use of TikTok was reported as discontinued. Additionally, SDMO laws are included in North Carolina’s training curricula for novice and senior drivers. Although North Carolina leverages multiple partnerships and community events, officials noted persistent issues with public awareness and the challenge of navigating varying laws across neighboring states, a message also echoed by several other states.

Partnerships play an essential role in Pennsylvania’s SDMO outreach efforts. Community traffic safety coordinators, funded through grants from NHTSA, collaborate with local nonprofits, automotive dealerships, and insurance companies to disseminate SDMO messages. These coordinators also work closely with district-level safety press officers. At the state level, messaging is coordinated through interagency and association partnerships to maintain consistency. However, one official noted that siloed communication among these groups continues to hinder the full integration of messaging and outreach efforts. Furthermore, officials reported that although outreach efforts to support compliance with the state’s SDMO law are ongoing, they are not supported by dedicated funding. Instead, SDMO messaging is integrated into existing public communication strategies at no additional cost. These strategies include the use of VMS, social media platforms, and public presentations. Officials noted, however, that real-time roadway incidents take precedence over SDMO messaging on VMS displays, and SDMO messages are typically promoted only during National Move Over Day, when contextually appropriate, or at the request of law enforcement conducting targeted enforcement campaigns. When asked about alternative avenues for disseminating information, one representative suggested gas pump toppers as effective messaging tools.

A representative from Virginia was aware of *some* PI&E efforts, including the use of VMS managed by the state DOT, especially during active incidents. Additionally,

officers and tow truck drivers use bumper stickers stating, “Slow Down Move Over—It’s the Law,” which are visible on police cruisers and service vehicles. Although the representative indicated that passive materials like bumper stickers are effective in maintaining visibility and reminding drivers of the law, they also recognized that more structured and comprehensive educational initiatives, such as dedicated public awareness campaigns or formal educational programs, remain limited.

The representative from Washington explained that they received grant funding in 2022 to specifically develop PSAs for SDMO education. This initiated a sustained campaign targeting audiences on social media and streaming platforms. Ads are typically run in March, so they do not conflict with other state or national campaigns. Media contractors assist in placing ads and reporting on their performance through metrics such as views and clicks. The Traffic Safety Commission has also coordinated with Washington State DOT to use VMS for SDMO messaging on occasion. However, the representative believes streaming platforms like Hulu, supported by geofencing, offer more cost-effective outreach than traditional broadcasting. Washington is also updating its educational materials. Officials recently indicated that the state updated its driver’s manual, and they believe SDMO content has been added as part of that update.

Message Content. Across all states, emotional storytelling and humanized messages were widely viewed as more effective than fact-based or legalistic approaches. Officials noted that messages featuring the children of roadside workers urging drivers to follow the law resonated strongly with the public, especially when they foster empathy or a sense of shared responsibility. Some representatives noted that the type of protected vehicle or driver depicted in the message may influence how it is perceived. For example, one law enforcement officer felt that the emotional impact of a tow truck driver’s death on the public was less than that of a police officer or firefighter. While emotional appeals are generally favored, states differ in their use of enforcement themes and graphic content, with most opting for narrative-driven or empathetic messaging over fear-based tactics. Message design is often shaped by stakeholder input and tailored to specific audiences, with some states experimenting with creative formats and delivery methods to improve engagement and reach.

Representatives from Pennsylvania emphasized the importance of careful message design in public outreach for SDMO laws. They noted that effective PSAs should clearly state the law, stress the need to slow down and move over, and foster a sense of shared responsibility among all road users. They also suggested that messages incorporating an enforcement element, making clear that violations are monitored and penalized, may be more impactful. Emotional appeals were also highlighted as a potentially effective strategy, with one official citing their proven impact in promoting seat belt use and preventing impaired driving. For example, one of the representatives mentioned that citing compelling statistics, such as the percentage of unbuckled fatalities that could have been prevented, has been shown to influence behavior. Officials

expressed interest in adopting emotional appeal strategies for SDMO messaging, though these have yet to be widely implemented. Although emotional impact is valued, there was caution around using graphic content in public campaigns. Pennsylvania generally avoids overtly graphic imagery in its traffic safety campaigns. Instead, ads may imply the consequences of noncompliance through sound or narrative rather than displaying visually explicit crash scenes.

In Washington, a variety of themes have been included in SDMO PSAs, including a recent video game–style ad intended to engage younger audiences on digital platforms. Officials reported that fear-based messaging or a focus on enforcement and penalties is generally avoided. Instead, “care and concern” are emphasized, and the desired driver behavior is promoted through positive calls to action. This messaging strategy is aligned with their broader philosophy of encouraging voluntary compliance rather than highlighting punitive measures. State officials indicated that the content of the PSAs is shaped by stakeholder input and market research. Representatives mentioned that the video game–style ad stood out because it was developed without traditional federal funding, allowing for greater creative flexibility. Input was gathered from a diverse group of stakeholders, including tow truck drivers, law enforcement, AAA, and the Washington State Department of Licensing. Due to tight deadlines, this ad was market-tested using surveys instead of traditional focus groups, though focus groups (including English and Spanish speakers) are typically used for longer campaign cycles. Historically, Washington has designed different PSAs to appeal to various demographic groups because tailoring delivery methods to audience preferences enhances message effectiveness. For example, video game–based messaging may resonate more with younger male audiences, whereas ads featuring children tend to appeal more to older drivers.

Maryland’s PSAs are shaped by input from its communications contractors, who advise on effective formats and delivery channels. Recent campaigns have featured personal stories, including firsthand accounts from roadside workers about near-miss incidents. One PSA included a Coordinated Highways Action Response Team driver who had been struck while on duty, achieving 5.6 million impressions² in its first month. Another showed footage of a close call involving a tractor trailer and a stopped vehicle. Messaging often highlights the perspective of roadside workers and focuses on the safety of both those on the shoulder and other drivers. Officials shared that their approach tends to avoid scare tactics. Instead, they aim to foster empathy by encouraging drivers to consider how they would want others to act if they, or someone they cared about, were on the side of the road. This approach is central to Maryland’s “Be the Driver” campaign, an initiative that has been in place for several years. Its core purpose is to

² The total number of times content (e.g., a post, image, video, or ad) is displayed on a user’s screen.

emphasize safe driving behaviors and personal responsibility among all road users. Representatives noted that messages based solely on statistics tend to be ineffective, emphasizing that emotionally engaging content is more likely to influence driver behavior. Similarly, one representative also highlighted the importance of countering the perception that enforcement is revenue-driven, stressing that messaging should focus on the law's lifesaving purpose.

Enforcement Practices and Challenges. Enforcement of SDMO laws varies widely among states, shaped largely by resource availability, including staffing, training, and funding. Many state representatives also acknowledged the inherent difficulty of enforcing an SDMO violation when officers are already actively engaged with a stopped motorist. Despite these challenges, Illinois, Maryland, and North Carolina conduct high-visibility enforcement campaigns, often through coordinated efforts among allied agencies. These campaigns are sometimes announced in advance, and signage may be used to alert drivers of enhanced enforcement.

On Scott's Day, officers across Illinois conduct educational traffic stops, typically without issuing citations, to raise driver awareness. Participation is not universal across the state, and the timing near the holiday season, coupled with winter weather, can impair these efforts. In addition to this annual campaign, officers consistently distribute informational pamphlets about the law during traffic stops throughout the year as part of their public education initiatives.

The Maryland SHSO partners with state police for enforcement campaigns, which have expanded in recent years. According to officials, two statewide initiatives were held in 2024, with plans to increase that number significantly in 2025. State police monitor citations issued during these operations, and in some cases, troopers are funded for overtime at specific work zones through project-specific allocations permitted under state law. Additionally, the Maryland DOT occasionally supports enforcement efforts with overtime or dedicated enforcement blitzes throughout the year. Aside from these targeted efforts, most enforcement occurs during routine patrols. Officials reported that enforcement activities are often timed with National Police Week in May, during which SDMO and roadside emergency messages are jointly promoted.

Coordinated efforts are also a priority, with recent initiatives focusing on multi-agency collaboration rather than each agency acting independently. According to one representative, this shift has allowed for more comprehensive initiatives, such as coordinated weeklong enforcement campaigns, which are preceded by public information releases to raise awareness and notify drivers of increased enforcement. According to one representative, SDMO enforcement primarily rests with state patrol officers, especially on major interstates. Challenges arise in some local jurisdictions due to limited personnel and extensive coverage areas, often requiring county officers working alone to rely on communication to enforce the law.

With traffic enforcement generally declining nationwide, some officials suggested that SDMO enforcement could offer a reentry point for officers returning to traffic-focused duties. One representative advocated for elevating SDMO to a year-round enforcement and awareness priority, similar to campaigns for seat belt use or speeding. They also believed that publicizing near-miss footage could be a powerful tool for shifting driver attitudes and “humanizing the badge.”

The North Carolina State Highway Patrol conducts targeted enforcement campaigns where one officer makes a legitimate traffic stop while another monitors for SDMO violations. Officials emphasized that these are not staged scenarios but part of regular enforcement. During these campaigns, electronic highway signs often display messages about the law, and enforcement tactics may include strategic vehicle positioning, such as hiding a patrol car behind a stationary DOT vehicle to monitor compliance. Funding from GHSA supports these targeted enforcement efforts, with specific officers or units receiving support to carry out the campaigns. Although enforcement is strong during campaigns, officials noted that enforcement during routine patrols is more difficult because of staffing shortages, with officers often working alone and unable to pursue violators. Officials indicated that incidents involving officer injuries or fatalities often serve as a strong motivation for scheduling these enforcement events.

In Minnesota and Virginia, enforcement of SDMO laws is typically integrated into routine patrol duties. Officers use creative strategies, such as positioning their vehicles partially in a lane, to compel drivers to move over. Virginia State Patrol periodically conducts “wolf pack” traffic enforcement days where officers work in pairs and groups, though these are not specifically focused on SDMO violations. Conversely, in most jurisdictions, it is more common for officers to work alone, with a single officer being responsible for large areas, with limited backup. Officers in Minnesota and Virginia use upstream positioning, shoulder pull-offs, and nearby parking lots, when possible, to reduce risk. Additionally, due to staffing constraints, they often pull over only the last vehicle observed violating the law. In Virginia, department culture can influence officer behavior; one supervisor recalled being reprimanded for suggesting a safer stop location, despite the recommendation aligning with best practices. This conflict illustrates the challenge of promoting safety in an environment where policy, discretion, and organizational norms are not always aligned. There is also some resistance among officers to adding visible equipment like cameras or light bars that would more clearly identify vehicles as police, potentially reducing the ability to catch violators.

Representatives in Washington noted that SDMO enforcement is particularly challenging, primarily because these incidents are typically “ad hoc events.” First responders are more focused on attending to the immediate roadside situation than on citing drivers. Consequently, enforcement often occurs in response to secondary crashes

resulting from a violation of the law, suggesting a reactive approach to enforcement in the state.

In addition to resource and logistical challenges, officers cited ambiguous legal language as a challenge to SDMO enforcement, particularly in states where drivers are allowed to either slow down or move over. Officers reported that many drivers fail to either move over or slow down, often claiming it was not safe to move over, yet also failing to reduce speed as required. Representatives in Maryland and Virginia specifically mentioned the lack of clear speed reduction guidelines, which makes it difficult to prove noncompliance in court. Virginia officers noted that judges increasingly require video evidence rather than relying solely on officer testimony, yet many departments lack the necessary body cameras or rear-facing dashcams to support such claims. Additionally, officers in Virginia expressed concerns that using marked vehicles or obvious enforcement tools like camera systems would make it harder to catch violators.

Other Approaches to Increasing Roadside Safety. Ensuring the safety of roadside personnel is a shared priority across all jurisdictions. Several of the states that investigators spoke with highlighted additional strategies being used to support the law, such as training on safer approach techniques and enhancing first responder visibility through American National Standards Institute (ANSI)-compliant high-visibility clothing and lighting. Maryland has also outfitted officers with high-visibility gear, including vests and rain jackets, and installed upgraded light packages on patrol vehicles. In one Maryland county, drones have been deployed as first responders to help assess traffic incidents before officers arrive. In Illinois, officers are trained to approach the vehicle from the passenger side whenever possible and are required to wear their ANSI-compliant high-visibility vests when outside of the patrol car. Law enforcement is also exploring the use of lighting on their police vehicles, including altering the location of the lights and manipulating the flash patterns.

One law enforcement representative mentioned research that has shown the presence of many rapidly flashing lights can be counterproductive and potentially put officers at a greater risk. Therefore, new techniques include using “steady, consistent lights” and even synchronizing the light patterns on all police vehicles at an incident.

Automated Enforcement. When asked about automated enforcement for SDMO laws, most officials saw it as a promising but underutilized tool. Although some jurisdictions have piloted technologies, legislative, logistical, and financial barriers persist. More specifically, several representatives cited resistance to new technologies and the frequent turnover of vehicle fleets as practical challenges to implementing automated enforcement.

Representatives from Illinois indicated interest in using vehicle-mounted cameras, but implementation in Illinois has been slowed by legal uncertainties and privacy concerns. Some officials from Maryland expressed interest in piloting camera systems on cruisers or Coordinated Highways Action Response Team vehicles to capture violations. However, concerns from elected leaders about privacy and the use of automation have reportedly limited momentum. When asked, representatives from Maryland indicated they would likely use automated enforcement of the SDMO law as an education and outreach effort, issuing warnings and safety literature rather than citations. A law enforcement representative explained that using automated enforcement to give warnings instead of tickets is more likely to be accepted by lawmakers and the public.

A Minnesota representative noted that the state has a history of experimenting with automated enforcement, including a past attempt with red-light cameras. Although the state is currently planning to implement school bus cameras, recent legislation has pushed back against broader automated enforcement. In Pennsylvania, automated enforcement programs need to be authorized by law. Current programs include speed enforcement in work zones and red-light and speed camera enforcement in select areas of Philadelphia. Expansion of such programs faces institutional and logistical barriers.

Automated enforcement does not currently play a major role in the strategies of North Carolina, Virginia, or Washington. North Carolina officials cited financial disincentives, noting that state law requires much of the revenue from traffic cameras to be directed to public schools, which can result in net losses for municipalities. Efforts to authorize speed cameras in work zones have failed to pass the state legislature, and current law requires a police officer to be present and using radar for enforcement. A Virginia law enforcement official supported systems similar to school bus cameras, which would allow for mailed citations. In some Virginia municipalities, residents must vote to allow automated enforcement via cameras. Once approved, cameras may be installed without repeated public input, but few jurisdictions have taken such a step. Local political resistance and concerns about officer anonymity continue to stall progress.

Washington's current law does not allow for broad automated enforcement on highways, though recent expansions have enabled more localized use. A law allowing speed cameras in work zones was recently passed and will be implemented soon. Although funding remains a major issue, the official highlighted that there is still interest and openness toward this type of enforcement.

Availability of Enforcement Data. Officials across multiple states uniformly expressed frustration with the limitations of the existing enforcement data infrastructure. They collectively emphasized that better reporting mechanisms are essential for fully understanding the problem's scope, accurately evaluating the impact

of education and enforcement initiatives, and effectively informing future legislative actions.

Law enforcement representatives from Illinois and Maryland acknowledged that near-miss incidents, where officers narrowly avoid being struck by passing vehicles, are severely underreported. One representative cited an incident where an officer's holstered firearm was struck by a passing vehicle's mirror, emphasizing the severity of such encounters. The same representative also felt that these near-miss events underscore the urgent need for improved reporting mechanisms to fully understand and address the risks faced by roadside emergency personnel. Both states' representatives also noted limitations in existing data, as many relevant traffic stops are often categorized under broader violations, such as improper lane use or failure to yield, rather than specifically as SDMO infractions.

In North Carolina, the GHSA receives data on citations issued during agency-funded campaigns. The Minnesota representative indicated that citation and warning data are typically tracked only during designated campaign periods as well, with no statewide database readily available. Although the representative believed state police could access their issued citations, there is no unified system. Pennsylvania tracks the number of citations issued under the SDMO statute, but readily available data on enforcement outcomes or situational details are lacking. Furthermore, although shoulder-related crash data are accessible, they do not necessarily capture the full extent of SDMO noncompliance. Virginia represents an even greater challenge, lacking a centralized SDMO tracking system altogether. Washington's representatives voiced concern about the sustainability of tracking and evaluating outreach efforts, given uncertainties surrounding continued funding.

Legislative Considerations. State officials noted that SDMO legislation has gradually expanded in their states, though the rate and nature of these changes vary. Maryland, Minnesota, and North Carolina have amended their laws to broaden vehicle type coverage. Minnesota also changed the law to specify that drivers must leave an entire lane when passing a stopped vehicle, which clarified a previously vague expectation. In contrast, two North Carolina stakeholders felt that the state's SDMO law was "well-written" and "clear and concise," with one noting that they rarely receive questions about the law from the public.

The Illinois representative, active in legislative committees, believed that increasing fines and making SDMO violations towable offenses would effectively increase compliance. They also noted that amending existing laws is more achievable than creating new ones but emphasized that higher penalties must be carefully considered for their impact on low-income drivers, as this directly influences officers' willingness to enforce them.

Virginia recently expanded SDMO protections to include tow trucks, a change which was positively received, especially among workers who typically do not have the backing of police presence during roadside operations. An officer explained that enforcing the law is difficult because it relies on subjective judgment as to whether a driver had the ability to move over. Courts increasingly require objective evidence, like video footage, which law enforcement departments currently lack, making enforcement even more challenging.

Washington's SDMO law has undergone two significant modifications within the past 3 years. The most recent change requires drivers to both move over and slow down when approaching stationary emergency or service vehicles, as opposed to the previous requirement to do one or the other. According to state officials, this change has introduced challenges both in terms of compliance and public understanding. One official expressed concern that the modified law may be unclear to many drivers, particularly because moving over often necessitates merging into faster moving lanes, making it counterintuitive to slow down. Additionally, officials noted that the new version of the law complicates public messaging, especially as it now places expectations on drivers in the middle lane, who must adjust to allow others to move over.

Officials in several states, including Maryland and Illinois, advocated for legislative revisions to change "OR requirements" (i.e., requiring drivers to either move over **OR** slow down) to "AND requirements" (i.e., drivers are required to both slow down **AND** move over). They argue that this adjustment would simplify enforcement, increase clarity for drivers, strengthen legal outcomes, and ultimately improve safety. Officials emphasized that public understanding of Maryland's requirements remains a challenge. A member of Maryland law enforcement explained that drivers claim they lack the time or space to move over, ignoring the slow down component entirely. One interviewee expressed that mandating both slowing down **and** moving over might significantly improve clarity and compliance. A Virginia officer supported this view, observing that recent legislative updates have modestly improved compliance. However, he stressed that further clarity in the law language, along with expanded support for enforcement and automation, is needed to drive meaningful change.

Summary of Key Findings from Phase I

- **Substantial Variation in SDMO Laws:** State-level SDMO laws differ significantly in terms of vehicle types covered, required motorist behaviors, and associated penalties. A growing number of jurisdictions are expanding protections to include all roadside vehicles, indicating a national trend toward more inclusive and comprehensible legislation.
- **Inconsistent Enforcement Practices:** While most states report enforcing SDMO laws, enforcement is often limited to targeted enforcement campaigns,

which are infrequent and typically tied to specific events or awareness periods.

- **Public Education and Outreach Limitations:** PI&E efforts vary widely in scope, frequency, and funding. Many states rely on partnerships and broader traffic safety initiatives to promote SDMO awareness. Emotional storytelling and human-centered messaging are consistently viewed as the most effective communication strategies.
- **Stakeholder Collaboration and Challenges:** Although multi-agency collaboration is common, fragmented communication and limited resources may hinder the consistency and reach of outreach and enforcement efforts.
- **Data Collection and Evaluation Gaps:** Many states lack centralized systems for tracking SDMO violations and evaluating outreach effectiveness. Near-miss incidents are underreported, and enforcement data are often categorized under broader traffic infractions, limiting the ability to assess impact.
- **Legislative Momentum and Opportunities:** Several states have recently revised or are considering updates to their SDMO laws. Stakeholders broadly support legislative changes that clarify expectations, particularly shifting from “move over **OR** slow down” to “move over **AND** slow down,” to improve compliance, enforcement, and overall roadside safety.

Phase II—Driver Knowledge, Perceptions, and Behavior

Phase II of the study included two main tasks:

- Focus groups with motorists to investigate driver knowledge, perceptions, and self-reported driving behavior.
- Collection and analysis of observational video data from traffic cameras to investigate real-world driving behaviors.

For Phase II, a subset of states was selected to reflect a variety of SDMO laws, with the selection guided by insights from the environmental scan, survey responses, and in-depth interviews. The strength of each state’s law was evaluated based on several key characteristics, including the inclusivity of vehicles protected under the law, required motorist behavior, enforceability, and associated penalties. States were clustered together based on similarly structured legislation, outreach, and enforcement efforts, and their relative scores. Regional distribution and additional population characteristics were also considered, including roadside responder fatalities, the number of licensed drivers, overall population numbers from the U.S. census, and average vehicle miles traveled. Table 3 lists the factors considered in this selection process and a description of each.

Table 3. Factors Considered When Selecting States

Factor	Description
Law includes	Inclusivity of the law with respect to vehicles protected (first responders, tow, municipal, utility, road maintenance, and disabled passenger vehicles)
Required behavior	Categorization of “move over OR slow down” versus “slow down AND move over,” also taking into consideration those laws that specify a defined speed reduction
Fine	The fine for noncompliance for a first offense.*
Unique PI&E & enforcement	Identification of unique enforcement or PI&E efforts; also considered the frequency of efforts and listed any special or non-traditional funding sources
Emergency responder struck-by-vehicle fatalities	Number of fatalities for each year between 2020–2023, and a total number across the 4 years
Licensed drivers	Number of licensed drivers for the years 2020–2023, and an average over the 4 years
Vehicle miles traveled	Number of vehicle miles traveled for the individual years 2020–2023, and an average across the 4 years

** Many states impose larger fines and other penalties for repeat offenses or if the violation results in a crash, injury, or fatality. For the purpose of selecting states for Phase II tasks, only penalties applicable to a first offense were considered.*

From the clusters, a sample of 10 states and 3 alternate states were selected for participation in the focus groups and observational video analysis. The final sample included states that represent the full spectrum of laws and driving populations (see Table 4). A similar table containing information for all 50 states and the District of Columbia is available in Appendix C.

Table 4. Characteristics of State Sample: Fatality Data and SDMO Law Components

State	Emergency responder fatalities (2020–2023) ^b	Required Behavior		
		Move over OR slow down	Slow down AND move over	Specific Speed Reduction Required ^c
California	13	X		
Florida	14	X		20 mph below posted speed limit
Maryland	5	X		
Michigan	3		X	10 mph below posted speed limit
Minnesota	0	X		
Nevada	5		X	
New York	8	^a		
North Carolina	4	X		
Pennsylvania	10	X		20 mph below posted speed limit
Tennessee	3	X		
Texas	20	X		20 mph below posted speed limit
Virginia	5	X		
Washington	5		X	10 mph below posted speed limit; 50 mph if speed limit ≥ 60 mph

a. New York's law instructs drivers to use "due care", the definition of which includes moving over but does not explicitly include slowing down.

b. Source for fatalities is Emergency Responder Safety Institute. (n.d.). Struck By Vehicle Fatality Incidents Reports; retrieved from <https://www.respondersafety.com/news/struck-by-incidents/yearly-fatality-reports/>

c. Several states have different requirements applicable only on lower speed roads (e.g., posted speed limit ≤ 25 mph), which are not shown.

Within the selected sample of 13 states, virtual focus groups were conducted with drivers (in 10 of the 13 states), and observational data were collected and analyzed using traffic camera footage (in 12 of the 13 states).

Focus Groups with Motorists

Methods

Virtual focus groups were conducted with motorists in California, Florida, Maryland, Michigan, Nevada, New York, North Carolina, Pennsylvania, Texas, and

Washington. These focus groups were convened to better understand driver awareness of SDMO laws, related outreach efforts, and motorist behavior, as well as to assess public acceptance of the law and the factors that influence compliance. A total of 20 virtual focus groups were conducted with motorists (two groups in each state). An experienced focus group moderator led the sessions, and a notetaker was present. Summaries of the sessions were generated from the notes, transcripts, and video recordings.

Participants were recruited through a recruitment agency. Recruiting materials provided a brief study description, noted the anticipated time commitment of up to 90 minutes, and indicated that a \$50 gift card would be provided to participants upon completion of the focus group. Interested parties were directed to an online screener questionnaire.

Participants were screened to ensure they possessed a driver's license, resided in the state for at least 6 months, and drove at least 2 to 3 days a week, including driving on the highway at least 1 day a week. Efforts were made to balance the sessions by gender and include participants with a range of driving experience and frequency.

Each state hosted two focus groups: one group included experienced drivers (35+ years old or those who drive 4 or more days a week, with 2 or more days a week on highways), and the other group consisted of less experienced drivers (18–34 years old or those who drive 1 to 3 days a week and 1 day a week on highways).

To account for potential attrition, 12 participants were scheduled for each group, with a target of 6 to 9 participants. Participants exceeding the limit of nine were compensated but did not take part in the focus group discussions.

The focus groups were facilitated via the Zoom platform. Each session began with participants providing verbal consent. Before any topic-specific discussion took place, participants completed a brief questionnaire (Appendix D) designed to capture their unbiased knowledge and perceptions of the SDMO law, along with their driving behaviors. Following the questionnaire, each participant answered an icebreaker question before the moderator began the topic-specific discussion. At the close of the discussion, participants learned about the study's intent and sponsor, and were invited to share any final insights or questions before the session concluded.

Drawing on insights from the Phase I exploration, a moderator's guide (Appendix E) was developed to structure the group discussions and ensure consistency by asking each group the same set of questions. The first set of questions asked participants about their encounters with vehicles stopped on the side of the road. They were asked to describe their immediate thoughts and actions in such situations, the factors that influence their behavior, and whether the type of vehicle affects their response. The discussion shifted to participants' awareness of their state's SDMO law,

including its specific requirements and penalties for noncompliance. Participants were also asked about the sources from which they had received this information. After participants talked about awareness of their state law, the moderator provided participants with an overview of the law and its details. Participants were then questioned about their interpretation of the law and opinions on its associated penalties. Questions in this section were tailored to each state's specific law. For example, if a state's law required drivers to reduce their speed by a specified margin beneath the posted limit, participants were asked whether they were aware of this requirement and if they felt it was appropriate. The discussion then transitioned to focus on other motorists, and participants were asked about their perceptions of social norms for behavior when passing stopped vehicles, driver beliefs regarding the likelihood of being cited for violating the law, and how they believed safety and compliance could be improved.

Following the discussions of driver behavior and the law itself, participants were asked about the enforcement of the SDMO law in their state. This included whether they had ever experienced or observed enforcement of the law, their perception of the actual risk of receiving a citation for noncompliance, and their awareness of other enforcement efforts for driving under the influence (DUI) or seat belt laws. The moderator also asked participants to consider and discuss what might happen if certain types of law enforcement actions were carried out, to see how these might influence driver behavior or awareness of the law.

Lastly, participants were prompted to talk about their awareness of any outreach or education materials informing the public about the SDMO law. The moderator also solicited suggestions for improving PI&E campaigns, such as specific channels or methods to use, types of reminders, and effective messaging. Finally, participants were shown one or two examples of education or outreach materials created by their state. The examples varied in format and approach, and included video and radio PSAs, billboard content, and informational graphics. Participants discussed their interpretations of the materials, highlighting elements they liked or disliked, suggesting improvements, and recommending the most effective methods for reaching and engaging drivers.

After each focus group session, the notetaker(s) reviewed and supplemented notes using the session transcript and video recording. Participants' responses were then categorized based on key themes and topics discussed during the session. Recurring opinions, insights, and ideas were identified through a process of thematic analysis, which involved coding responses, grouping similar ideas, and noting patterns that emerged across different participants. Responses were initially organized according to the structure of the discussion guide, which was segmented by topic areas. Any comments or themes that did not align with the pre-determined topics but were still relevant or insightful were also captured for analysis. The results of each group were

compared to highlight any differences in opinion across participants from different states and among participants with different driving frequencies. The pre-discussion survey data were cleaned using Microsoft Excel (version 2048) and analyzed with R (version 4.4.3).

Findings

Participant Demographics. A total of 135 participants were recruited from 10 states: California (n=13), Florida (n=17), Maryland (n=15), Michigan (n=16), Nevada (n=14), New York (n=12), North Carolina (n=12), Pennsylvania (n=12), Texas (n=13), and Washington (n=11). In all, 78 participants identified as female (57.8%) and 57 (42.2%) identified as male. Efforts were made to achieve representation across age groups: 18–24 (n=24), 25–34 (n=37), 35–44 (n=28), 45–54 (n=19), 55–64 (n=21), and 65–74 (n=6).

Pre-Discussion Survey Findings. The pre-discussion survey consisted of 11 questions. It gathered demographic data and information on how often participants drove on limited-access roadways each week. The remaining questions assessed participants' unbiased passing behaviors when encountering various types of vehicles stopped roadside, such as passenger vehicles, emergency vehicles, tow trucks, and law enforcement vehicles. It also measured their awareness and understanding of their state's SDMO law. The data were analyzed across all participants and examined differences in responses across states and differences based on driving experience.

For the questions regarding passing behaviors, the available response options were as follows:

- Slow down and, if possible, change lanes to give more space to the *[vehicle type]*
- If possible, change lanes to give more space to the *[vehicle type]*
- Continue driving in your lane but at a slower speed
- Continue driving in your lane at the same speed
- Speed up to get past the *[vehicle type]*
- Check to see if the driver needs assistance (only for stopped/disabled vehicles)

Self-Reported Behavior—All Participants. Most participants (n=75; 55.6%) reported that they slow down and change lanes when approaching a stopped/disabled vehicle on the highway. Approximately one-third (n=43; 31.9%) indicated that they only change lanes. A smaller percentage of participants reported they continue in the same lane but at a slower speed (n=9; 6.7%) or continue in the same lane at the same speed (n=6; 4.4%). Finally, one participant (0.7%) reported

checking if the driver needed assistance, and one participant (0.7%) reported speeding up to move past the stopped/disabled vehicle.

Overall, participants reported more cautious driving behavior when approaching a disabled vehicle(s) involved in a crash (before first responders arrive). A greater percentage of participants (n=92; 68.1%) reported that they slow down and change lanes when approaching a crash scene before first responders arrive, compared with when they approach a stopped/disabled vehicle (not involved in a crash). Additionally, a greater percentage of participants reported they check if the driver involved in the crash needs assistance (n=19; 14.1%) relative to checking if drivers of stopped/disabled vehicles (not involved in a crash) require assistance (n=1; 0.7%). Only two participants (1.5%) indicated they continue driving in the same lane at the same speed when passing a crash scene, whereas three participants (2.2%) indicated they continue in the same lane but at a slower speed.

Participants responded similarly when approaching either a tow truck or a stopped/disabled vehicle on the highway. A majority (n=77; 57.0%) reported that they slow down and change lanes, whereas fewer participants (n=39; 28.9%) indicated they only change lanes. A smaller percentage reported that they continue driving in the same lane at the same speed (n=11; 8.1%), continue in the same lane but at a slower speed (n=7; 5.2%), or speed up to get past the tow truck (n=1; 0.7%).

When asked about driving behavior when traveling past an emergency vehicle stopped on the side of the road, most participants report slowing down and moving over (n=101; 74.8%). Twenty-seven participants (20.0%) reported only changing lanes, four participants (3.0%) continue driving in the same lane but at a slower speed, and three participants continue in the same lane at the same speed (2.2%).

Similar patterns of behavior were reported when participants were asked how they respond when passing a law enforcement vehicle stopped on the side of the road. Most participants (n=93; 68.9%) reported that they slow down and change lanes. Fewer participants (n=22; 16.3%) reported that they only change lanes, whereas 19 participants (14.1%) reported that they continue driving in the same lane but at a slower speed. One participant (0.7%) reported continuing in the same lane at the same speed.

It is also notable that the percentage of participants that indicated that they stay in their lane and continue driving at the same speed was highest (8.1%) when approaching a stopped tow truck. This behavior was less frequently reported for other stopped vehicles: 4.4% for a stopped/disabled passenger vehicle, 2.2% for an emergency vehicle, and 0.7% for law enforcement.

Awareness of State Law—All Participants. Overall, participants reported varied levels of awareness regarding their state's SDMO law. Although 54 participants

(40.0%) knew such a law existed, most participants (n=60; 44.4%) were unsure. Additionally, 21 participants (15.6%) believed incorrectly that their state had no such law.

Participants who were aware that their state had a SDMO law had limited understanding of the law's requirements. Most participants (n=23; 42.6%) indicated that the law required drivers to slow down and/or move over. A similar proportion, 22 participants (40.7%), said the law only required drivers to move over. (Note that all states included in focus groups except New York included a requirement to slow down, either in all cases or if unable to move over.) This distribution suggests participants primarily focused on the move over component of the law. In contrast, far fewer participants (n=5; 9.3%) indicated that the law required drivers to only slow down, and one participant (1.9%) indicated the law required drivers to pull over and call a tow truck. Three participants (5.6%) responded either "N/A" or "I don't know" or listed licensure requirements in response to this question.

Participants were subsequently asked whether they looked up the law while completing the survey. Although one participant reported looking up the law when responding to the pre-discussion survey, several other participants admitted doing so during the group discussion that followed.

Self-Reported Behavior—by Experience Level. When examining driving behavior based on driver experience (a combination of age and driving frequency, as defined by screener responses), participants tend to report very similar responses, except for stopping to check if drivers need assistance when approaching a crash and with respect to slowing down and, if possible, changing lanes to give more space when approaching law enforcement vehicles. More experienced drivers (n=13; 19.2%) were more likely to stop and check if assistance was needed when approaching a crash, compared with less experienced drivers (n=6; 9.0%). For stopped law enforcement vehicles, more experienced drivers are more likely to report SDMO behaviors (n=53; 77.9%), compared with less experienced drivers (n=40; 59.7%). Conversely, less experienced drivers are more likely to continue in the same lane at the same speed (n=17; 25.4%) when compared with more experienced drivers (n=2; 2.9%).

Awareness of State Laws—by Experience Level. Overall, awareness of SDMO law was evenly distributed across participants with different levels of driving experience, with the more experienced group having just slightly more participants who were aware of the law. Among the more experienced group, 44.1% (n=30) were aware such a law existed, 39.7% (n=27) were unsure if a law existed in their state, and 16.2% (n=11) did not think their state had a law. For the less experienced group, 35.8% (n=24) were aware such a law existed, 49.3% (n=33) were unsure if a law existed in their state, and 14.9% (n=10) did not think their state had a law.

Group Discussion Findings. This section presents the key findings from the discussion portion of the focus groups, delving into general themes, unique attributes, and notable differences and similarities observed among states and across various age groups and driving experience.

Self-Reported Behavior. Participants were initially asked to discuss their behavior and considerations when approaching vehicles that were stopped either on the roadside or in travel lanes. Across states, participants generally reported engaging in similar behaviors, such as assessing the situation, slowing down, and changing lanes. However, the specific cues that prompted these actions, as well as the behaviors themselves, varied by state and driver experience.

Drivers frequently prioritize the presence of individuals outside a stopped vehicle as the most important factor when deciding how to react when passing. For example, many drivers in Maryland and Michigan specifically note that they look for individuals near the vehicle and check for hazard lights or debris. Nevada participants were particularly alert to the presence of law enforcement, debris, and people. One participant mentioned looking for “a dead body.” Similarly, in North Carolina, drivers look for people in or near the vehicle, and two participants also mentioned checking for signs of abandonment, like a towel in the window, which they interpreted as a sign that it was not necessary to move over. Interestingly, only one person, a participant from Washington, diverged from this prevailing viewpoint by stating that she intentionally avoids looking at stopped vehicles, believing that doing so could cause drivers to inadvertently steer toward the stopped vehicle.

Although the presence of people on the side of the road is a primary concern, other contextual factors also influence how drivers react to a stopped vehicle. Common considerations include the type and condition of the stopped vehicle(s), with the presence of law enforcement and other first responder vehicles often cited as having a significant impact on driver response.

A few participants noted that their response changes when the situation involves a crash. For instance, participants remarked that when vehicles are stopped because of a crash, they tend to be on higher alert, watching for people who might step into the roadway if they are in shock or disoriented. Participants were also concerned about debris near the vehicle(s): one Pennsylvania participant “looks for signs of damage, such as smoke or debris,” and another participant checks for signs that a vehicle, such as an emergency vehicle or tow truck, might be reentering the road from the shoulder.

Some participants shared more situational and context-specific factors that influence their decision-making. For instance, a Washington participant considers the time of day when passing a stopped vehicle, believing that drivers or others outside a vehicle are more likely to be intoxicated at night, increasing the risk of them

unexpectedly entering the roadway. A Pennsylvania participant cited a common situation during hunting season where vehicles are often left by the roadside near wooded areas and noted that they would not move over if they believed the vehicle was stopped for this reason.

With regard to driving behaviors, most participants across all states reported they would either move over or reduce speed when approaching a stopped vehicle. Most cited reasons such as it being “the right thing to do,” “common courtesy,” and the “safe thing to do,” with far fewer individuals stating they do so because “it is the law.” One Nevada participant offered personal rationale for slowing down, stating, “I care about myself, and I don’t want to get into a crash,” with another participant agreeing that reducing speed provides more time for the driver to react if someone were to enter the roadway.

Participants’ reported behaviors varied significantly when approaching a stopped vehicle. Some individuals prioritized reducing their speed while maintaining their current lane, often citing heavy traffic as the main barrier to changing lanes, which they perceived as disruptive or unsafe. In contrast, other participants prioritized changing lanes, only considering reducing their speed if a lane change proved unfeasible. This approach was frequently driven by strong concerns about being rear-ended if they were to slow down excessively or abruptly in their original lane. Apprehension about reducing speed was widespread, with many participants expressing concern that slowing down could introduce traffic congestion or significantly increase the risk of a rear-end collision. This opinion was a commonly voiced issue across several states, notably Michigan, Pennsylvania, and Texas.

Initially, many participants stated that they *always* slow down and/or move over when required. However, further discussion often prompted participants to acknowledge that situational factors could alter their behavior, resulting in fewer lane changes or speed adjustments. For instance, during one of the sessions in Maryland, although most participants indicated they would move over to avoid a stopped vehicle, one participant clarified they would only do so if the vehicle’s hazard lights were activated, and others nodded their heads in agreement. Similarly, participants in other sessions noted they would not move over for what appeared to be an unoccupied passenger vehicle. Although the majority of the participants in one of the New York sessions reported that they would try to move away from a stopped vehicle, three participants reported they would only move if the vehicle was in the travel lane.

Participants’ self-reported behaviors and compliance with the law varied by state, the type of stopped vehicle (e.g., passenger, emergency, tow, or law enforcement vehicles), and more consistently, the number of stopped vehicles that were present. A clear theme emerged: nearly all participants reported that they were more likely to slow down and move over when law enforcement vehicles were present. Additionally, participants were more likely to move over when more stopped vehicles were present,

often citing a desire to distance themselves from the commotion. Many also reported slowing down, partly out of curiosity.

Generally, participants viewed law enforcement and emergency response vehicles (like fire trucks and EMS vehicles) similarly, with most opting to move over and/or slow down upon encountering them. They typically equated the presence of law enforcement and emergency vehicles with increased incident severity, thereby warranting additional space. One of the participants explained that she “places more importance with law enforcement,” and another participant similarly reasoned that he “honors” emergency vehicles more than the average driver. Participants also indicated a general tendency to slow down when law enforcement was present, often out of a heightened awareness of being subject to a traffic stop. However, in one California session, three participants admitted they would neither move over nor reduce speed if the law enforcement officer appeared to be conducting a traffic stop.

Responses regarding tow trucks were mixed. Some participants admitted they typically ignore them, with one explicitly stating that tow truck drivers are accustomed to working on the roadside and understand the risks involved, thus there is no need to slow down or change lanes. In contrast, other participants recognized that the presence of a tow truck means there will be a person working on or around a stopped vehicle, thus meriting additional caution from passing drivers. One participant in Washington mentioned that they may move over multiple lanes if a tow truck is present.

For passenger vehicles, most individuals seemed to indicate they would slow down or move over, again citing it as simply “the right thing to do.” Interestingly, despite SDMO laws existing in some states for passenger vehicles, not a single person mentioned legal obligation as their motivation. Instead, the decision appeared to stem purely from a sense of courtesy and responsibility. In a few sessions across states, participants tended to focus more on the stopped vehicle’s occupants. They expressed an inclination to slow down and move over more significantly if the occupants were women or children. To illustrate, in New York, one participant specifically reported modifying their behavior based on vehicle type, explaining they would exercise extra caution when passing a “family van” or similar vehicle likely to be carrying children, due to the increased risk of a child unexpectedly exiting the vehicle.

Driver experience appeared to influence participants’ self-reported behavior. More experienced drivers reported greater caution and heightened awareness of the need to slow down and move over under certain situations. These experienced drivers often mentioned personal experiences, such as having been stopped on the side of the road themselves, which influenced their cautious behavior. Less experienced drivers also reported slowing down and moving over, but to a lesser extent than the experienced drivers. Both groups, however, expressed concern for their safety and the safety of people stopped on the roadside. Overall, though most participants generally reported

that they slowed down and moved over for stopped vehicles, their actions were influenced by factors such as the type of vehicle involved, personal experiences, and specific situations encountered.

Perceptions of Other Motorists' Behaviors. Participants across all 10 states unanimously agreed that though they were likely to slow down and move over, other drivers were far less likely to do so. This observation highlights a common self–other discrepancy in reported behavior, where participants consistently perceived their own compliance as higher than that of others.

Across all groups, most participants felt that other drivers frequently fail to slow down or move over, especially when the stopped vehicle is a passenger car. They believe other drivers are more likely to perform SDMO behaviors when passing emergency response vehicles (e.g., police cars, ambulances, tow trucks), attributing this to the presence of flashing lights and the perceived importance of these vehicles.

Participants were divided on whether other drivers were more likely to move over, slow down, or do both when approaching a stopped vehicle. They believed this choice hinged on situational factors such as traffic volume and speed, the type of incident (e.g., stalled vehicle vs. crash), and the presence of law enforcement. Overall, participants did not feel one behavior was more common—instead, they perceived a general unwillingness among drivers to comply with either action.

Participants offered a variety of perspectives on why some drivers choose to move over and/or slow down, and what factors influence compliance. A common opinion was that drivers often slow down because of curiosity or “rubbernecking” and not necessarily out of safety concerns or adherence to the law. Participants also noted that in heavy traffic, it is harder for drivers to safely change lanes or reduce speed, which can lead to inconsistent compliance. Other, less common opinions also emerged, such as one California participant suggesting that other drivers may find moving over an “inconvenience” that they “may not want to bother with.” In Pennsylvania, a few participants believed compliance was correlated with location—they thought drivers were less likely to slow down and move over in busier or urban settings.

Many participants said their actions were influenced by the drivers ahead of them, often describing a “follow the leader” mindset. If the vehicle ahead slowed down or moved over, participants generally reported they would do the same, often viewing it as an indication of unseen hazards. This behavior was prevalent across California, Maryland, North Carolina, and Michigan. Though largely true in other states, some participants offered more nuanced responses. For instance, over half of the New York participants reported that they would follow a lead vehicle, though two participants mentioned they would still use their own discretion. In Nevada and Washington, several participants reported being influenced by other drivers moving over, often seeing it as a

guide for their own safety and increased caution. In contrast, Pennsylvania participants expressed more skepticism, believing other drivers' behaviors might make them more vigilant but not necessarily cause them to move over. Lastly, seven Texas participants said that they were influenced by a lead vehicle, but one clarified their decision would also depend on general traffic and their current lane.

Awareness of the Law. Participants' awareness of SDMO laws varied significantly by state and driver experience level. Generally, most participants were unsure if their state had such a law and lacked knowledge of its specific details, beyond the general understanding to move over or slow down. Although many guessed the law protected law enforcement and emergency responders stopped on the road, they were uncertain about whether the law also protected other vehicle types. When participants expressed greater confidence about which vehicles were protected, it was typically because a law had recently changed and received public attention.

Participants in California, Nevada, and Washington demonstrated the lowest awareness of the law:

- In California, 5 out of 13 participants across both sessions believed a law existed, but none were aware of the penalties. Even among those aware of the law, the understanding was largely limited to a move over component, with only one participant recognizing that the law also included a requirement to slow down.
- Nevada participants demonstrated the lowest awareness overall, with only a few having vague recollections of such a law, none fully confirming its existence, and all lacking specific details.
- Washington participants demonstrated a similar lack of awareness, with just 4 out of 11 participants thinking their state had an SDMO law. Of these, only one demonstrated any detailed knowledge, limited to understanding the protection applied solely to vehicles with flashing lights.

Awareness of SDMO laws was more evenly split among participants in Michigan, New York, North Carolina, and Pennsylvania:

- In Michigan, awareness varied by experience level: nearly all the participants in the more experienced driver group knew about the SDMO law, whereas in stark contrast, all participants in the less experienced group were unsure. Among the more experienced participants, three believed the law only applied to emergency vehicles. Participants held differing views on the specific requirements for drivers. One individual understood the law as requiring drivers to slow down and move over if safe to do so. In contrast, another believed the law mandated drivers to move over if possible, with slowing down only becoming a requirement if a lane change was not an option.

- In New York, though half of the participants were aware of the SDMO law, none were aware of the associated penalties or were fully confident in the required behaviors required by the law. Only one participant correctly identified that the law protects all types of stopped vehicles, including personal vehicles.
- North Carolina participants' awareness of the law varied by driving experience. Almost all in the experienced driver group believed a law existed, whereas the less experienced group was divided. Some of the less experienced drivers were uncertain, and others believed a law existed. Both North Carolina groups lacked awareness regarding which vehicles are protected under the law, the specific driver behaviors required, and the associated penalties.
- Pennsylvania participants were divided, with half uncertain whether such a law existed and half who believed it did. Of those who thought a law existed, four believed it only required drivers to move over. When asked about protected vehicle types, two thought the law applied to all vehicles, one thought it only protected emergency vehicles, and another thought it protected non-passenger vehicles (tow trucks, first responders, emergency vehicles). Similarly, most participants were unsure if there was a specific speed by which they needed to slow down, although one participant in the less experienced driver group believed the law required a 20-mph speed reduction. None of the Pennsylvania participants demonstrated awareness of the penalties associated with noncompliance.

The three states with the highest awareness of SDMO laws among the focus group participants were Florida, Maryland, and Texas.

- In Florida, 12 out of 17 participants reported awareness of their SDMO law. Notably, two had learned about the law after being personally cited for a violation, and another had been informed by her mother, who had been stopped for an SDMO violation. Such experiences were seldom found in other states' focus groups, as only one other participant from the remaining nine states reported being pulled over for violating the SDMO law. Florida participants also had more detailed knowledge of the law, as exemplified by the seven participants who were aware that the law requires slowing down by a set speed. Although none of the participants could cite the exact requirements, four drivers did reference 20 mph as the speed reduction requirement, but none specified that the reduction be specifically 20 mph below the posted speed limit.
- In Maryland, 10 of 15 participants knew about the SDMO law. Although none were aware of associated penalties, several assumed that a violation would result in a fine. Several Maryland participants knew the law's protections applied to all stopped vehicles.

- Similarly, in Texas, 10 of the 13 participants were aware of the SDMO law, but few were aware of its details. One participant in the more experienced driver group was familiar with the law, correctly stating the requirement to move over if safe or slow down if unable to move over. Another participant knew about the requirement to reduce the vehicle speed to 20 mph below the speed limit for law enforcement and emergency vehicles but was unaware of other protected vehicle types.

Additionally, participants across various focus groups expressed confusion regarding whether neighboring states had similar laws and what their specific requirements entailed. Several participants pointed out the importance of this knowledge, particularly for individuals who frequently travel across state lines. This concern was particularly prominent among Maryland participants, who noted it was common for them to travel to Virginia, the District of Columbia, and Pennsylvania.

Although overall awareness of SDMO laws was not high among participants—and specific legal requirements were even less understood—those who were aware gained their knowledge from a diverse range of sources. These sources varied considerably by state, encompassing everything from formal education programs to personal experiences and dedicated public information campaigns.

- In California, one participant recalled learning about the law through a AAA driver's education program.
- Nevada participants mentioned local news reports about a tow truck driver's death, though they were unsure whether the incident led to the law's enactment or simply its reinforcement. Some also vaguely remembered learning about the law during driver's education.
- In Florida, participants who demonstrated detailed knowledge of the SDMO law often cited personal experiences, such as receiving citations for violations. In contrast, those with less specific awareness typically referred to more general sources like local news, road signs, or information from friends and family.
- Maryland participants generally had better recall of their information sources compared with participants from other states. They frequently cited road signs, newspapers, and news broadcasts. This improved recall may be attributed to a 2022 public information campaign following an amendment to the law that expanded its coverage to include passenger vehicles.
- In New York, the information sources were highly individualized. Participants reported learning about the law through a variety of channels, including a family member training to become a state trooper, Uber driver continuing education, CDL testing requirements, and the television show *Live PD*.

- North Carolina participants specifically recalled learning about the law from highway signs, including both fixed roadway signs and VMS, although they could not remember the exact locations or messages. Notably, roadway signs and VMS were mentioned as information sources by at least one participant in every other state's focus groups.
- In Pennsylvania, participants cited family members and driver education classes as their primary sources of information.
- More than half of the participants in Texas believed they learned about the law through driver education courses. Three others could not recall a specific source but felt the law was simply "common sense."
- In Washington, participants who were aware of the law generally attributed their knowledge to PSAs, though several could not recall the source.

The focus group findings also demonstrated a disparity in awareness of SDMO laws between the more experienced and less experienced drivers. More experienced drivers generally showed greater awareness of their state's SDMO law and its requirements, though they still lacked specific details. They often recalled learning about the law from billboards, VMS on highways, and news broadcasts. These drivers were also more likely to feel that slowing down and moving over is "common sense" or "common courtesy," even if they were not explicitly aware of the law. In contrast, less experienced drivers demonstrated lower and less consistent awareness of the SDMO law and its specific requirements. Their primary sources for learning about the law included driver's education, social media, and word of mouth.

Interpretation of the Law. Participants reported varied opinions and levels of awareness regarding the SDMO law's requirements to move over and/or slow down for stopped vehicles. Although the move over requirement of the law was relatively well-understood, the slow down requirement frequently led to confusion. Upon learning the requirements of their state law, which does not explicitly mandate a specific speed reduction, California participants expressed uncertainty about the extent to which they were expected to reduce their speed. One participant worried that reducing speed too drastically, such as from 60 mph to 20 mph, could potentially cause a crash. In contrast, another participant interpreted the law as requiring only a modest reduction of 5 or 10 mph, which they did not view as a risk.

A Maryland participant shared her confusion about the slow down requirement of the law, finding the phrase "reasonable and prudent speed" from the law's text to be "very vague." She suggested that the law could offer specific guidance, proposing a 10-mph reduction below the speed limit as a practical speed requirement to adopt. Other Maryland participants generally suggested slowing down by 10 to 20 mph below the posted speed limit. However, one outlier stated he would only "tap" the brake rather than reduce to a specific speed. One New York participant noted that their law directs

drivers to “exercise due caution” rather than specifically instructing them to slow down, leading them to question whether a requirement to slow down is explicitly mandated.

Participants in the five selected states where the law specifies a particular speed reduction were unaware of this provision. Instead, they generally understood the law to require a general reduction of speed rather than a specific amount by which they needed to slow down. After reviewing the specific requirements of the law, participants in Pennsylvania generally expressed neutral to positive views regarding the mandate to reduce speed by 20 mph below the posted limit. However, a few participants raised concerns about the practicality of this requirement, noting that such a reduction may not always be feasible due to surrounding traffic conditions or safety considerations.

In Florida, participants were surprised to learn that the law instructed drivers to slow to a speed that is 20 mph below the posted speed limit when the posted speed limit is 25 mph or greater, or to travel at 5 mph when the posted speed limit is 20 mph or less. Several participants admitted they typically do not slow down by that much and expressed concern that such a significant reduction in speed could exacerbate traffic problems. Similarly, most of the participants in Texas admitted they do not typically slow down to the required 20 mph below the posted speed limit. Despite this, they generally agreed with the rule itself, with only one participant expressing reservations. In Michigan, over a third of the participants were surprised that their state’s law requires both slowing down and moving over. Many were also unaware that the law specifies a required speed reduction below the speed limit. One participant suggested using VMS at incident locations to inform drivers to slow down by the required 10 mph below the posted speed limit. Likewise, none of the participants in Washington were aware that the law specifies that drivers must slow down to 10 mph below the speed limit, but opinions toward this requirement were positive, with participants considering it an appropriate amount to reduce speed by.

Beyond speed reduction, participants believed that other aspects of the laws were also unclear or ill-defined. In North Carolina, three-quarters of the participants felt the law was vaguely worded and left some aspects “up to interpretation.” One participant specifically noted the law’s “only if safe” clause regarding lane changes, expressing concern that their judgment of safety might differ from that of law enforcement, resulting in citations despite efforts to comply. This concern was echoed by others in both sessions.

In Michigan, participants questioned why the law only protects authorized vehicles, noting that regular citizens on the side of the road face the same dangers from passing vehicles. Washington participants also expressed surprise that the law does not require drivers to move over when passing stopped passenger vehicles, with some feeling the law should be expanded to include all vehicles. However, one participant pushed back on this, explaining that such an expansion would be “a bit much,” implying

it would result in drivers having to make SDMO maneuvers more often. Still, another Washington participant expressed that he would move over for all vehicles, regardless of whether it was required by law, because it is “the right thing” to do.

Lastly, Pennsylvania’s unique requirement that stopped passenger vehicles must display at least two of three warning signs (e.g., hazard lights, flares, safety triangles) surprised most participants. Several noted that this provision would effectively prevent the law from protecting most passenger vehicles stopped roadside. Others expressed concern about not typically carrying flares or safety triangles, thus being unable to mark their own disabled vehicle. One participant raised concerns about the law’s requirement that emergency vehicles must have their lights activated to be protected under the law. They noted that these vehicles often turn off their lights before reentering traffic and may technically lose legal protection during that transition.

Opinions on the Penalties. Across all states, participants demonstrated limited awareness of the specific penalties associated with violating the SDMO law. Although some participants knew or guessed that a citation may result in both financial and licensing consequences, very few knew the specific amounts or details of these consequences. After being informed of the law’s details, participants were asked for their views on the listed penalties, and their opinions varied. Participants in several states felt that the fines were too low. For example, California participants considered the \$50 fine insufficient, suggesting that it should be raised to \$100 or \$250. Similarly, Florida participants believed the \$60 base fine was too low, remarking that a fine that low would not encourage behavior change. Before being informed of the actual penalties, two Florida participants had initially guessed the fine would be around \$200, comparing it to school zone violations because both situations involve heightened safety concerns for people who are vulnerable near the roadway. Maryland drivers also thought the penalties were too low, with several participants voicing a perceived lack of enforcement, leading one participant to describe the law as a “joke.” Across all states, when participants were asked why fines for SDMO violations should be increased, they suggested that the penalties should be commensurate with those for other serious traffic offenses that pose a risk of severe injury or fatality.

A different trend emerged when talking with participants in states with higher monetary penalties. Participants were more likely to find them sufficient or, in some cases, too high. Washington participants generally found the penalties fair (base fine of \$214, with potential to increase up to \$5,000 and up to 364 days in jail), with only one participant suggesting a slight increase. A participant from Nevada expressed the view that penalties for violating the SDMO law should be based on the risk the behavior poses, not just the actual harm caused. In other words, even if no one is injured, the fact that the violation could have led to serious injury or death should justify a stronger penalty. This participant felt the fine of up to \$1,000 and possible 6 months of jail time to be fair. Other Nevada participants believed that the threat of jail sentences was unlikely

to be enforced, but suggested that financial penalties should be more severe. Conversely, in Texas, where the base fine ranges from \$500 to \$1,250, a few participants felt the fines were excessively high. One of these individuals stated the fine was “five times more” than they would have expected. In Michigan, some participants felt the fines were more severe than expected, whereas others thought the \$400 fine and two points on the driver’s license were fair.

Opinions of participants from other states were more divided. In New York, opinions on the \$275 fine for SDMO violations seemed to vary by experience level: participants in the less experienced group found it inadequate, whereas participants in the more experienced drivers group considered it satisfactory. One participant from New York advocated for a higher fine, noting that they had previously received a \$150 ticket for parking in a no-standing zone, a violation they considered far less serious than failing to comply with the SDMO law. They argued that, given the risk of fatal outcomes, the fine should be increased to better reflect the seriousness of the violation.

In Pennsylvania, most participants felt the fine of \$500 and two points on the driver’s license for a first offense was suitable, though a few believed it was not severe enough. Participants’ opinions varied widely in North Carolina, where the penalty is a \$250 fine, with additional charges if there are injuries to emergency responders, property damage, or death. One participant proposed that penalties should escalate with the severity of the violation. This suggestion indicated an unawareness that the law is already structured this way, even though the participant had reviewed language to that effect. Conversely, other participants felt penalties should be lowered because of the law’s ambiguity. A third participant proposed adding non-monetary penalties to avoid disproportionately penalizing lower income citizens.

Although participants across all groups did not seem to reach consensus on the exact level of fines or penalties, there was a general inclination toward increasing monetary penalties. They believed that higher fines and points on a driver’s license would serve as a stronger deterrent and reduce repeat violations. However, there was also a common belief that the law is difficult to enforce or only enforced in cases of injury or death. Several participants felt the lack of consistent enforcement reduces the impact of the penalties or renders them meaningless altogether.

Awareness of SDMO-Related Crashes. Participants demonstrated a general awareness of SDMO-related crashes, particularly those involving law enforcement officers, emergency responders, or tow truck drivers. Most participants remembered hearing about these incidents through TV news stories, although a few participants also shared personal experiences of friends or family members who were involved in incidents where a driver failed to move over. When discussing news reports, participants were often able to recall specific incidents where individuals were struck and killed while assisting disabled vehicles on the side of the road. Several participants also

mentioned seeing videos or dashcam footage online of crashes or near-crashes involving vehicles on the side of the road. Unlike the news stories, social media (TikTok, Instagram, and YouTube) was the primary source for such videos. Notably, almost all participants who reported viewing these videos fell into the younger age categories.

Participants generally believed such incidents occur regularly. Even those without knowledge of specific events felt they happened often, with one participant describing it as “more than people realize or want to think about.” Participants suggested several reasons for the perceived frequency, including contributing factors like alcohol or drug-impaired driving, distraction, and poor visibility due to weather or time of day.

Perceptions of Enforcement and Risk of Receiving a Citation. Across states, most participants felt that SDMO laws are rarely enforced. They believed that law enforcement officers are often too busy with roadside duties to ticket noncompliant drivers. Participants perceived this as a logistical issue related to manpower resources, with officers generally unable to leave the scene where they are working to pursue and cite SDMO violators. They also felt that law enforcement officers would prioritize what several participants described as “critical” driving violations or emergencies rather than enforce the SDMO law, which they view as a lower priority. Participants listed driving under the influence, distracted driving, and speeding as examples of infractions that would take precedence over the SDMO law.

One Texas participant, who had been stopped for violating the law, also did not believe it was commonly enforced. They felt their experience was due to a specific, unusual scenario: they passed an officer who had just finished issuing a citation and was, therefore, available to pursue them. This participant described their chances of being stopped for future violations as “slim to none.” Incidentally, none of the three participants who had been stopped for violating the law had received citations; they only received warnings.

Most participants believed the risk of receiving a ticket for noncompliance is low. They believed that the circumstances in which the law would be enforced would need to be severe or have put the person(s) on the side of the road at great risk. For example, a driver would need to be moving past the stopped vehicle at a high speed or have been close to striking the vehicle. One Maryland participant dismissed the law as “kind of a joke” because of this perceived low level of enforcement and consequences. Except for one Florida participant who was stopped during an SDMO enforcement campaign, none had witnessed publicized enforcement, which likely contributed to their perception of low risk. Overall, participants felt that although the SDMO law exists, it is rarely enforced, and the likelihood of receiving a citation is low.

Opinions on Staged Enforcement Activities. Participants held varied opinions regarding the effectiveness and feasibility of staged SDMO enforcement efforts, such as those in work zones.

Some believed these activities could be beneficial for raising awareness and encouraging compliance. They felt that highly visible enforcement, like law enforcement officers actively monitoring and ticketing noncompliant drivers, would serve as a strong deterrent and alter driver behavior. One participant suggested that drivers stopped during such efforts should receive a warning and education about the law and its penalties rather than a citation.

However, many participants expressed skepticism regarding the practicality and social acceptability of staged SDMO enforcement efforts. They noted that police officers are often too busy with emergencies and other priorities to consistently enforce the SDMO law. This sentiment was particularly strong among participants in North Carolina, Pennsylvania, and Washington, who felt that effective enforcement would require a dedicated law enforcement presence.

Participants in other states voiced similar negative sentiments, including skepticism about whether staged efforts would reach drivers beyond those pulled over by law enforcement. Some individuals were strongly opposed to any staged enforcement, believing it would be inappropriate and an inefficient use of police department funds and time. For example, one California participant commented that their taxes could be put to better use than “slowing down traffic.”

As an alternative, automated enforcement via cameras was suggested in every focus group to address the challenges of traditional enforcement. However, this idea received mixed reactions. Although some participants saw potential benefits in ensuring compliance, others raised concerns about privacy and the surveillance aspect, with one participant simply describing all automated enforcement as “wrong.”

To address negative public perceptions of automated enforcement, participants proposed issuing warnings instead of fee-based citations. Across focus groups, several participants highlighted the unfairness of fining people who did not know the law existed. They often pointed out how few in their own sessions were even aware of the law, suggesting that education should come before punishment. This approach, they explained, would effectively educate the public and provide outreach while still signaling that compliance is actively monitored.

Awareness of PI&E Efforts. When participants were asked if they had seen any outreach materials or educational efforts regarding the SDMO law—its requirements or the safety reasons behind its existence—most participants indicated they had not. Those

who did recall any materials primarily cited VMS and other static roadway signage. A few remembered news stories, which typically surrounded a change to the law.

Suggestions for PI&E. Participants' suggestions spanned a range of approaches for outreach and education efforts to increase awareness and compliance with the law. The most frequently suggested distribution channel was road signs along the highway, including billboards and VMS. Some participants recommended that the signs include information about the fines or other penalties to incentivize drivers to follow the law. It was proposed that the message be presented in the form of a "catchy" slogan, similar to "Click It or Ticket," to help drivers remember both the law and its consequences. Others proposed posting SDMO messages on VMS upstream of vehicles stopped on the side of the road. Participants thought this could boost compliance by reminding drivers to slow down (and the specific amount of speed reduction required) and move over shortly before they are required to take action. Another recommendation was adding reminders about slowing down and/or moving over to notifications about stopped vehicles on navigation apps, like Waze and Google Maps, that already alert drivers to the upcoming road hazards.

The second most common suggestion was to use social media platforms such as TikTok, Instagram, Facebook, and X to post engaging and shareable content. Though all age groups recommended these platforms, younger participants frequently elaborated on content strategies and provided their rationale. For Instagram, several participants mentioned that the short-form video section of the app, known as Reels, could serve as a suitable platform for video PSAs. The video-sharing app TikTok, which works similarly to Reels but allows for longer videos, was favored by one Pennsylvania participant because they "get better information from TikTok." A suggestion was made to use social media influencers to promote SDMO laws, a strategy they felt would be effective in reaching younger drivers. Participants also recommended distributing video or audio PSAs via advertising channels such as TV commercials, radio and YouTube ads, and on streaming services like Spotify and Hulu.

Incorporating information about the SDMO law into driver education courses and materials, as well as adding questions about the law to driver's permit and license tests, was also frequently mentioned. Participants recommended including information in DMV renewals, registration mailings, and insurance packets, as these are items that most drivers will encounter, and if included with such documents, may be less likely to be discarded as "junk mail." Other suggestions included raising awareness using local or state law enforcement participation in community safety events, farmers markets, or state fairs. Finally, participants suggested leveraging the protected vehicles themselves to advertise information about the SDMO law when stopped roadside. These suggestions included wrapping vehicles with PSAs, using bumper stickers, and placing changeable electronic signs on the rear of vehicles. A unique idea from a Pennsylvania participant

was to use a “move over” sign that could be folded in or out as needed, similar to a school bus stop sign arm.

Participants emphasized that SDMO PSAs should be visually appealing, emotionally impactful, and unambiguous regarding the law’s requirements. A widely held opinion was that PSAs should be dramatic and forge an emotional connection with viewers. Many suggested using real-life testimonies and crash footage to underscore the law’s importance. Younger participants, in particular, favored including crash footage, with a select few even advocating for especially graphic and severe incidents. A Maryland participant felt that showing videos where “someone gets killed” would “tug at heartstrings” and encourage compliance. Similarly, a Nevada participant stated videos should depict “someone getting struck” to convey the severity of potential harm. Highlighting the “human” side of the issue by showing the consequences of noncompliance was considered highly effective.

Participants also frequently recommended personal stories from individuals affected by SDMO-related incidents to enhance relatability. A few participants suggested including roadside workers’ children, which a Michigan participant believed would “play at the guilt factor.” A North Carolina participant referenced a memorable DUI PSA from a previous decade, attributing its lasting impact to the emotional effect it had on him.

Additionally, participants suggested that ads should be short and to the point, with clear visuals and messages. It was often recommended that PSAs explicitly state, “it’s the law,” and several participants who made this recommendation expressed concern that without it, viewers may interpret the PSA as a suggestion for safer driving habits. Some participants also suggested using information about the penalties and fines in the ads to reinforce the importance of compliance or including statistics on the number of crashes and/or fatalities caused by drivers who failed to slow down and move over. When asked about the core components for SDMO messages, participants consistently emphasized the safety element and the fact that it is the law. They also highlighted the need to clearly articulate the specific behaviors required (slowing down, and by how much, and/or moving over), list the types of vehicles protected, and detail the penalties for noncompliance, including points, potential loss of license, and applicable jail time, beyond just the fine.

Participants were shown examples of PSAs from their respective states and given the opportunity to comment. Viewing these examples helped them refine their ideas about ideal content for video or graphic PSAs, enabling them to identify liked or disliked elements. Because participants viewed these PSAs after learning about their state’s SDMO law, they could compare the PSA information to the law’s actual requirements.

In doing so, some participants noted a common discrepancy: although state laws might apply to various vehicle types, PSAs often depicted only one type, typically law

enforcement vehicles. One participant argued that drivers are already inclined to move over for law enforcement and emergency vehicles, suggesting that including other vehicle types would better spread awareness or improve understanding among drivers already familiar with the law. This sentiment aligns with a recent GAO report (GAO, 2024), which recommends NHTSA update its SDMO public awareness materials to reflect the broad range of covered vehicles more fully, thereby assisting states in promoting compliance.

Participants also found statistics to be impactful. For example, the video PSA shown to Pennsylvania participants highlighted that “151 emergency responders have been struck and killed while assisting on Pennsylvania roadways,” a piece of information participants reported as particularly salient. A Maryland participant also supported using statistics, believing they would “scare people” and thus make the PSA more memorable.

Conversely, video PSAs with lighthearted tones sometimes received negative reception, being described as “childish” or “corny.” Comments on example infographics primarily centered on simplicity and clarity. Beyond content, participants suggested technical improvements for video PSAs, such as using subtitles for voiceovers, creating versions in multiple languages, and adding attention-grabbing audio like squealing tires or honking horns.

The overarching theme of participants’ comments on outreach and education efforts was that SDMO PSAs should not only explain what drivers are required to do but why they should follow the law. The PSAs should show both the legal and personal consequences of breaking the law and demonstrate how choosing not to follow the law could impact others.

Observational Video Data Collection and Analysis

Self-reported data, such as insights from the focus groups, offer drivers' opinions and beliefs, while observational data provide evidence of actual behavior. To examine the differences between self-reported and objective measures and to identify other factors influencing driver behavior when approaching stopped vehicles, an observational study was conducted. Using traffic camera footage from 13 states, the University of Maryland Center for Advanced Transportation Technology (UMD CATT) applied its Object Detection and Tracking (ODT) software system to estimate compliance rates with SDMO laws. Data were collected over a 12-month period (however, not all states contributed data for the entire duration). Aggregate data from all states is presented in the following section; results are also presented at the state level in Appendix F.

Methods

Study Enrollment. Thirteen states were recruited to participate in the observational data collection. The states that were targeted had either participated in previous SDMO observational data collection efforts with UMD CATT and/or were states where focus groups were conducted as part of this study. Recruitment efforts began in April 2024 with an email to target states. The initial email included a summary document that explained the study's process and requirements (Appendix G) and requested a follow-up call with state representatives to discuss potential participation. If no response was received, we sent a follow-up email or identified and contacted other state representatives to encourage participation.

Westat and the UMD CATT successfully scheduled meetings with all 13 states to discuss their participation in the project. Although the initial plan was to collect data from 10 states, all 13 states that were approached expressed interest and were subsequently enrolled.

During discussions with state representatives, insights were gained regarding the capabilities and limitations of their existing traffic camera footage. Many states do not routinely record footage, primarily for litigation-related reasons. For these states, representatives indicated permission to access their live camera feeds for recording, with some even offering further assistance in identifying suitable locations and incidents.

Data Collection. Data collection was composed of two components:

1. **Traffic Video Footage:** Participating agencies' Transportation Management Centers (TMCs) framed and recorded video of traffic passing real-world incident scenes, following the guidelines outlined in Appendix G. These

recordings enabled the ODT software to automatically analyze vehicle behavior, specifically lane changes and speed reductions, using a behavior recognition algorithm. No control was imposed on the selection of incident times or locations, other than limiting the inclusion to those for which video processing could be conducted accurately to count and classify vehicles for SDMO law compliance.

2. **Contextual Event Data:** For each recorded event, additional contextual information was documented. This included the location, time of day, environmental conditions, roadway characteristics, and specific details about the incident scene, such as the type of responders present (e.g., law enforcement, fire services, EMS, or towing personnel).

Data Capture. Data capture employed the TMC's pole-mounted closed-circuit cameras. Cameras were mounted high above the roadway, allowing an elevated view of upstream traffic as it approached the incident scene. A typical installation of these cameras is shown in Figure 3, and a typical view from a pole-mounted camera is provided in Figure 4. Video footage was obtained through two methods: (a) directly recorded by the TMCs, which then transferred the video files to UMD CATT for processing, or (b) captured by UMD CATT using screen recording software. Note that in the first capture method, the agency, using their TMC operations staff, identified the incidents they thought met the SDMO video capture criteria and recorded video for UMD CATT. For the second capture method, UMD CATT was provided access to agency CCTV monitoring systems where student and professional staff researchers monitored agency transportation networks in real time, identified incidents that appeared to meet the SDMO video capture criteria, and recorded using screen recording software. In some cases, UMD CATT researchers were able to work with agencies and their law enforcement counterparts to schedule video capture during routine speed enforcement operations. The reason UMD CATT researchers were involved in video capture is due to the fact that the majority of agencies do not, by policy, record CCTV camera video.

Video Data Processing—ODT. The ODT software was developed by UMD CATT to specifically analyze video footage for compliance with state SDMO laws. The ODT system was validated as part of UMD CATT's participation in a federal research effort to investigate first responder and road worker safety technologies (Federal Highway Administration, in press). Additional technical details regarding the ODT system and its implementation as part of the current study as well as previous research efforts are provided in Appendix H.



Figure 3. Typical Installation of a Pole-Mounted Traffic Camera (Source: Federal Highway Administration)

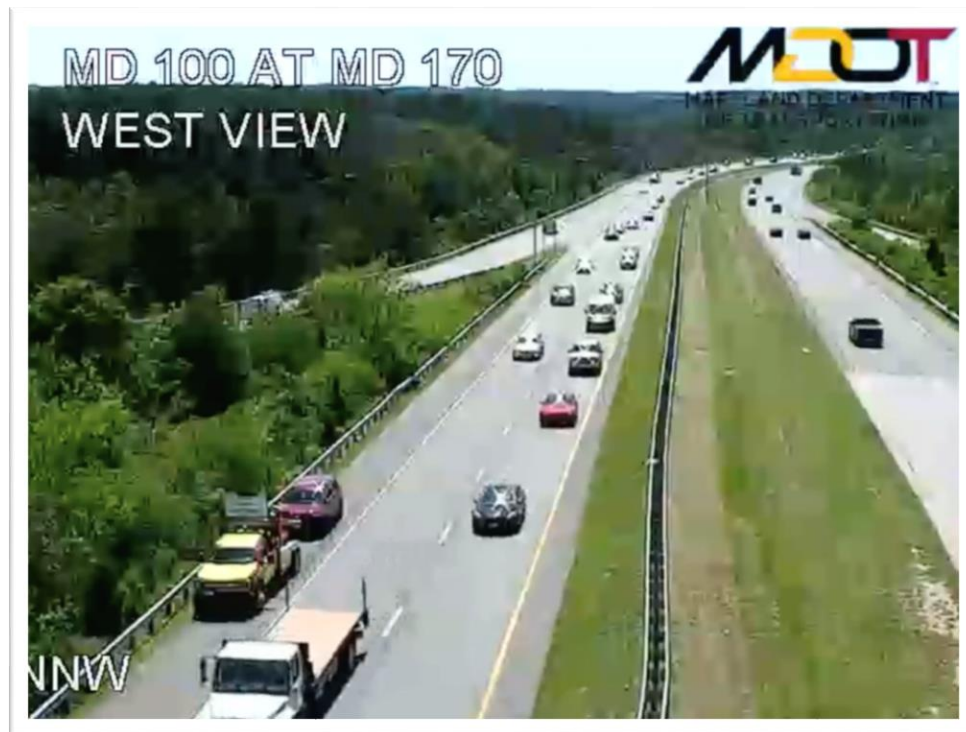


Figure 4. Upstream View of Incident Scene from Maryland DOT Closed-Circuit Television (Source: Maryland DOT)

The software system was designed around three primary challenges: object detection, object tracking, and assessment of SDMO law compliance. In the ODT software, a Faster Regions with Convolutional Neural Network features (F-RCNN) model was used

for object detection and classification (passenger car, medium/heavy trucks). For object tracking, a DeepSORT model was adopted. Finally, for object localization on the world coordinate system a simple linear homography method was adopted that relies on manual matching of a handful of fixed features in the camera field of view with the same identifiable features in the ortho-rectified birds-eye-view aerial image of the area of interest.

SDMO law compliance detection was based on (a) the analysis of vehicle position relative to specific lanes and proximity to a vehicle at a roadside incident, (b) the relative speed of the vehicle throughout the framed portion of the footage, and (c) the state law regarding the specific behavioral requirements of the driver when passing the stopped vehicle. Figure 5 illustrates the algorithm's decision tree. The algorithm's logic was structured around four related classifications:

- Whether a passing vehicle was determined to be subject to the SDMO law (i.e., the stopped vehicle it was passing was protected under the law)
- Whether the passing vehicle was judged to have moved over (partially or completely into the adjacent lane)
- Whether the vehicle was found to have slowed down, regardless of whether it moved over, and by what percentage
- Whether the vehicle was found to have both slowed down and moved over (partially or completely) to be compliant with state laws that require both actions

The ODT software cannot always reliably calculate the absolute speed of vehicles; however, it can reliably estimate ratio change in speed. Thus, while many states require a specific absolute speed (e.g., 10 mph or 20 mph below the posted speed limit) to be in compliance with the law, the current study used an ODT-calculated speed reduction of 20% (e.g., from 60 mph to 48 mph, or from 70 mph to 56 mph) as a proxy for compliance with the “slow down” component of various states’ requirements. Thus, a vehicle was designated as compliant (as illustrated in Figure 5) by moving over or by reducing its speed by more than 20% (for states that require either action), or by performing both move over and speed reduction actions (for states that require both to be compliant). Separate measurements and reporting of move over actions and speed reductions were used to offer additional insights into compliance. The ODT output allowed such variations in statutes to be considered when identifying specific state compliance rates. To account for the fact that not all states mandate a specific speed reduction amount and to determine if drivers were reducing their speed at all, a secondary analysis was performed, which examined what percentage of vehicles reduced their speed by at least 10% (e.g., from 60 mph to 54 mph, or from 70 mph to 63 mph).

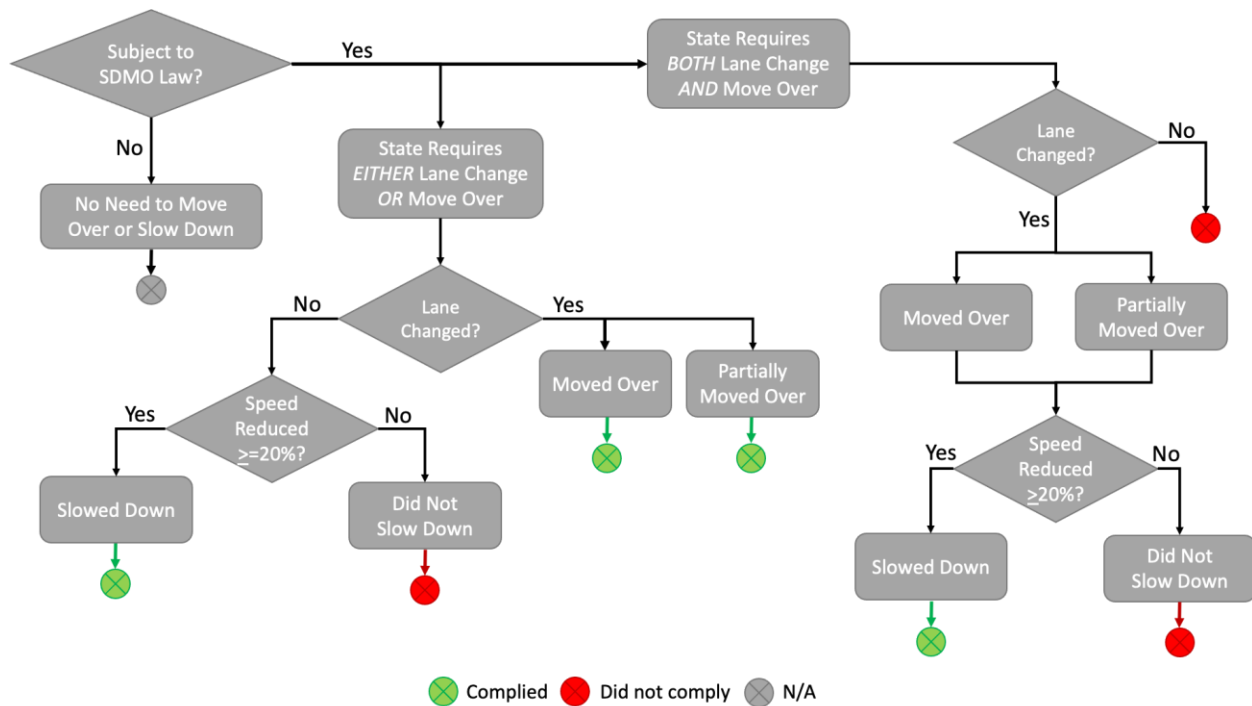


Figure 5. Diagram of SDMO Law Compliance Detection Algorithm

It should be noted that the analysis did not assess whether drivers who failed to move over actually had the opportunity to do so. Such judgements would have required data on drivers' perceptions, which were not captured; this issue is discussed further in the Limitations section.

When implemented, the algorithm was confronted with situations where a definitive determination of speed reduction could not be made. These cases were documented in the dataset. In cases where the slowdown status was unknown but a vehicle did move over, compliance with the SDMO law was still achieved for states requiring either a speed reduction or lane change; thus, the unknown slow down status did not influence the estimates. However, when speed reductions could not be determined, data were not included in rate calculations for states requiring both a move over and speed reduction action to achieve compliance. Table 5 provides a summary of state SDMO compliance requirements.

The following conditions should be met for the videos to be processed by the ODT software:

- A viewing angle of at least 15° should be maintained by the highway camera to prevent occlusions in the field of view.
- The road should be free of objects (such as bridges or large road signs) that might obstruct important parts of the roadway.

- The camera's location (latitude and longitude) must be provided, with accuracy within 30 meters.

Table 5. Characteristics of State Sample: Fatality Data and SDMO Law Components

	Move over OR slow down	Slow down AND move over	Specific Speed Reduction Required^c
California	X		
Florida	X		20 mph below posted speed limit
Maryland	X		
Michigan		X	10 mph below posted speed limit
Minnesota	X		
Nevada		X	
New York	^a		
North Carolina	X		
Pennsylvania	X		20 mph below posted speed limit
Tennessee	X		
Texas	X		20 mph below posted speed limit
Virginia	X		
Washington		X	10 mph below posted speed limit; 50 mph if speed limit ≥ 60 mph

a. New York's law instructs drivers to use "due care," the definition of which includes moving over but does not explicitly require slowing down.

b. Source for fatalities is Emergency Responder Safety Institute. (n.d.). Struck By Vehicle Fatality Incidents Reports; retrieved from <https://www.respondersafety.com/news/struck-by-incidents/yearly-fatality-reports/>

c. Several states have different requirements applicable only on lower speed roads (e.g., posted speed limit ≤ 25 mph), which are not shown.

Participating states were made aware of these requirements at the outset of the study. Although the algorithm can be applied to videos that do not meet all these conditions, consistent accuracy is not always guaranteed. Although some videos acquired for this study were not aligned with all the aforementioned conditions, they were still successfully processed by the ODT software. Approximately 40% of the videos provided by states could not be used in the final analysis because of various issues.

The ODT analysis included the use of two types of variables: (a) output from the ODT process (Table 6), and (b) variables derived from the captured videos (Table 7). Detailed descriptions of the ODT output variables are included in Table 6 below.

The determination of whether a vehicle had moved over (fully or partially) was made by tracking a single point denoting its center, which was determined from the center of the bounding box generated by the ODT algorithm.

Speed reduction was assessed as a percentage decrease. If a vehicle within the tracked frame reduced its speed by 20% or more from its initial measurement, it was marked as having slowed down. As noted previously, the 20% reduction threshold was used as a proxy for compliance with the slow down component of state laws requiring a specific speed reduction. (As discussed previously, depending on the initial speed prior to slowing down, some state laws might actually require a larger speed reduction to be in compliance with the law.)

Table 6. ODT Output Variables

ODT Output Variables	Description
Vehicle class	Vehicle classification: For purposes of ODT processing and based on the discernible size of the vehicle tracked, <i>passenger vehicle</i> refer Classes 1-3 (cars, pickup trucks, vans, minivans, and SUVs), whereas <i>medium/heavy trucks</i> refer to Classes 4 and higher
Eligibility for review	Passing vehicles determined to be ineligible for review (e.g., the vehicle was not in the lane adjacent to the stopped vehicle)
Fully moved over	Passing vehicles identified as having fully shifted into the next lane, or specifically those with more than 60% of the vehicle occupying the adjacent lane
Partially moved over	Passing vehicles that partially moved over, meaning 25%–59% of the vehicle was in the adjacent lane
Speed (estimated)	Passing vehicle speed, meaning the estimated speed across detected video frames
Slowed down	Passing vehicle speed reduction of 20% or more. Secondary analyses were also conducted with a speed reduction threshold of 10%.
Did not move over	Passing vehicles that did not move over or slow down
Did not move over but slowed down	Passing vehicles that did not move over but did slow down
Did not move over but speed unknown	Passing vehicles that did not move over and had an unknown slow down status
Moved over and slowed down	Passing vehicles that moved over and slowed down by 20%

To evaluate the algorithm’s accuracy, bounding boxes were overlaid onto the base video for each vehicle that passed through the frame. A bounding box is used to identify and locate objects within an image or video frame. This visual aid allowed the algorithm’s results to be reproduced by an informed observer. For this study, a small sample of videos was evaluated to verify that ODT’s accuracy during testing was consistent with its development and pilot phases. The ODT accuracy was determined through partial manual tabulation of a sample of incident videos. Validation of absolute speed and move over classifications is described in Appendix I. When considering a

composite of slow down and move over maneuvers (the main outcome measure for the current study), the manual validation resulted in accuracies ranging between 66% and 100% (average 94%) for different recordings across a sample of 85 recordings.

The derived independent variables proposed for this analysis were related to responder scene characteristics, roadway or location context, situational elements, and policy factors. These variables are listed in Table 7.

Table 7. Derived Variables

Derived variables	Description
Location	The state and roadway location descriptions, as well as latitude and longitude coordinates, were obtained for each of the 183 recordings.
Urban/rural	Each video recording location was assigned an “Urban” or “Rural” designation based on the definitions established by the U.S. Census Bureau. Population density and land use information were used to define urban geographies, with remaining locations classified as rural. A shapefile containing the polygon boundaries of these geographies was available on the Census website and each video location was classified using a spatial search that was performed on the camera latitude/longitude.
Number of lanes	The number of travel lanes in the direction of the incident was determined from the video, with values ranging from 2 to 5.
Time and date	The date and time of day were recorded from the video metadata. Incidents ranging from April 2024 through June 2025 were included.
Duration	The lengths of the videos varied from less than 5 minutes to more than 45 minutes. Each video was truncated to include only the time span during which a qualifying incident was observed.
Event type	Events were categorized as either involving disabled vehicles, collisions, or law enforcement activities.
Scene characteristics	Characteristics were identified through video review, including the presence of DOT/safety service patrol/tow trucks, police, fire, or EMS/ambulance responders. A weather indicator was also assigned, with 166 incidents labeled “Clear,” 4 labeled as “Reduced Visibility,” and 4 incidents labeled “Fog” and “Rain.”
Traffic flow rate	This variable was derived from the number of vehicles observed traveling in the same direction of travel as the incident being recorded, the video duration, and the number of lanes.
Camera direction	The direction in which the camera was facing (oncoming or outgoing traffic) was recorded.
Move direction	The direction (left or right) from which vehicles needed to change lanes to comply was recorded.

The main outcome measure was defined as the indication of whether a particular vehicle complied with the SDMO law. From this outcome, a compliance rate was calculated as the proportion of vehicles within an observed group that were found to

comply with the SDMO law. Generally, this was calculated as the number of vehicles that took the action required by the relevant state's law (i.e., slowed down and/or moved over) divided by the total number of applicable vehicles (i.e., vehicles that were in the lane adjacent to the incident scene, prior to moving over if applicable).

Using ODT processing of individual vehicles, the following count variables were identified:

- V_s is all observed vehicles of a segment s . The compliance calculations are defined and repeated for three separate segments s as passenger vehicles, heavy vehicles, or the summed total of passenger vehicles and heavy vehicles.
- V_{sNA} is the count of vehicles in segment s not subject to SDMO law compliance, such as not in the lane adjacent to the incident.
- V_{sMOSD} is the count of vehicles in segment s subject to SDMO law compliance that did move over and did slow down.
- V_{sMONSD} is the count of vehicles in segment s subject to SDMO law compliance that did move over but did not slow down.
- V_{sMOSDU} is the count of vehicles in segment s subject to SDMO law compliance that did move over, and for which slow down status could not directly be measured. V_{sMOSDU} can further be divided into V_{sMOSDU_SD} and V_{sMOSDU_NSD} :
 - V_{sMOSDU_SD} is the count of vehicles in segment s subject to SDMO law compliance that did move over or partially move over, and for which slow down status could not directly be measured, but the vehicle did slow down.
 - V_{sMOSDU_NSD} is the count of vehicles in segment s subject to SDMO law compliance that did move over or partially move over, and for which slow down status could not directly be measured, but the vehicle did **not** slow down.
- V_{sNMOSD} is the count of vehicles in segment s subject to SDMO law compliance that did not move over but did slow down.
- $V_{sNMONSD}$ is the count of vehicles in segment s subject to SDMO law compliance that did not move over and did not slow down.
- $V_{sNMOSDU}$ is the count of vehicles in segment s subject to SDMO law compliance that did not move over, and for which slow down status could not directly be measured. $V_{sNMOSDU}$ can further be divided into $V_{sNMOSDU_SD}$ and $V_{sNMOSDU_NSD}$:
 - $V_{sNMOSDU_SD}$ is the count of vehicles in segment s subject to SDMO law compliance that did **not** move over, and for which slow down status could not directly be measured, but the vehicle did slow down.

- $V_{sNMOSDU_NSD}$ is the count of vehicles in segment s subject to SDMO law compliance that did **not** move over, and for which slow down status could not directly be measured, but the vehicle did **not** slow down.

Figure 6 shows the total number of vehicles traversing a segment as a function of all of its components (i.e., vehicles that slowed down and/or moved over, vehicles that were required to slow down and/or move over but did not do so, and vehicles not required to slow down or move over because they were not in the lane adjacent to the incident scene).

$$V_s = V_{sNA} + V_{sMOSD} + V_{sMONSD} + V_{sMOSDU_SD} + V_{sMOSDU_NSD} + V_{sNMOSD} + V_{sNMONSD} + V_{sNMOSDU_SD} + V_{sNMOSDU_NSD}$$

Figure 6. Relationship Between Variables Used to Estimate SDMO Compliance

To estimate the compliance proportion for a particular segment s , the formula in Figure 7 can be used. It includes the sum of all count groups in compliance in the numerator and divides by the total number of vehicles subject to the SDMO law in the denominator.

$$CP_s = \frac{V_{sMOSD} + V_{sMONSD} + V_{sMOSDU_SD} + V_{sMOSDU_NSD} + V_{sNMOSD} + V_{sNMOSDU_SD}}{V_s - V_{sNA}}$$

Figure 7. Formula for Calculating SDMO Compliance Proportion

The V_{sMOSDU_SD} and V_{sMOSDU_NSD} terms in the numerator for this estimate are not directly measured but their sum is V_{sMOSDU} , which is known. The $V_{sNMOSDU_SD}$ term cannot be measured directly, therefore it is included here merely as an error term. In this study no assumptions or imputations were attempted to estimate number of vehicles with unknown slow down status that indeed had completed a slow down maneuver.

Secondary outcome measures of potential interest are the compliance rates for move over actions alone (MOP_s) and the compliance rates for speed reduction alone ($SDOP_s$). These two formulas are shown in Figure 8.

$$MOP_s = \frac{V_{sMOSD} + V_{sMONSD} + V_{sMOSDU}}{V_s - V_{sNA}}$$

$$SDOP_s = \frac{V_{sNMOSD} + V_{sNMOSDU_SD}}{V_s - V_{sNA}}$$

Figure 8. Formulas for Estimating SDMO Law Compliance Strictly for Vehicles That Moved Over and for Vehicles That Only Complied Through at Least 20% Slow Down

While the overall compliance proportion (CP_s) is the main outcome measure for the current study, the move over proportion (MOP_s) is also reported for specific incidents, as in some states moving over is by definition fully compliant with the SDMO law irrespective of whether a vehicle also slows down. MOP_s is calculated as the number of vehicles that moved over divided by the total number of vehicles to which the SDMO law was applicable. The $SDOP_s$ is the difference between the CP_s (total compliance proportion) and MOP_s (move over proportion) and provides a means to understand how frequently drivers are slowing down without moving over.

Limitations of Captured Video. The research team acknowledges that the quality and consistency of video footage from TMC highway cameras posed technical challenges for processing through the ODT system. Several factors may have affected the successful capture of videos suitable for ODT processing. These factors include the following:

- Proper framing of the video to ensure an adequate view of approaching traffic
- Sufficient lighting (daytime, nighttime lighting, weather conditions) to allow the ODT system to identify individual vehicles
- Visual obstructions (e.g., roadway signage, topography) that might have impacted the camera's view and inhibited continuous vehicle tracking
- Responder vehicles blocking multiple traffic lanes
- Congested low traffic speed (e.g., "stop and go" conditions), which made SDMO compliance irrelevant

It is important to note that the sample of videos examined in the current study cannot be used to calculate statewide nor national compliance rates with SDMO laws. The evaluated situations were sampled from specific incidents that happened to occur within view of existing TMC cameras and cannot be considered fully representative of driving conditions nationally nor in any participating state.

Study Recording Capture Summary. Thirteen participating transportation agencies provided a total of more than 15 hours of processable video collected during 169 unique recordings from 106 unique locations (Table 8). Note that a unique location may have multiple recordings associated with it, thus there is not a one-to-one correspondence between the number of recordings and the number of unique locations. Processing was restricted to time periods during which an active event was occurring (i.e., a disabled vehicle or an incident responder was present).

Table 8. Summary of Data Obtained from Participating Agencies

Agency	State	Roads Included	Data Collection Period	Number of Total Recordings**	Number of Unique Locations	Video Length (Total Minutes)
Caltrans	CA	I-710	9/24–5/25	4*	2	27
FDOT	FL	I-95	9/24–4/25	20	16	62
MDOT	MD	I-70	9/24–6/25	6*	1	29
MIDOT	MI	I-94	10/24–11/24	4*	2	58
MNDOT	MN	MN-610, MN-47, MN-77, I-94, I-494	10/24–4/25	17	8	67
NDOT/FAST	NV		9/24–9/24	1*	1	25
NYSDOT	NY	I-490	6/24–11/24	1*	1	5
NCDOT	NC	I-540, I-40, I-885, I-87, I-85	6/24–6/25	35	26	271
PennDOT	PA	I-81, PA-581, I-83, I-78, I-283	8/24–11/24	25	8	130
TDOT	TN	SR-385, I-75, US-27, SR-153, US-31	1/25–5/25	20	11	156
NTTA	TX	Chisholm Trail Pkwy, Sam Rayburn Tollway	5/24–11/24	26	21	67
VDOT	VA	I-95	8/24–1/25	6*	4	33
WSDOT	WA	I-205, SR-14, I-5	6/24–7/24	5*	5	16

*States with fewer than 10 total recordings were considered to have a low sample size, and thus the resulting state-level estimates of driver behavior should be interpreted with caution.

**The total number of recordings shown in this table is 170. However, the video received from Nevada was deemed unsuitable for analysis; therefore, the total number of processable recordings was 169.

Characteristics of Collected Data. Between June 2024 to June 2025, more than 100 hours of video were collected from 13 states, of these approximately 15 hours were deemed suitable for processing. Videos recorded by state DOTs and research team members shared several common characteristics that contributed to their successful processing via the ODT software solution. The specific characteristics are outlined below:

- **Clear Conditions**—The majority of videos were captured in generally clear weather conditions and without rain, fog, or other visual obstructions/impediments to the highway camera view of the scene. Clearer conditions enabled a better view of the incident and allowed for more accurate object detection via the ODT algorithm. Additionally, adverse weather conditions often result in slower, stop-and-go traffic, which reduces the likelihood of motorists needing to take SDMO actions.
- **Daytime**—Due to the nature of highway camera technology, daytime videos typically include better visual resolution of incident scenes and passing motorists. Nighttime or low light situations normally result in large, visual headlight glare on the camera sensor due to its inherently poor low light sensitivity. Lower light conditions often result in unfavorable video that is not processible via the ODT software due to the difficulty in discerning individual objects within each video frame. Consequently, 96% of the videos processed were in daytime.
- **Low-to-Medium Traffic Volume**—SDMO laws are inherently designed to target motorists passing incident scenes at highway speeds. However, motorist collisions with stopped vehicles that occur at or near the posted speed limit are typically more severe and life threatening. Thus the research team sought to limit analyses to situations in which traffic was moving at free-flow speeds, unaffected by any constraints imposed by volume.
- **Deployment of Fire/EMS Vehicles in Formation**—Incidents involving collisions more commonly occur in travel lanes and often remain in those lanes. As a result, typical responder vehicles, notably fire/EMS, generally setup “blocking” positions in advance of the incident scene itself and can cover several lanes of traffic. This typically creates slow, stop-and-go traffic conditions, which again may remove the need for SDMO actions by passing motorists. As a result, these types of incident scenes were excluded from the analysis.
- **Urban Environments**—Urban/suburban environments enjoy a larger deployment of traffic cameras per mile compared to rural locations, and this higher density of cameras provides greater opportunities for capturing videos of incident scenes. As a result, most videos captured and processed through the ODT system occurred in urban/suburban environments (92%). All sites

examined were Interstate highways, state highways, or limited-access toll roads.

Findings

Findings from this study are based on an analysis of both aggregate and state-level data. While the main body of this report discusses the consolidated findings, detailed results from each participating state can be found in Appendix F.

To provide a summary of observed SDMO behavior and performance in processed videos from across different states, this section aggregated metrics compiled from processed videos across multiple states. The format used to present the information is consistent with that used in the state-specific sections.

Across 169 videos, 12,365 vehicles were subject to SDMO requirements. Of these target vehicles, 60% (n=7,411) either fully (n=6,184; 50%) or partially (n=1,227; 10%) engaged in a move over maneuver as part of their response when passing a stopped vehicle on the side of the road. The remaining 40% (n=4,954) did not make any attempt to move over (see Figure 9).

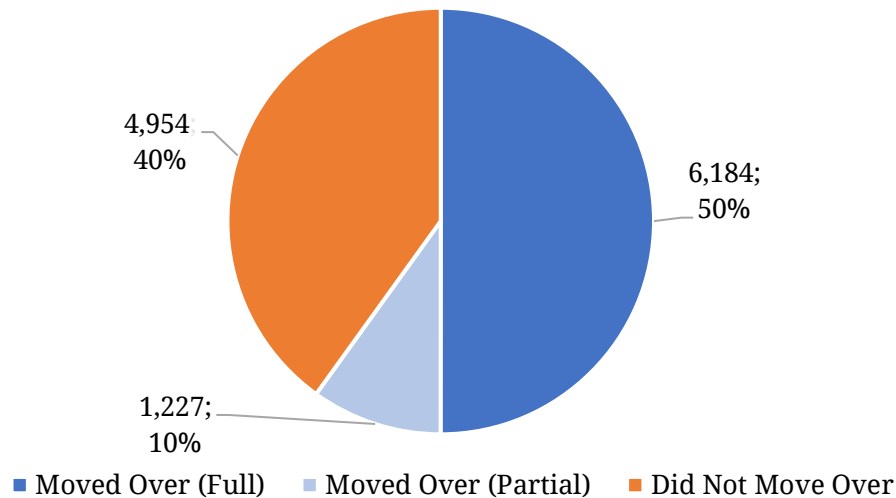


Figure 9. Vehicles That Moved Over as a Proportion of All Target Vehicles in All States

Out of all the target vehicles in all states, only 9% (n=1,162) slowed down by at least 20% as part of their response when passing a stopped vehicle on the side of the road (see Figure 10). When lesser speed reductions were also counted, 2,155 vehicles (17% of the total) reduced their speed by at least 10%.

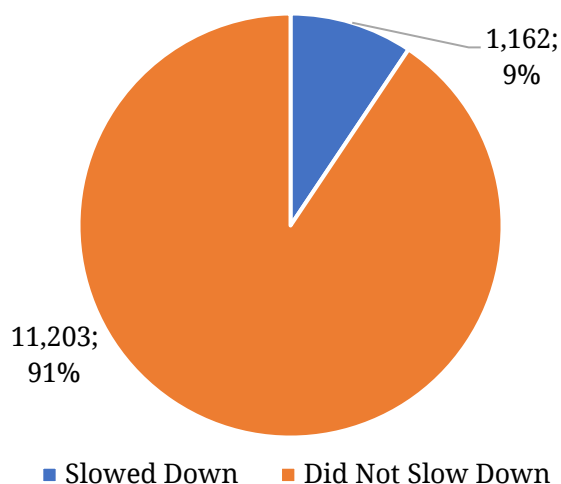


Figure 10. Vehicles That Slowed by at Least 20% as a Proportion of Target Vehicles in All States

Among target vehicles in all states, 55% (n=6,775) performed move over maneuvers without also slowing down. In contrast only 4% (n=526) of vehicles were observed slowing down without also moving over. Additionally, very few vehicles both slowed down and moved over (n=636; 5%). The remaining 36% of target vehicles (n=4,428) neither slowed down nor moved over (see Figure 11). Note that these percentages do not necessarily indicate compliance, as the specific actions required to comply with the law differed between states. However, those that neither slowed down nor moved over were always noncompliant irrespective of the state.

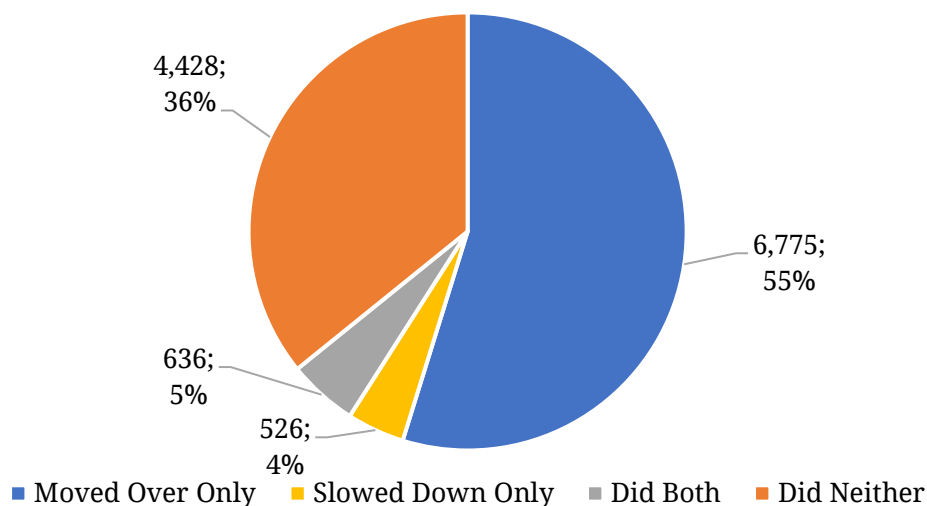


Figure 11. Aggregate SDMO Performance Among Target Vehicles in All States

Figures 12 and 13 show the same behavior metrics separately for passenger vehicles and heavy trucks, respectively. Note that the total numbers of vehicles in analyses of specific vehicle types do not add to the total number of vehicles in aggregate

analyses of all vehicles. This is because the ODT software was unable to classify vehicle type for some passing vehicles. When analyzing performance by passing vehicle type, heavy trucks demonstrated a slightly higher rate of slowing down and/or moving over (n=2,076; 70%) relative to passenger vehicles (n=5,238; 63%).

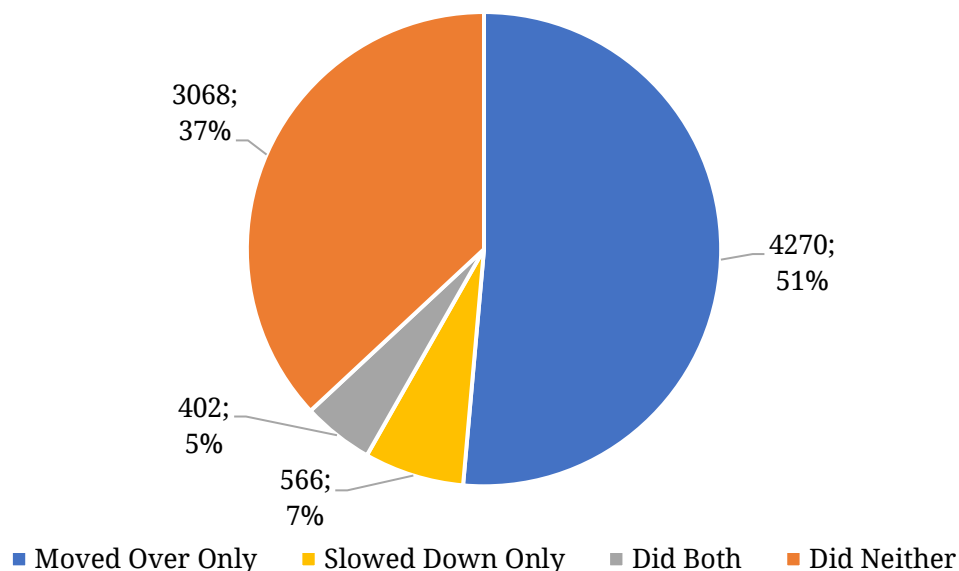


Figure 12. Aggregate SDMO Performance Among Target Vehicles in All States: Passenger Vehicles

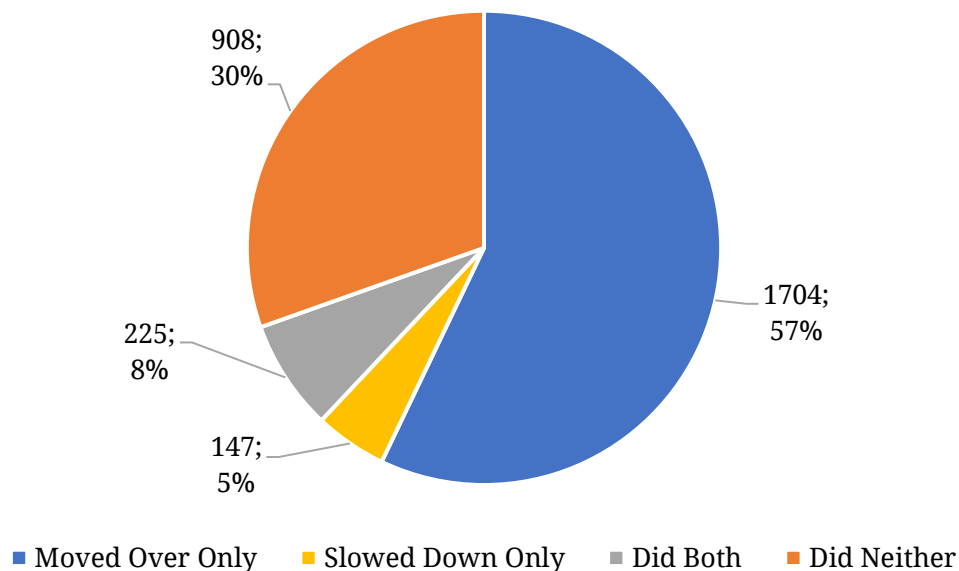


Figure 13. Aggregate SDMO Performance Among Target Vehicles in All States: Heavy Trucks

When analyzing the behavior of passing vehicles in relation to the type of responder or responders present, vehicles demonstrated varying propensity for slowing down and/or moving over as they approached the scene (Figure 14). When only police were present, 66% of all passing vehicles slowed down and/or moved over. The vast majority of these only moved over, with few slowing down alone or in combination with moving over. When a tow truck or DOT/safety service patrol vehicle alone was present on the side of the road, only 58% of passing vehicles slowed down and/or moved over, again with most only moving over and few slowing down. Vehicles observed in the study were by far the most likely to both slow down and move over when EMS alone were present; however, this was based on a very small sample of observations (only 18 passing vehicles) and thus must be treated with extreme caution. Vehicles were slightly more likely to slow down and/or move over when multiple responder types were present than when only police or only towing/DOT/safety service patrol were present, again with the vast majority only moving over and few slowing down or both slowing down and moving over. It was not possible to examine behavior of passing drivers when fire trucks alone were present because they were never the only responder on the scene in any video obtained for the study. (The multiple responders category includes some instances in which fire trucks were present alongside other types of responders.) Finally, the numbers of vehicles shown here add to fewer than the total numbers of vehicles in aggregate analyses of all vehicles because the ODT software was unable to classify the type of responder present in some cases.

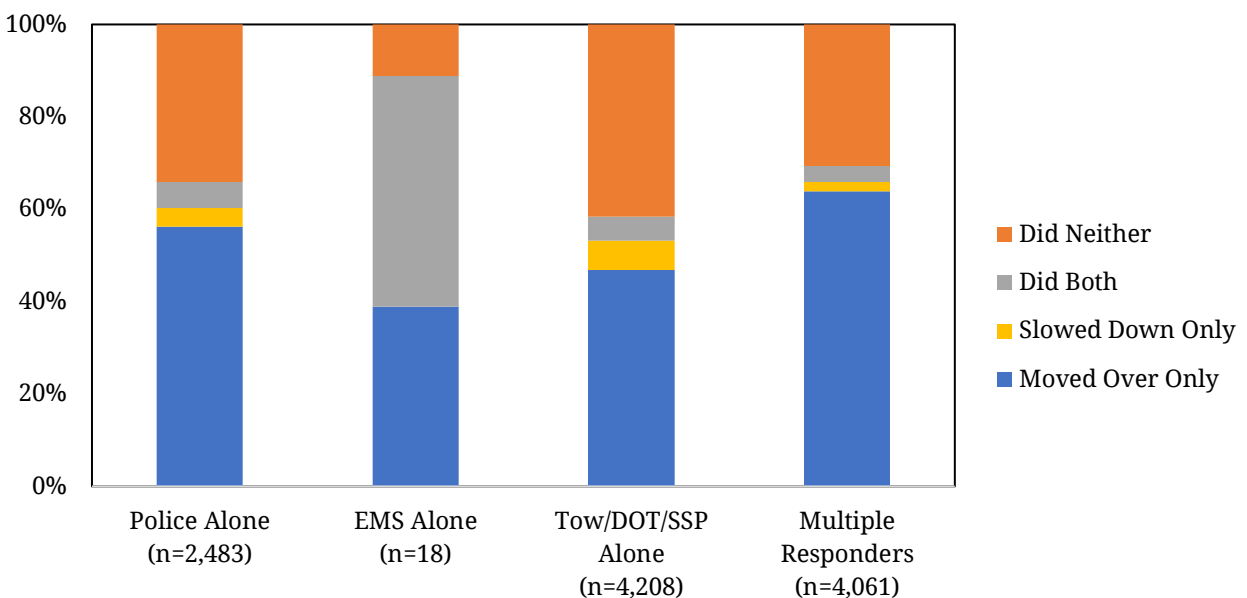


Figure 14. Aggregate SDMO Performance Among Target Vehicles in All States by Responder Vehicle Type

Table 9 provides a summary of observed SDMO metrics for the participating states and as an aggregate. Note that the compliance rate reported is based on comparison of drivers' observed behaviors to the specific requirements in the state (e.g., moving over without slowing down is counted as compliant in states that only require drivers to slow down if unable to move over, but is not counted as compliant in states that require all drivers to slow down.) Thus, because the data are not designed to be representative, compliance cannot meaningfully be summed or averaged across states, thus no summary statistics for compliance is reported for the aggregate of all states.

Table 9. Summary Statistics of SDMO Performance by State.

State	Number of Vehicles (Recordings)	Moved Over Only	Slowed Down Only	Moved Over and Slowed Down	Did Neither	Compliance Based on State Law
CA	417 (4)	82%	0%	11%	7%	93%
FL	783 (20)	51%	3%	3%	43%	57%
MD	184 (6)	44%	7%	6%	43%	57%
MI	1271 (4)	54%	2%	1%	43%	1%
MN	590 (17)	43%	2%	10%	45%	55%
NC	3,887 (35)	61%	6%	6%	27%	73%
NY	81 (1)	9%	0%	0%	91%	9%
PA	1,424 (25)	49%	3%	5%	43%	57%
TN	1,952 (20)	47%	3%	5%	45%	55%
TX	950 (26)	54%	10%	8%	28%	72%
VA	692 (6)	64%	0%	2%	34%	66%
WA	78 (5)	33%	9%	21%	37%	21%
Aggregate	12,365 (169)	55%	4%	5%	36%	N/A

Table 10 shows correlations of various factors with the proportions of vehicles that slowed down and/or moved over at each incident scene in the observational video dataset.

Correlations indicate that passing vehicles were less likely to move over, and more likely to neither slow down nor move over, when the responder present at the scene was a tow truck or DOT/safety service patrol vehicle. Both of these correlations were statistically significant at the 90% level. The number of lanes at the site was negatively associated with the proportion of vehicles that both slowed down and moved over, which was also significant at the 90% confidence level.

When examining behaviors of passenger vehicles and heavy trucks separately, a higher numbers of lanes, the presence of police, and the presence of multiple types of

responders at the incident scene were positively correlated with passenger vehicles moving over, all of which statistically significant at the 95% confidence level. The presence of EMS was positively correlated with passenger vehicles both slowing down and moving over, but was also positively correlated with heavy trucks neither slowing down nor moving over, both of which were significant at the 90% confidence level. Presence of tow trucks or DOT/safety service patrol vehicles was positively correlated with heavy trucks slowing down, which was significant at the 90% confidence level.

Table 10. Correlations of Slow Down, Move Over Behaviors with Various Factors.

	# Lanes	Total Vehicle Flow	Target Vehicle Flow	Police	EMS	Tow/DOT/SSP	Multiple Responders	MO	SD	Both	Neither	MO – Car	SD – Car	B – Car	N – Car	MO – Truck	SD – Truck	B – Truck	N – Truck
# Lanes	1																		
Total Vehicle Flow	0.464**	1																	
Target Vehicle Flow	0.130*	0.520**	1																
Police	0.196**	0.270**	0.071	1															
EMS	-0.045	-0.103	-0.136*	-0.131*	1														
Tow/DOT/SSP	-0.042	0.048	0.048	-0.212**	0.051	1													
Multiple Responders	0.101	0.156**	0.025	0.524**	0.205**	0.434**	1												
MO	0.075	-0.073	-0.084	0.049	-0.024	-0.137*	0.005	1											
SD	-0.095	-0.014	-0.040	-0.090	-0.036	0.049	-0.048	-0.082	1										
B	-0.137*	-0.112	-0.017	-0.068	0.089	0.007	-0.060	-0.103	0.432**	1									
N	-0.044	0.089	0.092	-0.028	0.018	0.129*	0.009	-0.974**	-0.115	-0.084	1								
MO – Car	0.213**	0.032	0.017	0.292**	-0.017	-0.119	0.179**	0.116	-0.207**	-0.103	-0.075	1							
SD – Car	-0.122	0.012	-0.083	-0.119	-0.043	0.086	-0.084	-0.080	0.391**	0.169**	0.005	0.036	1						
B – Car	-0.116	-0.071	0.008	0.031	0.139*	-0.115	-0.112	-0.064	0.434**	0.804**	-0.095	-0.159**	0.092	1					
N – Car	-0.008	-0.010	0.048	-0.098	0.004	0.040	-0.017	0.005	-0.279**	-0.279**	0.067	-0.591**	-0.783**	-0.240**	1				
MO – Truck	0.116	0.019	0.081	0.102	-0.109	-0.061	0.037	0.151**	-0.168**	-0.181**	-0.107	0.593**	-0.274**	-0.172**	-0.337**	1			
SD – Truck	0.019	0.008	-0.036	-0.101	-0.006	0.143*	-0.025	-0.126	0.403**	0.390**	0.026	-0.281**	0.818**	0.227**	-0.224**	-0.316**	1		
B – Truck	-0.010	-0.014	0.092	0.114	-0.070	-0.030	0.068	-0.029	0.190**	0.526**	-0.058	0.051	0.227**	0.473**	-0.346**	-0.250**	0.033	1	
N – Truck	-0.120	-0.015	-0.113	-0.109	0.150*	-0.002	-0.062	-0.062	-0.166**	-0.337**	0.124	-0.464**	-0.301**	-0.224**	0.652**	-0.670**	-0.260**	-0.341**	1

Notes: MO: move over only; SD: slow down only; B: both slow down and move over; N: neither slow down nor move over. Car denotes passenger vehicles; Truck denotes heavy trucks. Vehicle flow rates are in vehicles per minute. (**) indicates statistical significance at 95% confidence level; (*) indicated statistical significance at 90% confidence level.

Discussion

This study aimed to identify promising strategies to increase motorist compliance with SDMO laws, thereby enhancing the safety of emergency response and roadside service personnel. Drawing on both qualitative and quantitative data, this discussion synthesizes key findings to directly address the project's objectives:

- Analyzing driver passing behavior
- Assessing outcomes in relation to state laws
- Determining associations of modifiable factors with compliance
- Providing insights on intervention potential

Analyzing Driver Passing Behavior

Driver behavior when passing emergency response or roadside service personnel was investigated by two complementary methods: focus groups with motorists and analysis of real-world video from traffic cameras. Comparison of analysis of driver passing behavior revealed a significant disparity between self-reported actions and observed compliance. While focus group participants consistently reported high rates of slowing down and/or moving over for stopped vehicles, particularly law enforcement and emergency responders, observational data indicated considerably lower actual compliance rates. For instance, the proportions focus group participants who self-reported moving over ranged across states from 83% to 89%, whereas observed rates in some jurisdictions were as low as 54% (though in one jurisdiction was as high as 93% in the videos examined). The discrepancy was even more pronounced for slowing down: between 67% and 83% of focus group participants in various states claimed to slow down, though the observed proportion of drivers who slowed down was 30% or lower in all states examined and lower than 20% in all but one state. These differences highlight a critical gap between drivers' perceived actions and their actual behavior.

Findings from the focus groups revealed several contextual factors influencing drivers' decisions to slow down or move over. Key cues prompting a driver response included the presence of individuals outside a stopped vehicle, hazard lights, and roadside debris. A particularly interesting finding was the emergence of the "follow the leader" phenomenon, in which drivers often mirror the actions of lead vehicles, viewing it as an indicator of unseen hazards. This behavior highlights the strong influence of perceived social norms on directing driver behavior. However, it is important to note that slowing down may often be a passive or forced response as drivers are typically compelled to reduce speed if the vehicle in front of them does so, regardless of their own assessment of the situation. In contrast, moving over requires a more intentional

decision, one that is more directly influenced by perceived social norms or the observed behavior of other drivers.

The type of stopped vehicle (e.g., law enforcement, emergency, tow truck) also played a role, with law enforcement and emergency vehicles often prompting more compliant self-reported actions due to their perceived importance and increased incident severity. Interestingly, some participants admitted to ignoring tow trucks, believing their drivers were accustomed to roadside risks. This is consistent with analysis of observational video data: drivers of passenger vehicles were more likely to move over and/or slow down when passing incident scenes with police (or multiple types of responders) present than when passing scenes with only a tow truck or other roadside assistance provider. (Notably, however, this was not observed among drivers of heavy trucks, who in observational video data slowed down and/or moved over at similar rates when passing police and when passing roadside assistance providers.) Many focus group participants described their compliance as being motivated by a sense of courtesy rather than by legal obligation when passing stopped passenger vehicles (i.e., with no incident responders present), with some drivers expressing heightened caution if women or children were present.

Situational factors, such as traffic volume and speed, also significantly influenced behavior. Many participants expressed apprehension about reducing speed, fearing rear-end collisions, and often prioritized lane changes over speed reduction, especially in heavy traffic. This suggests that while drivers understand the general concept, practical considerations and perceived safety risks in dynamic traffic environments often override full compliance. Findings from analysis of observational video lend support to this behavioral tendency as well.

Assessing Outcomes in Relation to State Laws

The assessment of SDMO compliance outcomes in relation to specific state laws revealed varying degrees of effectiveness. States with “move over OR slow down” laws, requiring drivers to move over if able and only requiring speed reduction if unable to move over, generally showed higher compliance rates in the observational data, as drivers could technically satisfy the legal requirement by performing either action. However, states with “move over AND slow down” requirements, requiring all drivers to take both actions, exhibited significantly lower compliance rates. Importantly, this does not necessarily indicate that drivers in those states are less likely to engage in either behavior; rather, identical behaviors may be classified differently depending on the state’s law. Therefore, higher compliance under a more lenient law should not be interpreted as evidence of a better safety outcome. Further research is needed to investigate the substantive safety impact of laws requiring all drivers to both slow down

and move over versus laws requiring drivers to take only one of those two actions to be considered in compliance.

Lack of detailed public awareness about individual state requirements, including the types of vehicles protected and the precise actions required, likely contribute to inconsistent driver behavior. Focus group findings showed that while many participants were vaguely aware of SDMO laws, they often lacked knowledge of specific penalties, or the exact behaviors mandated. For instance, participants in Florida and Texas were surprised to learn about specific speed reduction requirements (e.g., 20 mph below the posted limit), admitting they rarely complied with such precise mandates. This suggests that even when laws exist, a lack of clarity hinders full adherence.

Determining Associations of Modifiable Factors with Compliance

Several modifiable factors were identified and examined for their potential influence on SDMO law compliance. Public awareness emerged as a critical factor. Focus group participants in Florida, Maryland, and Texas had reported higher levels of awareness, which, although not necessarily representative of all drivers in those respective states, aligned with relatively higher observed compliance rates compared to states in which focus group participants demonstrated lower awareness of the law. This suggests that effective PI&E campaigns can positively influence awareness, which in turn can lead to improved compliance. Focus group findings also revealed that more experienced drivers tended to have greater awareness of SDMO laws, often recalling exposure through roadway signs and news media, while less experienced drivers cited driver's education as a key source. The finding that less experienced but not more experienced drivers identified driver education as a key source makes sense, as the first SDMO law in the United States was enacted in 1996, after many of the more experienced drivers would have already taken driver education but before many of the less experienced drivers would have. This generational difference highlights the value of incorporating SDMO messaging into formal education programs to reach newer drivers early.

Perceptions of enforcement and the risk of receiving a citation were associated with self-reported compliance. Most focus group participants, across all states, felt that SDMO laws are rarely enforced and perceived the risk of receiving a citation as low. This perceived lack of consistent enforcement, coupled with officers often being too busy with roadside duties to pursue violators, diminishes the deterrent effect of existing penalties. The fact that none of the three focus group participants who had been stopped for violations received citations (all three were given warnings) further reinforces this perception of low enforcement risk. This suggests that increasing the visibility and perceived likelihood of enforcement represents a modifiable factor with the potential to significantly improve compliance with SDMO laws. Additionally, several officers

described enforcement as dependent on whether a driver had the ability to move over, an observation that, while practical, also reflects a broader trend of emphasizing the move over component of the law. This framing suggests that even those responsible for enforcing SDMO laws may unintentionally reinforce the idea that moving over is the primary or only acceptable response, overlooking the requirement to slow down, which is always required in some states and offers an alternative means of compliance if unable to move over in others. This underscores the need for messaging that clearly communicates the slow down component of the law, in addition to the move over component.

Based on the observational data, the type of vehicle stopped on the side of the road had relatively little influence on whether drivers slowed down and/or moved over. The presence of police and fire vehicles showed significant correlation with driver compliance, suggesting that their authority or perceived risk strongly influences behavior in this context. However, the presence of DOT/safety service patrol/tow trucks was associated with a weakly significant but positive correlation with drivers not slowing down or moving over. Also, observational data shows that at times when only a single emergency response vehicle is present, drivers are more likely to slow down and/or move over when it is a police vehicle than when it is a roadside assistance provider such as a tow truck (66% vs. 58%, respectively). Limited observational data seems to indicate that the presence of EMS vehicles leads to the highest SDMO compliance rate (89%), though this is based on a very small amount of data and thus should be considered uncertain. When multiple responder vehicle types are present SDMO compliance rate (69%) is slightly higher than when only a single responder is present. This finding is particularly interesting, aligning with focus group feedback indicating a greater driver inclination to move over for law enforcement and when multiple emergency response vehicles are present. The data suggests that emphasizing the vulnerability of all roadside workers in PI&E is still critical, as the impact of the specific type of responder, while not negligible, is not large.

Roadway design and traffic conditions emerge as important factors influencing SDMO compliance. The number of lanes available showed a weak positive correlation with compliance, suggesting that as the number of lanes increases, drivers are slightly more likely to move over. Under light and uncongested traffic conditions, drivers have more space and time to respond appropriately to roadside emergency vehicles, which may lead to higher observed compliance rates. The positive correlation between traffic volume and compliance might simply reflect the fact that more vehicles are present, increasing the chances of observing compliant behavior. However, this trend likely holds up only to a certain point—once traffic becomes congested, the situation changes. In heavy traffic, drivers may have less room to maneuver, making it harder to comply even if they want to. So, the relationship between traffic volume and compliance is not linear and may reverse under congested conditions. These environmental factors, while not

directly modifiable, underscore the importance of clear and adaptable public messaging that accounts for varying roadway conditions.

This finding also echoes concerns raised in focus groups, where many participants expressed difficulty moving over due to the presence of other traffic and often overlooked the requirement to slow down. It may be beneficial for educational outreach to emphasize that when moving over is not possible, slowing down remains a viable and meaningful action, and in many states is required by law. Outreach messaging could also remind drivers that slowing down does not need to be abrupt—even braking gently demonstrates concern and care for the roadside workers and activates brake lights, which can alert other drivers behind them to the situation ahead. One promising idea raised in the focus groups was the use of variable message signs at incident locations to display specific speed reduction guidance rather than generic slogans. This approach could enhance clarity and reinforce compliance by providing actionable instructions in real time.

Providing Insights on Intervention Potential

This study provides substantial insight into the potential impact of interventions targeting modifiable factors. The findings strongly suggest that a multi-faceted approach combining legislative updates, enhanced PI&E campaigns, and strategic enforcement is critical for increasing compliance.

Legislative Interventions

Standardizing SDMO laws to ensure broad protection for all roadside personnel and vehicle types, adopting simplified and consistent legal language across states, and clarifying penalties to be impactful and widely publicized are essential. The confusion expressed by focus group participants about varying state laws and specific speed reduction requirements underscores the need for clearer, more uniform legislation. Increasing fines and assigning penalty points were generally supported by participants, believing that higher penalties and consistent enforcement would serve as a stronger deterrent.

PI&E Interventions

The study highlights the need for emotionally compelling and visually clear PSAs that explicitly state legal requirements and emphasize the human impact of noncompliance. Focus group participants responded well to dramatic content, personal stories, and visuals featuring children of roadside workers. Some participants noted that drivers are already inclined to move over for law enforcement and emergency vehicles, suggesting that public messaging feature a broader range of vehicle types, such as tow

trucks, service vehicles, or passenger cars, to improve understanding among drivers who may associate the law with certain vehicle types. Leveraging multimodal outreach channels, including driver's education, digital platforms (e.g., navigation apps, streaming services), and traditional media, supported by consistent funding and strategic timing, is critical to reach diverse audiences. The observation that younger participants were more likely to view crash footage on social media platforms suggests that digital outreach with impactful, real-life scenarios could be particularly effective for this demographic.

Enforcement Interventions

Recommendations emphasize high-visibility enforcement campaigns, utilizing routine traffic stops as educational opportunities, and coordinating joint enforcement efforts across agencies. Focus group findings indicated a low perceived risk of enforcement, which underscores the need for greater visibility and consistency in enforcement efforts. The expressed frustration among officials regarding limitations in existing enforcement data infrastructure also points to the need for improved reporting mechanisms to accurately assess the scope of the problem and evaluate the effectiveness of any interventions.

Exploring innovative technologies like dashcams and automated enforcement systems, implemented with transparency and an emphasis on education over pure punitive measures, holds significant potential to address resource limitations and enhance enforcement efficiency. The suggestion from focus group participants to issue warnings with education before citations in automated enforcement scenarios could improve public acceptance for these technologies.

In conclusion, while drivers generally express a willingness to comply with SDMO laws, a significant gap exists between self-reported and observed behavior, largely due to a lack of detailed awareness of legal requirements, inconsistencies in state laws, and a perceived low risk of enforcement. By strategically addressing these modifiable factors through integrated legislative, educational, and enforcement actions, states can significantly enhance driver awareness, improve compliance with SDMO laws, and ultimately create safer environments for all road users.

Study Limitations

While this study provides valuable insights into the understanding and implementation of SDMO laws, several limitations should be acknowledged when interpreting the findings. The data gathered through surveys, interviews, focus groups, and observational video data analyses may not fully reflect the nationwide diversity of roadway environments, drivers, driver behaviors, or state-level context. Stakeholder participation was voluntary, which may have resulted in overrepresentation of

individuals and jurisdictions that are already more actively engaged in SDMO initiatives. Likewise, although the ten states selected for focus groups provided useful variation, the results may not fully represent the broader range of driver behavior and enforcement contexts across the country.

Another important limitation involves the distinction between nominal compliance versus substantive safety. While the observational study was able to capture whether drivers slowed down or moved over when passing stopped vehicles on the roadside, these nominal indicators of compliance may not always translate directly to meaningful improvements in safety of roadside personnel. For example, in some states, drivers are only required to reduce their speed if unable to move over, and there is no specific magnitude of speed reduction required. However, in other states, drivers must both move over and reduce their speed to 20 mph below the posted speed limit to be in compliance with the law. However, it is not necessarily the case that higher nominal compliance with a less demanding law reflects greater substantive safety to roadside personnel than lower nominal compliance with a more demanding law. Further research is needed to determine the relative safety impacts of differing legal requirements regarding moving over and/or reducing speed.

Relatedly, in analysis of observational video data, some drivers clearly lacked opportunity to move over due to dense traffic in the adjacent lane. However, analyses could not quantify in a reliable and systematic way whether drivers who failed to move over actually had the opportunity to do so. While measurable variables such as spacing and temporal gaps were available, a full assessment would have required information on drivers' perceptions of safety and opportunity, which could not be measured using this methodology. This limitation is further supported by focus group discussions, where drivers reported that surrounding traffic conditions often made it difficult to comply with the law even when they were aware of the law and its requirements. Such constraints highlight how external factors can inhibit full compliance, reinforcing the gap between legal expectations and practical roadway behavior.

The study was also constrained in the range of conditions it could examine. The observational data were primarily collected during daylight hours and did not capture nighttime driving, or driving during in adverse weather conditions, or many rural roadway environments, all of which may influence compliance behaviors, the safety consequences of noncompliance, or both. For example, Tefft et al. (2024) found that while most roadside assistance provider fatalities occurred in clear weather on dry roads, nearly two-thirds occurred in darkness. Similarly, while stakeholders described a wide range of public education campaigns and enforcement strategies, the effectiveness of these countermeasures has not been thoroughly examined and the existing evidence remains limited. As a result, the study could document the types of efforts being implemented, it is not positioned to draw definitive conclusions about which approaches are most effective.

Finally, the research methods used carry inherent limitations. Self-reported information from interviews and focus groups may be influenced by recall bias or social desirability, potentially influencing the accuracy of responses. Additionally, video analyses relied on the availability and quality of footage, which varied across states and may have affected the completeness and precision of the findings. Despite these challenges, the use of multiple, complementary methods helps to balance these limitations and provides a more nuanced understanding of the findings.

Future research could build on this work by expanding data collection across more diverse geographic areas and integrating administrative data such as traffic citations, crash reports, or emergency response records. These details could help to quantify the frequency and outcomes of SDMO violations. It could also support the exploration of whether SDMO compliance varies by demographic factors, such as age, gender, income, and geography. Additionally, data from cameras worn by law enforcement officers could offer insight into driver behavior as well as law enforcement practices. While some states implement SDMO awareness campaigns, few are rigorously evaluated. Researchers can investigate whether campaigns have a positive impact on driver behavior or reduce crashes. Together, these approaches can support and strengthen more targeted policy and enforcement strategies.

Phase III—Recommendations for Increasing Compliance

This section outlines recommendations developed to enhance compliance with SDMO laws. The recommendations draw from extensive research and stakeholder engagement, offering practical guidance that combines established methods with innovative, technology-driven approaches.

Development of Recommendations and Soliciting Stakeholder Feedback

Methods

The findings from all project activities—including the environmental scan, survey, in-depth discussions with traffic safety officials, focus groups with drivers, and insights from the analysis of observational video data—were integrated to develop a comprehensive list of draft recommendations. These practices were designed to identify tried-and-tested approaches, as well as emerging methods in legislation, PI&E, and enforcement, with a particular emphasis placed on innovative strategies and the integration of technology.

To ensure the scalability and feasibility of the recommendations, particularly when considering the resource challenges faced by states (including funding, manpower, and time), a preliminary draft of proposed strategies was shared with key stakeholders for input. This feedback process was used not only to validate the recommendations but also to refine and prioritize them based on practical considerations. Stakeholders were asked to assess feasibility and provide suggestions for improvement, which led to modifications and refinements of the original draft. Their feedback helped ground the proposed strategies in practical realities and increase the likelihood that jurisdictions will consider implementing them. This crucial step occurred via a webinar hosted in June 2025, with representatives from SHSOs, DOTs, law enforcement, and other traffic safety stakeholders in attendance. Attendees were invited based on their roles, expertise, and involvement in relevant safety initiatives, ensuring a diverse and knowledgeable group of participants. Over 60 people attended the session.

The format of the webinar was highly interactive, using surveys, polling, and other engagement tools to gather rich feedback from participants. The webinar began with an introductory presentation providing background on the project and the current state of SDMO laws. The presentation described the importance of SDMO laws in protecting roadside workers as well as stranded motorists. To highlight the ongoing dangers faced by roadside responders, national fatality data from the Emergency Responder Safety Institute and the AAA Foundation for Traffic Safety, and enforcement statistics from NHTSA and the Insurance Institute for Highway Safety were presented. The presentation also highlighted existing challenges, such as general lack of public

awareness despite nationwide adoption of SDMO laws, inconsistencies between self-reported behaviors and real-world observations, and contributing factors like variability in state laws and gaps in PI&E efforts. Additionally, the presentation also outlined the objectives for both the overall project and the webinar itself, which focused on identifying promising strategies across legislation, education, and enforcement to improve compliance. To provide additional context, high-level findings from recent driver focus groups were also shared.

Following the background, an overview of the developed recommendations was presented, organized around three core focus areas: legislation, PI&E, and enforcement. For each area, participants were guided through specific components of the recommendations, with justifications and reasoning provided.

The legislative recommendations addressed several key areas. These included expanding the scope of state laws to ensure broader protection for all vehicle types, standardizing penalty structures, and increasing public awareness of legal requirements. More innovative strategies were also proposed, such as encouraging the adoption of model legislation with standardized language and establishing legislative champions or inter-agency task forces to drive progress and positive change. Finally, the team also highlighted how aligning with stronger laws could enhance eligibility for federal grants like Section 405(h), Section 405(i), or Safe Streets and Roads for All (SS4A).

The PI&E recommendations emphasized the importance of reaching every driver through multiple channels. These included established strategies like integrating SDMO laws into driver education materials, leveraging traditional media during national safety weeks, and building upon existing partnerships (such as with local sports teams or regional AAA clubs). The value of employing VMS and permanent roadway signage to reinforce awareness and promote compliance was also highlighted. For more innovative approaches, recommendations focused on expanding digital outreach. This included forming partnerships with navigation apps like Waze and using geo-fenced advertising to target drivers in specific areas. The team also recommended leveraging state mailings, such as license or registration renewal notices, as a channel for ongoing public messaging. Additional strategies discussed included passive, vehicle-based messaging (e.g., decals on tow trucks and responder vehicles), ensuring message consistency across campaign periods, creating a centralized message bank, and tailoring messages to specific seasons or events. Finally, the potential of using online dashboards to publicly share citation and crash data was also discussed.

The enforcement section highlighted examples of successful dedicated enforcement campaigns and introduced emerging strategies to enhance compliance. These included integrating SDMO education into all traffic stops and promoting cross-agency enforcement coordination. Regarding technology, recommendations included exploring the use of dashcam and bodycam footage to document violations, and piloting

automated enforcement systems mounted on police and other government-owned vehicles. Suggestions were also offered for effectively implementing these systems, such as starting with small-scale pilot programs, securing the necessary legal authority, ensuring transparency about enforcement practices, and emphasizing the educational value of these systems rather than focusing purely punitive measures.

Interactive tools, including real-time polling and targeted feedback questions (see Appendix I), were embedded at the end of each major section of the presentation to promote dialogue about state-level challenges, implementation barriers, and priority messaging. These interactive tools not only provided real-time insights into audience understanding but also boosted engagement, allowing for a more direct and immediate collection of opinions and preferences. This approach helped ensure the content was relevant, usable, and actionable to the broader audience, building on themes identified during earlier data collection and stakeholder engagement sessions. The webinar concluded with an invitation for participants to complete a follow-up survey to provide more detailed feedback.

Findings

Stakeholder feedback gathered through the webinar polls and during the discussions that followed the presentation provided a nuanced understanding of the challenges and opportunities associated with improving public awareness and compliance with SDMO laws.

Legislative. With respect to the legislative strategies proposed, several state representatives noted encountering resistance from internal stakeholders such as legal and enforcement communities, as well as a perceived lack of urgency to revise existing SDMO laws. Adapting model language to fit state-specific contexts and securing legislative champions were also cited as significant barriers. While some states are actively leveraging federal funding opportunities such as Section 405(h), Section 405(i), and SS4A, others reported limited engagement or challenges in accessing these resources. These challenges often stem from a lack of dedicated staff, competing priorities for safety funding, and difficulties in demonstrating the effectiveness of SDMO initiatives for grant reporting.

PI&E. Outreach strategies, particularly those involving digital platforms, were seen as promising but challenged by logistical and financial hurdles. Participants cited the high cost of digital advertising and the difficulty of forming partnerships with technology companies, such as navigation app providers. Evaluating the effectiveness of digital outreach was also noted as a persistent challenge. When integrating SDMO messaging into state-issued or partner mailers, stakeholders pointed to limited space, regulatory constraints, and the perceived cost of design changes as primary obstacles.

Passive messaging approaches, such as decals on vehicles or signage on mudflaps, were similarly constrained by regulatory issues and the need for consistent design across diverse vehicle types. Ensuring year-round consistent messaging emerged as a critical but complex goal. Respondents highlighted the need for sustained funding, dedicated staff, and a centralized message bank to support ongoing campaigns. The difficulty of continuously generating fresh and engaging content was also a recurring theme. Despite these challenges, stakeholders offered several impactful phrases for outreach materials, including “Slow down, move over, save a life,” “Give them space,” and “We all want to get home.”

During the post-presentation discussion, a key concern emerged regarding the current order in which safety instructions are communicated to the public. One representative strongly advocated for reversing the emphasis, suggesting drivers first be instructed to “move over,” followed by slowing down only if a lane change is not possible. The rationale was to prioritize creating space for emergency responders and roadside workers. However, opinions on this approach were mixed. While some participants supported prioritizing moving over, others maintained that slowing down should always be a primary directive, regardless of whether a lane change is feasible. Another key suggestion was to explicitly include the word “safely” in the “move over” directive, underscoring the importance of safe lane changes. Furthermore, it was recommended that messaging should target drivers in all lanes, not just those immediately adjacent to an incident. The idea is that appropriate action from drivers in outer lanes can create a crucial buffer zone, allowing drivers in the adjacent lane more time and space to move over safely.

Regarding messaging style, while many states currently employ positive reinforcement, the discussion explored the perceived impact of more graphic messaging highlighting the consequences of noncompliance. One representative noted that although some focus group participants found graphic content more memorable, research indicates such messaging does not necessarily change behavior.

Enforcement. In terms of enforcement practices, stakeholders identified significant barriers to cross-agency joint operations, including challenges in inter-agency communication, aligning enforcement priorities, and maintaining consistent messaging.

There was a general consensus among stakeholders that enforcement strategies relying solely on warnings would be insufficient. While some acknowledged that warnings might have a limited effect, the prevailing view was that citations are essential to achieving meaningful compliance among drivers. Several stakeholders emphasized that without tangible consequences, driver behavior is unlikely to change.

In discussion of using automated enforcement to enforce SDMO laws, stakeholders expressed concerns regarding the deployment of automated enforcement

systems on police vehicles. Key issues included public acceptance, privacy issues, and the high costs and technical challenges associated with such technologies. Additionally, some stakeholders questioned whether violations detected through automation would be legally viable and upheld in court, potentially undermining the credibility of enforcement efforts. During the discussion, an innovative suggestion for automated enforcement was put forth. Rather than issuing citations or warnings to violators, it was proposed that images from automated systems could be used to identify and acknowledge drivers who exhibit positive driving behavior. For example, images captured by these systems could help identify drivers who slow down and move over appropriately. These drivers could receive positive recognition notices or be included in public awareness campaigns highlighting compliance statistics.

The discussion also underscored the importance of data-driven enforcement. Several stakeholders emphasized the need for observational data on compliance. It was suggested that this data could provide valuable insights into the effectiveness of current messaging and help identify areas for improvement or targeted enforcement.

Recommendations

Improving driver compliance with SDMO laws requires a comprehensive, coordinated strategy that integrates legislation, public education, and enforcement. This strategy must close existing knowledge gaps, reinforce safe driving behaviors, and create an environment in which both awareness and accountability are consistently promoted. When effectively implemented, these strategies form a comprehensive framework for advancing SDMO compliance and protecting the lives of emergency responders, roadside workers, and all road users. General themes in recommendations are discussed, and specific recommendations and supporting rationale are provided below in Table 11.

Table 11. Recommendations to Improve Compliance with Slow Down Move Over Laws

Recommendation	Rationale
Legislation	
Ensure SDMO laws cover all roadside personnel and vehicles (e.g., tow trucks, utility vehicles, disabled passenger vehicles)	• Inconsistent coverage across states contributes to confusion and noncompliance • Focus group participants often assumed protection applied only to police or emergency responders
Adopt standardized, simplified SDMO language across states	• Confusing or inconsistent wording of state laws limits public understanding • Streamlined language supports national awareness efforts and improves compliance
Maintain clear and consistent penalties, and publicize them	• Maintaining clear and consistent penalties helps clarify expectations for drivers and establishes predictable consequences for violations • Focus group participants were often unaware of fines and reported that stronger penalties might increase deterrence
Align with federal programs (e.g., 405(h), 405(i), SS4A) to support law enhancement and funding	Legislative alignment opens access to federal grant opportunities and promotes shared priorities across states
Public Information and Education	
Integrate SDMO messaging into driver's ed materials and licensing processes	Without inclusion in foundational driver education, many new drivers may never be exposed to SDMO laws
Use emotionally compelling, visually clear PSAs across media	• Dramatic or emotionally charged content may be more effective in PI&E campaigns • Focus group participants responded better to dramatic content (e.g., crash footage, personal stories), especially when messages explained both the 'what' and 'why'
Feature all protected vehicle types in outreach campaigns	• Many drivers were unaware that SDMO laws applied to non-emergency vehicles, which diminishes compliance • Inclusive visuals can broaden understanding
Use digital outreach (e.g., navigation apps, geo-fenced ads, streaming platforms)	Digital delivery reaches drivers, especially younger drivers, more effectively than traditional media alone by delivering messages where they are most active
Incorporate passive messaging (e.g., decals on tow trucks, mudflaps, signage)	Constant visual cues reinforce SDMO behavior, especially in environments where active enforcement or education may be lacking
Develop centralized message banks and coordinate seasonal/event-based campaigns	Shared, consistent messaging supports unified communications across agencies and helps maintain year-round visibility
Deploy public-facing data dashboards showing crash, citation, and enforcement data	Transparency helps drivers understand risk and enforcement likelihood, which may serve as a deterrent and build public trust

Recommendation	Rationale
Enforcement	
Conduct high-visibility enforcement campaigns and patrols	• Visible enforcement helps challenge perception and improve behavior • Drivers in focus groups believed the law was rarely enforced
Educate during routine traffic stops, regardless of violation type	Every driver interaction can serve as a learning opportunity, increasing awareness with minimal added cost or effort
Coordinate joint enforcement efforts across agencies	Unified operations amplify visibility and create a stronger impression of consistent enforcement
Pilot test automated enforcement (e.g., dashcams, patrol car systems) with public transparency	• Cameras can provide indisputable evidence of violations while reducing resource burdens • Automated enforcement is a force multiplier and helps to address resource issues • Transparency and warnings may improve public support

Legislation plays a foundational role for setting clear expectations of driver behavior. To maximize public understanding and compliance, SDMO laws should uniformly apply to all relevant personnel and vehicle types, including emergency responders, tow truck operators, utility workers, and occupants of disabled passenger vehicles. Legal language should be simple and standardized to reduce confusion and facilitate broad public comprehension. Additionally, penalties should be consistent across jurisdictions and align with similar traffic offenses to reinforce the seriousness of noncompliance and support enforcement. Aligning states' legislation with federal transportation safety programs can unlock funding opportunities and ensure consistency with national safety priorities. Finally, identifying legislative champions or dedicated task forces can be instrumental in advancing the effectiveness of SDMO laws.

A robust PI&E strategy is essential to reach diverse driving populations and foster sustained behavioral change with respect to SDMO laws. To build a strong foundation, educational content should be integrated into formal learning environments such as driver's education programs and licensing processes. This ensures that all new drivers are introduced to SDMO requirements early in their driving experience. Effective messaging campaigns should be emotionally resonant and visually clear, emphasizing both the legal requirements and the consequences of noncompliance. PI&E materials should accurately represent all protected vehicle types to correct common misconceptions (e.g., that the law only requires slowing down or moving over for law enforcement vehicles).

Modern outreach techniques such as geo-targeted digital ads, streaming media platforms, and navigation apps, can extend the reach of traditional campaigns by delivering timely, location specific messages. In parallel, passive communication strategies, including vehicle decals and roadside signage, offer persistent reminders in

high-risk environments. To maintain message consistency and promote collaboration, states should consider developing centralized message banks and tailoring content to seasonal travel patterns or local events. Additionally, public-facing data dashboards that display crash and citation statistics can enhance transparency and reinforce the seriousness of SDMO violations.

Enforcement remains a critical pillar for promoting compliance. Predictive analytics, powered by historical data, can guide resource deployment by anticipating where violations are most likely to occur and where risk to responders is highest. High-visibility enforcement campaigns can raise public awareness and counter perceptions that the law is rarely enforced. Beyond dedicated enforcement periods, law enforcement officers can use routine traffic stops as opportunities to educate drivers about SDMO laws and driver requirements. Coordinated enforcement operations involving multiple agencies such as state patrols, local police, and commercial vehicle units can further amplify these efforts. By working together, these agencies amplify visibility and demonstrate a unified commitment to roadway safety, which can serve as a powerful deterrent to noncompliance. Such collaboration allows for broader geographic coverage and more consistent enforcement across jurisdictions. It also helps align messaging and enforcement practices, reducing confusion among drivers and reinforcing the seriousness of SDMO violations. Resource sharing among agencies, whether personnel, equipment, or data, can improve operational efficiency and make large-scale enforcement efforts more feasible, particularly for smaller or resource-constrained departments. Moreover, joint operations facilitate better data collection and analysis, enabling agencies to identify high-risk areas and evaluate the effectiveness of enforcement strategies. These efforts not only strengthen interagency relationships but also contribute to a more coordinated and strategic approach to traffic safety.

Technology also presents opportunities for more efficient enforcement. The use of body cameras, dashcams, and automated enforcement systems may help capture violations in real time with greater accuracy and reduce demands on personnel. These systems reduce the need for direct law enforcement intervention, allowing for safer and more consistent enforcement. License plate recognition (LPR) technology further supports this by identifying vehicles that fail to comply with the SDMO law, thus enabling follow-up actions such as warnings or citations.

States should employ modern communication technologies to deliver timely, location-based alerts to encourage compliance with SDMO laws. Navigation apps and digital platforms can be integrated to provide real-time warnings to drivers approaching roadside incidents, prompting them to slow down or change lanes. Additionally, jurisdictions may consider piloting the use of drones and aerial surveillance to monitor traffic behavior around emergency scenes. These tools offer a broader, real-time perspective without placing officers in harm's way, enhancing both enforcement

capabilities and responder safety. For example, law enforcement might use this information to direct ground-level officers to specific high-risk areas.

Pilot programs testing the impact of these technologies should be implemented thoughtfully, with legal authorization, clear communication to the public, and an emphasis on transparency to build public trust.

Together, these recommendations form an integrated approach that addresses the legal, behavioral, and operational dimensions for improving SDMO compliance. Through collaboration across legislative bodies, public educators, and enforcement agencies, states can significantly enhance the safety of roadside environments and better protect all those who work or are stranded on the roadside.

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Appendix A.

Survey of the State Highway Safety Office Leaders

GHSA is partnering with Westat and the AAA Foundation for Traffic Safety to examine factors influencing driver compliance with Slow Down Mover Over (SDMO) laws and identify ways to increase compliance. Your state highway safety office (SHSO) is uniquely positioned to provide information about SDMO public information and outreach campaigns in your state, as well as enforcement/mobilization activities, and legislative initiatives.

We would appreciate your response to this survey by February 5, 2024.

Section A. Submitter Information

Name: *(short answer)*

Email: *(short answer)*

Phone Number: *(short answer)*

State/Territory: *(drop down)*

Section B. About your SDMO law

1. Please share a link/URL to your state's law: *(short answer)*
2. When was your SDMO law first enacted? *(Year selection via drop down menu, starting with before 2010)*
3. When was the law last revised? *(drop down: Not revised, Year selection via drop down menu)*
4. Is there an effort underway to revise the law? *(Yes/No)*
IF YES – Please briefly describe the proposed revision (include a link to the proposed legislation) and who is leading this effort. *(Text)*
5. Have there been any challenges to revising/updating your law? *(Yes/No/Have not tried to update or revise the law)*

IF YES – Please explain the challenges and how they're being overcome, if known.

6. Does the slow down component of the law currently require a specific reduction in speed (in MPH)? *(Yes/No)*

IF YES – What is the slow down requirement? *(Text)*

7. How do the ***fin***es associated with your SDMO law differ by ...

- a. Offense (e.g., 1st, 2nd, 3rd or subsequent)? *(long answer)*
- b. Other factors (e.g., results in a crash, injury, death)? *(long answer)*

8. In your opinion is/are the fine(s) appropriate? *(Yes/No)*

IF NO – Why not (Too high? Too low? Please specify)? *(long answer)*

9. Does the law reference any increased ***penalties*** (e.g., points, license suspension, jail time) if there is ...

- a. A second or subsequent offense *(Yes/No)*

IF YES – What is the penalty? *(short answer)*

- b. Property damage *(Yes/No)*

IF YES – What is the penalty? *(short answer)*

- c. An injury *(Yes/No)*

IF YES – What is the penalty? *(short answer)*

- d. A fatality? *(Yes/No)*

IF YES – What is the penalty? *(short answer)*

Section C. Public Information and Education (PI&E) efforts for the SDMO law

10. Please share specific PI&E efforts to promote the SDMO law...

- a. Within the past 5 years? *(long answer)*
- b. Ongoing? *(long answer)*

11. If your SHSO promotes the SDMO, what channels or media are used? Check all that apply. *(checkbox)*

- a. Social media
- b. Variable message boards
- c. PSAs on TV or radio
- d. Pamphlets/Handouts
- e. Other, specify_____

12. Please upload any PI&E materials produced by your SHSO and/or other entities that you can share (e.g., handouts, stickers, PSAs, videos, social media, links)? (*space to upload/ Links*)
13. Does your SHSO provide funding for SDMO PI&E efforts? (*Yes/No*)
- IF YES – What is the annual budget for these efforts? (*short answer*)
14. Please share information on any other funding sources for SDMO PI&E? Skip if no other funders are known. (*long answer*)
15. Is there a specific SDMO awareness day/month or time of year in your state? (*Yes/No*)
- IF YES – When do you conduct the SDMO awareness campaign(s)? (*long answer*)
- IF YES – Is this conducted in conjunction with any national or regional joint SDMO efforts? (*Yes/No*)
- IF YES – Please describe the effort. (*long answer*)
16. Were there special PI&E activities following the enactment/revision of your state’s SDMO law? (*Yes/No*)
- IF YES – Please share information about these activities. (*long answer*)
17. Have the SDMO law PI&E activities been evaluated (e.g., motorists’ awareness of the law or awareness of the PI&E campaign)? (*Yes/No*)
- IF YES – Please share information on the evaluation, including who conducted the evaluation and their findings. (*long answer*)

Section D. Enforcement Efforts for the SDMO law

18. Do law enforcement officers enforce the SDMO law? (*Yes/No*)
- IF NO: please share your thoughts as to what might prevent or limit enforcement activities. (*long answer*) *Skip to 21*
- IF YES: Please describe the enforcement efforts (e.g., normal patrol, specialized time periods, areas with known issues)? (*long answer*)
19. How are enforcement efforts funded? (*long answer*)
20. Does your state track citations issued for SDMO violations? (*Yes/No*)
- IF YES – a. What agency is responsible for tracking the data?
- b. Who has access to it?
- c. Is it used to guide enforcement efforts? (*long answer*)

Section E. Key SDMO Partners

21. Who are the key SDMO partners in your state? Check all that apply. *(checkbox)*

- a. AAA
- b. Highway patrol
- c. First responder organizations
- d. State Department of Transportation (DOT)
- e. Other, specify _____

IF A: How does AAA support the SDMO law? *(long answer)*

IF B: How does highway patrol support the SDMO law? *(long answer)*

IF C: How do first responder organizations support the SDMO law? *(long answer)*

IF D: How does the DOT support the SDMO law? *(long answer)*

IF E: What other organizations support the SDMO law and how do they support it? *(long answer)*

22. Please provide the names and contact information for additional individuals within your office and/or with other agencies or organizations who are working on the SDMO law with whom we should follow up. *(long answer)*

23. Please share any additional comments/thoughts regarding your SDMO law. *(long answer)*

Thank you for completing this survey. To get a better picture of your state's efforts, Westat may follow up for more detail.

Appendix B.

Public Information & Education SDMO Interview Discussion Guide

Today, we are hoping to delve into the critical aspects of Slow Down, Move Over initiatives, focusing on the interplay between public information and education (PI&E), the legal framework, and its enforcement. Your diverse experiences and expertise are invaluable in helping us understand how these elements work together, or where they may fall short, in promoting safety on our roads.

We'll be exploring the effectiveness of current PI&E strategies in your states, but we'll also be broadening our scope to examine the laws themselves and the challenges of enforcement. Our goal is to gain a comprehensive understanding of what's working well, identify areas for improvement, and ultimately, enhance the safety of emergency responders, tow truck operators, and all those who work on or near our roadways, and general road users.

About the Law

- Do you think your current SDMO laws are effective?
 - Probe – If No – How would you improve the law if you could?
- Is there an effort underway to revise the law? (Yes/No)
 - Probe – If Yes – Please briefly describe the proposed revision (include a link to the proposed legislation) and who is leading this effort. Including any challenges faced.

PI&E Efforts

- Describe your organization's current PI&E efforts for SDMO?
 - Probe – How often is your PI&E information circulated for SDMO?
 - Probe – How often do you update or overhaul these campaigns?
 - Probe – Does your state have a standing website to provide information about SDMO laws and enforcement?
- What modalities (channels or media) does your organization use to communicate your SDMO campaigns to the public?
 - Probe – social media, variable message boards, PSAs on TV/radio, pamphlets or handouts, and roadside signage? What about the driver's license test (or study materials)?

- Probe – Do you think any of these modalities is more effective than others?
- Probe – If not using multiple sources, inquire as to why.
- What funding sources exist for your PI&E campaigns? Where does that funding come from?
- How does your organization decide on PI&E strategies for SDMO?
- Have the PI&E activities been evaluated? If so, how is it measured?
 - Probe – Do findings impact future strategies? If so, how?
- How does your organization decide when to focus on PI&E for SDMO?
 - Probe – Is there a specific SDMO awareness day, month or time of year? Or possibly in response to a fatal or serious injury crash involving a failure to SDMO incident.
- What challenges has your organization faced with sustaining implementations of PI&E for SDMO?
 - Probe – How does your organization overcome these challenges?
- In your opinion, what are the most effective PI&E efforts for SDMO?
 - Probe – What the primary barriers to implementing these strategies?

Enforcement

- Is the law enforced?
 - Probe – What are challenges in your state for enforcing SDMO laws?
- Does your organization possess data for enforcement of SDMO? Such as the issuance of warnings and citations for violations of SDMO laws?
- What about automated enforcement? (examples – red light cameras, school bus cameras, speed cameras)

Specific State Questions:

- FOR CALIFORNIA: How do you assess the efficacy of the year-round paid media campaigns? Can you speak to their efficacy?
- FOR FLORIDA: The Florida Highway Safety and Motor Vehicle website provides a crash and citation data dashboard for incidents related to the Move Over law. How do you collect the data used to create the dashboard? How often are the dashboards updated?
 - Flip out sign – similar to on the side of the school bus that says slow down/move over?

- FOR MARYLAND: Did the MHSO complete the paid media wave last summer? Can you speak to the efficacy of the campaign?
- FOR MINNESOTA: Can you speak to the efficacy of the annual news conference done on the day Trooper Ted Foss' death?
- FOR NEW YORK: Can you speak to the efficacy of the SDMO website run by the State Police and Thruway Authority? How often is the website updated? Does it have any information that is automatically updated?
- FOR NORTH CAROLINA: Can you speak to the efficacy of the May-June enforcement campaigns?
- FOR PENNSYLVANIA: How are Variable Message Board locations chosen? What is their efficacy? How about PSAs, social media and earned media?
- FOR TEXAS: Can you speak to the efficacy of your annual PI&E efforts?

Appendix C.

Characteristics of State SDMO Laws: Required Behaviors, Types of Vehicles Protected, and Fines

The information shown in this Appendix was originally compiled in November–December 2023. Information related to types of vehicles protected and fines was updated subsequently in a brief scan in August 2025. However, please note that updates made in 2025 did not include an exhaustive review of all legislative amendments and therefore may not reflect recent changes in other provisions such as required behaviors.

	Required Behavior			Vehicles Protected (All States Include First Responders)			
	Move Over OR Slow Down	Slow down AND Move Over	Specific Speed Reduction Required ^a (relative to posted speed limit unless noted otherwise; none if blank)	First Responders & Towing Only	First Responders, Towing, & Other Specific Vehicles ^g	All Stopped Vehicles	Base Fine ^h
Alabama	X		15 mph below limit ^b		X		\$200
Alaska	X				X		\$150
Arizona	X					X	\$275
Arkansas	X				X		\$250
California	X				X	effective 1/1/2026	\$50
Colorado	X		20 mph below limit ^c			X	\$70
Connecticut		X				X	\$181
District of Columbia	X						\$100
Delaware	X					X	\$150
Florida	X		20 mph below limit			X	\$30
Georgia	X				X		\$250 ⁱ
Hawaii		X		X			\$200
Idaho		X			X		\$90
Illinois		X				X	\$250
Indiana	X		10 mph below limit			X	\$161

	Required Behavior			Vehicles Protected (All States Include First Responders)			
	Move Over OR Slow Down	Slow down AND Move Over	Specific Speed Reduction Required ^a (relative to posted speed limit unless noted otherwise; none if blank)	First Responders & Towing Only	First Responders, Towing, & Other Specific Vehicles ^g	All Stopped Vehicles	Base Fine ^h
Iowa	X					X	\$100
Kansas	X					X	\$195
Kentucky	X					X	\$60
Louisiana	X				X		\$200
Maine	X					X	\$275
Maryland	X					X	\$110
Massachusetts		X			X		\$100
Michigan		X	10 mph below limit		X		\$400
Minnesota	X					X	\$125
Mississippi	X				X		\$250
Missouri	X			X			\$2,000 ⁱ
Montana		X	Varies ^d		X		\$100
Nebraska	X					X	\$100 ⁱ
Nevada		X				X	\$1,000
New Hampshire		X				X	\$75
New Jersey	X					X	\$100
New Mexico		X		X			\$50
New York	X					X	\$150
North Carolina	X				X		\$250
North Dakota	X					X	\$50
Ohio	X				X		\$300
Oklahoma	X					X	\$1,000
Oregon	X		5 mph below limit			X	\$265
Pennsylvania	X		20 mph below limit			X	\$500 ⁱ

	Required Behavior			Vehicles Protected (All States Include First Responders)			
	Move Over OR Slow Down	Slow down AND Move Over	Specific Speed Reduction Required ^a (relative to posted speed limit unless noted otherwise; none if blank)	First Responders & Towing Only	First Responders, Towing, & Other Specific Vehicles ^g	All Stopped Vehicles	Base Fine ^h
Rhode Island	X					X	\$95
South Carolina		X		X			\$300
South Dakota	X		20 mph below limit			X	\$272.50
Tennessee	X					X	\$250
Texas	X		20 mph below limit		X		\$500
Utah		X				X	\$750 ⁱ
Vermont	X			X			\$335
Virginia	X					X	\$250 ⁱ
Washington		X	50 mph if limit ≥ 60 mph, otherwise 10 mph below limit		X		\$214
West Virginia	X		25 mph ^e			X	\$500 ⁱ
Wisconsin	X				X		\$30
Wyoming	X		20 mph below limit ^f		X		\$235

a. Several states have different requirements applicable only on lower speed roads (e.g., posted speed limit ≤ 25 mph), which are not shown.

b. On Interstates or other multilane highways; different on some other roads.

c. On roads with speed limit of 45 mph or higher; different on some other roads.

d. 20 mph posted below limit on Interstate highways if also moving over and half of posted limit if not moving over; 30 mph below if moving over/half if not moving over on state/county roads; half on all other roads.

e. 25 mph on divided highways; 15 mph on non-divided highways.

f. Applicable on 2-lane roads with posted speed limit of 45 mph or greater.

g. Other specific vehicles vary by state and may include municipal vehicles, road maintenance vehicles, utility vehicles, and other authorized vehicles.

h. “Base fine” refers to the minimum monetary penalty imposed for a first-time violation of the state’s SDMO law. Actual fines may vary depending on circumstances such as type of protected vehicle present, repeat offenses, presence of aggravating factors, or additional court fees.

i. Some states do not specify a minimum fine for a basic SDMO violation, instead stating that fines may be “up to” or “no more than” a certain amount. In these cases, the listed fine represents the maximum penalty allowed for a first-time, non-aggravated violation, not a typical or guaranteed amount.

Appendix D.

Focus Group – Introduction Survey Questionnaire

Please answer the following questions to the best of your ability.

1. When traveling on the highway what do you typically do when you are approaching a stopped/disabled vehicle next to you on the side of the road?
 - a. Speed up to get past the stopped vehicle
 - b. Continue driving in your lane at the same speed
 - c. Continue driving in your lane, but at a slower speed
 - d. If possible, change lanes to give more space to the stopped/disabled vehicle
 - e. Slow down and if possible, change lanes to give more space to the stopped/disabled vehicle
 - f. Check to see if the driver needs assistance
2. When traveling on the highway what do you typically do when you are approaching vehicles involved in a crash (before first responders arrive)?
 - a. Speed up to get past the crash scene
 - b. Continue driving in your lane at the same speed
 - c. Continue driving in your lane, but at a slower speed
 - d. If possible, change lanes to give more space to the vehicle(s) involved in the crash
 - e. Slow down and if possible, change lanes to give more space to the vehicle(s) involved in the crash
 - f. Check to see if they need assistance
3. When traveling on the highway what do you typically do when you are approaching a tow truck stopped next to you on the side of the road?
 - a. Speed up to get past the tow truck
 - b. Continue driving in your lane at the same speed
 - c. Continue driving in your lane, but at a slower speed
 - d. If possible, change lanes to give more space to the tow truck
 - e. Slow down and if possible, change lanes to give more space to the tow truck

4. When traveling on the highway what do you typically do when you are approaching an emergency vehicle stopped next to you on the side of the road?
 - a. Speed up to get past the emergency vehicle
 - b. Continue driving in your lane at the same speed
 - c. Continue driving in your lane, but at a slower speed
 - d. If possible, change lanes to give more space to the emergency vehicle
 - e. Slow down and if possible, change lanes to give more space to the emergency vehicle
5. When traveling on the highway what do you typically do when you are approaching a law enforcement vehicle stopped next to you on the side of the road?
 - a. Speed up to get past the law enforcement vehicle
 - b. Continue driving in your lane at the same speed
 - c. Continue driving in your lane, but at a slower speed
 - d. If possible, change lanes to give more space to the law enforcement vehicle
 - e. Slow down and if possible, change lanes to give more space to the law enforcement vehicle
6. To the best of your knowledge, does your state have a law that requires you to take any specific action(s) when passing a vehicle that is stopped on the side of the road?
 - a. Yes
 - b. No (Skip to question 8)
 - c. I am not sure (Skip to question 8)
7. Please tell us more about the requirements of the law. (*open response*)
8. When responding to the last question, did you look up the state law on the internet?
 - a. Yes
 - b. No
9. Which one of the following categories best describes your age?
 - a. 18-24
 - b. 25-34
 - c. 35-44
 - d. 45-54
 - e. 55-64
 - f. 65-74
 - g. 75+

10. What is your gender?

- a. Male
- b. Female
- c. Transgender
- d. Non-binary/Non-conforming
- e. Rather not say

11. How often do you drive on the highway in an average week?

- a. 6 or 7 days a week
- b. 4 or 5 days a week
- c. 2 or 3 days a week
- d. 1 day a week
- e. Less than 1 day a week

Appendix E.

SDMO Focus Group Moderator Guide

Introduction and Informed Consent

The focus group will be conducted virtually. Participants will be sent the consent form to review prior to this session.

Introduce yourself and the note taker and obtain verbal consent. Briefly reiterate that we will be recording this session to assist with our analysis and report writing only, and no personally identifying information will ever be included in any reports produced. This recording will only be used by project staff.

My name is _____ and I will be leading our discussion today. With me is _____, s/he will be taking notes and monitoring the chat for any questions or comments. Before we begin, I want to remind you that we will be recording today's session. The recording will only be used to help us summarize our notes. Your name and any other identifying information will not be used in any reports that we prepare about the focus group. Please indicate you are O.K. with being recorded by typing, "I agree" into the chat.

Do not begin recording until you have asked for and received consent from all participants. The note taker will take a screenshot. After turning on the recording, ask participants to verbally agree to participate in the study.

Now that we have started the recording, if everyone can please indicate that they received a copy of the consent form and that they agree to participate in this study. You can indicate your consent by saying "Yes" when I call your name.

After all participants have consented remind them that they can elect to end their participation at any time.

Remember, you may choose to end your participation in this discussion at any time, for any reason.

Rules and Etiquette

The purpose of this focus group is to learn more about your driving experiences. No special knowledge or ability is required to participate.

You have been selected to participate in this focus group because you indicated that you drive at least 2 – times a week and you live in _____ (name state). During this focus

group, you will have an opportunity to share your experiences driving in _____ (name state).

How many of you have taken part in a focus group?

Before we begin our discussion, I would just like to review some basic focus group rules and guidelines.

A. Focus groups have certain rules and etiquette that we follow:

- i. No one will be judging your responses.
- ii. We need to hear about your feelings and opinions, not ours. We are not here to reach consensus, but to hear and discuss a range of views. There are no “right” or “wrong” answers.
- iii. If there are any discussion points, questions, etc. that you do not want to address or discuss, you are free to keep quiet or let us know by saying, ‘I’d prefer not to discuss that’ or something similar.
- iv. We want to give all participants the opportunity to speak – it is important to hear from everyone.
 - a. Please set yourself to ‘mute’ when you are not speaking to reduce background noise.
 - b. You can use the ‘raise hand’ icon to indicate that you have something to say.
 - c. You can also use the chat box to comment on the discussion.
- v. Please keep your cameras on to facilitate communication.

B. Please be completely honest during this discussion.

- i. Your responses will NOT be shared with anyone other than people working on the project.
- ii. Please respect the privacy of the other people in this group by not discussing what is said here with anyone outside the group or in public. With that in mind, please make sure you are in a location that reduces the likelihood that others may overhear this conversation.

During the session, I will guide us along various topics; but YOU are the experts and will be doing most of the talking.

Survey

Ensure that the link to the survey has been placed in the chat field in Zoom.

Before we begin our discussion, we would like everyone to complete a brief **anonymous** survey. The link to the survey is in the chat. Once you finish and submit your survey, please indicate you are done by selecting the “thumbs-up.” Additionally, we will be monitoring for completion.

Icebreaker

First, I would like everyone to say their name and describe what a typical day of driving looks like on a weekday. I will call on each of you one-by-one.

Discussion

Now we’re going to talk about your experiences while driving and some of the unusual things that can disrupt your normal driving experience. Again, we want to hear from each of you and get your honest insights and opinions. We’re interested to learn from your experiences and knowledge to better understand your views.

Let’s talk about what you do when you see a vehicle stopped on the side of the road or in one of the travel lanes.

Behavior when vehicles are stopped on the side of the road/in the travel lanes

- What’s your first thought when you see a vehicle stopped on the side of the road?
- What do you look for when you see a vehicle stopped on the side of the road or in the travel lanes?
 - *If necessary, probe – (1) Do you ever look to see if there are people in the vehicle or standing nearby? (2) What about flashing hazard lights, flares, flashing lights of response vehicles, temporary signs, or cones.*
- What do you typically do when you see a personal vehicle stopped **on the side of the road**?
 - *Probe – Do you think you are more careful? Do you slow down? Do you move over to the next lane? Do you ever stop to see if the driver needs assistance?*
- What factors do you consider when deciding whether to take action when passing a stopped vehicle on the side of the road?
- Do you do anything differently if the vehicle is stopped **in the lanes of travel**?

- Is your behavior different for any specific type of vehicle?
 - Probes
 - How about when you see a tow truck?
 - How about when you see an emergency vehicle?
 - How about when you see a law enforcement vehicle?
- Are there situations in which your behavior is different? Are there situations that are more worrisome?
 - Probes – How about when there are multiple cars stopped? How about in a crash situation? What if you see people standing outside of their vehicle?
- Are there times when you do not slow down or move over for a ...
 - Personal vehicle stopped in the lane next to you or on the side of the road?
 - Follow up question – What are some of the reasons why you don't slow down or move over?
 - Tow truck that is responding to a stopped or disabled vehicle?
 - Follow up question – What are some of the reasons why you don't slow down or move over?
 - Emergency vehicle responding to a stopped vehicle?
 - Follow up question – What are some of the reasons why you don't slow down or move over?
 - Law enforcement vehicle responding to a stopped vehicle?
 - Follow up question – What are some of the reasons why you don't slow down or move over?

Awareness of SDMO law

Is there a law in your state that requires drivers to take specific actions when a vehicle is stopped or disabled on the side of the road or in traffic lanes?

- What does the law require?
 - **Probe**-Does it require you to move over to a lane that is not next to the lane/shoulder with the disabled vehicle?
 - **Probe**- Does it require you to slow down?
 - **Probe**- Do you have to reduce to a specific speed?
 - **Probe**- Which types of stopped or disabled vehicles are included in the law? Do you have to slow down or move over for specific types of vehicles? **(If necessary, further probe – for example, tow trucks, emergency vehicles or law enforcement with or without lights)**
- Do you know of any additional requirements under your state law?
- What is the penalty if you don't take any specific action when a vehicle is stopped or disabled on the side of the road or in traffic lanes?
- How did you learn about this law in your state?
- Have you heard about any injuries/ crashes involving a driver hitting a vehicle or a person that was outside of their vehicle?

Description of the state SDMO law – tailored to each state

All states have a law requiring drivers to slow down and/or move over when there is a disabled vehicle in the travel lanes or on the side of the road. In ____ (name state) the law says:

READ PARAPHRASED STATE LAW

Show PowerPoint slide with paraphrased law so that participants can follow along.

Motorists' behavior related to SDMO law

- In general, in the places where you drive, what do most other drivers do when there is a stopped vehicle on the side of the road?
 - Probe – Do most people usually slow down?
 - Probe – Do most people usually move over?
 - Probe – how about if there's a tow truck on the side of the road?
 - Probe – how about if there's a law enforcement vehicle?
 - Probe – how about if there's an emergency vehicle?

- Do you think other drivers respond differently when passing a stopped vehicle in the travel lanes versus the side of the road?
- What factors do you think other drivers consider when deciding whether to take action when passing a stopped vehicle?
- How does their (other drivers) behavior influence your behavior?
 - Probe- If you see someone else moving over, what do you do?
 - Probe- If you see everyone else driving by without moving over, what do you do?
- What steps can we take to ensure that drivers slow down and move over when there is a stopped or disabled vehicle on the side of the road?
 - Probe: Are there steps that could improve visibility of disabled vehicles?
 - Probe: Would increasing the fine be effective?
 - Probe: What about adding points to your license?
 - Probe: What about PSAs? (Probe for PSAs: what message would be most effective?)
 - Probe: Can you think of any technologies that could be used?

Enforcement of SDMO law

- Have you ever been pulled over or was someone you know pulled over for not slowing down or moving over for a stopped ____ (*insert applicable vehicles according to the law*) in the lane next to you or on the side of the road?
- Have you ever seen law enforcement conducting patrols or pulling someone over because they did not slow down or move over when passing a ____ (*insert applicable vehicles according to the law*)?
- Do you think there is a risk of receiving a ticket if you don't slow down or move over when there is a stopped ____ (*insert applicable vehicles according to the law*) in the lane next to you or on the side of the road?
- Have you ever seen law enforcement promote their enforcement activities, like DUI checkpoints or seatbelt enforcement?
 - Follow up questions –
 - What are some of the ways law enforcement informs the public about these activities?
 - What about slow down move over enforcement efforts – have you ever seen these publicized? If so, how?

Outreach and Education Efforts

- Are you aware of any of any outreach efforts to educate the public about slow down move over laws?
 - Probe: If so, what have you seen? Where was this information made available to you?
 - Probe: Have you seen any social media posts on the slow down move over law?
- Have you seen any roadside/overhead signs or billboards for slow down move over laws?
 - Probe: If so, where are these signs?
- How can we improve public information and education campaigns on this issue?
 - Probe: Are there steps that can improve awareness of the laws? Are there specific channels/ methods we should use? Do you think any types of reminders would help? What, when, and where?
- *If available:* Here is an example of an outreach message developed for your state.
Play PSA video from state (example from CA: [CA OTS CONE X SLAMSON-16x9 Cut3.mp4](#) – [CA OTS CONE X SLAMSON-16x9 Cut3.mp4 – Frame.io](#))
 - Have you ever seen this video before?
 - In your own words, what is the message in the video?

Closing Remarks

Does anyone have anything else they would like to mention about slow down move over laws before we conclude the focus group? Are there any issues that we have not touched on?

Do you have any questions about the study or what was discussed today?

Thank you for your time. What we have heard and learned about today will help the AAA Foundation for Traffic Safety better understand ways to help improve compliance with slow down move over laws.

If you have any questions after this focus group, you can contact Amy Benedick, the Project Director at amybenedick@westat.com.

Appendix F.

State-Level Observational Data

The findings in this section are organized to reflect the range of driver behaviors observed during the study. The discussion begins with an examination of vehicles that executed a move over maneuver, some of which may have also slowed down or taken additional actions. This is followed by an analysis of vehicles that engaged in a slow down maneuver, which in some cases may have been accompanied by a move over action or other responses. The next portion explores the overlap and distinctions among vehicles that moved over only, slowed down only, or performed both actions in combination. The findings then turn to an assessment of how these behaviors align with specific state laws governing move over and slow down requirements.

Findings for states with fewer than 10 processed recordings should be interpreted with caution. These states—California, Maryland, Michigan, New York, Virginia, and Washington—have low numbers of processed recordings, meaning the results may not be statistically reliable and should not be generalized.

California

Only four recordings were analyzed in California, so the results from this section should be interpreted with caution. In the processed videos, 417 vehicles were subject to SDMO requirements. Of these target vehicles, 93% (n=387) either fully (n=371; 89%) or partially (n=16; 4%) engaged in a move over maneuver as part of their response when passing a stopped vehicle on the side of the road. The remaining 7% (n=30) did not make any attempt to move over (see Figure F.1).

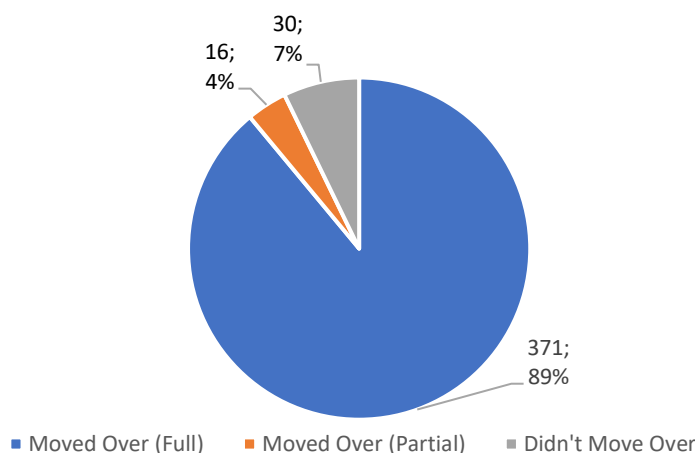


Figure F.1. Move Over Maneuvers Among Target Vehicles in California

Out of the 417 target vehicles in California, 11% (n=47) slowed down as part of their response when passing a stopped vehicle on the side of the road (see Figure F.2). When lesser speed reductions were examined, 55 vehicles (13% of the total) reduced their speed by at least 10%.

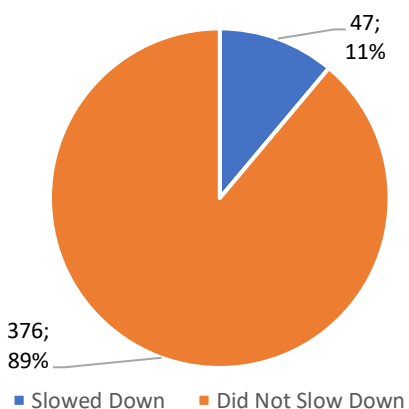


Figure F.2. Slow Down Maneuvers Among Target Vehicles in California

Among target vehicles in California, 82% (n=341) performed a move over maneuver without an accompanying deceleration, while only a single vehicle slowed down without also moving over (n=1; 0%). Additionally, a few drivers both slowed down and moved over (n=46; 11%), indicating that this combined behavior was rare. The remaining 7% (n=29) of target vehicles failed to either reduce their speed or change lanes.

California law states that a motorist must move over or slow down. Considering these requirements, overall compliance among target vehicles in California was 93% (see Figure F.3).

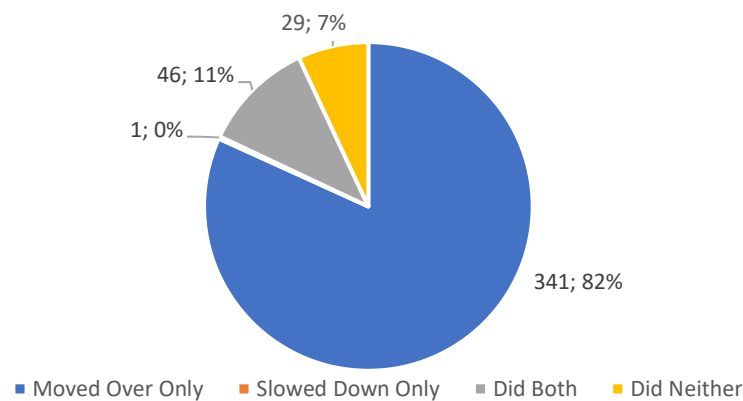


Figure F.3. Compliance Among Target Vehicles in California

Florida

Twenty recordings were analyzed in Florida. In the processed videos, 783 vehicles were subject to SDMO requirements. Of these target vehicles, 54% (n=422) either fully (n=279; 36%) or partially (n=143; 18%) engaged in a move over maneuver as part of their response when passing a stopped vehicle on the side of the road. The remaining 46% (n=361) did not make any attempt to move over (see Figure F.4).

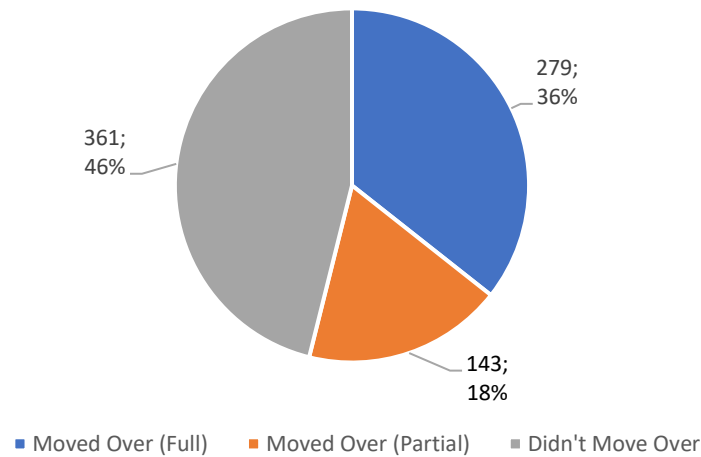


Figure F.4. Move Over Maneuvers Among Target Vehicles in Florida

Out of all the target vehicles in Florida, 7% (n=52) slowed down as part of their response when passing a stopped vehicle on the side of the road (see Figure F.5). When lesser speed reductions were examined, 119 vehicles (15% of the total) reduced their speed by at least 10%.

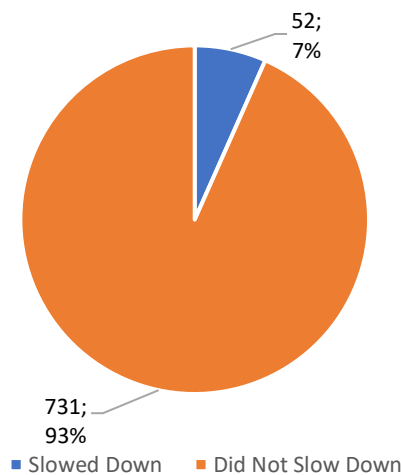


Figure F.5. Slow Down Maneuvers Among Target Vehicles in Florida

Among target vehicles in Florida, 51% (n=396) performed move over maneuvers without also slowing down. Fewer vehicles were observed slowing down without moving over (n=26; 3%), and similar number of vehicles engaged in both behaviors simultaneously (n=26; 3%). The remaining 43% (n=335) of target vehicles failed to either slow down or move over.

Florida's law states that a motorist must move over or slow down, overall compliance among target vehicles in Florida was 57% (see Figure F.6).

Also, note that Florida's law requires slowing to 20 mph below the posted speed limit. In some cases, this may be greater than the 20% threshold that is adopted in this report to estimate compliance with slow down requirements. Therefore, rates of compliance may actually be slightly lower than reported.

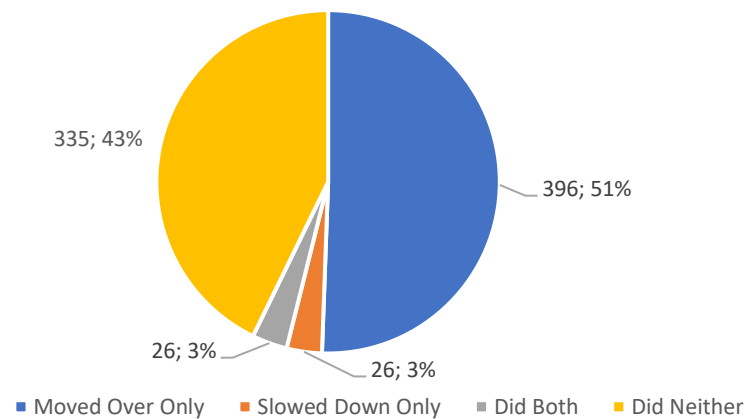


Figure F.6. Compliance Among Target Vehicles in Florida

Maryland

Only six recordings were analyzed in Maryland, so the results from this section should be interpreted with caution. In the processed videos, 184 vehicles were subject to SDMO requirements. Of these target vehicles, 50% (n=92) either fully (n=89; 48%) or partially (n=3; 2%) engaged in a move over maneuver as part of their response when passing a stopped vehicle on the side of the road. The remaining 50% (n=92) did not make any attempt to move over (see Figure F.7).

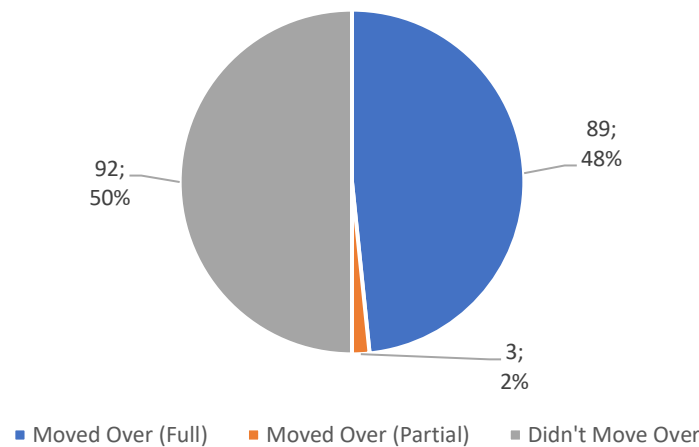


Figure F.7. Move Over Maneuvers Among Target Vehicles in Maryland

Out of all the target vehicles in Maryland, 13% (n=24) slowed down as part of their response when passing a stopped vehicle on the side of the road (see Figure F.8). When lesser speed reductions were examined, 40 vehicles (22% of the total) reduced their speed by at least 10%.

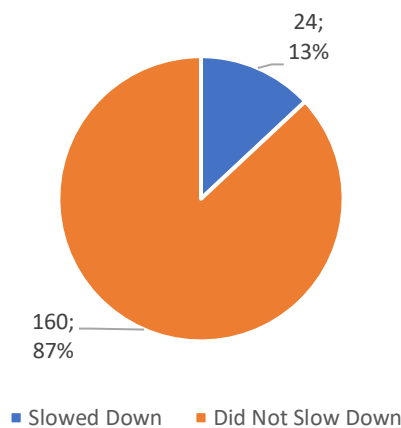


Figure F.8. Slow Down Maneuvers Among Target Vehicles in Maryland

Among target vehicles in Maryland, the most frequently observed response was a move over maneuver (n=81; 44%) without an accompanying reduction in speed. A smaller portion of drivers slowed down without moving over (n=13; 7%), while only 6% (n=11) of drivers slowed down and moved over. The remaining 43% (n=79) of target vehicles failed to either slow down or move over.

Maryland's law states that a motorist must move over or slow down. Therefore, overall compliance among target vehicles in Maryland was 57% (see Figure F.9).

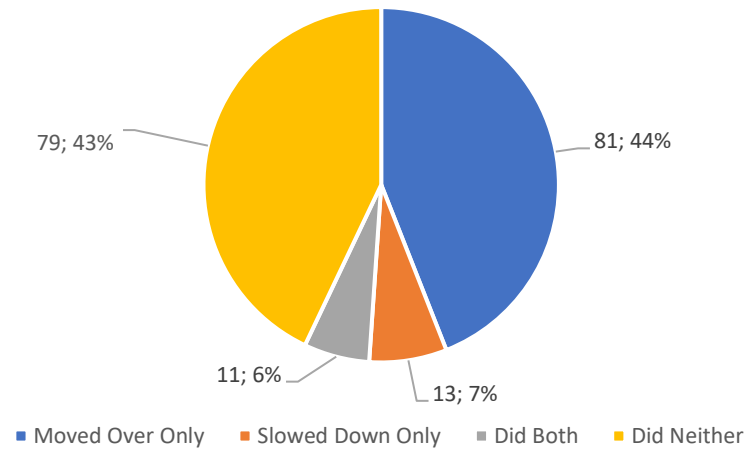


Figure F.9. Compliance Among Target Vehicles in Maryland

Michigan

Only four recordings were analyzed in Michigan, so the results from this section should be interpreted with caution. In the processed video, 1,271 vehicles were subject to SDMO requirements. Of these target vehicles, 60% (n=737) either fully (n=636; 52%) or partially (n=101; 8%) engaged in a move over maneuver as part of their response when passing a stopped vehicle on the side of the road. The remaining 40% (n=481) did not make any attempt to move over (see Figure F.10).

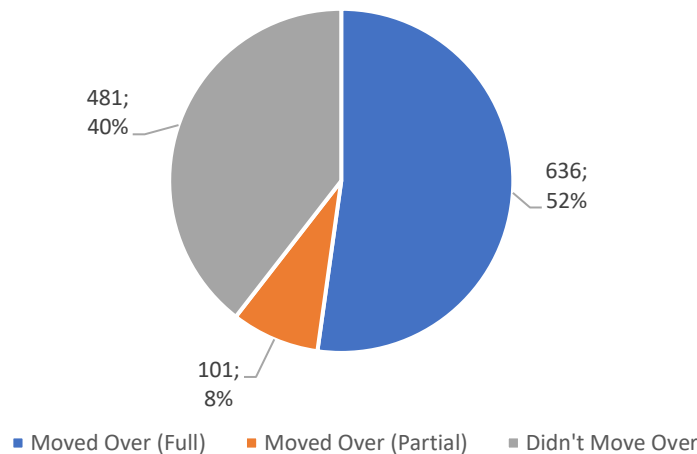


Figure F.10. Move Over Maneuvers Among Target Vehicles in Michigan

Out of all the target vehicles in Michigan, 9% (n=35) slowed down as part of their response when passing a stopped vehicle on the side of the road (see Figure F.11). When lesser speed reductions were examined, 146 vehicles (36% of the total) reduced their speed by at least 10%.

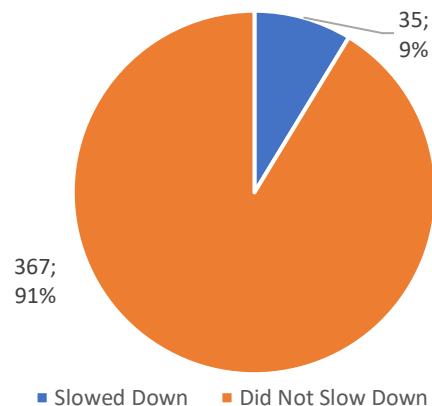


Figure F.11. Slow Down Maneuvers Among Target Vehicles in Michigan

Among target vehicles in Michigan, the most common response was a move over maneuver without slowing down (n=720; 54%). In contrast, only 2% (n=18) of the vehicles slowed down without moving over, and very few drivers slowed down and moved over (n=17; 1%). The remaining 43% (n=572) of target vehicles failed to either slow down or move over. Michigan has a move over and slow down law, and therefore overall compliance among target vehicles in Michigan was 1% (see Figure F.12).

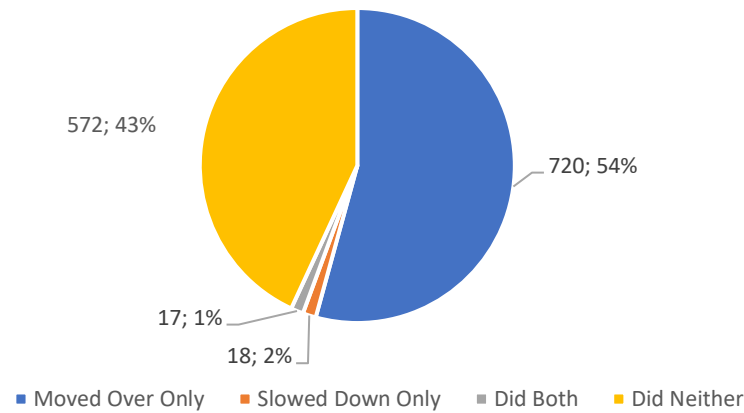


Figure F.12. Compliance Among Target Vehicles in Michigan

Minnesota

Seventeen recordings were analyzed in Minnesota. In the processed videos, 590 vehicles were subject to SDMO requirements. Of these target vehicles, 53% (n=314) either fully (n=281; 48%) or partially (n=33; 5%) engaged in a move over maneuver as part of their response when passing a stopped vehicle on the side of the road. The remaining 47% (n=276) did not make any attempt to move over (see Figure F.13).

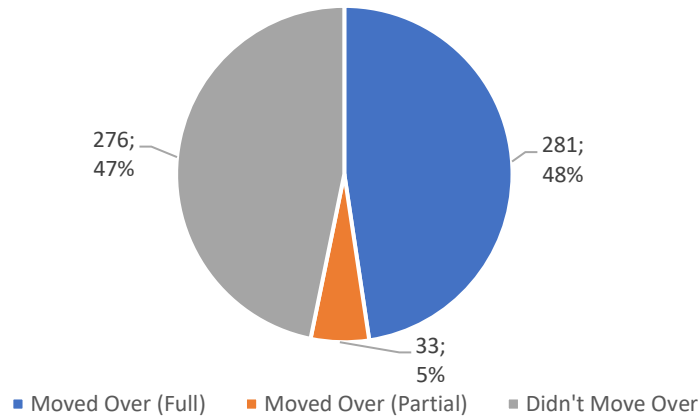


Figure F.13. Move Over Maneuvers Among Target Vehicles in Minnesota

Out of all the target vehicles in Minnesota, only 12% (n=71) of drivers slowed down as part of their response when passing a stopped vehicle on the side of the road (see Figure F.14). When lesser speed reductions were examined, 154 vehicles (26% of the total) reduced their speed by at least 10%.

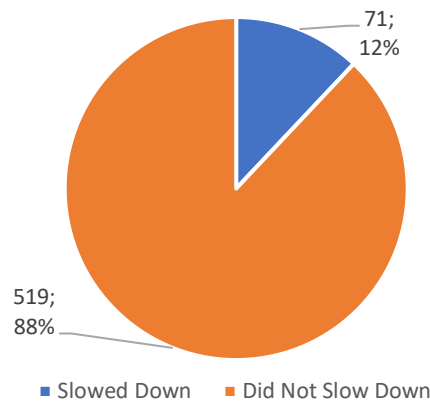


Figure F.14. Slow Down Maneuvers Among Target Vehicles in Minnesota

Among target vehicles in Minnesota, 43% (n=254) performed a move over maneuver without slowing down, while only 2% slowed down without changing lanes (n=11). A larger percentage of vehicles engaged in both slow down and move over behaviors (n=60; 10%). The remaining 45% (n=265) of target vehicles failed to either slow down or move over.

Minnesota law requires motorists to either move over or slow down when approaching a roadside vehicle. Therefore, overall compliance among target vehicles in Minnesota was 55% (see Figure F.15).

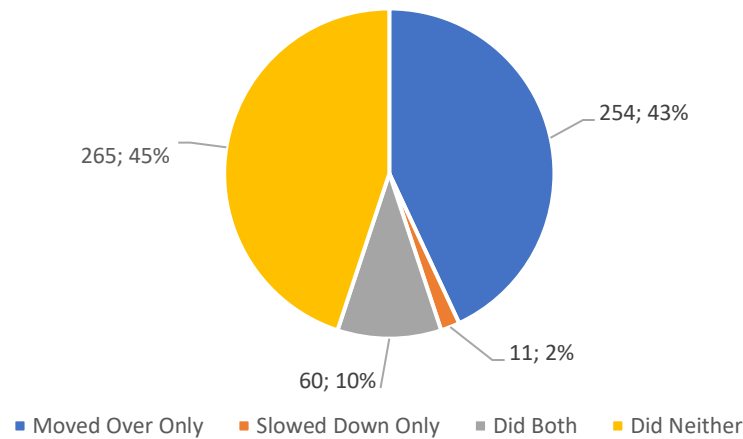


Figure F.15. Compliance Among Target Vehicles in Minnesota

North Carolina

Thirty-five recordings were analyzed in North Carolina. In the processed videos, 3,887 vehicles were subject to SDMO requirements. Of these target vehicles, 67% (n=2,603) either fully (n=2,432; 63%) or partially (n=171; 4%) engaged in a move over maneuver as part of their response when passing a stopped vehicle on the side of the road. The remaining 33% (n=1,250) did not make any attempt to move over (see Figure F.16).

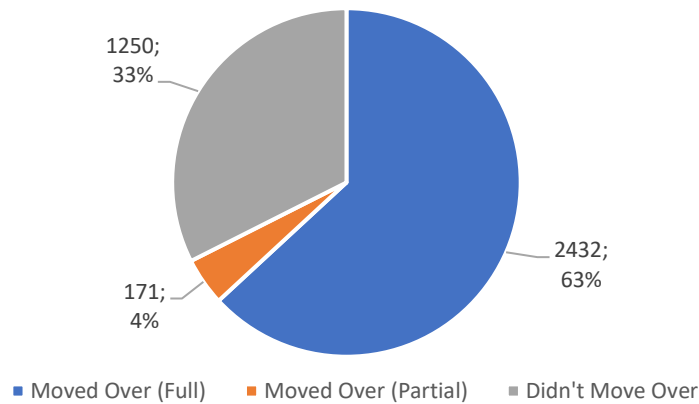


Figure F.16. Move Over Maneuvers Among Target Vehicles in North Carolina

In North Carolina, only a small percentage (n=448; 12%) of vehicles slowed down as part of their response when passing a stopped vehicle on the side of the road (see Figure F.17). When lesser speed reductions were examined, 898 vehicles (24% of the total) reduced their speed by at least 10%.

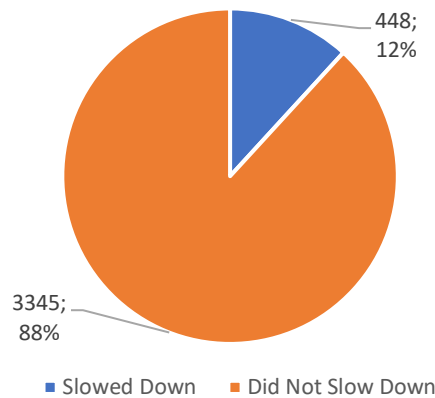


Figure F.17. Slow Down Maneuvers Among Target Vehicles in North Carolina

In North Carolina, the majority of target vehicles moved over without slowing down (n=2,388; 61%). A much smaller portion of drivers only slowed down (n=233; 6%). And even fewer drivers slowed down and moved over (n=215; 5.5%). The remaining 27% (n=1,051) of target vehicles failed to either slow down or move over.

North Carolina's law states that a motorist must move over or slow down. Therefore, overall compliance among target vehicles in North Carolina was 73% (see Figure F.18).

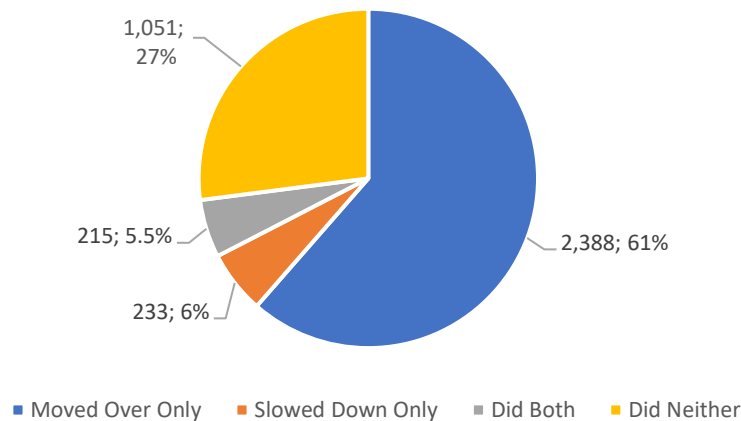


Figure F.18. Compliance Among Target Vehicles in North Carolina

New York

Only a single recording was analyzed in New York, so the results from this section should be interpreted with extreme caution. In the single processed video from the state, 81 vehicles were subject to SDMO requirements. Of these target vehicles, 9% (n=7) fully engaged in a move over maneuver as part of their response when passing a stopped vehicle on the side of the road. None of the target vehicles engaged in a partial move over maneuver (n=0; 0%). The remaining 91% (n=74) did not make any attempt to move over (see Figure F.19). Note these findings should be interpreted with caution due to the smaller sample size.

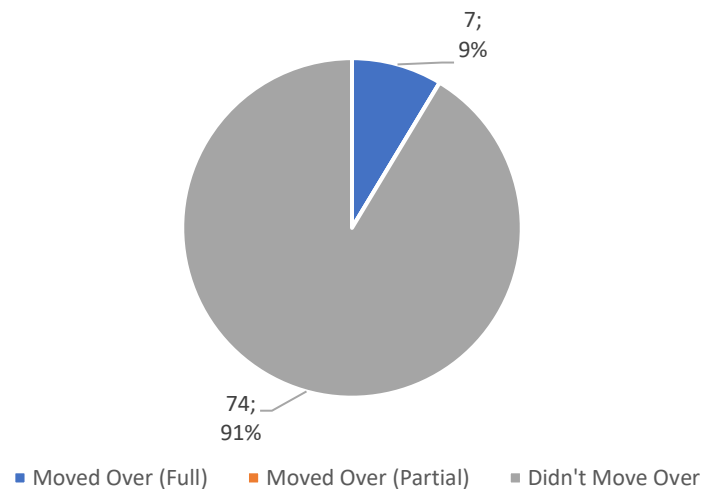


Figure F.19. Move Over Maneuvers Among Target Vehicles in New York

Out of all the target vehicles in New York, no vehicles (n=0) only slowed down as part of their response when passing a stopped vehicle on the side of the road (see Figure F.20). When lesser speed reductions were examined, still 0 reduced their speed by at least 10%.

Among target vehicles in New York, 9% (n=7) performed a move over maneuver without an accompanying slow down behavior. No vehicles were observed slowing down or exhibiting both slow down and moved over maneuvers. The remaining 91% (n=74) of target vehicles failed either to slow down or move over.

New York's law states that a motorist must move over but does not have any slow down requirements. Therefore, overall compliance among target vehicles in New York was 9% (see Figure F.20).

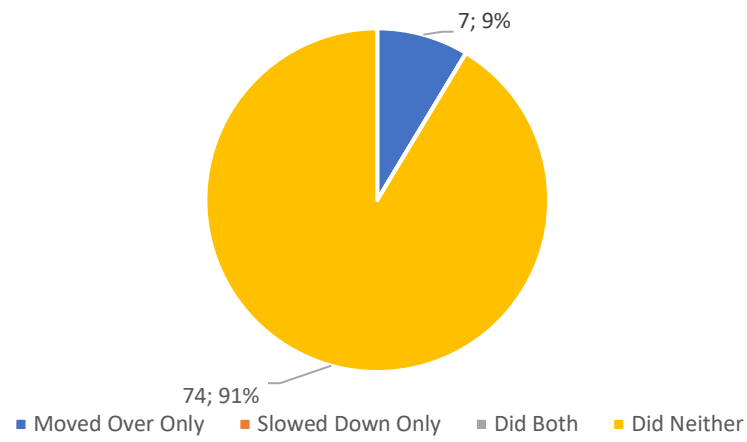


Figure F.20. Compliance Among Target Vehicles in New York

Nevada

One recorded video was received from Nevada; however, it was determined to be unsuitable for analysis. Therefore, no compliance data for Nevada could be presented in this report.

Pennsylvania

Twenty-five recordings were analyzed in Pennsylvania. In the processed videos, 1,424 vehicles were subject to SDMO requirements. Of these target vehicles, 55% (n=767) either fully (n=650; 46%) or partially (n=117; 9%) engaged in a move over maneuver as part of their response when passing a vehicle on the side of the road. The remaining 45% (n=646) did not make any attempt to move over (see Figure F.21).

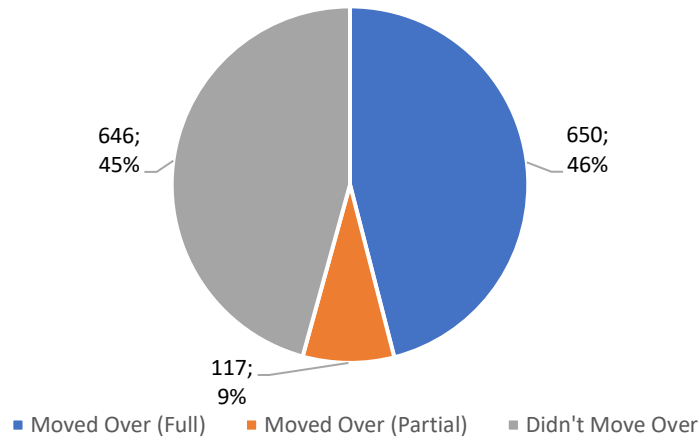


Figure F.21. Move Over Maneuvers Among Target Vehicles in Pennsylvania

Out of all the target vehicles in Pennsylvania, only a very small percentage (n=123; 9%) slowed down as part of their response when passing a stopped vehicle on the side of the road (see Figure F.22). When lesser speed reductions were examined, 178 vehicles (13% of the total) reduced their speed by at least 10%.

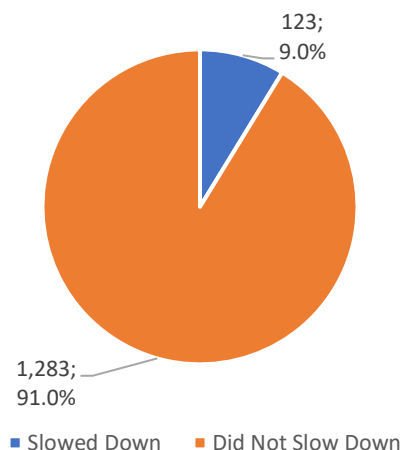


Figure F.22. Slow Down Maneuvers Among Target Vehicles in Pennsylvania

Among target vehicles in Pennsylvania, move over maneuvers without an accompanying reduction in speed (n=694; 49%) were more common compared to slow down only maneuvers (n=50; 3%). Additionally, few people slowed down and moved over (n=73; 5%). The remaining 43% (n=607) of vehicles failed to either slow down or move over.

Pennsylvania's law states that motorists must move over or slow down. Therefore, overall compliance in Pennsylvania was 57% (see Figure F.23).

Also, note that Pennsylvania's law requires a 20 mph speed reduction. In some cases, this may be greater than the 20% threshold that is adopted in this report to determine compliant slowdowns. Therefore, actual compliance rates may have been slightly lower than reported.

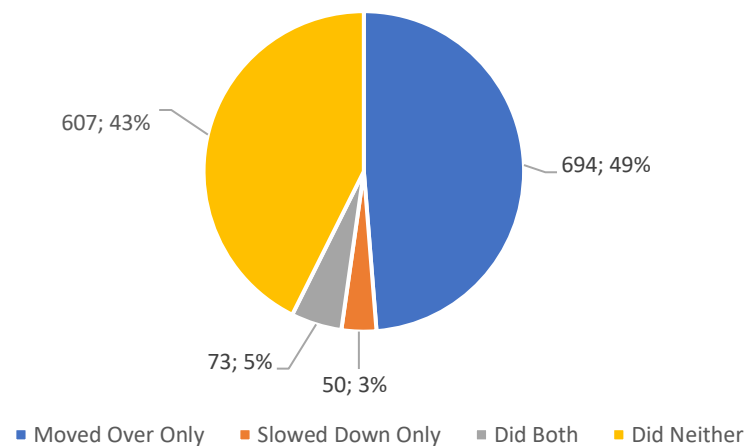


Figure F.23. Compliance Among Target Vehicles in Pennsylvania

Tennessee

Twenty recordings were analyzed in Tennessee. In the processed videos, 1,952 vehicles were subject to SDMO requirements. Of these target vehicles, 51% (n=1,002) either fully (n=605; 31%) or partially (n=397; 20%) engaged in a move over maneuver as part of their response when passing a vehicle on the side of the road. The remaining 49% (n=950) did not make any attempt to move over (see Figure F.24).

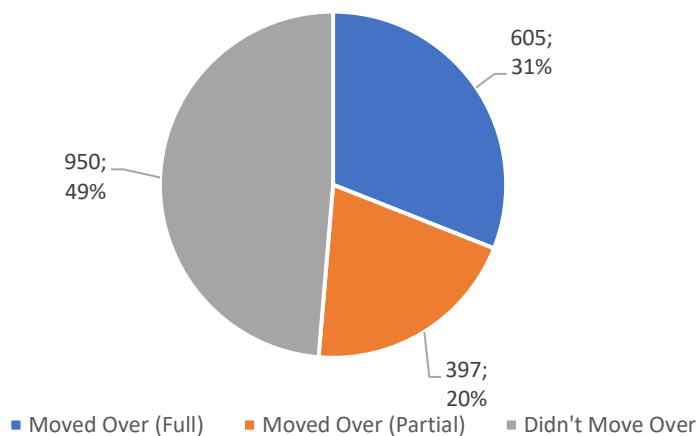


Figure F.24. Move Over Maneuvers Among Target Vehicles in Tennessee

Out of all the target vehicles in Tennessee, only a small percentage (n=156; 8%) slowed down as part of their response when passing a stopped vehicle on the side of the road (see Figure F.25). When lesser speed reductions were examined, 256 vehicles (13% of the total) reduced their speed by at least 10%.

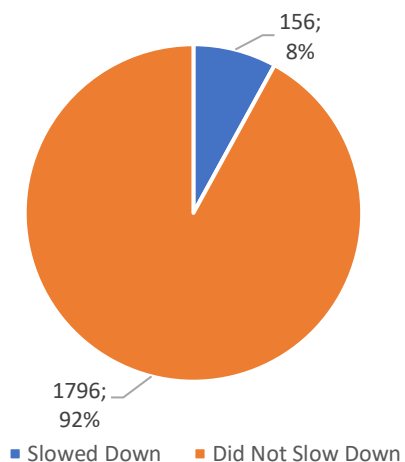


Figure F.25. Slow Down Maneuvers Among Target Vehicles in Tennessee

Among target vehicles in Tennessee, 47% (n=914) performed move over maneuvers but did not slow down. In contrast, only 3% (n=68) of vehicles were observed slowing down without moving over. Additionally, very few vehicles both slowed down and moved over (n=88; 5%). The remaining 45% (n=882) of target vehicles failed to either slow down or move over.

Tennessee's law states that a motorist must move over or slow down. Therefore, overall compliance among target vehicles in Tennessee was 55% (see Figure F.26).

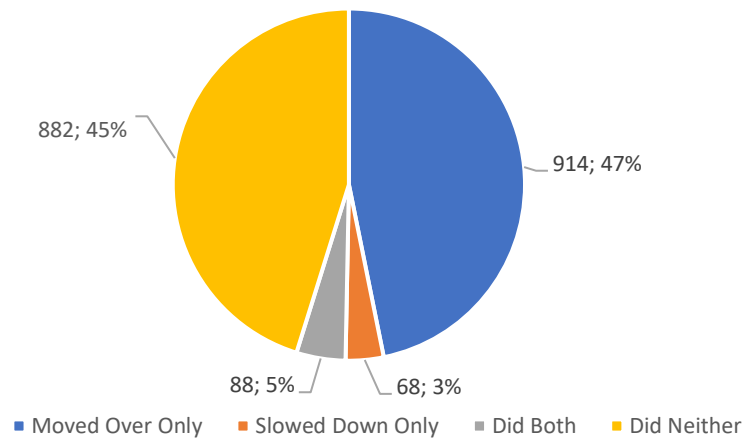


Figure F.26. Compliance Among Target Vehicles in Tennessee

Texas

Twenty-six recordings were analyzed in Texas. In the processed videos, 950 vehicles were subject to SDMO requirements. Of these target vehicles, 63% (n=581) either fully (n=418; 45%) or partially (n=163; 18%) engaged in a move over maneuver as part of their response when passing a stopped vehicle on the side of the road. The remaining 37% (n=342) did not make any attempt to move over (see Figure F.27).

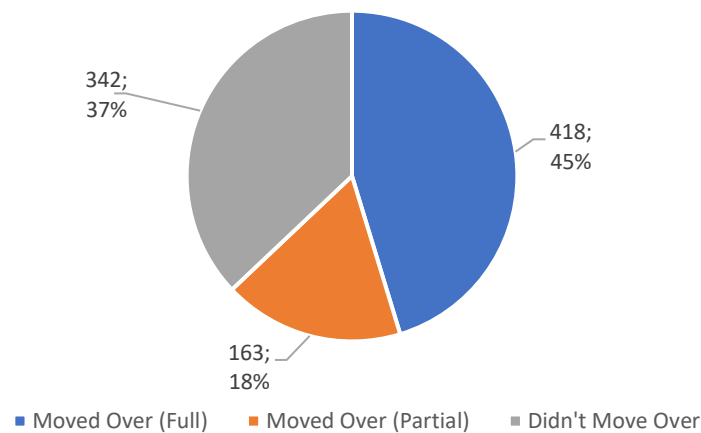


Figure F.27. Move Over Maneuvers Among Target Vehicles in Texas

Out of all the target vehicles in Texas, almost one in five (n=170; 18%) slowed down as part of their response when passing a stopped vehicle on the side of the road (see Figure F.28). When lesser speed reductions were examined, 241 vehicles (34% of the total) reduced their speed by at least 10%.

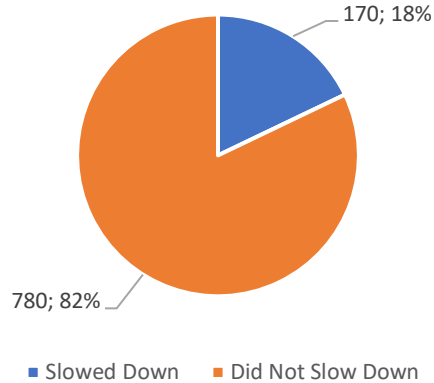


Figure F.28. Slow Down Maneuvers Among Target Vehicles in Texas

Among target vehicles in Texas, 54% (n=509) performed move over maneuvers without also slowing down. Whereas only 10% (n=98) of vehicles were observed slowing down without moving over when passing a stopped vehicle. Additionally, very few vehicles engaged in both slow down and move over behaviors simultaneously (n=72; 8%). The remaining 28% (n=271) of target vehicles failed to either slow down or move over.

Texas' law states that a motorist must move over or slow down. Therefore, overall compliance among target vehicles in Texas was 72% (see Figure F.29). Also, note that Texas' law requires a 20 mph speed reduction. In some cases, this may be greater than the 20% threshold that is adopted in this report to determine compliant slowdowns. Therefore, actual compliance rates may have been slightly lower than reported here.

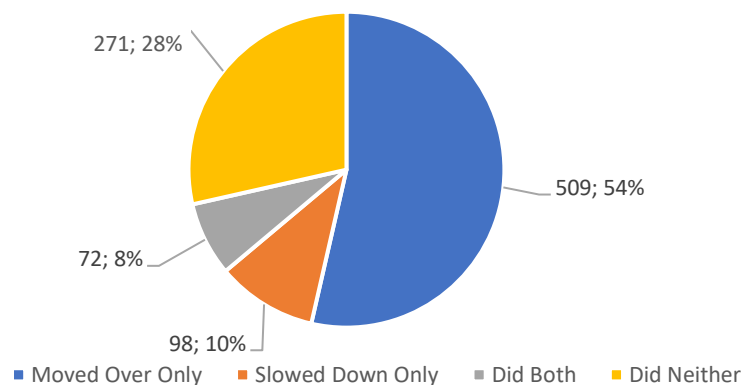


Figure F.29. Compliance Among Target Vehicles in Texas

Virginia

Only six recordings were analyzed in Virginia, so the results from this section should be interpreted with caution. In the processed videos, 692 vehicles were subject to SDMO requirements. Of these target vehicles, 66% (n=457) either fully (n=376; 54%) or partially (n=81; 12%) engaged in a move over maneuver as part of their response when passing a stopped vehicle on the side of the road. The remaining 34% (n=235) did not make any attempt to move over (see Figure F.30).

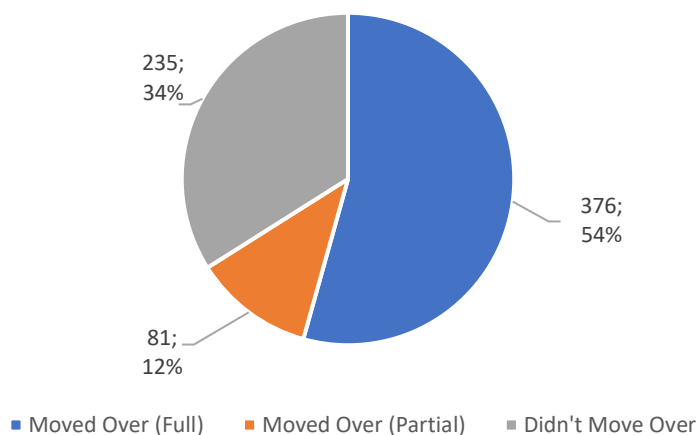


Figure F.30. Move Over Maneuvers Among Target Vehicles in Virginia

Out of all the target vehicles in Virginia, only 2% (n=13) slowed down as part of their response when passing a stopped vehicle on the side of the road (see Figure F.31). When lesser speed reductions were examined, 39 vehicles (6% of the total) reduced their speed by at least 10%.

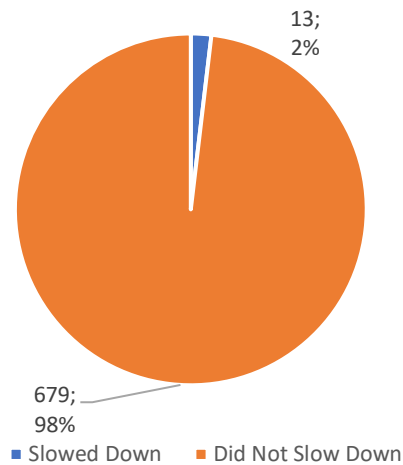


Figure F.31. Slow Down Maneuvers Among Target Vehicles in Virginia

Among target vehicles in Virginia, 64% (n=445) performed move over maneuvers without also slowing down, and an additional 0.1% (n=1) of vehicles were observed slowing down without moving over. Additionally, very few vehicles engaged in both behaviors simultaneously (n=12; 2%). The remaining 34% (n=234) of target vehicles failed to either slow down or move over.

Virginia's law states that a motorist must move over or slow down. Therefore, overall compliance among target vehicles in Virginia was 66% (see Figure F.32).

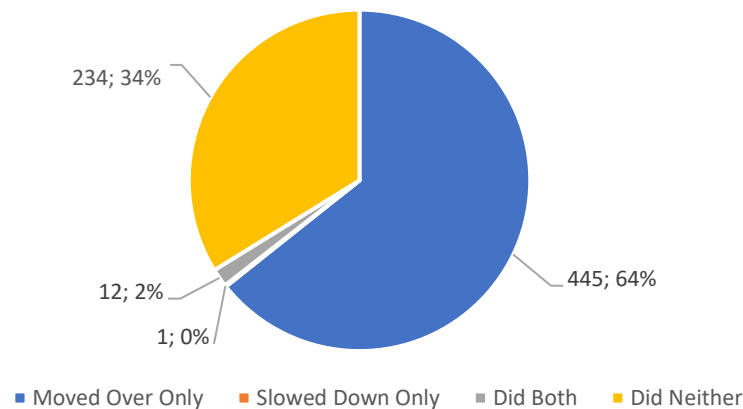


Figure F.32. Compliance Among Target Vehicles in Virginia

Washington

Only five recordings were analyzed in Washington, so the results from this section should be interpreted with caution. In the processed video, 78 vehicles were subject to SDMO requirements. Of these target vehicles, 54% (n=42) either fully (n=40; 51%) or partially (n=2; 3%) engaged in a move over maneuver as part of their response when passing a stopped vehicle on the side of the road. The remaining 46% (n=36) did not make any attempt to move over (see Figure F.33).

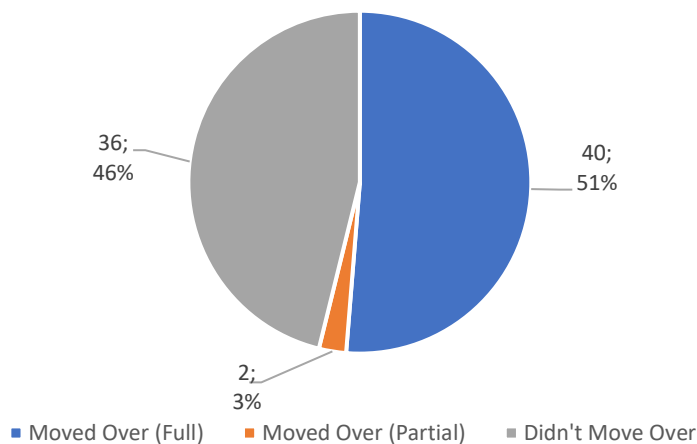


Figure F.33. Move Over Maneuvers Among Target Vehicles in Washington

Out of all the target vehicles in Washington, 32% (n=23) slowed down as part of their response when passing a stopped vehicle on the side of the road (see Figure F.34). When lesser speed reductions were examined, 29 vehicles (40% of the total) reduced their speed by at least 10%.

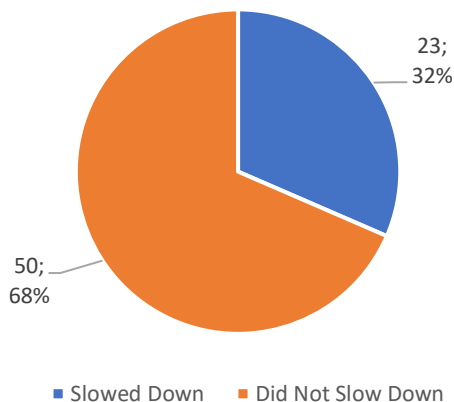


Figure F.34. Slow Down Maneuvers Among Target Vehicles in Washington

Among target vehicles in Washington, 33% (n=26) performed move over maneuvers without also slowing down and 9% of vehicles (n=7) were observed slowing down without moving over. Additionally, quite a few vehicles engaged in behaviors simultaneously (n=16; 21%). The remaining 37% (n=29) of target vehicles failed to either slow down or move over.

Washington's law states that a motorist must move over and slow down. Therefore, overall compliance among target vehicles in Washington was 21% (see Figure F.35).

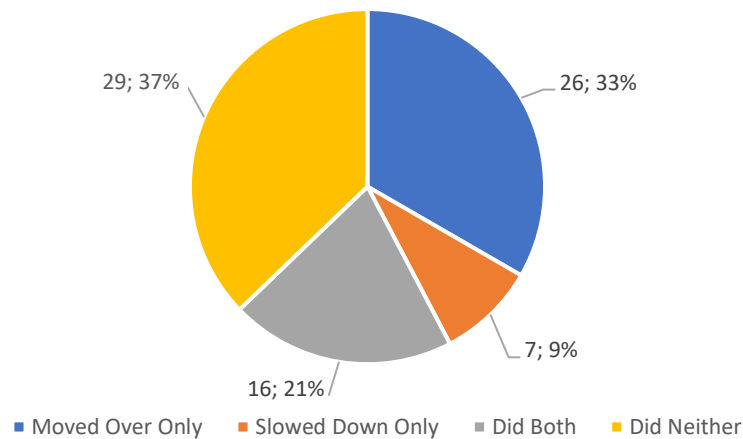


Figure F.35. Compliance Among Target Vehicles in Washington

Appendix G.

Guidelines for TMC Video Capture

Project Background

All fifty states have “slow down, move over” (SDMO) laws aimed at protecting law enforcement and emergency personnel responding to traffic incidents. SDMO laws vary with respect to the vehicles included under the law, the required driver response, the degree to which the law is enforced, and fines/penalties assessed for noncompliance. Recent studies demonstrate that motorists are not aware of their state law, which negatively impacts compliance and safety. Further research is needed to better understand motorists’ awareness of and compliance with SDMO laws and to identify effective methods that will increase compliance. The [AAA Foundation for Traffic Safety](#) has contracted with Westat, a Maryland-based research firm, to conduct this research on their behalf. As part of the research, Westat will be selecting a sample of states where we will conduct focus groups with motorists to better understand their awareness of their SDMO law. We will also conduct an observational assessment of driver behavior when passing stopped vehicles using traffic management center (TMC) camera footage. For this effort, Westat is partnering with traffic safety experts from the University of Maryland Center for Advanced Transportation Technology (CATT). CATT will manage the observational assessment using traffic camera video data to estimate SDMO compliance rates in selected jurisdictions.

Traffic Camera Video Data Collection Effort

The primary data collected for this research is captured using TMC video of incident scenes taking place on your jurisdiction’s roadways. By capturing and analyzing video from actual incidents, the research team will estimate driver compliance with SDMO when approaching and passing incident scenes. This analysis will include documenting whether a driver changed lanes and/or reduced their speed when approaching the scene. The following sections discuss the desired criteria for traffic camera video collected.

Framing TMC Video

The research team will be electronically processing and manually analyzing video captured by TMCs for incidents. To support analysis assessing SDMO compliance, the captured video should provide a comprehensive view of the incident scene that is properly framed. This includes a view of the incident scene and responder vehicle(s) and an extended view of upstream traffic to the incident scene and responders.

The image below illustrates ideal video framing for the study. In this example, the incident vehicle is positioned in one corner of the frame, allowing the remainder of the view to capture a large amount of the upstream traffic.



Figure G.1. Ideal TMC video framing

To achieve this framing, the research team requests that TMCs, wherever possible, use the Pan, Tilt, and Zoom (PTZ) features of your agency's highway cameras. We recognize that not all incidents will occur within the view of a given camera location. However, if some framing is possible, and the video provides a view of the incident scene as well as approaching traffic, the research team can often accept it. For research purposes, once a given incident is framed as best as possible via PTZ, it is important to maintain this view for the duration of video recording.

Capturing Video

The research team is looking to receive the highest quality video possible. We understand that some TMCs and toll authorities use the public internet to stream their highway cameras. However, many agencies also have a "local view" of their video within the office/TMC handling the streaming process that may have access to better quality video in terms of resolution and frame rate. If this is the case, we would like to receive this higher quality video of the incident. If possible, we would like to have the captured video stored on a local hard drive (provided by us) and then mailed to the research team. If not possible, we will work with you to determine how best to capture video with the least impact on your operations.

Nighttime

The research team is interested in obtaining some video for nighttime incident scenes where it is possible to view oncoming traffic. Well-lit stretches of roadways may allow for acceptable views of both incident scenes and upstream vehicles.

Data to be Captured for Submitted Videos

For each incident captured by TMC video and provided to the research team, we may need to clarify some basic information to ensure effective analysis and data processing. Examples of this include incident date/time, highway video camera location, incident type, type(s) of responder vehicles(s) present, and roadway conditions.

Data Security Measures

All video and data provided will be handled according to the specific requirements set forth by providing agencies and jurisdictions. In addition, all videos will be permanently deleted from any storage devices used during this research at the conclusion of the study. If remote access to agency video or data is provided to the research team by participating agencies, all required security measures will be followed. No Personally Identifiable Information (PII) data will be collected.

Appendix H.

Validating Performance and Accuracy of the ODT Algorithms and Data Collected

The accuracy evaluation process was divided into two subprocesses: changing lane accuracy and speed estimate accuracy. This distinction was made due to different ways of collecting “ground truth” data, which resulted in different accuracy estimation methods. This evaluation was conducted in 2022 as part of a U.S. Federal Highway Administration (FHWA) involving Slow Down Move Over law compliance.

Changing Lane Accuracy

Changing lane accuracy evaluation was based on obtaining ground truth data by manual video observations. First, a base video was overlaid with bounding boxes for each vehicle moving through the frame. With this visual tool, an informed observer reproduced the results of the algorithm.

Accuracy was measured by comparing the results of the algorithm with the manual analysis results. The manual analysis followed the algorithm steps, which was as follows:

- For each vehicle, it is manually determined if it was subject to the jurisdiction’s Move Over law
- For each vehicle that could move over, it is manually determined if it moved over

Manual identification results served as real (ground truth) data. Both manual and algorithm-based identification assigned each vehicle to one of the following categories:

- Not subject to Move Over law
- Subject to Move Over law but did not move over
- Moved over

Then, for each category, the percentage accuracy was calculated according to the formula:

$$Accuracy = \left(1 - \frac{|No. of vehicles(ground truth) - No. of vehicles(algorithm)|}{No. of vehicles(ground truth)} \right) * 100$$

Figure H.1. Formula for Accuracy of Counts Using ODT Algorithm Versus Ground Truth.

The final accuracy was calculated as an arithmetic mean of all three accuracies. The overall accuracy of the ODT algorithm in a pre-pilot test was shown to be 90.6%. As part of the FHWA study, a small video sample was evaluated to establish that the ODT accuracy during the test was consistent with the ODT development and testing accuracy.

To determine the final accuracy, three different videos recorded as part of the 2022 study were evaluated:

- I-97 and New Cut Road Intersection (76.641161W, 39.127670N)
- US30 and PA501 intersection (76.311897W, 40.069843N)
- MD100 and MD170 intersection (76.688703W, 39.148420N)

The videos were recorded at different times with different cameras. All the videos met the visibility requirements, which were as follows:

- The camera has a viewing angle of at least 15° to avoid occluding camera field of view
- No objects (like bridges or large road signs) occlude important parts of the road
- The videos were recorded during a day, with normal (not limited) visibility
- The videos were recorded with frame rate 30 fps

Two videos were recorded in high resolution (1920 x 1080, frame rate 30 fps) and one in reduced resolution (704 x 480, 15 fps).

The summary of the accuracy analysis is presented in Figure H.2, and the detailed results are in Table H.1 and Table H.2.

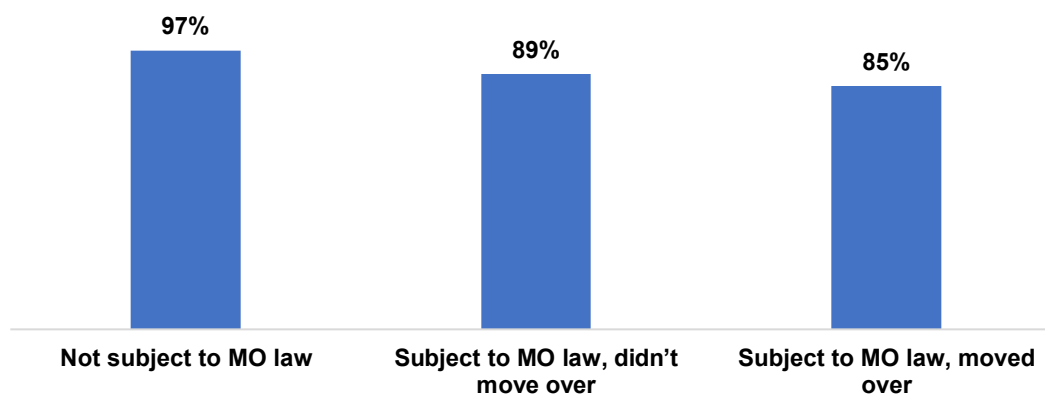


Figure H.2. Lane Change Accuracy – Summary

Table H.1. Lane Change Accuracy—Percentage Results

Video	Not subject to MO law	Subject to MO law, didn't move over	Subject to MO law, moved over	Average
I-97	98.2%	85.4%	81.8%	88.5%
US30	97.6%	97.2%	82.4%	92.4%
MD 100	96.4%	85.3%	90.9%	90.9%
Average	97.4%	89.3%	85.0%	90.6%

Table H.2. Lane Change Accuracy—Detailed Results

		I-97	US30	MD100
Not subject to MO law	No. of vehicles (model)	481	80	160
	No. of vehicles (manual)	490	82	166
	Accuracy	98.2%	97.6%	96.4%
Subject to MO law, didn't move over	No. of vehicles (model)	123	140	122
	No. of vehicles (manual)	144	144	143
	Accuracy	85.4%	97.2%	85.3%
Subject to MO law, moved over	No. of vehicles (model)	18	20	12
	No. of vehicles (manual)	22	17	11
	Accuracy	81.8%	82.3%	90.9%

For the current study, a small sample of video was evaluated to establish that the ODT accuracy during the test was consistent with the ODT development and pilot testing.

Speed Accuracy

Determining the accuracy of speed measurements also required ground truth data (real speeds) that cannot be obtained from manual video observations. Thus, the controlled experiment with speeds registered by GPS was conducted.

During the experiment, two vehicles were driving back and forth simulating typical Move Over-related behaviors, which is:

- Driving at a fixed speed on the same lane
- Driving at a fixed speed while changing the lane
- Reducing speed and not changing the lane
- Reducing speed and changing the lane

Additionally, due to traffic conditions, occasionally some other behaviors (like stopping the car) occurred. We registered all the speeds with a GPS device and recorded the entire experiment using a camera installed to resemble road infrastructure cameras. Videos were then processed using the ODT algorithm and compared the speeds obtained from the algorithm with the GPS-based speeds. To determine the speed estimation error, a mean absolute error (*MAE*) was used as a main metric (Figure H.3) and Free Flow Error (*FFE*) (Figure H.4) and Symmetric Mean Absolute Percentage Error (*SMAPE*) (Figure H.5) as complementary metrics. The metrics are defined as follows:

$$MAE = \frac{1}{n} \sum_{i=1}^n |Speed_{ODT_i} - Speed_{GPS_i}| \text{ [MPH]}$$

Figure H.2. Formula for Mean Absolute Error (MAE)

$$FFE = 100\% * \frac{1}{n} * \sum_{i=1}^n \frac{|Speed_{ODT_i} - Speed_{GPS_i}|}{Free\ Flow\ Speed_i}$$

Figure H.4. Formula for Free Flow Error (FFE)

$$SMAPE = 100\% * \frac{1}{n} * \sum_{i=1}^n \frac{|Speed_{ODT_i} - Speed_{GPS_i}|}{(|Speed_{ODT_i}| + |Speed_{GPS_i}|)/2}$$

Figure H.5. Formula for Symmetric Mean Absolute Percentage Error (SMAPE).

Both *FFE* and *SMAPE* are relative errors that were used for better understanding and deeper analysis of the algorithm accuracy. *FFE* was normalized with respect to free-flow speed, thus the error level did not depend on the actual speed. *SMAPE* was normalized with respect to the actual speed.

Overall, during the tests, 19 experiments were conducted, and 138 speed measurements (138 pairs of $Speed_{GPS}$, $Speed_{ODT}$) were collected. The aggregated results are presented in Table H.3.

Table H.3. Speed Error Metrics Summary

Metric	MAE [mph]	FFE [%]	SMAPE [%]
mean	2.15	6.33%	13.19%
std. dev.	2.01	5.89%	24.02%
min	0.06	0.16%	0.20%
25 perc	0.85	2.58%	3.25%
50 perc (median)	1.51	4.31%	5.64%
75 perc	2.89	8.72%	13.02%
95 perc	5.94	16.97%	53.63%
max	12.54	35.82%	200%

Appendix I.

Stakeholder Webinar Questions

Legislation

1. **What would be the biggest challenge(s) your state may face in adopting more standardized and simplified SDMO law language?**
(select all that apply)
 - A. No challenge
 - B. Lack of legislative will or champion
 - C. Resistance from specific in-state stakeholder groups (e.g., legal, enforcement)
 - D. Difficulty in adapting “model” language to state-specific contexts
 - E. Perceived lack of a compelling need for change
 - F. Budgetary constraints related to legislative efforts
 - G. Other
2. **To what extent is your state currently engaged with or leveraging federal grant programs (such as Sections 405h for Roadside Safety, 405i for Move Over, or Safe Streets and Roads for All – SS4A) for SDMO-related initiatives?**
(select one)
 - A. Actively engaged and leveraging funds for SDMO/roadside safety
 - B. Aware of programs but not yet significantly leveraging for SDMO
 - C. Limited awareness or engagement with these specific programs
 - D. Not applicable
 - E. Unsure of current status

3. **What would be the biggest challenge(s) your state faces in effectively leveraging available federal funding opportunities (like 405h, 405i, SS4A) to enhance SDMO efforts?**

(select all that apply)

- A. No challenge
- B. Understanding complex grant requirements and application processes
- C. Lack of dedicated staff or resources to manage grant applications/compliance
- D. Competing demands for limited grant funds across other safety priorities
- E. Difficulty in proving the effectiveness of SDMO initiatives for grant reporting
- F. Insufficient matching funds (if required)
- G. Other

PI&E

A. Digital Outreach

4. **What would be the biggest challenge(s) in implementing or expanding targeted digital outreach specifically for SDMO messages in your state (e.g., integrating with navigation apps like Waze or using geo-fenced digital ads)?**

(select all that apply)

- A. No challenge
- B. High cost of digital advertising or app partnerships
- C. Lack of in-house technical expertise or vendor availability
- D. Difficulty in establishing formal partnerships with tech companies (e.g., Waze)
- E. Concerns regarding data privacy or targeting specifics
- F. Difficulty in accurately measuring the effectiveness of digital outreach
- G. Other

B. Mailer Integration (Insurance, Registration, Citations)

- 5. What would be the biggest challenge(s) for integrating SDMO messaging into state-issued or partner mailers (e.g., vehicle registration renewal notices, car insurance renewal mailers)?**

(select all that apply)

- A. No challenge
- B. Securing buy-in and cooperation from relevant state agencies (e.g., DMV) or private partners (e.g., insurance companies)
- C. Perceived high cost of printing or design changes for mass mailers
- D. Limited available space or strict content regulations on existing mailers
- E. Difficulty in evaluating the impact or effectiveness of messages on mailers
- F. Other

C. Passive Vehicle Messaging (Mudflaps, Wraps, Decals)

- 6. What would be the biggest challenge(s) to integrating or expanding passive SDMO messaging, such as signs on mudflaps, wraps on tow trucks, decals on first responder vehicles on vehicles in your state?**

(select all that apply)

- A. No challenge
- B. High cost of production and installation for large number of vehicles
- C. Gaining buy-in and cooperation from various public and private vehicle fleet owners
- D. Maintaining consistent design and quality across diverse vehicle types and operators
- E. Limited visibility or effectiveness of static messaging on vehicles
- F. Regulations regarding vehicle modifications or advertising
- G. Other

D. Consistent Messaging & Timelines (Year-Round, Centralized, Tailored)

- 7. What would be the biggest challenge(s) in maintaining consistent, year-round SDMO messaging and developing a centralized message bank for all partners in your state?**

(select all that apply)

- A. No challenge
- B. Securing sustained, long-term funding for ongoing campaigns
- C. Achieving consensus and consistent messaging among diverse partners and jurisdictions
- D. Difficulty in continuously developing fresh and engaging creative content
- E. Limited staff or resources dedicated to message development and dissemination
- F. Measuring the long-term impact of continuous messaging
- G. Other

E. Message Content

- 8. What top three phrases or terms are most important to include in SDMO outreach materials?**

(word cloud poll)

Enforcement

9. How effective would an SDMO enforcement campaign be if it primarily issued warnings instead of citations to encourage driver compliance?

(select one)

- A. Very Effective (Would significantly improve compliance)
- B. Moderately Effective (Would help, but citations are still important)
- C. Slightly Effective (Would have minor impact)
- D. Not Effective At All (Compliance requires citations)
- E. Unsure

10. What would be the biggest challenge(s) in implementing cross-agency joint enforcement operations for SDMO in your state?

(select all that apply)

- A. No challenge
- B. Gaining consistent officer buy-in and training for new protocols
- C. Operational time constraints or administrative burden per stop
- D. Overcoming inter-agency communication and coordination hurdles
- E. Ensuring uniform messaging and enforcement priorities across agencies
- F. Lack of readily available informational materials for distribution
- G. Other

11. What would be the biggest challenge(s) in implementing automated enforcement systems on police vehicles for SDMO violations?

(select all that apply)

- A. No challenge
- B. Securing necessary legal authority or legislative changes
- C. Addressing public acceptance and privacy concerns
- D. High upfront cost of acquiring and deploying the technology
- E. Ensuring technical accuracy and reliability of detection
- F. Integrating with existing citation/warning issuance systems
- G. Other