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TECHNICAL REPORT

FOUNDATION FOR TRAFFIC SAFETY

Countermeasures for Distracted Driving: An Exploration Beyond the Scientific Literature

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Title

Countermeasures for Distracted Driving: An Exploration Beyond the Scientific Literature

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Foreword

For more than 75 years, the AAA Foundation for Traffic Safety has been conducting research to identify casual factors leading to traffic crashes, injuries, and fatalities, as well as disseminating information and developing recommendations to improve traffic safety. Distracted driving remains a persistent and important road safety challenge. In 2019 and 2022, the AAA Foundation for Traffic Safety published research briefs that summarized the then-current evidence in scientific literature and gray literatures regarding the effectiveness of existing and emerging countermeasures against distracted driving. This report adds to the same body of work by capturing emerging driver distraction countermeasures from sources outside of scientific literature.

The information described in this report includes an examination of state, national and international efforts combating distracted driving implemented by various entities, including government, private, and non-government organizations. Findings and recommendations presented in this document should be a useful reference for policy makers, transportation practitioners at various levels of government, traffic safety researchers, and advocates who are working to advance safe mobility.

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President and Executive Director

AAA Foundation for Traffic Safety

About the Sponsor

AAA Foundation for Traffic Safety
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Founded in 1947, the AAA Foundation for Traffic Safety in Washington, D.C., is a nonprofit, supported charitable research and educational organization dedicated to saving lives by preventing traffic crashes and reducing injuries when crashes occur. Funding for this report was provided by voluntary contributions from AAA/CAA and their affiliated publicly motor clubs, individual members, AAA-affiliated insurance companies, and other organizations or sources.

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List of Acronyms

AAAFTS	AAA Foundation for Traffic Safety
AEB	Automatic Emergency Braking
CDC	Centers for Disease Control and Prevention
CPST	Child Passenger Safety Technician
DD	Distracted Driving
DDAC	Distracted Driving Avoidance Course
DDAM	Distracted Driving Awareness Month
DMS	Dynamic Message Sign
DOT	Department of Transportation
DUI	Driving Under the Influence
FCW	Forward Collision Warning
GDL	Graduated Driver Licensing
GHSA	Governor's Highway Safety Association
HVE	High Visibility Enforcement
IDA	Impaired Driving Assessment
IIHS	Insurance Institute for Highway Safety
ITD	Impact Teen Drivers
NETS	Network of Employers for Traffic Safety
NHTSA	National Highway Traffic Safety Administration
NSC	National Safety Council
NIRS	Near Infrared Spectroscopy
OEM	Original Equipment Manufacturer
SHSO	State Highway Safety Office
SHSP	Strategic Highway Safety Plan
TZD	Toward Zero Deaths
UMTRI	University of Michigan Transportation Research Institute
VMS	Variable Message Sign
VR	Virtual Reality

Executive Summary

This research focused on current efforts by national, state, local, and international organizations to address driver distraction, which may not be documented in scientific literature or have undergone formal evaluation. The objectives were (i) to document outcomes and practical guidance for implementing strategies to prevent distracted driving, (ii) to identify countermeasures that could benefit from further evaluation, and (iii) to understand the extent to which distracted driving countermeasures align with behavior change theories and constructs, as well as Safe System principles. More than 200 strategies addressing distracted driving were identified and synthesized into a set of tables (see Appendix E). The examination of these safety strategies was performed using four separate but interdependent data collection approaches: environmental scans, foundational interviews, surveys of stakeholders, and integrative interviews.

Findings derived from this research underscore the existing challenges in achieving consensus on the effectiveness and generalizability of distracted driving countermeasures. The interviews and surveys indicate a need for further countermeasure development and evaluation in areas including technology, driver refresher courses, and behavioral incentives from insurance companies. A major barrier indicated by participants is that distracted driving is difficult to quantify, and traffic safety professionals need a more accessible and objective way to assess distraction through technology and smartphone apps. Dedicated funding for the development of evaluation tools, guidance, and strategies to combat distracted driving was recognized as crucial. In addition, there is insufficient attention from national media or at national conferences promoting the need for distracted driving countermeasures. Participants mentioned that the Safe System approach presents a new separate but interdependent paradigm that should be emphasized and strengthened in concert with efforts targeting distracted driving.

This report presents recommendations and opportunities for safety practitioners to contribute to advancing the development, implementation, and promotion of distracted driving countermeasures to enhance roadway safety and save lives.

Background and Introduction

Distracted driving poses a threat to all road users. According to recent statistics from the National Highway Traffic Safety Administration (NHTSA), more than 3,500 people in the U.S. are killed in crashes involving a distracted driver each year. It is estimated that nine lives are lost every day because of inattention to the driving task and 18% of distracted driving fatalities in 2021 involved people outside the vehicles including pedestrians or cyclists (NHTSA, 2023). These statistics almost certainly underestimate the role of distraction in fatal crashes given the difficulties of assigning causality, disincentives for honest disclosure by drivers, and the continued expansion of in-vehicle information systems and smartphone apps, layered on longstanding sources of in-vehicle and external distraction. While there have been hundreds of scientific studies on the effects of driver distraction on safety and performance, the body of studies evaluating the implementation and effectiveness of distraction countermeasures has been more modest in comparison.

The AAA Foundation for Traffic Safety (AAAFTS) conducted two systematic reviews of studies on the effectiveness of driver distraction countermeasures, categorized into educational and behavioral, legislative and law enforcement, and technology-based approaches (Arnold et al., 2019; Arnold & Horrey, 2022). AAAFTS concluded that while some studies showed promising results, collectively, results were mixed, there was questionable generalizability to other populations or regions and, in cases, insufficient evidence to draw firm conclusions. Based on these reviews and an expert workshop convened in September 2019, AAAFTS pointed to the need for a deeper understanding of driver distraction countermeasures implemented by regional or government entities, as well as private entities, which might not be published in the peer-reviewed scientific literature or at all. The study reported here was conducted by the University of Michigan Transportation Research Institute (UMTRI) in response to the need identified by AAAFTS.

The overall objective of this study was to identify and document sources, useful outcomes, and practical guidance related to driver distraction countermeasures that stem from sources outside of the scientific literature (e.g., reports by government agencies and national or international traffic safety non-governmental organizations, surveys or interviews with government and organizational stakeholders in the United States and abroad). Also of interest was the identification of educational or behavioral, legislative or law enforcement, and technology-based countermeasures that could benefit from further or future evaluation.

An important strength of this study was the use of a systematic framework for assessing driver distraction countermeasures that was not only evidence-based (i.e., considered evaluation outcomes available in the non-scientific literature), but was also guided by

appropriate theory and practice. Specifically, wherever possible, we examined the extent to which countermeasures clearly incorporated or addressed recognized behavior change theories and constructs, as well as whether there was explicit communication (by those developing, implementing, promoting, or otherwise involved in distracted driving countermeasures) about how the countermeasures aligned with principles of the Safe System approach in addressing traffic safety. This expanded approach to assessing countermeasures from non-scientific literature and reaching conclusions about practical guidance on their use was especially important as many of these countermeasures had not undergone a formal evaluation.

Overall Approach

To achieve the study objective, four sequential but interdependent data collection tasks were undertaken by the research team, with results from each task informing and guiding the next data collection task. The data collection tasks included the following:

1. Focused environmental scans directed at important aspects of the environment with implications for driver distraction countermeasures
2. An initial round of interviews with stakeholders considered to be foundational in nature
3. A stakeholder survey
4. A second round of interviews, considered to be integrative in nature.

Each of these data collection tasks is discussed separately below. Collectively, results from these four data collection tasks were synthesized into a set of tables for driver distraction countermeasures by category (i.e., educational/behavioral, legislative/law enforcement, technology-based), as well as used as the basis for a set of recommendations for moving forward to address distracted driving. Before each data collection task, appropriate approval was received from the University of Michigan's Institutional Review Board, to ensure compliance with human subject research requirements at the University.

Focused Environmental Scans

The purpose of this task was to conduct four focused scans, each directed at an important aspect of the environment with implications for driver distraction countermeasures. In conducting each of these scans, efforts were made not only to obtain information on specific efforts to address distracted driving, but also, to identify whether and how

various stakeholders explicitly discussed the role of the Safe System approach, as well as behavior change theories and constructs in developing, implementing, promoting, or otherwise supporting distracted driving countermeasures. Appendix E provides a comprehensive list of strategies identified through the environmental scans.

Efforts from State Highway Safety Offices (SHSOs) and Other Organizations

The first scan identified information about driver distraction countermeasures and activities contained on relevant websites or in social media postings. Websites included those of the Governor's Highway Safety Association (GHSA) and each of its members—the SHSOs. Each State's SHSO coordinates at least some of the State's traffic safety activities and is responsible for developing the State's Strategic Highway Safety Plan (SHSP), which is required by NHTSA. Each SHSO website was systematically searched to gather information about current distraction-related countermeasures.

The examination included websites of other organizations involved in the development, implementation, and/or promotion of distraction-related countermeasures. For example, the most recent report of *Countermeasures that Work* (Venkatraman et al., 2021) contains a list of websites for such agencies and organizations that includes (in addition to GHSA): NHTSA's Office of Behavioral Safety Research and Traffic Safety Marketing site, the National Safety Council (NSC), the National Conference of State Legislatures, Insurance Institute for Highway Safety (IIHS), AAAFTS, and the Network of Employers for Traffic Safety. These represented a starting point for our search and led to the identification of websites for other national, state, and local organizations, both public and private. Websites of international organizations involved in efforts to promote traffic safety (e.g., World Health Organization, Organisation for Economic Co-Operation and Development) were also examined. In addition, social media and networking websites, such as Facebook, X (formally known as Twitter), LinkedIn, and Instagram, were searched to identify distraction-related countermeasures promoted on these platforms or links to program websites with additional material and information about the countermeasures.

Technology

The second environmental scan focused on available technologies, especially smartphone applications (apps), designed to reduce distracted driving. In conducting this scan, the intention was to build on and expand the work of the research team and others to leverage efforts already completed. For example, one of our goals was to update the search of apps or commercial products aimed at mitigating distracted driving conducted by Arnold and Horrey (2022) in March and April 2021. The research efforts also

leveraged work completed by the research team and other UMTRI faculty as part of a recent project funded by NHTSA (Peterson et al., under review).

Behavior Change Theories and Constructs

The third environmental scan focused on behavior change theories and constructs that have been or could be used in efforts to address distracted driving. Theories, in general, refer to "systems of assumptions and rules to describe, predict, and explain the nature of specified phenomena" (Nigg & Jordon, 2005, p. 292). Within the context of human behavior, they provide structure and describe factors underlying behavioral motivation (Buckley & Sheehan, 2004). Behavior change theories and constructs were an important focus of the environmental scans because of the important role they can play in the development of campaigns and other efforts to change behavior. To that end, they provide a conceptual framework that describes and explains the interrelationships among underlying constructs, as well as predicts and explains events in an accurate and efficient manner (Glanz et al., 2002).

The scan of behavior change theories and constructs built on research conducted by the UMTRI team. For example, UMTRI conducted two recent projects on the use of behavior change theory constructs in safety campaigns, and the influence of such constructs on distracted driving behavior. One study focused on impaired driving, distracted driving, and seat belt use (Zakrajsek et al., 2023a, 2023b) and the other focused on distracted driving (as part of risky driving; Molnar et al., 2021a, 2021b). Both projects provided insights into the important role that constructs not related to risk (e.g., behavioral intentions, norms, and non-risk attitudes such as pleasant vs unpleasant, necessary vs unnecessary) may play in distracted driving.

Safe System Approach

The final environmental scan focused on the Safe System approach and its underlying elements and principles. As described by the U.S. DOT Federal Highway Administration (Doctor & Ngo, 2022), the Safe System approach addresses five elements of a safe transportation system: 1) safe road users, 2) safe vehicles, 3) safe speeds, 4) safe roads, and 5) post-crash care.

In addressing these elements, six foundational principles come into play, which are the defining principles of the Safe System approach:

1. Deaths and serious injuries are unacceptable—Therefore, although zero crashes are desirable, the approach focuses on crashes that result in death and serious injuries.

2. Humans make mistakes—Therefore, the approach focuses on planning, designing, and operating a road system that is forgiving of inevitable human mistakes so that serious injury outcomes are unlikely.
3. Humans are vulnerable—Therefore, the approach focuses on managing the kinetic energy of crashes to avoid serious injury outcomes.
4. Responsibility is shared—Therefore, all stakeholders must work together to ensure that crashes do not result in death or serious injury.
5. Safety is proactive—Therefore, data-driven tools for identifying and mitigating latent risks in the system need to be used rather than waiting for crashes to occur.
6. Redundancy is crucial—Therefore, all parts of the system must be strengthened to ensure that if one part of the system fails, other parts will still protect road users.

The Safe System approach scan leveraged the research team's established relationships with traffic safety experts in countries that use these elements and principles as a guiding framework for improving traffic safety outcomes. Of special interest was to identify and document what has worked well and not worked well in countries outside the United States and strategies for overcoming the barriers and making better use of the facilitators that currently exist in the United States. This information can be invaluable in efforts to strengthen the use of the Safe System approach in traffic safety efforts overall, but especially in the implementation of distracted driving countermeasures.

Synthesis

The information gathered from the four environmental scans was documented in a large dataset (see Appendix E). The amount of information contained in this dataset was vast, especially for the scan of the SHSOs and SHSPs. This dataset constituted a large collection of "raw data" that was reviewed and, as appropriate, incorporated into a set of synthesis tables of distracted driving countermeasures—with one synthesis table for each of the three types of distracted driving countermeasures (i.e., educational/behavioral, legislative/law enforcement, and technology-based). Results from the other three data collection tasks were also incorporated into the synthesis tables. These synthesis tables are described later in this report (see Synthesis of Distracted Driving Countermeasures).

Foundational Interviews

The purpose of these interviews was twofold. First, they provided, in and of themselves, useful information about driver distraction countermeasures that may not be captured

in the scientific literature. Second, they served as the foundation for the next data collection task (stakeholder survey) by helping identify candidates for the survey, select specific aspects of countermeasures to explore in the survey, and craft questions using language that would resonate with the stakeholder groups and capture the ways in which these issues were thought and spoken about. The organizations identified in the environmental scans were the starting point for the candidate pool for the interviews, making sure to include national, state, local, and international organizations. The interview process was refined and expanded, accordingly, to elicit more detailed and insightful responses from the candidates. The UMTRI team reached out to traffic safety researchers and experts in several countries outside the United States, with whom the team has established relationships, to either recruit them personally for the interviews or seek their assistance in identifying appropriate individuals to interview.

A total of 15 interviews were conducted with a broad spectrum of international-, national-, regional-, and state-level traffic safety and health organizations. Each interview lasted approximately 60 minutes and was conducted by a trained moderator using a standardized interview guide (see Appendix A for the interview guide). To encourage interviewees to be candid in their remarks and to protect their personal identities, they were assured that their name and organization's name would not be reported, and results of the interviews would only be reported in summary form.

An overview of the themes that emerged during the foundational interviews is provided here, along with illustrative verbatim comments from interviewees when available and appropriate. The themes are organized around the topics discussed during the interviews. Please refer to Appendix E for a list of countermeasures identified during the foundational interviews.

Conceptualization of Distracted Driving

Most of the 15 interviewees considered distracted driving to be anything that takes a driver's attention from driving (e.g., talking or texting on a phone, interacting with passengers, in-vehicle systems such as infotainment or navigation, eating or drinking).

The majority of interviewees made a distinction between distracted driving and either impaired, drowsy, and/or risky driving, while three interviewees considered impaired/drowsy driving to be part of distracted driving. Almost half of interviewees noted that despite the recognition that distracted driving encompasses more than just smartphone and device use, most countermeasures (including legislation) are focused on these behaviors. Illustrative verbatim comments from the interviews included the following:

- "Anything that takes your visual, manual, or cognitive resources away from the driving task. So your eyes off the road, hands off the wheel, mind off the driving task."
- "It's hard to get people's focus away from just the cellphone part of it. [But], everything can be a distraction."
- "…using that smartphone behind the wheel is the true triple threat because it is taking your eyes off the road, your hands off the steering wheel, your mind off the task of driving. And so, even though we recognize that there are a lot of different distractions out there, um the [device use] is really what is the biggest problem out there for people because it does distract you in so many different ways."

Examples of Distracted Driving Countermeasures and Efforts

By far the most frequently mentioned examples of distracted driving countermeasures and efforts were those related to education. Educational efforts, either alone or in combination with other efforts such as enforcement, were mentioned by almost every interviewee. Specific types of educational efforts included school programs for children and teens, other educational efforts for teens such as peer-to-peer programs and driver education/training, and more general outreach. Numerous delivery mechanisms for these educational efforts were mentioned (e.g., statistics posted on organizational websites, programs implemented in schools or driver education classes, videos, information posted to social media, use of distracted driving simulators at outreach events, presentations/assemblies at schools and community events, television/radio public service announcements, coordinated media pushes with events such as National Distracted Driving Month).

Most Effective Distracted Driving Countermeasures Efforts

When asked about the most effective distracted driving countermeasures and efforts, however, interviewees were more likely to mention examples related to enforcement, either alone or in conjunction with laws, regulations, or licensing restrictions than to mention educational efforts. In fact, two interviewees commented that education does not work or is not effective. Comments from several interviewees suggest why there may be a disconnect between efforts considered to be effective and actual efforts being pursued by organizations. For example, two interviewees noted that public education, while not effective when used alone, is often undertaken by organizations because it is something they can actually do. Illustrative verbatim comments from the interviews included the following:

- “But you give someone a ticket, and that’s gonna change their behavior. Not that you like it and a lot of people are struggling from paycheck to paycheck. That’s true. But until we take it seriously and we really address the behavior that’s going on in that car, we’re going to see nothing change.”
- “We also know that policy and regulation work, so that if you have a texting law, we know that, that works.”

Limitations in Developing and Implementing Distracted Driving Countermeasures

Much of the discussion of barriers, limitations, and challenges fell into three broad categories: data limitations, resource limitations, and legislative limitations (often resulting in enforcement limitations). Although these are discussed separately in this section, it should be noted that there is considerable overlap and interdependence between them.

Issues related to data limitations received considerable attention. The majority of interviewees noted that distracted driving is difficult to measure, which makes it hard to determine its prevalence, impacts, and outcomes. Because of these limitations, many interviewees noted that distracted driving is likely to be underestimated, and, in turn, underprioritized and underfunded. It is also difficult to evaluate the effectiveness of interventions. Inaccuracies and/or inconsistencies in crash data collection, as well as challenges faced by police officers in determining distracted driving by crash-involved drivers without clear evidence were also mentioned by some interviewees. Many interviewees called for better data on the magnitude of distracted driving (including determining its prevalence, who is at elevated risk, and the risks associated with such behaviors). Also noted was the need for comprehensive and timely data, as well as the role that data collection approaches such as naturalistic driving and observational studies can play in overcoming some of the limitations of crash data. Illustrative verbatim comments from the interviews included:

- “We still don’t have a really good understanding of it, you know, it’s not like speeding, and it’s not like drink driving where we’ve got things we can detect and get a good handle on.”
- “…data on distracted driving is really awful. And, so even if I’m absolutely convinced that it’s entirely possible that there are countermeasures that are fairly well known already today that are much more effective at mitigating driver distraction than we realize, because we just don’t have good data to understand the magnitude and scope of it to begin with much less evaluate countermeasures to address it, that has always been a barrier.”

- "The actual numbers [in crash data] don't show much distraction in the data, because a lot of it is self-reported to the officer who shows up at the scene, or the officer has to make a judgement call of whether there was a distraction involved or not. And then you read the actual description of what happened in the crash and you're like how could this happen if they were paying attention, you know? But there's no distraction listed on here. Well, the officer wasn't there, they didn't witness it, so they don't want to make the judgement call on there."

Limitations in the area of legislation included weak, poorly worded laws, or the absence of laws altogether, due in part to lack of support from lawmakers and other stakeholders. These legislative limitations had implications for enforcement and other countermeasures for distracted driving. For example, it was also noted that police can only enforce the laws that are in place. In the absence of such laws, police face considerable challenges in being able to cite drivers for distracted driving. It was also noted that countermeasures, in general, must align with existing laws in the jurisdictions in which they are being implemented.

Limitations in the area of resources focused on both financial and personnel resources, with the two being inextricably intertwined. One interviewee noted a lack of federal, state, and/or local resources or support for distracted driving countermeasures, and another noted that even when funding is available, organizations may face challenges in covering costs until reimbursement is received. Specific concerns were raised regarding law enforcement resources. Some interviewees noted that law enforcement agencies are facing cuts in traffic patrols due to funding challenges, despite the need for more police officers to enforce distracted driving laws.

Interviewees were also asked how distracted driving countermeasures are funded. A sizable number noted that their organization did not have a dedicated budget for distracted driving. Interviewees reported some strategies for obtaining funding such as applying for grants for specific efforts, adding distracted driving to funded countermeasures for other behaviors, seeking contributions from corporate partners, or using data to argue that distracted driving was a fund-worthy priority based on the magnitude of the problem. Distracted driving was considered to be more challenging to fund compared to other countermeasure areas (e.g., seatbelts and alcohol) by two interviewees, with another noting that the end result of the lack of funding for distracted driving was a reduction in ability to implement distracted driving countermeasures.

Development of Distracted Driving Countermeasures

The majority of interviewees reported that they rely on programs, resources, or countermeasures developed or promoted by others (e.g., NHTSA, AAAFTS, GHSA,

Lifesavers), either adopting them completely or adapting them as necessary. One reported reason for adopting a countermeasure was the need to be responsive to the organization's geographic area. Another reported reason was the need to balance marketing considerations with research evidence, with some interviewees highlighting the challenges in finding this balance (e.g., using humor or emotional appeals in distracted driving messaging).

Several interviewees reported developing their own countermeasures, typically in conjunction with other teams in their organization (e.g., communications, marketing, behavioral specialists) or external partners. Examples of reported considerations and activities in such development included using crash data to identify risky behaviors, reviewing the research literature to identify effective countermeasures developed elsewhere, conducting market research to develop or refine appropriate media talking points and specific messaging, using the 4Es (i.e., Education, Engineering, Enforcement, Emergency services) as a framework, and combining distracted driving with other topics or behaviors to maximize resources. The importance of pretesting or pilot testing before implementation and conducting an evaluation after implementation (e.g., conducting public awareness campaigns and perception surveys) was specifically noted by a few interviewees. Illustrative verbatim comments from the interviews included the following:

- "Maybe AAA piloted something…Maybe that pilot just showed preliminary results that were positive. It didn't have to be a 10-year study…based on this preliminary data, we think we want to try this."
- "We get a lot of push to put funny messages, humorous things in our [messaging]. The marketing team likes it, but we don't from a road safety perspective."

Identifying Distracted Driving Behaviors and Target Audiences

The most frequent comment in response to which distracted driving behaviors and audiences to target was the use of crash data (cited by five interviewees). Interviewees also mentioned using information and/or recommendations from the research literature and other organizations' reports (e.g., federal agencies, AAAFTS, etc.), or market research conducted by their own organization. One interviewee mentioned relying on video or telematic data (e.g., closed-circuit video on the roadway, road, or vehicle sensors).

There was also some discussion about which distracted driving behaviors and groups should be targeted by distracted driving countermeasures. Comments tended to focus on audiences or groups for targeting rather than behaviors themselves, although regarding the latter, smartphones were most likely to be mentioned. At the same time, a few

interviewees pointed to the potential of smartphone apps to be a 'positive distraction' (e.g., by alerting drivers to road incidents ahead, allowing drivers to access emergency responders or law enforcement, or receive messages that encourage them to avoid distracted driving).

Teens and young drivers were the groups most likely to be mentioned by interviewees (six interviewees). Other groups called out by interviewees included vulnerable users (i.e., pedestrians and bicyclists), commercial and truck drivers, and road workers and first responders. Two interviewees noted that their organizations do not target specific groups and instead use the same countermeasures for all groups.

An illustrative verbatim comment from the interviews was as follows:

- "Who is engaging? That is not to say that older people don't. But I think if we're looking at demographics, you would be looking at the younger people who are starting to drive [now] right through to those who have grown up in the digital era."

Assessing the Effectiveness of Distracted Driving Countermeasures

Over half of interviewees cited tracking crashes and violations or citations as at least one component of how they evaluate the effectiveness of distracted driving countermeasures. Assessing public awareness, outreach, and knowledge of countermeasure messaging through surveys and other means (e.g., social media) was also mentioned by several interviewees. Others pointed to the importance and need for evaluation but did not elaborate on how their organizations did this. It was noted, however, that behavioral programs are difficult to evaluate, with some interviewees explicitly stating that their organizations either do not know how to assess effectiveness, lacked the capacity or funding to do so, or did not try to assess effectiveness. Illustrative verbatim comments from the interviews included the following:

- "How effective really was the measure that was implemented? How much did it reduce the behavior? How much did it reduce the incidents? That's really hard to break out."
- "If we're spending money, we've got to be able to account for it."
- "I think it's so hard to tell what kind of an impact any of them are having and I think that's one of the things that needs to be addressed is, you know, what is actually making a difference? If nothing's making a difference, what would make a difference?"

Considerations for Future Countermeasures

Discussions around countermeasures that should be developed and implemented in the future centered mainly around new or expanded technological approaches and solutions (e.g., visual displays in vehicles for providing alerts about roadway problems or delivery of distracted driving messages, apps, or blocking controls in smartphones to prevent phone use while driving, cameras in vehicles to detect cellphone use). Also noted by a couple of interviewees was the need for strict, well written, enforceable distraction legislation paired with clear communication/education to the public about the legislation, followed by strict enforcement. Examples cited by a single interviewee included a need for countermeasures related to distractions other than smartphone use, better training for police officers relative to data collection and enforcement, strategies that tie back to documented behavioral change, and the creation of ratings related to distracted driving risk/mitigation for integration into vehicle safety ratings. Illustrative verbatim comments from the interviews included the following:

- "Technology got us into this problem. Technology can help us get out of this problem or at least help solve it."
- "I don't know what the answer [is]. I just know we gotta do something different because, you know, doing the same thing and expecting a different result is crazy. So, we gotta do something different."

Communicating the Risks of Distracted Driving

Examples of countermeasures using risk messaging were mentioned, including traditional public information campaigns, social media campaigns, dynamic message signs targeting high volume traffic. Some interviewees recognized a need for such messaging given their view that the general public may not understand the risks associated with distracted driving or that risk perception relative to the dangers of distracted driving and getting cited or fined for distracted driving is low. An example of this given by two interviewees was that most people believe they are good drivers who can multitask without adverse consequences, making it difficult to change behavior. Other interviewees noted that distracted driving is an acceptable risk for many drivers, and that risk tolerance in the United States appears to be growing. An illustrative verbatim comment from the interviews was as follows:

- "It's not gonna happen to me. It happens to everyone else. I'm just gonna continue to drive the way I want to drive…until you lose a loved one in a car crash, people just don't get it."

Public–Private Partnerships Addressing Distracted Driving

Collectively, interviewees identified a broad range of organizations with whom they partner including federal, state, and local government agencies, dedicated safety organizations, research organizations, foundations, law enforcement, news media agencies, schools, driver education programs, legislators and policy makers, corporations, and individuals in the community personally affected by distracted driving crashes. Four interviewees specifically mentioned participating in a coalition to address distracted driving.

Awareness and Perceived Usefulness of the Safe System Approach

All but four of the 15 interviewees were able to accurately describe the Safe System approach in terms of the overall concept, pillars, and approach. Six interviewees explicitly noted that they see potential for the Safe System approach in terms of distracted driving countermeasures, and another alluded to this, noting that the traditional approach of putting all responsibility on individual road users is not a sustainable solution and that the Safe System approach opens up a new toolbox and offers greater potential for success. Some cited examples of how the Safe System approach is helping or can help organizations address distracted driving included providing a framework for planning, keeping stakeholder groups (or pillars) working together, setting jurisdictional safety targets, finding ways to prevent distracted driving beyond telling the driver to stop driving distracted (e.g., technology solutions, removing distractions from roadways), and taking a less reactionary approach by looking at infrastructure and addressing potential risks before crashes occur. One interviewee perceived there to be a useful role for the Safe System approach at the organizational level but not in messaging directed at the general public. Another interviewee noted that because the root cause of distraction is driver choices, significant change will not occur until behavior changes (i.e., when drivers are distracted, safe streets will not prevent crashes). Illustrative verbatim comments from the interviews included the following:

- “Whatever you’re doing, in whatever environment, you should be able to survive something that goes wrong.”
- “Why [Safe System approach] is needed: Not everything is going to work with everyone and there are those who are going to do what they do regardless of how much you try to protect them out there.”
- “When we come up with a range of countermeasures based on a project that we’ve done, we’re definitely not focused on just the ones related to stopping drivers doing things. We tend to be broader in saying, these are some of the design changes that could be made to the technology itself or to the vehicle, some

road infrastructure countermeasures that could be implemented, and then even further up the chain, perhaps some legislative changes that could be made or regulatory changes that need to be implemented. So, we try to span the full road safety system and all the actors that are involved in that."

- "You're helping this person to not be in a crash and they don't even know it."

Implementing the Safe System Approach

Interviews discussed what is needed to facilitate the implementation of the Safe System approach. Most frequently identified by interviewees was the need for organizations that promote the Safe System approach (e.g., FHWA) or programs that that have incorporated the Safe System approach to share resources, examples, results, and/or specific advice with stakeholders in other organizations (e.g., road engineers, planners, other traffic safety practitioners). Also mentioned by some interviewees was the need for a significant paradigm shift among all stakeholders involved in distracted driving so that their thoughts and actions are consistent and fully aligned with the approach. Two interviewees whose organizations have implemented the Safe System approach offered advice on implementing the approach; common to both was the central role of strong leadership/capable experts in supporting the Safe System approach. In terms of how the approach fits into planning, it was noted by several interviewees that the Safe System approach has been integrated into or is in line with their organization's planning process. However, one interviewee reported being unsure about how the approach fits in with the organization's planning framework.

Illustrative verbatim comments from the interviews included the following:

- "…the degree to which we can make employing safe system principles legitimately easy for [stakeholders], decision-makers, that sort of thing, the more rapidly we'll see that approach used in the [United States]."
- "I think we're looking at cultural change that is going to require this issue surfacing in a variety of ways, probably well beyond typical traffic safety education efforts."

Barriers to Implementing a Safe System Approach in the United States

Only a few interviewees discussed such barriers. Cited barriers of note included: lack of understanding or misunderstanding of the Safe System approach (by both practitioners and the public), privacy concerns by the public and resistance to interventions considered intrusive, reactionary rather than proactive response to safety issues,

jurisdictional variation, and skepticism about whether the approach has staying power. Some suggestions for improving the implementation of the Safe System approach were made; of note were calls for more attention to all elements of the approach, especially post-crash care, better coordination between organizations at the state and local levels, and increased focus by technology providers on using technology safely. Illustrative verbatim comments from the interviews included the following:

- "…for them it's very esoteric and it's like trying to balance Jello in their hand. They don't really understand what this, I mean they can kind of loosely describe what it is...but if you say…walk me through how what you created on paper in the last strategic highway safely plan might look different implementing Safe System principles, they can't."
- "Because right now, I think for most stakeholders in highway safety, the Safe System approach is just a new name for the 4Es."
- "That's a hard one. American culture is very much about power to the individuals, individual rights, and all of this stuff, but the Safe System is about that shared responsibility."
- "[Technology providers] are happy to sell things to us, but then it's up to us to survive in a very harsh environment."

Adopting Behavior Change Theories and Constructs

In discussing the use of behavior change theories and constructs, the most frequent comments made by interviewees centered around their interest in or use of the Health Belief Model overall or some of the constructs embodied in that and/or other models, especially social norms, and also self-efficacy, susceptibility, severity, and keys to action.

Some interviewees did not explicitly mention the use of behavior change theories or constructs but the countermeasures they described using reflected constructs such as risk perception and social norming. A few comments referenced the value of behavior change theories more generally (e.g., one interviewee noted they can help organizations move countermeasures from concepts to something that people are engaged in every day) or spoke to behavior change in general rather than behavior change theories (e.g., works with an expert in behavior change, is not familiar with behavior change theory).

Traffic Safety Culture and its Application to Distracted Driving Countermeasures, and the Safe System Approach

Over half of the interviewees were familiar with the term 'traffic safety culture' and another three had some awareness of it but could not define or describe it. Several interviewees commented on efforts being undertaken in their organization to promote a positive traffic safety culture. Examples included encouraging such safety culture within their own organization and then counting on employees to spread the culture outward, holding organization-wide conversations about core safety constructs, engaging in efforts to change the culture around the acceptance of distracted driving and apathy toward the danger of distracted driving behaviors, and using findings from the AAAFTS Traffic Safety Culture Index annual survey of U.S. drivers to inform media engagements, advocacy, and message development. Interviewee comments on the relationship between traffic safety culture and the Safe System approach focused mainly on their complementary nature and interconnections. For example, comments from a few interviewees supported the idea that understanding and promoting a positive culture helps to facilitate the creation of a Safe System approach. A few distinctions between the two were noted. For example, one interviewee considered traffic safety culture changes to evolve over the long-term as a result of implementation of the Safe System approach. For another interviewee, the Safe System approach was seen as more salient for traffic safety professionals while traffic safety culture was seen as more salient for everyone else. Illustrative verbatim comments from the interviews included the following:

- "For me, safety culture is much more this organization's or [jursidiction's] philosophy around safety and how a society deals with safety."
- "Having it be a cultural norm to prioritize keeping people safe on the roads, which I think is something that we have in our mindset and then we're hoping we can promote that mindset for others."
- "The two concepts really go hand in hand such that if we create a traffic safety culture where distracted driving is unacceptable this should then increase the number of safe road users, and lead to a reduction in distracted driving, and thus hopefully a related decrease in injuries and fatalities."

Stakeholder Survey

The purpose of this task was to gather more detailed information about driver distraction countermeasures through an on-line survey of appropriate representatives from each SHSO, as well as other stakeholder groups identified in earlier data collection tasks. The SHSOs were considered to be an especially important respondent group, given

their presence in the United States and their strong commitment to national and state distracted driving enforcement and awareness initiatives. Appendix E presents additional information on countermeasures identified by survey respondents.

The initial plan by the research team was to develop the survey, based in large part, on a previous survey of SHSOs on distracted driving that GHSA conducted in 2013 (GHSA, 2013), the most recent year for which such a survey was conducted at the time the study began. Topics in that survey included distracted driving laws, enforcement, public education, education and training efforts for teens and parents, partnerships, and policies. Also addressed were social media and websites, whether distracted driving was included in each state's SHSP, major obstacles in the area of distracted driving, and state data collection efforts. States also identified research efforts with colleges and universities, as well as other state agencies and private organizations they were working with to combat distracted driving.

After this study began, however, the research team learned that GHSA had updated its survey of the SHSOs in late 2021 and findings from the survey were integrated into a special GHSA report on how SHSOs can combat distracted driving (GHSA, 2022). Therefore, the UMTRI research team decided to modify the stakeholder survey for this study so as not to duplicate the updated efforts of GHSA and instead, create a shorter, more streamlined questionnaire focused more narrowly on best practices and strategies for addressing distracted driving. In addition, results from the foundational interviews led the research team, in conjunction with AAAFTS, to expand the survey audience beyond the SHSOs to include a much broader group of relevant organizations (e.g., law enforcement, governmental and non-governmental organizations with a stake in health and/or traffic safety, and academic organizations). To ensure that findings from the most recent GHSA survey of SHSOs were taken into account, relevant findings from the GHSA report were incorporated into the synthesis tables developed for this study, which are included in the report as Appendix E.

Five main activities were completed as part of the stakeholder survey task: questionnaire development, pre-testing, respondent selection, survey administration, and data analysis. A brief overview of these activities is provided here.

Prior to developing items for the survey, the research team reviewed the GHSA survey to avoid duplication of items. As noted, researchers were primarily interested in gathering information about specific countermeasures for distracted driving. To that end, respondents were asked about the top strategies or countermeasures for distracted driving that their organization was currently implementing, promoting, or supporting in some way. For each strategy or countermeasure listed, respondents were asked to identify the following:

- Strategy type (e.g., education/awareness campaign, policy/law, enforcement-related, technology-related)
- Where the strategy originated (e.g., organization created it from scratch, adapted it from someplace else, adopted it entirely from someplace else)
- How long it has been in place
- How they judge effectiveness (e.g., conduct their own evaluation, partner with another organization to evaluate effectiveness, use results from others' evaluations, assess how widely strategy is being used)
- How effective it is (not at all–to–extremely effective)
- What can be done to strengthen effectiveness (e.g., funding for implementation/promotion, data on prevalence/risk/outcomes, enforcement).

Respondents were also asked about their familiarity with the Safe System approach, how it helped them address distracted driving, and what challenges they faced in using the approach to address distracted driving.

The survey was pre-tested to ensure item clarity and understandability, and revised, based on results. A copy of the survey can be found in Appendix B. Selected stakeholder groups were contacted to identify the appropriate individual to complete the survey. Surveys were administered online using Qualtrics, a leading online survey platform. Selected respondents were sent a link through email explaining the study and asking them to complete the survey. Survey respondents were told that their name, email address, telephone number, or any information that could identify them would not be collected and therefore, information that could identify them would not be linked to their survey responses in any way. However, they were advised that their survey responses might be shared with other researchers for future research. Survey data were analyzed using the Statistical Analysis Software (SAS) package.

A total of 78 individuals completed the survey. Due to the limited scope of the data collection, the information gathered is not fully representative of all 50 states and the overall analysis presented in the next sections have limitations. Interpretations of findings should consider the potential impact of the missing data from other states and organizations that did not participate in the survey.

Respondents were asked: Which of the following best describes the type of organization you represent? Several predefined categories were provided for them to select from. Of the 78 survey respondents, 25.6% (n=20) were from SHSOs, 26.9% (n=21) from other government organizations, 29.5% (n=23) from non-governmental organizations, 10.3% (n=8) from law enforcement agencies, 3.8% (n=3) from academic institutions, and 3.8%

(n=3) from other organizations (one research consultant/contractor, one tech company, and one trauma center).

Strategies and Countermeasures Addressing Distracted Driving

Respondents were asked: "What do you consider to be the top three strategies or countermeasures for addressing distracted driving that your organization is currently implementing, promoting, or supporting in some way? Please provide the strategy name/title (if applicable) and/or a brief, specific description."

Collectively, the 78 respondents identified 207 strategies or countermeasures for addressing distracted driving. Most were described by respondents in very general terms (e.g., education, education campaigns, elementary educational programs, engineering, traffic enforcement, media, media campaigns). However, some strategies/countermeasures were more fully described (e.g., Bills 4250-4252 Handsfree MI). A detailed listing of the 207 strategies or countermeasures identified by respondents can be found in Appendix C.

Respondents were also asked to categorize each strategy or countermeasure by type, with specific categories provided (see Table 1). Among the countermeasures for which type was identified, the most frequent types identified were education/awareness media campaigns and enforcement/activity approaches, followed closely by educational/behavioral approaches other than education/awareness media campaigns. The "other" category contained a broad mix of countermeasures; many represented some combination of the specified categories (e.g., "a bit of both" or "all of the above") as well as other strategies (e.g., data collection, coalition building, roadway design). Appendix C includes information on the type of strategy/countermeasure for each of the 207 strategies/countermeasures listed.

Table 1. Strategies or Countermeasures by Type (n=168)

Strategy/Countermeasure Type	Percent
Education/awareness media campaign	28.6
Other type of education/behavioral approach	17.9
Policy or law	11.3
Enforcement/activity approach	21.4
Technology-based approach	11.9
Other	8.9

The identified strategies and countermeasures in Table 1 were consolidated into three categories consistent with the overall focus of the study (i.e., educational/awareness media campaigns and other types of educational/behavioral approaches were combined into one educational/behavioral category, policy/law and enforcement were combined into one legislative/law enforcement category, and technology-based was kept as is), and comparisons were made across type of organization represented by survey respondents (see Table 2).

As might be expected, the majority of strategies/countermeasures identified by respondents from law enforcement were in the legislative/law enforcement category. Most strategies/countermeasures identified by respondents from government organizations other than the SHSOs were in the educational/behavioral category, while strategies/countermeasures identified by respondents from the SHSOs were more evenly split between the educational/behavioral and legislative/law enforcement categories, with close to 10% in the technology-based category. Respondents from non-government organizations were more likely to identify technology-based approaches than other organizations except academic institutions but the latter group of respondents was quite small in number.

Table 2. Strategies or countermeasures by category by type of organization responding (n=168)

Organization Type	Educational/ Behavioral	Legislative/ Law Enforcement	Technology-Based	Other
		Percent		
Law enforcement	40.0	60.0	0.0	0.0
SHSOs	46.2	42.3	9.6	1.9
Other Government	62.8	23.3	4.6	9.3
Non-Government	38.0	28.0	16.0	18.0
Academic Institution	20.0	0.0	60.0	20.0
Other	33.3	0.0	66.7	0.0

Origination of Strategies or Countermeasures

For each strategy or countermeasure identified, respondents were asked: “Where did this strategy or countermeasure originate?”

Respondents were asked to select the response that best described their situation from a set provided to them (see Table 3). Of the strategies or countermeasures for which an

origination was identified, the majority were reported to have been created from scratch or adapted from someplace else.

Table 3. Origination of Strategies or Countermeasures (n=165)

Origination of Strategies or Countermeasures	Percent
Our organization created it from scratch	32.1
We adapted it from someplace else	27.9
We adopted it entirely from someplace else	12.7
Other	27.3

Length of Time Strategy or Countermeasure in Use by Organization

For each strategy or countermeasure identified, respondents were asked: "How long has your organization been implementing, promoting, or supporting this strategy or countermeasure?"

Respondents were asked to select the response that best described their situation from a set provided to them (see Table 4). Of the strategies or countermeasures for which length of time in use was identified, most were well established, with over half reported to have been in place for more than 5 years and an additional quarter reported to have been in place for 3–5 years.

Table 4. Length of time strategy or countermeasure in use (n=158)

Length of time strategy or countermeasure in use	Percent
1 year or less	8.9
More than 1 year but less than 3 years	14.6
3–5 years	25.3
More than 5 years	51.3

How Effectiveness of Strategy or Countermeasure is Judged

For each strategy or countermeasure identified, respondents were asked: "How do you judge the effectiveness of this strategy or countermeasure?"

Respondents were asked to select all responses that applied from a set provided to them (see Table 5). Of the strategies or countermeasures for which information on judging

effectiveness was identified, most were reported to have undergone some type of evaluation (i.e., conducting own or partnering with another organization to conduct evaluation, or using results from someone else's evaluation of another similar program) as at least part of the process of judging effectiveness. For nearly two-thirds of the strategies or countermeasures for which information was provided, respondents only selected one of the response categories. In the remaining cases in which multiple responses were selected, there was no clear pattern in the combinations of responses selected. Rather, there were 28 unique combinations recorded, with most having three or fewer observations.

Table 5. How effectiveness of strategy or countermeasure is judged (n=168)

How effectiveness of strategy or countermeasure is judged	Percent
Conduct own evaluation	45.8
Partner with another organization to evaluate	29.8
Use results from someone else's evaluation of another program	11.9
Assess how widely the strategy is being used by other stakeholders	19.0
Assess anecdotal accounts of successes and challenges encountered while implementing the program	14.3
Other	18.4
Do not judge the effectiveness	13.7

Effectiveness of Strategy or Countermeasure

For each strategy or countermeasure identified, respondents were asked: "How effective do you think this strategy or countermeasure is in addressing driver distraction (with 1 being not at all effective and 7 being extremely effective)?"

Effectiveness ratings are presented in Table 6. Of the strategies or countermeasures for which an effectiveness rating was identified, over three-quarters were considered relatively effective, with ratings between 5 and 7. No strategy or countermeasure was considered 'not at all effective.'

Table 6. Effectiveness rating for strategy or countermeasure (n=163)

Effectiveness rating for strategy or countermeasure	Percent
1 Not at all effective	0.0
2	2.4
3	6.1

Effectiveness rating for strategy or countermeasure	Percent
4	16.0
5	38.0
6	19.0
7 Extremely effective	18.4

Suggestions for Improving Strategies or Countermeasures

For each strategy or countermeasure identified, respondents were asked: "In general, what do you think could be done to strengthen the effectiveness of this strategy or countermeasure?

Respondents were asked to select all responses that applied from a set provided to them (see Table 7). Of the strategies or countermeasures for which suggestions for improvement were identified, the top three suggestions were increasing funding for implementation and promotion, increasing public awareness, and strengthening policies or laws.

Table 7. Suggestions for improving strategy or countermeasure (n=164)

Suggestions for improving strategy or countermeasure	Percent
Increase funding for implementation/promotion	53.0
Improve data on prevalence, risk, outcomes of distracted driving	26.2
Reduce barriers to enforcement	23.8
Include a safety champion	13.4
Enhance multiagency collaboration	24.4
Expand public and private partnerships	20.7
Increase public awareness	42.1
Establish/follow best practice guidelines	16.5
Strengthen policies or laws	30.5
Other	10.4

Familiarity with Safe System Approach

Respondents were asked: "Are you familiar with the term "Safe Systems Approach"?

Of 59 respondents who replied to this item, 76.3% (n=45) reported that they were familiar with the Safe System approach and 23.7% (n=14) reported they were not. Of those familiar with the Safe System approach, 35.6% were from SHSOs, 31.1% from government organizations other than SHSOs, 28.9% from non-government organizations, 2.2% each from law enforcement and other organizations. Of those not familiar with the Safe System approach, 42.9% were from law enforcement, 21.4% from non-government organizations, 14.3% from government organizations other than SHSOs, and 7.1% each from SHSOs, academic institutions, and other organizations. Of note was that all but one of the respondents from the SHSOs (16 of 17) and most of the respondents from government organizations other than SHSOs (14 of 16) and non-governmental organizations (13 of 16) were familiar with the approach. On the other hand, all but one of the respondents from law enforcement organizations (6 of 7) were not familiar with the approach.

How the Safe System Approach Helps Addressing Distracted Driving

Respondents who reported being familiar with the Safe System approach were asked: "How do the components of the Safe System approach (i.e., Safer Roads, Safer Speeds, Safer Road Users, Safer Vehicles, and/or Post-Crash Care) help your organization address distracted driving?"

For the most part, responses to this question can be characterized as either focusing on Safe System approach elements or principles. Illustrative examples of verbatim responses focusing on one or more elements included the following:

- "[We are] promoting safer road users as a responsible component of a safe system."
- "Addressing the safe road users and safe vehicles can help provide education and technology to drivers who may be driving distracted."
- "We are focused on safer road users, addressing the source of the problem. The other pillars here address the consequence of the problem rather than preventing the crash in the first place."
- "We focus on "Safer Road Users" and work to help them choose safer behaviors through a unique approach that is designed to influence drivers to be empowered and ultimately take ownership of their behaviors. For example, when working with parents I help them connect their desire to keep their child safe (as evidenced by them working with me to get their car seat properly installed) with how distraction-free driving will keep their child safe now and how the

distraction-free parent is demonstrating the safest behavior they want their children to adopt someday when they begin driving."

- "Slower speeds would reduce distracted driving crashes."
- "Safer road users—the driver behavior can be changed to make us safer."
- "Road design can clearly influence driver behavior, including distractions and speed. [Our organization] is currently considering the role of design in self-enforcing speeds and attention (ex. roundabouts, road diets, etc.)."

Illustrative examples of verbatim responses focusing on one or more principles included the following:

- "Yes, we pair distracted driving enforcement with speed enforcement."
- "My agency has the Safe Systems Approach as a core element of our Strategic Highway Safety Plan. We're seeking to build redundancy by providing multiple infrastructure [programs] and by partnering with agencies engaged in behavioral safety programs."
- "The more we can collaborate with other traffic safety partners, the more effective and successful we can be in reaching our target audience and ultimately reduce distracted driving–related severe injury and fatal crashes."
- "The components are all related. You make safer vehicles by decreasing inside distractions, which works to make safer road users; by reducing speeds and enforcing traffic laws, you can make safer road users; by decreasing speed, you reduce the damage caused by a crash, which helps post-crash care; lowering speeds make survivability chances increased for pedestrians."
- "Our aim is to incorporate all components of the Safe System approach for all road safety programs. For distracted driving all components can play an impact in the outcome of a crash. Teaching teens about the concept of traffic safety as a wholistic concept contributes to the Safe System approach. We also provide assets and resources to our community partners to work across agencies and through advocacy to address each of the tiers of the approach."
- "We are in the process of developing a regional safety action plan based on the Safe System approach."
- "We work on strategies in each area to implement a comprehensive approach."
- "It is integrated into our Transportation Safety Action Plan and has been for quite some time. It helps us build a collaborative framework."
- "So important to take a holistic approach. We must address or partner to address all components of the Safe System approach."

- “Improving technologies and creating Safer Vehicles (technologies) can reduce incidents from human error.”
- “Informing and challenging drivers has become more difficult with so many sources of false information. To create Safer users, we must be more convincing of the safest approach, or take away the decision-making process from the human.”
- “Safer roads, signs, and infrastructure should be built for connected vehicle technology. Improvements should be made with the idea that humans make errors, and the infrastructure should be built in anticipation of those errors with proper countermeasures to reduce the impact.”
- “We utilize all aspects of the Safe System in addressing driver distraction. The National Roadmap to Address Driver Distraction takes an ecosystem approach across all aspects of the system. This roadmap was led by Queensland and is now the Australian Roadmap.”

Challenges in Implementing Safe System Approach to Address Distracted Driving

Respondents who reported being familiar with the Safe System approach were asked: “What challenges does your organization face in implementing the Safe System Approach to address distracted driving?”

The challenges identified tended to fall within four areas: collaboration and coordination; culture; resources, capacity, and priorities; and evaluation and data. Only two survey respondents reported explicitly that they do not face challenges.

Illustrative verbatim examples of challenges identified in the area of collaboration and cooperation included the following:

- “The main challenge to implementing Safe System approach is that the different portions of the approach fall under the jurisdiction of entities that do not effectively (if at all) coordinate their efforts.”
- “Coordination of multiagency collaboration is often difficult and can be hard to propel forward momentum without strong community champions and legislative support. Grass roots movements are important, but without the buy in from decision makers and funders, the impact seems to be isolated.”
- “The biggest challenge is the scale of the problem and how to organize and work with all the disciplines that play a role in solving the problem.”

Illustrative verbatim examples of challenges identified in the area of culture included the following:

- “Political/cultural barriers to changing ‘behavior’ to make safer road users.”
- “Cultural changes. Until it happens to someone, they have no idea how prevalent these crashes are; myself included. Distracted driving needs to stop.”
- “Public and political will. Most drivers (and legislators are drivers, too) would like other drivers to not use devices in vehicles or be otherwise distracted—but not them.”
- “Getting education out to the public and creating buy-in.”

Illustrative verbatim examples of challenges identified in the area of resources, capacity, and priorities included the following:

- “Our federal funding is very restrictive. The Safe System approach encourages our organization to look beyond just the behavior but our funding does not always allow us to fund the other strategies and solutions.”
- “Distracted driving is always an afterthought. It may be talked about a lot but it is ignored in most planning and execution… It is always about the big 3: belts, booze, and speed, and until that is changed to include distracted driving all efforts will fail.”
- “Enforcement is effective but understaffed.”
- “We are a very small organization, so we just have limited capacity.”

Illustrative verbatim examples of challenges identified in the area of evaluation and data included the following:

- “Seeing if it is effective.”
- “Distracted driving is difficult to obtain measurable results due to the numerous types of distractions that may not easily be confirmed.”
- “Having all the collaborating agencies involved [to] evaluate their programs for effectiveness.”

Illustrative verbatim examples of identified challenges that did not fit cleanly into any of the above four areas included the following:

- “We're a research institute and not an advocacy organization, so we can educate individuals but we're not well-positioned to push for change.”
- “Funding is there and awarded, however too many restrictions hamper the efforts to administer an effective campaign.”
- “Getting use of all the tools such as automated enforcement. Counties are not authorized at this time in our state.”

- “As a planning agency, we don’t implement projects.”
- “Safer Road Users is not different from before—just a new name.”
- “Change in law. If the law doesn't change, people see no consequences, and a hands-free law would make a more significant impact.”

Integrative Interviews

The purpose of this task was to conduct a second round of interviews to integrate what was learned from the environmental scans, foundational interviews, and stakeholder survey. In developing the candidate pool for the integrative interviews, we thought about additional stakeholders (beyond those already interviewed or surveyed) who might have valuable perspectives to share, as well as issues and/or questions related to countermeasures that had emerged from the previous data collection tasks that would benefit from more in-depth or nuanced exploration. A separate interview guide was developed to address these emerging issues, based on our analysis of results from earlier data collection tasks. Similar with other data collection tasks, countermeasures identified by interviewees were compiled into Appendix E.

Eight integrative interviews of approximately 60 minutes each were conducted, with national, state, local, and international organizations represented. Each of the eight interviews focused on delving more deeply into results from the previous data collection efforts. Two of the eight interviews focused on results relative to educational/behavioral countermeasures, two focused on results relative to legislative/law enforcement countermeasures, two focused on results relative to technology-based approaches, and two focused on results relative to the Safe System approach. As was the case with the foundational interviews, interviewees were assured that their name and organization’s name would not be reported, and results of the interviews would only be reported in summary form. A copy of the complete interview guide can be found in Appendix D, with separate modules for each focus area.

Educational/Behavioral Countermeasures

Discussion during the interviews focused on each organization’s general approach to educational/behavioral programs/countermeasures, critical strategies used to develop/implement those programs/countermeasures, limitations of campaigns to prevent distracted driving and strategies for overcoming them, and promising results or experiences relative to program audiences.

General Approach Used in Educational/Behavioral Programs

The general approach of the organization represented by the first interviewee regarding educational/behavioral countermeasures was to focus on young drivers, empowering them to influence their peers and others to behave safely (primarily in the areas of distracted driving and seat belt use). The general approach of the organization represented by the second interviewee focused on distraction from all mobile devices (expanded from an original focus on texting) and aimed to avoid vilifying or blaming the target audience for engaging in distracted driving. They also focused on youth, with both interviewees pointing to the effectiveness of peer-to-peer communication. An illustrative verbatim comment from the interviews was as follows:

- "We've really moved away from kind of blaming the person because we are realizing it is this unconscious behavior and it is coupled with this knowledge that it's not right. That it's not the right thing to do."

Critical Strategies Used by Organizations for Educational/Behavioral Programs

The most important strategy reported by the first interviewee was to establish partnerships with school leadership groups, who then bring the organization into the schools, thereby improving access to other stakeholders and the target audience. While the organization tailors its efforts to the community it is working with, in general it works to provide student groups with guidance and resources (e.g., sample program lesson plans and other materials) for conducting multiple activities throughout the year, as well as evaluating those activities (e.g., pre- and post-surveys, data analysis). The organization also requires a written agreement with each student group, seeks youth input into messaging content, maintains close communication with all stakeholders, and conducts outreach at the local and national levels to promote the program, inspire activity ideas, and connect with stakeholders/partners.

An important strategy reported by the second interviewee was to incorporate knowledge and advice from cognitive and behavioral science to better focus their strategies. One example of this, as described by the interviewee, included using a 'name the behavior/name the problem' approach, which identifies or assigns a name to an unconscious emotion or behavior so as to move that emotion/behavior into the rational part of a driver's brain, making it easier to change that emotion/behavior. As noted by the interviewee, this approach might include campaign elements that attempt to make drivers aware of distracted driving that they might not realize they are doing or situations where they might be blurring the lines between device use or vehicle instrument panel use, thereby encouraging them to make the correct decision to not drive distracted. Other reported examples included: focusing campaigns on content

relatable to most drivers rather than just the negative consequences of distracted driving (e.g., "almost moments" from not fully paying attention rather than getting into actual crash), given that most people tend to think those consequences do not apply to them; and making sure that campaigns address the drivers' potential belief in 'radical exceptionalism'—that is, they understand that distracted driving should not be done in general but they think it is okay for them to engage in it in that instant. Illustrative verbatim comments from the interviews included the following:

- "So we try not to say things like "don't text and drive." First of all, kids don't hear "text." They don't feel like they text. They scroll, they use Instagram, and fewer and fewer of them are texting. They're mostly on Snapchat or Tik Tok."
- "There's a lot of like, yes I can do this [distracted driving behavior] and I have this confidence that I can do it in the moment and that's kind of coupled with really the almost unconscious nature now of this point and the habit of just picking up the phone when you have a thought or need a question or you're bored."

Limitations of Campaigns to Prevent Distracted Driving and Strategies for Overcoming Them

Some of the limitations mentioned in the interviews resulted from restrictions imposed by finding sources for distracted driving countermeasures. For example, one interviewee noted that organizations receiving government funding are not allowed to access Tik Tok, therefore depriving them of information about a smartphone app thought to be commonly used by teens while driving. Another government restriction, according to the interviewee, was that funds could only be used for programming/messaging that provides information about driving, thereby limiting the extent to which they could incorporate behavior change theories/approaches. The organization addressed this limitation by attempting to find additional funding sources for countermeasures that allow more flexibility. Other reported limitations (not related to funding requirements) had to do with insufficient or lack of the following:

- Attention from national media or at national conferences
- Data/statistics on distracted driving
- Access to technology and telematics data
- Funding/staffing to conduct actual programming rather than spending so much time on paperwork and administrative compliance
- Affordable and accessible evaluation tools
- Guidance/strategies for dissemination of distracted driving programs that work

An illustrative verbatim comment from the interviews was a follows:

- "When are we gonna have a plenary that focuses on distracted driving? It's part of every single other traffic safety issue and you cannot ignore the fact that our phones are getting even more complex and our cars are getting even more complex and until we recognize that it is a powerful part of the work that we need to be doing across our nation in traffic safety, we will continue to miss the boat."

Promising Results or Experiences Relative to Educational/Behavioral Program Audiences

Focusing on youth and partnering with student groups has led to several positive outcomes, according to the first interviewee. Examples included the following:

- Extending the reach of traditional distracted driving countermeasures by actively involving families and community members
- Greater youth participation in activities, due to the activities being led by peers rather than adults
- Access to funding/incentives from local/state/national sources available to youth groups
- Unique ideas from teens for programs and messages
- Added assistance with high school programming due to program alumni often returning to help out during their college breaks

According to the second interviewee, results of their unpublished tracking studies demonstrate recognition of the campaign by the target audience and improvement in self-reported distraction-related behavior. Illustrative verbatim comments from the interviews included the following:

- "If youth help create it, they're more likely to support it. Their parents are more likely to support it and their younger siblings. It's just the whole family and everybody in these small communities. So our strategic work is multi-level. It's youth voice, but those groups surrounding the youth voice can then support the youth voice."
- "Teens get such a hard rap…They have an incredible voice and enthusiasm that we need to capture and utilize."

Technological Approaches

Discussion during the interviews focused on aspects of technological approaches to reducing distracted driving, including respondent's use of distracted-driving prevention technology, how the technology works and impacts distracted driving, how technologies are being implemented, the significant contributions of the technology, and barriers to implementation.

Use of Distracted-Driving Prevention Technology

Interview discussions focused on two primary technologies for preventing distracted driving. One was a Smartphone app that detected distracted driving. These types of apps use built-in sensors and data from the smartphone to determine high-acceleration events, such as hard-braking and crashes, and driver interaction with the smartphone when driving. Based on these data, the app can develop trip risk scores and risk events and present this information back to the driver. The second type of technology used a connected vehicle platform, whereby roadside emergency and service responders' vehicles could transmit their location, alerting oncoming drivers who have this technology in their vehicle that there is a stopped vehicle ahead. The technology can present this alert through a smartphone app and/or through the vehicle's dashboard. This technology can be installed as an aftermarket device.

Technology Implementation

Interviewees indicated that smartphone-based apps aimed at preventing distracted driving are widely available and are widely used by the general public. While there is little data available, it has been estimated that at most only around 20% of drivers in the United States use blocking apps regularly (Reagan & Cicchino, 2020); however, potential avenues to widen usage have been explored (e.g., Delgado et al., 2018; Reagan & Cicchino, 2020). They noted that many insurance companies offer financial incentives to use these apps to provide a record of their safe driving. Interviewees noted that some companies outside of the United States have used smartphone-derived information to attempt to shame drivers into driving more safely by sending distracted drivers messages letting them know that their driving is among the riskiest 1,000 drivers. There was mention that some smartphone apps include a parental monitoring component, and some are developing feedback based on social norming and gamification. It was reported that the stopped-vehicle-ahead technology is being used by several thousand emergency response agencies (e.g., police, fire, and ambulance). Work is also ongoing to include this technology in school buses and to modify the technology to alert drivers of other potential roadway hazards such as wildfires. Interviewees also stated that the technology is already compatible with Waze and the Apple CarPlay navigation system.

Significant Contributions of the Technology

Discussions focused largely on the benefits of these technologies to help quantify and monitor unsafe driving behaviors in actual driving and the potential for crash reduction. It was noted that distracted driving is difficult to quantify. The smartphone apps have distracted-driving metrics and can track these metrics over time, giving traffic safety professionals a more objective way to assess distraction-related crashes. Interviewees discussed the high rate of traffic fatalities among roadside workers struck by passing vehicles and noted that this was a leading cause of death among roadside workers and emergency response personnel. It was noted that a study on the effects of stopped-vehicle-ahead technology by the HAAS Alert group found an 80% reduction in hard-braking in the presence of a stopped roadside vehicle. Illustrative verbatim comments from the interviews included the following:

- "When we look at distracted driving, if we're not looking at smartphone telematics drive data, the picture of distracted driving is not clear and it's substantially undercounted."
- "…incorporating data that is timely and more complete than what exists today from crashes is the key to starting to solve this problem."

Barriers to Technology Implementation

Discussions addressed several barriers to the implementation of both types of technologies. Interviewees noted that people have to both have access to the technology (e.g., some people do not have smartphones or cannot afford the technologies) and also be willing to use the technology. Interviewees discussed how these technologies are currently only useful for specific traffic safety situations and behaviors when drivers engage in a range of risky driving behaviors other than distracted driving. Discussions mentioned that there is difficulty working with different Original Equipment Manufacturers (OEMs) to get the stopped-vehicle-ahead technology included in a wide range of vehicles and there is a lack of funding for agencies to purchase the technologies for their fleets. Discussion also mentioned strategies to overcome these barriers, including providing incentives to use the technologies, efforts to promote and raise awareness of the technologies among communities, providing demonstrations of technology effectiveness to OEMs, advocacy at the Federal level to include funding for these technologies in transportation funding bills, and forming distracted driving coalitions to promote the potential of these technologies.

Legislative and Law Enforcement Countermeasures

Discussion during the interviews focused on the critical features and components that need to be included in distracted driving laws, critical barriers to enacting these laws, promising strategies for getting laws passed, strategies for enforcing distracted driving laws, barriers to enforcement of laws, and the need for ongoing evaluation and implementation of countermeasures beyond laws.

Critical Features and Components of Laws

As discussed in the interviews, legislation must have the following characteristics:

- Be written as simply as possible with concrete examples of violations
- Include penalties
- Clearly define/describe those penalties, as well as any exemptions in the law and consequences for violating the law
- Be enforceable by specifying visible behavior that can be detected and proven
- Focus on behavior change that will lead to reduced crashes, injuries, and deaths
- Include requirements for ongoing evaluation, based on crashes and other outcomes.

It was also noted that implementing hands-free legislation was achievable because technology exists that allows drivers to shift from hand-held to hands-free cellphone use despite that research has shown that hands-free use while driving is not without risk.

Critical Barriers to Enacting Distracted Driving Laws

The main barrier identified was the difficulty of convincing lawmakers due, in part, to limitations in data to demonstrate need, concerns about the risk of racial profiling in enforcement, insufficient opportunities for full legislative review prior to voting, and lawmakers own use of smartphones and other devices while driving. Illustrative verbatim comments from the interviews included the following:

- “Lack of statistics. Lack of data that actually show that distraction was a cause of the injury and death. I got to tell you, from my perspective, the fact that there are so many people that die in this country on our roadways and people aren’t outraged about it is a huge barrier to me.”
- “It just took a lot of effort because, you know, we have to talk to so many people to get them on board.”

The discussions yielded a series of strategies for addressing arguments that might be made by lawmakers in opposition to legislation:

- While avoiding distraction should be a civic duty to drivers, legislation can address broader systemic issues that may not be effectively addressed through nudging drivers alone.
- Media campaigns could promote public interest to change behavior while safety legislation demonstrates a commitment to protect individuals and to encourage compliance among drivers.
- Establishing clear guidelines for enforcement against distracted driving is crucial to holding individuals accountable for their actions.
- Enforcing legislation to target and racially profile drivers is an illegal practice that is not specific to distracted driving.
- Changing distracted driving laws from primary offense to a secondary offense could help minimize racially profiling in their enforcement.
- There is a need for better regulation and partnerships with automobile dealerships to provide accessible solutions for low-income drivers that have a smartphone. Hands-free adapters such as mounting clips could help mitigate distraction caused by engaging in other activities while driving.
- Penalties for violating the law can be reduced if determined to be too harsh.

Promising Strategies for Enacting Laws

For one of the interviewees, the most promising strategy was having a stakeholder group of people with traumatic experiences that resulted from distracted driving make the primary push for legislation; this group connected with wealthy donors who pressured lawmakers to support the legislation or face difficulty getting re-elected. For the other interviewee, the most promising strategy was focusing on passing hands-free legislation rather than a texting ban or all-smartphone-use ban, given the difficulties in either enforcing or passing the latter two types of laws. However, the second interviewee also noted that a key turning point with lawmakers in their jurisdiction was mobilizing stakeholders involved in a recent high-profile distraction-related fatality for legislature testimony and media outreach. The interviewee further mentioned that the joint involvement of the distracted driver, the victim's widow, and the victim's infant, as well as the fact that the victim was a police officer, made this more impactful than more traditional emotional appeals.

Strategies for Enforcing Distracted Driving Laws

Among the most important strategies discussed were conducting community outreach to educate the public about the legislation (e.g., what is expected of them, why it is in place, how it will be enforced, etc.) and getting buy-in from police officers. In regard to the former, it was noted that outreach should be broad-based and multifaceted (e.g., go beyond traditional media outlets to include presentations to civic groups, public service announcements in movie theaters), include communication of safety statistics specific to the community, and be facilitated by use of branding (e.g., logos and slogans) and establishing partnerships with businesses and community stakeholders. In regard to the latter, it was noted that buy-in must start at the top. The message to police officers should stress the importance of enforcement and convey the need to go beyond just issuing citations to include raising awareness among the public that their first goal is to change behavior. To this end, officers need to be provided with the training and tools to do this. Illustrative verbatim comments from the interviews included the following:

- "I'm a real fan of telling the public what we're doing and why."
- "The public needs to see that we're serious about that. And so again, if you allow it, you condone it."
- "Enforcement is important and it needs to be done by law enforcement and it has to be valued and seen as something that's important…So there needs to be a campaign where they understand that if you're not enforcing traffic and distracted drivers, you're going to continue killing people."

Barriers to Enforcement of Laws

Interviewees noted that one of the biggest barriers to enforcing laws was the difficulty police officers have in clearly identifying or proving distraction, or in the case of texting bans, differentiating between texting and dialing. Other noted barriers included the following:

- Lack of public awareness, particularly among drivers, about the laws
- The tendency of both drivers and police officers to minimize or discount the risks associated with distracted driving
- The belief among drivers that everyone drives distracted
- The reluctance by police officers to cite drivers because they drive distracted themselves or disagree with the law
- Reductions in resources for enforcement.

Illustrative verbatim comments from the interviews included the following:

- "…it's not like [having] a blood alcohol content or being able to show a THC…Unless somebody's actually seeing it happen or the person admits to it, it's tough to get that information."
- "As a driver, you know, you are supposed to know all the current laws and if you have not gone to driver's training since this law passed, you may not have heard about it."
- "I do it. Why should I have somebody have to pay a $500 fine for doing the same thing I do?"

The Need for Ongoing Evaluation of Countermeasures Beyond Laws

Although not specifically questioned about these issues, one interviewee emphasized the need for ongoing evaluation and reassessment of legislation/enforcement due to changes that might come up such as advancements in vehicle technology or exemptions added to laws. The interviewee also pointed to the need for countermeasure development in areas in addition to legislation/enforcement such as technology, driver refresher courses, and behavioral incentives from insurance companies. An illustrative verbatim comment in this regard included the following:

- "You can't just make a law and expect people's behavior to change and you can't just give people information and expect their behavior to change…there's other like systemic, structural things that could be done."

Strengthening the Implementation of the Safe System Approach

Discussion during the interviews focused on what it will take for the United States to strengthen its Safe System Approach and better implement it, and critical strategies that might work in across the country.

One theme that emerged was that efforts to implement the Safe System approach need to take place at the national, state, and local grassroots levels, with an opportunity for states to adopt the approach first and then filter efforts down to local communities. It was also noted that successful implementation requires a good understanding of the Safe System approach and how it can be applied (e.g., facilitated by webinars or individualized training), setting of specific safety targets, and evaluation of outcomes to assess effectiveness, all of which take time and money. It was also recognized that mapping out and coordinating responsibilities at various levels, setting priorities, and identifying evaluation strategies are not without their challenges.

Several strategies that could be effective in the United States were identified. Key among them were the following needs:

- Demonstrate outcomes in terms of not just safety but how safety affects other sectors such as healthcare
- Obtain buy-in from leaders at both national and grassroots levels
- Prioritize the safety of vulnerable road users
- Incorporate technological solutions such as automated enforcement, as well as other approaches rather than relying solely on regulation
- Be knowledgeable (e.g., understand the Safe System approach and how it aligns with the goals of other stakeholders, explore effective strategies being undertaken elsewhere) and communicate that knowledge to a broad range of stakeholders both inside and outside traffic safety
- Be purposeful (e.g., have an engagement plan, facilitate the documentation of efforts by organizations involved in the process)
- Build capacity and capabilities
- Foster coordination and collaboration.

Illustrative verbatim comments from the interviews included the following:

- You need to actually build that capability and capacity. People have to understand what it's about. And that's from the very top right down to the very bottom. So, when they start talking, it's what tools have you got available to help them? And you've got a population of 350 odd million. That's not that many that you have to influence, but everybody needs to live and be safe within the system. So, who are the people and who are the organizations that are going to help you get on the way? And that's that map. And then what are the tools to help them? But this sort of thing is actually… could be helpful."
- "So, I think that is an opportunity for the U.S. to use and take advantage of this technology that is coming through now and use it for safety purposes."

Synthesis of Distracted Driving Countermeasures

As noted earlier, findings from the four data collection tasks were synthesized into a set of tables of distracted driving countermeasures by category (e.g., educational/behavioral, legislative/law enforcement, and technology-based). These tables can be found in Appendix E. Each table contains the following, as appropriate:

- Names and descriptions of each countermeasure
- Sources of information
- Geographic area where implemented
- Available evaluation results (primarily from the non-scientific literature consistent with the focus and scope of this study)
- Explicit consideration/discussion identified in data collection tasks of how behavior change theories/constructs and/or the Safe System Approach was used or integrated into the development, implementation, promotion, or other involvement with distracted driving countermeasures.

A brief overview of the synthesis is presented here.

The synthesis table on behavioral/educational countermeasures is broken into six categories, based on information gathered during data collection:

1. Communication and outreach targeted to the general public
2. Communication and outreach targeted to youth/novice drivers
3. Driver licensing strategies
4. Employer education and strategies
5. Victim advocate impact stories
6. Other behavioral/educational countermeasures

The synthesis table on legislative/law enforcement countermeasures is broken into three categories, based on information collected:

1. Cellphone use while driving laws
2. Law enforcement
3. Automated enforcement.

The synthesis table on technology-based approaches is broken into two distinct categories:

1. Phone applications
2. Dynamic message signs (DMSs)

Each synthesis table contains example countermeasures currently in use or under consideration that were identified through one or more of the data collection tasks. Given the amount of information on the examples in the synthesis tables, the intent of this section is not to provide details on each example countermeasure, but rather to highlight some of the notable observations from the synthesis tables overall.

The first observation is that the four data collection tasks yielded a vast number of distracted driving countermeasures that organizations at the international, national, regional, and state levels have developed, implemented, supported, or otherwise been involved in. The synthesis table on educational/behavioral countermeasures contains 108 such examples including the following:

- 64 examples of communication and outreach targeted to the general public (16 national in scope and 48 state-specific)
- 25 examples of communication and outreach targeted to youth/novice drivers
- 7 employer education strategies
- 6 victim advocate impact story–based countermeasures
- 6 examples of other countermeasures

It is also worth noting that while there are no specific driver licensing strategies or countermeasures listed in the table, every U.S. state has a graduated driver licensing law, most of which contain requirements intended to reduce distraction for young novice drivers.

The synthesis table on legislative/law enforcement countermeasures contains 22 examples including: eight types of cellphone use while driving laws (enacted in broadly in U.S. states), nine examples of law enforcement countermeasures, and three examples of other countermeasures.

Finally, the synthesis table on technology-based approaches contains 29 examples including: 20 technology-based phone applications, three DMSs, and six examples of other countermeasures.

The second observation is that the four data collection tasks yielded little information about the evaluation of specific countermeasures; thus, the column on evaluation information in each of the tables is very sparsely populated. Given the focus of this study on non-scientific rather than scientific literature, we only included evaluation information that came up as part of the environmental scans, interviews, and stakeholder survey conducted for this study. It was expected that more evaluation information would be available in the scientific literature, but a review of that literature

was beyond the scope of this study. However, a major impetus for conducting this study was that information available in the scientific literature on the effectiveness of countermeasures for distracted driving have been largely inconclusive, due in part to a paucity of evaluation activity or reported evaluation results.

The third observation is that behavior change theories/constructs and the Safe System approach were topics that rarely came up regarding specific countermeasures or countermeasure types, but were associated with distracted driving on a more general level. Therefore, there is little information about those topics in the respective columns in the tables reserved for such information. To the extent that these topics were addressed more generally or as part of responses to direct questions in the interviews or stakeholder survey, results are summarized in the sections on those specific data collection tasks.

Conclusions and Recommendations

The overall objective of this study was to identify and document sources, useful outcomes, and practical guidance related to distracted driving countermeasures that stem from sources outside of scientific literature. Another objective was to identify educational/behavioral, legislative and law enforcement, and technology-based countermeasures that could benefit from further or future evaluation. A main impetus for this study was that two systematic reviews of the scientific literature on distracted driving countermeasures conducted by AAAFTS had yielded mixed results, questionable generalizability, and/or insufficient evidence to draw firm conclusions about effectiveness (Arnold et al., 2019; Arnold & Horrey, 2022). Gathering guidance documents, data inventories, and other operational information and best practices that agencies may not disclose is another critical avenue towards practical recommendations and informing decision-making processes for combating distracted driving.

Using four separate but interdependent data collection approaches (environmental scans, foundational interviews, a stakeholder survey, and integrative interviews), we identified a vast array of strategies and countermeasures that international, national, regional, and state organizations have developed, implemented, supported, or otherwise been involved in to address distracted driving. Appendix E presents a compendium of practical strategies aiming at eliminating distracted driving.

In addition, many of these countermeasures are well established and considered by stakeholders to be quite effective in addressing distracted driving, although opportunities on many fronts were noted for strengthening their impact. The

stakeholders we talked with directly or heard from through surveys were passionate about the issue of distracted driving and committed to finding ways to address the toll that distracted driving takes on society.

Despite these promising results, an important take-away from this study was that the limitations found in the scientific literature with regard to reaching conclusions about the effectiveness of distracted driving countermeasures—that is, mixed study results, questionable generalizability, and/or insufficient evidence—are even more pronounced in the non-scientific literature. That said, there are still important insights gleaned from this study that can help inform continuing and future efforts to address distracted driving. In the rest of this section, we build on those insights to present recommendations and opportunities for moving forward in the area of distracted driving countermeasure development, implementation, and promotion. Based on the overall results of the study, it made sense to organize the recommendations largely around the challenges identified in the stakeholder survey and other data collection tasks. To that end, we start with recommendations around countermeasures in general, and then move on to recommendations around evaluation and data, collaboration and coordination, safety culture (with the Safe System Approach added as a separate but complementary challenge topic), and finally, close with recommendations regarding resources, capacity, and priority.

Countermeasures

Expand the range of distracted driving behaviors targeted by countermeasures. Currently, most distracted driving countermeasures focus on reducing hand-held smartphone use. However, it is well-known that other types of distraction can also be risky, including talking with passengers, reaching for objects, interacting with in-vehicle technologies (e.g., navigation), eating/drinking, grooming, and attending to events outside the vehicle.

Extend the targeting of distracted driving countermeasures beyond young drivers. While some countermeasures do target all age groups, most focus solely on young drivers. However, evidence suggests that drivers of all ages engage in distracted driving behaviors and even when the level of engagement is lower than for young drivers, the negative impacts of these behaviors may be greater, particularly for older adults.

Continue the development of smartphone-based distracted driving countermeasures. While few of these countermeasures have been formally evaluated, these countermeasures are easy and relatively inexpensive to implement, enabling them to reach a wide audience. Continuing development should focus on methods for motivating drivers to use the smartphone app, such as monitoring by an authority (e.g.,

parent or employer), financial incentives, and gamification. Development should also focus on creating metrics that are more closely related to actual distracted driving behavior.

Strengthen educational/behavioral distracted driving countermeasures by incorporating constructs of behavioral change theory that are known to be effective in changing other risky behaviors. There is considerable research on the effects of potential building blocks of countermeasures from other areas of health and safety; therefore, we can make assumptions about the transference to distracted driving to the extent that these building blocks are applied in a thoughtful tailored way. For example, behavior change theory constructs, such as attitudes, norms, and perceived behavioral control, have been found to be effective in reducing unsafe health behaviors.

Expand the framing of educational/behavioral countermeasures to include non-risk-related messaging. Results from this study reinforced insights gleaned from previous UMTRI work (Molnar et al., 2021a, 2021b; Zakrajsek 2023a) on the role that constructs not related to risk (e.g., behavioral intentions, norms, and non-risk attitudes such as pleasant or unpleasant, necessary or unnecessary) play in distracted driving. These findings may help explain why improving drivers' understanding of risks associated with distraction may not in and of itself translate into changes in on-road behaviors. They also point to the potential usefulness of assessing driver distraction countermeasures within the context of non-risk-related constructs.

Focus on educating law enforcement on the value of enforcing distracted driving laws. High visibility enforcement of distracted driving laws is effective for reducing distracted driving. However, this countermeasure requires concerted effort from law enforcement agencies tasked with multiple public safety responsibilities.

Evaluation and Data

Promote the use of objective measures of general driving and distracted driving in the development and evaluation of distracted driving countermeasures. Given the difficulties in using crash data to examine and quantify distracted driving (e.g., rarity of events, limitations in coding distracted driving events), there is an opportunity to make better use of naturalistic driving data to identify prevalence of and factors related to distracted driving to evaluate distracted driving countermeasures. Such data can also be useful in informing the development and implementation of distracted driving countermeasures by helping identify factors associated with such behavior.

Clarify among distracted driving stakeholders the importance of outcome evaluations that measure changes in behavior in understanding the effectiveness of

distracted driving countermeasures. There seems to be a discrepancy between many stakeholders' perceptions about the scope and breadth of evaluation being undertaken (as identified in this study) and the evaluation results available from not only non-scientific but also scientific sources. To better understand why so many stakeholders in our study reported that distracted driving countermeasures were evaluated and effective, while both the scientific literature and non-scientific literature suggest that evaluation results are limited or inconclusive, further efforts are warranted. These efforts should focus on understanding how stakeholders think about, conceptualize, and operationalize "evaluation" and what constitutes effectiveness, as well as determine whether there are evaluation activities and data that have been generated by stakeholders but not made available.

Collaboration and Coordination

Develop a consistent and coordinated branding of distracted driving prevention efforts across jurisdictions. There is an opportunity for more consistent, coordinated, and unified branding and presentation of countermeasures across jurisdictions. Much of the discussion about collaboration and coordination identified in this study had to do with efforts within a single jurisdiction, which is clearly an important part of effective messaging and action. However, on a broader scale, there appears to be considerable overlap and redundancy in messaging across jurisdictions that could be more unified to facilitate understandability, ease of use, and usefulness by a wide audience.

Increase the visibility of the National Distracted Driving Coalition and other existing alliances that address distracted driving. Existing coalitions, like the National Distracted Driving Coalition, include a broad spectrum of stakeholders and generate valuable information and resources that could be used by state and local jurisdictions to inform their own efforts. However, many of these jurisdictions lack awareness of these resources.

Safety Culture and the Safe System Approach

Address safety culture and the Safe System Approach in efforts to reduce distracted driving. It is clear from the results of this study that safety culture and the Safe System approach are separate but interdependent and mutually reinforcing paradigms, and that both should be emphasized and strengthened in concert. Fundamental principles of the Safe System approach are that humans make mistakes and therefore, there must be redundancy in the transportation system to reduce the risk of severe crash outcomes. This requires all parts of the system to be strengthened so that if one part of the system fails, the others will still protect road users (Doctor & Ngo, 2022). At the same time, the

Safe System approach also recognizes that responsibility must be shared. Therefore, road users—as a key element of the system—still need to understand and follow laws on the roadway and to act with care for themselves and others. Cultivating positive safety cultures facilitates the motivation and willingness of individuals to take responsibility and act responsibly.

Develop a Safe System Approach toolkit. While many stakeholders have a basic idea of what the Safe System approach is, results from this study suggest that they could clearly benefit from shelf-ready, easy-to-understand strategies and materials for implementing their efforts to address distracted-driving.

Resources, Capacity, and Priorities

Consider the necessary resources for success as a fundamental component of distracted driving efforts. One theme from this study was the lack of resources to engage in countermeasure implementation and evaluation. Prior to developing, implementing, and/or evaluating countermeasures, stakeholders should consider the necessary and realistic financial and human resources to successfully engage in an effort to reduce distracted driving. Ideally, these resources could then be secured prior to engaging in activities.

Ensure that underserved and low-income communities have the resources to implement and engage in distracted driving countermeasures. Most countermeasures considered in this study were not developed for or implemented specifically with underserved communities. Some countermeasures, particularly those that involve purchasing technologies, may not be affordable for lower income drivers. Efforts need to be made to ensure that countermeasures are effective and affordable for all drivers by, for example, including members of underserved communities in distracted driving coalitions and countermeasure development and implementation efforts, and by providing low-cost or no-cost technologies and training.

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Appendix A: Foundational Interview Discussion Guide

Foundational Interview Discussion Guide (HUM00232461)

Introduction for Foundational Interviews

My name is [Interviewer], and I'm a [Role] at the University of Michigan Transportation Research Institute (UMTRI). Also with me here at UMTRI are [introduce other Study Team Members]. We are conducting this study on behalf of the AAA Foundation for Traffic Safety to learn more about strategies to prevent distracted driving.

Thank you very much for being part of this work and sharing information about your organization's experience related to distracted driving prevention. We expect the discussion today will take about 60 minutes to complete. We will record your responses so that we can accurately capture all the details from our conversation. The reporting of information that we are collecting will not include your name or your organization's name, and we will only report the results as summaries.

Please ask any questions that you have as we go through our questions. We appreciate any details that you can provide and understand if you do not have knowledge about some of the questions. Just let us know this.

Before we begin, do you have any questions?

Questions for Interview Guide for Foundational Interviews

Question	**Prompts/Probes**
Background on role, conceptualization of distracted driving	
1. Can you briefly describe your role at the [agency/organization name] in developing, implementing, and/or promoting distracted driving countermeasures or efforts?	Probe for role beyond development, implementation, promotion. If do not have role specifically associated with distracted driving, then follow up with role in broader traffic safety efforts.
2. How do you define distracted driving for the purposes of carrying out your day-to-day job?	Probe for distinction between distracted driving and: impaired driving, risky driving, other behaviors. Probe for whether distracted driving is a separate distinct area for planning, implementation and funding, and how it is supported if not.
Identification of countermeasures	

Question	Prompts/Probes
3. What do you consider to be the most effective countermeasures or efforts for reducing or preventing distracted driving?	Probe for most effective for their agency/organization and also most effective in general. Probe for types of countermeasures (e.g., enforcement alone, combined enforcement and education, technology) as well as specific countermeasures.
4. How do you identify distracted driving countermeasures or efforts to develop, implement, promote, or otherwise be involved in?	Probe for where they identify existing countermeasures and/or criteria for developing new countermeasures. Probe for whether/in what way Countermeasures that Work is used as a resource. Probe for role of data driven problem ID. As follow-up, probe for what would help them better identify countermeasures and implementation strategies. Probe for whether/how these issues are incorporated into strategic planning activities.
5. How do you assess the effectiveness of potential distracted driving countermeasures or efforts?	Probe for whether they assess themselves, rely on other internal or external experts, do not assess, etc. Probe for what types of data they use in these assessments. If they do assess, probe for how often they conduct such assessments. As a follow-up, probe for types of data or information and resources that would be useful to them that they don't currently have.
6. What distracted driving behaviors do you target for intervention or think should be targeted and for which groups?	Probe for just cellphone use or other behaviors. Probe for all ages, young novice drivers, older drivers, etc.
7. Could you briefly discuss the role of communication about the dangers and risks of distracted driving in your efforts to reduce or prevent these behaviors?	Probe for how this is done. Follow up with probe on disconnect between people reporting that distracted driving behaviors are risky but doing them anyway?
8. Can you briefly describe any public and private partnerships you have in the area of distracted driving?	Probe for partnerships at international, national, regional, state, and local levels. For SHSOs, probe for GHSA, NHTSA, ASSHTO connections (e.g., coordination with National Distracted Driving Mobilization).
9. In general, how do you think your agency/organization is doing in your efforts to reduce/prevent distracted driving?	Probe for what would help your agency/organization be more effective in reducing/preventing distracted driving.

Question	Prompts/Probes
10. Is there anything we haven't touched on in terms of what you are doing in the areas of distracted driving that we should be aware of?	
Safe Systems Approach	
11. Are you familiar with the term "Safe Systems Approach"? How would you define the Safe Systems Approach?	If not familiar with the term, probe for familiarity with concept using other names – Toward Zero Deaths, etc. If not familiar with concept at all, skip to next section. Probe for overall description, objectives, and principles. Prompt, as necessary for whether it is goal for fatality reductions, framework for reaching goal, etc.
12. Do you think the Safe System Approach is something that can be useful in addressing distracted driving specifically rather than traffic safety more generally?	
13. If so, how do you incorporate the Safe Systems Approach into countermeasure or strategy development, implementation, and/or promotion specifically for preventing or reducing distracted driving.	Probe for whether/how Safe System Approach informs distracted driving countermeasures or efforts specifically. For SHSOs, probe for whether explicitly built into SHSP and if so, in what way.
14. What information or resources would you like to have to help you apply the Safe System Approach to your distracted driving countermeasures or efforts?	Probe for examples such as a toolkit for integrating Safe System Approach into decision making and planning.
15. How does the Safe System Approach fit with other planning or decision-making approaches or frameworks used by your agency/organization?	Probe specifically for fit with 4Es (enforcement, engineering, education, emergency care). Probe for fit with Complete Streets. Probe for how these get linked together.
Behavior Change Theory/Safety Culture	
16. Are you familiar with the terms "behavior change theories and constructs"? Have you tried to apply these ideas to distracted driving and if so, how?	If not familiar, probe for whether and how they have tried to incorporate things like attitudes, norms, self-efficacy into countermeasure planning, development, implementation, etc. Probe for whether this is an approach that is salient and valued in their organization.
17. Are you familiar with the term "traffic safety culture"? What does traffic safety culture mean to you? Are you involved in activities to promote a positive traffic safety culture?	Probe for distinctions between behavior change theory constructs (e.g., norms, attitudes, beliefs) and components of traffic safety culture. Probe for specific traffic safety culture activities related to distracted driving.
18. How/where does traffic safety culture fit within the Safe Systems Approach?	

Question	Prompts/Probes
Final Thoughts	
19. Are there any people you think we should talk to about distracted driving countermeasures?	Probe for names, organizations, and contact information.
20. Are there any other final thoughts you would like to share with us?	

Emerging Countermeasures for Distracted Driving: Stakeholder Survey

Start of Block: Default Question Block

Q1

Welcome to the Online Survey about Distracted Driving Countermeasures (HUM00236041)

Dr. Lisa Molnar of the University of Michigan Transportation Research Institute (UMTRI) invites you to participate in a study on behalf of the AAA Foundation for Traffic Safety to learn more about strategies and countermeasures for preventing distracted driving.

If you agree to be a part of this research study, you will be asked to complete an online survey about your organization's efforts to prevent distracted driving. We expect this survey to take about 10 minutes to complete.

Participating in this study is completely voluntary. Even if you decide to participate now, you may change your mind and stop the survey at any time, for any reason. You may choose not to answer any question for any reason.

Your name, email address, telephone number or any information that can identify you will not be collected. Therefore, information that can identify you will not be linked to your survey responses in any way. Your survey responses may be shared with other researchers for future research.

Your employer will not know who participates in the survey and who does not.

You may not receive any direct benefits from being in this study. The results of this study may help improve countermeasures to prevent distracted driving.

If you have questions about this research study, please contact Dr. Lisa Molnar at (xxx) xxx-xxxx.

As part of their review, the University of Michigan Institutional Review Board Health Sciences and Behavioral Sciences has determined that this study is no more than minimal risk and exempt from on-going IRB oversight.

By selecting "Start the survey" below, you are consenting to participate in this research.

If you do not wish to participate, click in the “x” in the top corner of your browser to exit.

End of Block: Default Question Block

Start of Block: Block 1

Q2 Which of the following best describes the type of organization you represent?

- ○ Law enforcement agency (1)
- ○ State highway safety office (2)
- ○ Other government organization (Federal, State, Local) (3)
- ○ Non-governmental organization (4)
- ○ Academic Institution (5)
- ○ Other, please specify (6) _____

End of Block: Block 1

Start of Block: Block 4

*

Q25 What do you consider to be the top three strategies or countermeasures for addressing distracted driving that your organization is currently implementing, promoting, or supporting in some way? Please provide the strategy name/title (if applicable) and/or a brief, specific description.

- ○ 1. (1) _____
- ○ 2. (2) _____
- ○ 3. (3) _____

End of Block: Block 4

Start of Block: Block 5

Q5 Please answer the following questions for each of the strategies or countermeasures you listed.

Strategy: ${lm://Field/1}

Which of the following best describes this strategy?

- ○ Education and awareness media campaign (1)
- ○ Other type of education/behavioral approach, please specify (2) _____
- ○ Policy or law (3)
- ○ Enforcement activity/approach (4)
- ○ Technology-based approach (5)
- ○ Other, please specify (6) _____

Q6 Where did this strategy or countermeasure originate? Please select the response below that best applies.

- ○ Our organization created it from scratch. (1)
- ○ We adapted it from someplace else, please specify (2) _____
- ○ We adopted it entirely from somewhere else, please specify (3) _____
- ○ Other, please specify (4) _____

Q24 How long has your organization been implementing, promoting, or supporting this strategy or countermeasure?

- ○ 1 year or less (1)
- ○ More than 1 year but less than 3 years (2)
- ○ 3-5 years (3)
- ○ More than 5 years (4)
- ○ Don't know (5)

Q7 How do you judge the effectiveness of this strategy or countermeasure? Please select all that apply.

- ☐ Conduct own evaluation (1)
- ☐ Partner with another organization to evaluate (2)
- ☐ Use results from someone else's evaluation of another program (3)
- ☐ Assess how widely the strategy is being used by other stakeholders (4)
- ☐ Assess anecdotal accounts of successes and challenges encountered while implementing the program (5)
- ☐ Other, please specify (6) _____
- ☐ We do not judge the effectiveness (7)

X→ X→

Q8 How effective do you think this strategy or countermeasure is in addressing driver distraction (with 1 being not at all effective and 7 being extremely effective)?

- ○ Not at all effective 1 (8)
- ⊗ 2 (1)
- ⊗ 3 (2)
- ⊗ 4 (3)
- ⊗ 5 (4)
- ⊗ 6 (5)
- ○ Extremely effective 7 (6)

Q9 In general, which of the following do you think would strengthen the effectiveness of this strategy or countermeasure? Please select all that apply.

- ☐ Increasing funding for implementation/promotion, please specify (1) _____
- ☐ Improving data on prevalence, risk, outcomes of distracted driving, please specify (2) _____
- ☐ Reducing barriers to enforcement, please specify (3) _____
- ☐ Including a safety champion, please specify (4) _____
- ☐ Enhancing multiagency collaboration, please specify (5) _____
- ☐ Expanding public and private partnerships, please specify (6) _____
- ☐ Increasing public awareness, please specify (7) _____
- ☐ Establishing/following best practice guidelines, please specify (8) _____
- ☐ Strengthening policies or laws, please specify (9) _____
- ☐ Other, please specify (10) _____

End of Block: Block 5

Start of Block: Block 5

Q21 Are you familiar with the term “Safe Systems Approach”?

- ○ Yes (1)
- ○ No (2)

Skip To: End of Survey If Are you familiar with the term “Safe Systems Approach”? != Yes

Q24 How do the components of the Safe System Approach (i.e., Safer Roads, Safer Speeds, Safer Road Users, Safer Vehicles, and/or Post-Crash Care) help your organization address distracted driving?

_____

_____

_____

_____

_____

Q25 What challenges does your organization face in implementing the Safe System Approach to address distracted driving?

_____

_____

_____

_____

_____

End of Block: Block 5

Appendix C: Specific Countermeasures and Strategies Identified by Survey Respondents by Organization and Countermeasure Type

Education and Awareness Media Campaigns

Organization Type	Countermeasure
Academic institution	Participation in events as guest speakers
Law enforcement agency	Traffic Enforcement
	Education
	Educating the public through social media posts.
	Education Campaign
	Engineering
	Educating motoring public
Non-government organization	Elementary Educational programs
	Education
	K-2 programs books resources
	Safe Roads Alliance is partnering with a hands-on nonprofit called In Control Family Foundation - they offer ride-along demonstrations to high school students, so they can feel, and directly experience, the impact of speed, distractions, impairment, and directly link it to the ability to control a car.
	Education with more signage
	Teen education
	DDAM - Distracted Driving Awareness Month
	Changing views on who the roads are for - i.e. not just cars.
	Collaboration across the field with other nonprofits focused on distracted driving prevention. When a group is open to collaborating and sharing messaging, materials, etc., then we can all accomplish a lot more.
Other government organization	Targeted behavioral change campaigns using Positive Culture Framework.
	Public educational campaigns
	Impact Teen Drivers Presentations
	Educational Programming
	Education support driver ed
	Factsheets for law enforcement
	Education: training, presentations, handouts
	$1M Media Campaign to promote new law
	Education
	Media-work with other agencies- billboards
	Information for travelers
	Collaboration with highway safety agencies: state-wide campaigns
	Community engagement events that involve community partners.

Organization Type	Countermeasure
	Safety Saturday messages on Twitter occasionally tackle this topic
	Distracted Driving Goggles
State Highway Safety Office	Media campaigns (who do you make it home for)
	Media
	Education
	In-person education
	Ford Driving Skills Event - Hands on education for parents and teens
	Communications/Paid Media Outreach
	Buckle Up Phone Down initiative
	Promotion of distracted driving laws on the radio during peak drive times
	2.1 Communications and Outreach on Distracted Driving
	Distracted Driving School Kits were sent out to top 20 counties
	Media Buys (Online, TV and Radio)
	Paid media maximizing the enforcement's effect
	Communication with media and outreach
	Social media and video messaging
	Addressing dangers of distracted driving in schools

Other Education and Behavioral Approach

Organization Type	Countermeasure Description
Non-government organization	Community based education with evidence informed curriculum for parents and teens
	Empowering youth to share the traffic safety message peer to peer
	Distracted Driving Summit
	Educating future drivers (children in the back seat) to recognize DD and to speak up to the driver. The program, called Kids Speaking Up for Road Safety, is currently being rolled out in MA through partnership with the Highway Safety Division. The program can also include observation studies in a community (5th or 6th graders going out to count the proportion of drivers who are on their phone vs focused drivers)
	Peer led educational initiatives
	Mentoring
	Distracted Driving VR Simulator
	Heads-Up Advisory Solutions: dynamic advisory signage to target messages to drivers using cellphones
	Teen mentoring programs
	Education
Other government organization	TZD weekly messages - distracted driving articles are provided throughout the year
	In-person presentations (Target: youth) - "Young Drivers In Control" - It's about empowering young drivers and providing them the opportunity to take ownership of their choices. It's about helping them choose instead of telling them what to do. We are trying to avoid psychological reactance.
	Campaigns provided by Impact Teen Driver
	Peer education (Teens in the Driver's Seat)
	CPST education - CPSTs learn about mirrors to look at a rear facing child
	Peer-to-Peer outreach and education
	In school presentations and classes that reinforce campaigns.
	Online Course in development (Target: youth) - "Young Drivers In Control" - An longer more detailed version of the in-person presentation. The online course is designed to reach youth when in-person may not be possible. Additionally, it reinforces the in-person and allows you to revisit and explore the material deeper. It's about empowering young drivers and providing them the opportunity to take ownership of the
	Community education - educate the community about mirrors to look at rear facing children
	Phone Awareness Monitoring - non-enforcement
	Working with Young Parents - as a Child Passenger Safety Tech (CPST), I help young parents discover how their children will be safer if they drive distraction free. The children will be safer now because the parents are safer drivers and, in the future, because the children will ultimately adopt their driving behaviors when they start driving.
	Incorporating the topic in other communications, projects, etc.
Other non-government organization	Impact Teen Drivers (ITD): Education and Outreach Program

Organization Type	Countermeasure Description
State Highway Safety Office	Education through the Sudden Impact hospital and school-based program (DD is one component of this program)
	Law
	Enforcement
	Outreach and Education
	Public Engagement
	Education (Schools and Community Events)
	Education through the ThinkFirst program which uses speakers that have experienced injury in motor vehicle crashes due to poor choices (DD, impairment, or lack of seatbelt) to education students and community members to change behavior

Policy or Law Countermeasures

Organization Type	Countermeasure Description
Non-government organization	Hands free device law and enforcement thereof
	Bills 4250-4252 Hands Free Michigan (cellphone use)
	Legislation & Enforcement - Passing Hands-Free Laws in the remaining states, working with LE on effective enforcement measures and making DD a priority.
	Support legislation
	Enact legislation to protect vulnerable roadway users
	Hands Free/ no phone use
	Accountability
	Enact a law to grant flexibility in setting safer speed limits
	Comprehensive Hands-Free Employer policy
Other government organization	Hands-Free Legislation
	Encouraging roadway design that minimized exposure for vulnerable roadway users and encourages drivers' attention.
	Laws/policies
	Significantly increased penalties
State Highway Safety Office	Strong laws
	Program Management
	Laws
	Cellphone and Text Messaging Laws - MN passed the Hands-Free Law that went into effect Aug. 1, 2019
	Cellphone and Text Messaging Laws
	Recent passing of Hands-Free Law

Enforcement Activity or Approach

Organization Type	Countermeasure Description
Law enforcement agency	Enforcement
	Statewide distracted driving violation participation
	Ghost car
	Citations for distracted driving
	Citations on crashes - currently no targeted enforcement
	Proactive traffic enforcement
	Driving around
	Data collection from crash reports
	Specific Enforcement of Violations
Non-government organization	Acusensus Heads-Up: automated detection and enforcement of cellphone use
	Educational
	Automated enforcement of traffic laws
	Acusensus Heads-Up Realtime: technology assisted police enforcement of cellphone use
	Law enforcement
Other government organization	Enforcement detention cameras - Mobile Phone and Seatbelt Enforcement Cameras
	Enforcement
	Supporting High Visibility Enforcement
	We're looking into a universal parent-teen driver agreement (CDC parents are the key; Checkpoints)
	Support enforcement agencies
	Judge tools for use in enforcing dd laws
State Highway Safety Office	Enforcement
	DUI enforcement
	High-Visibility cellphone and Text Messaging Enforcement
	Enforcement
	DDHVE (High Visibility Enforcement)
	Enforcement campaigns (high-visibility overtime targeting distracted drivers and violations)
	Law Enforcement
	Enforcement of those laws
	Speed enforcement
	Enforcement
	High Visibility Enforcement
	High-Visibility cellphone/Texting Enforcement
	Strategic enforcement around areas known for vulnerable road users (pedestrians, kids, bicyclists, rural roads)
	Distracted driving enforcement
	Traffic reports
	Education

Technology-based Approach

Organization Type	Countermeasure Description
Academic institution	Usage based insurance - pay more if use phone while driving
	Smartphone apps - passively track phone use while driving and prompt user to reduce use
	Do not disturb while driving setting automatically defaulted
Non-government organization	Crash avoidance features in vehicles
	Crash avoidance - FCW/AEB and lane departure prevention
	Limit distractive potential of vehicle infotainment centers
	Automatic Do Not Disturb mode for all mobile devices
	Increasing use of do not disturb while driving apps
	In-vehicle driver monitoring\alerting
	More use of tech to limit device use in vehicles
	Technology solutions - promotion of technology solutions to mitigate distraction. From apps to auto maker technologies, and enforcement mechanisms.
Other government organization	Considering how to use telematics data to target strategies
	Data Analysis for programming
Other	Automated Enforcement - developing smart roadside cameras to detect distracted driving
	On-road prevalence measurement - using smart cameras to measure prevalence of distracted driving in real-world conditions
State Highway Safety Office	Centerline and Edgeline Rumble Stripes on undivided roadways
	Hands on experience
	User activated Pedestrian Crossing Warning devices.
	Education through the Ready, Set, Drive! program - school based program that uses a driving simulator (DD is one component)
	Intersection Conflict Warning Systems

Other Countermeasure Types

Organization Type	Countermeasure Description
Academic institution	Social media campaign
	Research on best practices
	Use of Driver Focus or Do Not Disturb
	Translating research to practice
	Raising awareness
Non-government organization	Primary Enforcement for all types of inattentive driving
	Promoting non-motorized infrastructure
	Data Collection
	Comprehensive state traffic safety laws to restrict mobile device use and curb visual, manual and cognitive distraction
	Coalition building for education and awareness and resource/information sharing and dissemination of materials. We have been working in assisting states form coalitions on distracted driving to engage more in DD. These coalitions work together on education and awareness efforts to push the needle further and to address the needs that individual state has. We must find a way to reach new audiences
	Research
	Vehicle safety technologies to prevent or mitigate crashes including automatic emergency braking, blind spot detection, lane departure warning/lane keeping assistance and driver monitoring
	Advocacy
	Automated enforcement of hands-free cellphone bans
	Education
	Impaired Driving Assessment -The IDA has eight domains that assess a handful of major areas of impaired-driving recidivism: prior involvement in the justice system related to impaired driving, as well as in general; prior involvement with alcohol and/or other drugs; mental health and mood adjustment problems; and resistance to or non-compliance with justice system interventions.
	Traffic calming infrastructure design
	Public information campaigns
	Definition
	Technology
	Incentivizing youth with contests and awards
	Lower speed limits
	Seminars
	Enforcement
	Bringing community stakeholders alongside the youth including law enforcement and parents
	Federal standards limiting distraction caused by nomadic devices and in-vehicle systems (infotainment, etc.) rather than non-binding guidelines as is currently in use

Organization Type	Countermeasure Description
Other government organization	Added distracted driving module to the Behavioral Risk Factor Surveillance Survey
	Roadway design features are present to warn drivers that they are drifting off the road (rumbles, safety edge, cable barrier, etc.)
	Research/data on teen driver risks/behaviors
	Participation on the MD Highway Safety Office's Distracted Driving Emphasis Area Team
	Employee training/online course
	Education
	Media
	Executive order on texting for government officials
	Outreach
	Distracted driving law
	Traffic Safety Culture framework application to programming & resources
	Education and Enforcement campaigns
	Advocacy/Public Policy
	Hands-on learning dispelling the myth of multitasking behind the wheel
State Highway Safety Office	Youth traffic safety programs, such as MoDOT's TRACTION
	Education
	Media/Outreach and Education
	Enforcement
Law enforcement agency	Phone in the cup holder
	Public Relations
	Safe speeds
	Seat belts on
Other	Enforcement
	Education
	Awareness

Appendix D: Integrative Interview Discussion Guide

Integrative Interview Discussion Guide (HUM00239228)

Questions for Interview Guide for Integrative Interviews

Module: Education/behavior

1. What are the critical components or features that need to be included in a campaign to prevent distracted driving?
    a. Probe for specific content components (e.g., behavior change theory, social norms, attitudes, risk perception)
    b. Probe for specific delivery components (e.g., credible source, mode of delivery)
2. Are there existing campaigns that embody these components or features?
3. How are they best targeted to appropriate audiences and who are those audiences?
4. What are the limitations of campaigns and how can they be overcome?

Module: Technology

1. What are the critical components a technology needs to have to be successful in preventing or reducing distracted driving?
2. What specific technologies do you think could be effective in 1) preventing distraction and 2) reducing the adverse consequences of distracted driving?
    a. Probe for types of technology (blocking technology for the mobile phone, vehicle-based countermeasures, ADAS technologies)
3. What are the barriers to implementing technology?
4. How would you get people to adopt the technology?

Module: Legislative/enforcement

1. What are the critical features/components that need to be included in these laws to be successful in preventing distracted driving?
2. What are the most critical barriers to enacting these laws?
3. What are promising strategies to get these laws passed?
    a. For an interview in a state with a strong distracted driving law - What did it take to get this law passed?
4. What is the most effective method for enforcing these laws?

5. What are the most critical barriers to enforcement?

Module: Safe System Approach

1. What do you think it will take for the U.S. to strengthen its SSA and better implement it?
2. From your perspective, what are the critical strategies that might work in the U.S. and those that might not work in the U.S.? Why?

Appendix E: Synthesis Tables

Educational/Behavioral Countermeasures

The synthesis of educational/behavioral countermeasures includes six types of such countermeasures identified during the course of the environmental scans, interviews, and surveys conducted in this project: 1) communication and outreach targeted to the general public; 2) communication and outreach targeted to youth/novice drivers; 3) driver licensing strategies; 4) employer education and strategies; 5) advocate impact stories; and 6) other behavioral/educational countermeasures. In this appendix, we provide a general overview of each of these countermeasure types. Specifically, for each countermeasure type to the extent possible, we provide the following:

- A report on where we obtained the information for the countermeasure type (i.e., which data collection task yielded the information)
- A brief description of the countermeasure type
- An identification of the geographic location(s) where the countermeasure type is being implemented or available
- A description of any evaluation activities and/or results identified through the data collection
- Notes of any explicit mention of behavior change theories/constructs and/or Safe System Approach elements or principles considered to have contributed directly to the development or implementation of the countermeasure type

It should be noted that given the focus of this project on non-scientific rather than scientific literature, it was beyond the scope of the project to review the scientific literature for evaluation information for every countermeasure identified. Rather, we only included evaluation information that came up as part of the environmental scans, interviews, and stakeholder survey conducted for this project. It should also be noted that behavior change theories/constructs and the Safe System Approach were topics that rarely came up with regard to specific countermeasures or countermeasure types, but

were associated with distracted driving on a more general level. Therefore, there is little information about those topics in the appendix; however, the topics are discussed more generally in the body of the report. For each type of educational/behavioral countermeasure type, we tried to identify specific countermeasure examples currently in use or under consideration. When such examples were found for a given countermeasure type, they are included in a table following the overview of that countermeasure. Similar to the general overviews, we included in the tables, as available and appropriate, the source of information, a brief description of the specific countermeasure, the geographic location where implemented or available, any evaluation information identified during the project data collection activities, and notes on behavior change theories/constructs and the Safe System approach components specifically related to countermeasure development or implementation. When such information was not identified, the corresponding section of the table was left blank.

Communication and Outreach Targeted to the General Public

Sources of Information

- Environmental scans (SHSO/SHSP, other organizations)
- Foundational interviews
- Stakeholder survey
- Integrative interviews

The environmental scans included each U.S. State's Highway Safety Office website and the websites of the following organizations: GHSA, NHTSA, National Safety Council, National Conference of State Legislatures, IIHS, AAAFTS, AAA Southern California, AAA–The Auto Club Group, Network of Employers for Traffic Safety, Centers for Disease Control and Prevention, World Health Organization, International Transport Forum at the OECD.

Brief Description

This type of countermeasure involves efforts to educate members of the general public and raise awareness about distracted driving (e.g., by providing information on statistics, types, and dangers of distracted driving), using a variety of methods. It often involves collaborations or partnerships between stakeholders in the community (e.g., traffic safety advocates, the education system, public health and/or community departments, businesses, organizations, employers, national, state, county, and municipal agencies, and nonprofit agencies). Unified messages across partnerships are considered to be more effective than individual messages. Examples of outreach strategies include the following:

- Paid media and/or earned media, print and digital advertising/educational methods of dissemination
- School/college projects
- Victim impact stories/testimonials
- Live readings during major events
- Educational materials provided to law enforcement, courts, judges, and prosecutors
- Vehicle technology education provided to customers at dealerships
- Employers who partnered to institute safe driving policies and training in the workplace
- Strategies for stopping when needed at rest areas and other “safe phone zones” promoted to drivers
- Vehicle technology that could increase driver safety promoted to drivers
- Cellphone features (e.g., do not disturb settings) promoted to drivers
- Distracted driving material included in driver education programs and driver improvement courses
- Encouragement of passengers to speak up if their driver is distracted
- Incentive programs/competitions for drivers to promote non-distracted driving behaviors or promote desired behaviors
- Guest speakers at events

- Increased signage
- Community events
- Community/state/national champions (e.g., a national level athlete, actor, musician, other celebrity or influencer, relevant business)
- Reminder to the public that it is not just passenger vehicles that use the roadway.
- Targeted behavioral change campaigns
- State level campaigns that promote new electronic communication device laws and educate people about existing laws
- Radio ads during peak driving hours
- Public information about consequences of distracted driving (e.g., numbers of deaths and injuries)
- Tools like go-karts, distracted driving goggles, or simulators to get messages across
- Messaged target to specific groups
- Weekly email messages, distracted driving articles
- Equating distracted driving to drinking and driving

Geographic Location

Most information focused on United States (much of it state specific).

Evaluation Activities and/or Results Identified Through Data Collection Tasks

- The main source of evaluation activities/results for communication and outreach was NHTSA's Countermeasures that Work (Venkatraman et al., 2021). They examined several countermeasures for reducing distracted driving, including communications and outreach. The authors concluded that communications and outreach has not been

determined to be effective because there has been limited or no high-quality evaluation evidence (especially as measured by reductions in crashes or injuries), despite being highly used (defined by the authors as in use by more than two-thirds of the states, or a substantial majority of communities). This conclusion was for communications and outreach efforts overall, rather than those directed at particular segments of the population.

- The conclusion reached by Venkatraman et al. (2021) was also voiced by some of the interviewees for this project. It was noted that research/evaluation is lacking to definitively say that this type of countermeasure is effective. It was also noted that education campaigns have not been greatly effective in Australia—while they have raised awareness about particular behaviors, people still engage in those behaviors.
- Results of a survey of attitudes and awareness regarding Connecticut's distracted driving public messaging campaign (reported in their SHSP) provided support for media strategies undertaken in conjunction with high-visibility enforcement. In the survey, 70% of respondents thought they would be ticketed for using a hand-held cellphone while driving and 70% also thought they would be ticketed if they text or send emails on a cellphone while driving.
- Evaluation activities/results identified in data collection tasks that pertained to a specific countermeasure included in Table E-1 are noted in the evaluation section of the table corresponding to that countermeasure, unless otherwise noted.

Explicit Mention of Behavior Change Theories/Constructs

Social norming, traffic safety culture.

Table E-1: Countermeasures Related to Communication and Outreach Targeted to the General Public

Countermeasure	Sources of Information	Brief Description	Location	Evaluation Activities	Explicit Mention of Behavior Change Theories and / or Safe System Approach
Vision Zero Sweden	Website, Foundational and Integrative interviews	Website for Sweden's Vision Zero road safety strategy – stated philosophy is "no loss of life is acceptable."	Sweden	General mention on website that "Vision Zero approach has proven highly successful."	Website notes that Vision Zero is also known as Safe System approach.
AAA Speak Up	Website, Foundational interviews, YouTube video	Public service announcement by AAA Auto Club Enterprises encouraging children and passengers to speak up to distracted drivers.	U.S.		
CDC	Website, Foundational interviews	Webpage that includes information about the types of driving distraction, a description of the issue, who is at risk, and distracted driving prevention tips, including what States and the Federal Government are doing to address distracted driving.	U.S.		
Distracted Driving Awareness Month	Website, Environmental Scan - Organizations, Stakeholder survey	National campaign during the month of April to educate the public on the dangers of distracted driving and take responsibility for choices made on the road.	U.S.		
Distracted Driving Online Courses	Website, Environmental Scan - Organizations	The National Safety Council's full and abridged courses on distracted driving for workplace employees. The courses teach the dangers and consequences of cellphone use while driving, as well as state and federal laws.	U.S.		Website mentions changing drivers' risky behaviors and attitudes about distracted driving.
Distracted Driving Prevention Campaign	Website, Environmental Scan - Organizations; Foundational interviews, Integrative interviews	Nationwide media campaign to raise awareness of the dangers of texting while driving. Originally named *Stop the Texts, Stop the Wrecks.* Partnership between the Ad Council and NHTSA.	U.S.		Social norming (from interviews).

Countermeasure	Sources of Information	Brief Description	Location	Evaluation Activities	Explicit Mention of Behavior Change Theories and / or Safe System Approach
Do Not Disturb While Driving Day	Website, Foundational interviews	An initiative by the National Distracted Driving Coalition. During the third Thursday of October, drivers are urged to turn on the "Do Not Disturb" feature on their cellphones.	U.S.		
Don't Drive Intoxicated. Don't Drive Intexticated.	Website, Environmental Scan - Organizations, Foundational interviews	A traffic safety education campaign to make the public aware that driving while using a cellphone can be just as dangerous as drinking and driving and should be just as socially unaccepted. The website includes stories and a documentary about how the consequence of distracted driving can change families' lives.	U.S.		The campaign's website discusses changing attitudes and behaviors for cellphone use while driving. Noted by one interviewee that purpose is to increase social stigma of using phone while driving, similar to stigma for alcohol impaired driving.
Every Second Matters: Reducing Distracted Driving, One Voice at a Time	Website, Integrative interviews	An educational guide from Cambridge Mobile Telematics and the Travelers Institute on distracted driver dangers, with advice on staying focused or speaking up to a distracted driver.	U.S.		
It Can Wait	Website, Foundational interviews	AT&T's public education campaign to inform the public (especially teens) on how to speak up to distracted drivers, tips for not driving distracted, impact stories, and a pledge to never drive distracted.	U.S.	Anecdotal evidence from foundational interview that the repetitive nature of the campaign (i.e., repeated every year) contributed to making the campaign effective.	
One Text or Call Could Wreck It All	Website, Environmental Scan - Organizations	NHTSA campaign to raise awareness about the dangers of phone use while driving.	U.S.		Focus on social norming (GHSA, 2022)

Countermeasure	Sources of Information	Brief Description	Location	Evaluation Activities	Explicit Mention of Behavior Change Theories and / or Safe System Approach
Parents Are the Key to Safe Teen Drivers	Website, Stakeholder survey	CDC webpage that lists teen driver safety education resources for parents, pediatricians, and community partners.	U.S.		
Smartdogs	Website	A 2019 campaign by Geico Insurance to raise awareness of the dangers of distracted driving and promote the use of the "Do Not Disturb" feature when driving. The ad had 2.5 billion impressions and cost $33.5 million in television ad buying. (Cambridge Mobile Telematics, 2023).	U.S.		
Traffic Safety Marketing	Website, Environmental Scan - Organizations, Stakeholder survey	NHTSA's website for States, partner organizations, and highway safety professionals to obtain campaign materials and marketing tools for numerous unsafe driving behaviors including distracted driving. Resources include campaign materials for One Text or Call Could Wreck It All and U Drive. U. Text. U Pay., as well as Evergreen Campaign Material, general/generic resources from NHTSA (e.g., posters, tv/radio ads, reports, web videos) used for educating the public on dangers of distracted driving.	U.S.		
U Drive. U Text. U Pay.	Website, Environmental Scan - Organizations	Annual NHTSA enforcement media campaign to remind drivers of the dangers, illegality, and monetary consequences of texting/messaging while driving.	U.S.		
Safe Home Alabama	Website, Environmental Scan - SHSO/SHSP	Website that provides information on various safety topics, including distracted driving, to Alabama residents and its traffic safety community. The Safe Home Alabama website was developed through federal funding provided by NHTSA through Alabama Department of Economic and Community Affairs. Website developed and maintained by University of Alabama's Center for Advanced Public Safety.	AL		
Toward Zero Deaths Arkansas	Website, Environmental Scan - SHSO/SHSP	Program by the Department of Public Safety, Arkansas State Police, Highway Safety Office, the Arkansas State Highway and Transportation Department and the Arkansas Department of Health to reach zero roadway deaths.	AR		The website describes achieving zero deaths on the roadways using the 5Es.

Countermeasure	Sources of Information	Brief Description	Location	Evaluation Activities	Explicit Mention of Behavior Change Theories and / or Safe System Approach
Go Safely California	Website, Environmental Scan - SHSO/SHSP	An education program from California Office of Traffic Safety and Caltrans featuring campaigns targeting risky driving behavior (e.g., Get Off Your Apps) information about California's cellphone laws, resources, and tips.	CA		The website states that this program "promotes a safety culture where everyone will 'go safely.'"
Distraction Reactions	Website, Environmental Scan - SHSO/SHSP	Awareness campaign by the Colorado Department of Transportation to educate the public on the negative impacts of distracted driving on everyone.	CO		Social norming. Website notes that CDOT's goal is to change perceptions by increasing social stigma of distracted driving (i.e., distracted driving is a negative action that puts everyone's safety at risk).
Arrive Alive DE	Website, Environmental Scan - SHSO/SHSP	Website by the Delaware Office of Highway Safety with information on various traffic safety issues including distracted driving. The distracted driving page includes types of distraction, tips to stay focused, distracted driving statistics, and tests/games for drivers to test their knowledge about the dangers of distracted driving and ways to stay distraction-free on the road.	DE		
Put It Down	Website, Environmental Scan - SHSO/SHSP	Campaign to educate Florida drivers about the dangers of distracted driving. The website includes information about Florida's distracted driving law, campaign resources, and a list of campaign partners.	FL		Website displays the Target Zero Florida logo.
Safe Phone Zones	Website, Environmental Scan - SHSO/SHSP	Campaign by the Florida Department of Transportation, in partnership with GEICO Insurance, to promote "safe phone zones" where drivers can stop to safely use a cellphone. The website includes more information about the campaign including a map of where the safe phone zones are located in the State.	FL		
Drive Smart Iowa	Website, Environmental Scan - SHSO/SHSP	Website from Iowa's Governor's Traffic Safety Bureau with information on traffic safety issues including distracted driving types and statistics.	IA		

Countermeasure	Sources of Information	Brief Description	Location	Evaluation Activities	Explicit Mention of Behavior Change Theories and / or Safe System Approach
Put It Down Iowa	Website, Environmental Scan - SHSO/SHSP	Campaign described on Iowa's Department of Public Safety website as a partnership between various organizations and citizens- goal is to reduce distracted driving crashes and save lives.	IA		
What Drives You	Website, Environmental Scan - SHSO/SHSP	Public information campaign from the Iowa Department of Transportation. The website addresses numerous unsafe driving behaviors including distracted driving and offers tips to pay better attention to the road.	IA		Website notes that the mission is to reduce fatalities by changing driver behaviors and attitudes.
Shift Idaho	Website, Environmental Scan - SHSO/SHSP	Idaho's Toward Zero Deaths campaign is now Shift Idaho, a campaign promoting safe driving behaviors. The website includes information on traffic safety issues including distracted driving and Idaho's hands-free law.	ID		The website describes shifting road users' thinking and behavior.
Drop It and Drive	Website, Environmental Scan - SHSO/SHSP	Website by the Illinois Tollway, Illinois Secretary of State, Illinois Department of Transportation, Illinois State Police and AAA Chicago to educate the public on Illinois's handheld cellphone ban.	IL		
It's Not A Game	Website, Environmental Scan, SHSO/SHSP	Website from the Illinois Department of Transportation on traffic safety issues. The site includes a distracted driving section with information about the law, types of distraction, a video and a safety quiz.	IL		
Hands-Free Indiana	Website, Environmental Scan - SHSO/SHSP	A webpage on the Indiana Department of Transportation's website with information on the hands-free law including a back story, statistics, and an FAQ.	IN		
Who Do You Make It Home For?	Website, Stakeholder survey	Kansas' Drive to Zero Traffic Deaths website with traffic safety information on various unsafe driving behaviors. On the website's homepage, there is a link to learn more about *Who Do You Make It Home For?* which takes the user to the Kansas Traffic Resource Office website.	KS		

Countermeasure	Sources of Information	Brief Description	Location	Evaluation Activities	Explicit Mention of Behavior Change Theories and / or Safe System Approach
Destination Zero Deaths	Website, Environmental Scan - SHSO/SHSP	Statewide website with information on distracted driving among other areas. The distracted driving page includes statistics, definition of distracted driving, and a link to Louisiana's SHSP. The website's home page previously had a banner with AAA's and Destination Zero Deaths logos, promoting "Thrive to Survive the Driver," a statewide distracted driving video contest.	LA		The name of website is "Destination Zero Deaths."
Don't Be That Guy	Website, Environmental Scan - SHSO/SHSP	Awareness/behavioral change campaign from Massachusetts's Executive Office of Public Safety and Security's Highway Safety Division that aims to remind each driver to take personal responsibility and not engage in distracted driving.	MA		
Walk.Bike.Drive. Safe	Website, Foundational interviews	Public education initiative of the Southeast Michigan Council of Governments (SEMCOG). SEMCOG partners with local governments, agencies, and organizations in Southeast Michigan to promote safe driving, walking, and biking behaviors. The website includes safety tips, social media campaign materials, articles, tip cards, and additional resources.	MI	Stakeholder focus groups and public surveys were used to assess awareness and gather feedback. Results were used to revise messaging, as appropriate.	Safe System approach is described on website along with goal of Toward Zero Deaths on Michigan roadways.
Distractions Are Real/SPEAK UP	Website, Environmental Scan - SHSO/SHSP	Public service announcements and spots from the Minnesota Department of Public Safety on the dangers of distracted driving.	MN		
Drive Smart! Minnesota	Website, Environmental Scan - SHSO/SHSP	Website from the Minnesota Department of Public Safety with information on traffic safety issues including distracted driving types and statistics. The site also includes a dedicated section on the Hands-Free Law.	MN		
Park the Phone	Website, Environmental Scan - SHSO/SHSP	Website that redirects readers to a page on the Minnesota Department of Public Safety's Office of Public Safety's website where the public can find information and resources regarding the hands-free cellphone law.	MN		

Countermeasure	Sources of Information	Brief Description	Location	Evaluation Activities	Explicit Mention of Behavior Change Theories and / or Safe System Approach
Buckle Up Phone Down	Website, Environmental Scan - SHSO/SHSP, Foundational interviews	A statewide challenge launched by the Missouri Department of Transportation in 2017 to decrease traffic fatalities in Missouri. The challenge focuses on personal responsibility, calling for individuals, businesses, and organizations to use their seatbelt and put their phone away while driving. The challenge has been replicated in other states and a campaign starter kit is available on the website.	MO, KS, KY, NE	MoDOT uses two measures of campaign success: public awareness of the message and improvement in driver behavior. Results from a 2020 survey of people who took the pledge indicated that 96% reported either never using a phone while driving or using a hands-free device only. Distracted driving fatalities in MO were found to decrease from 102 in 2015 to 82 in 2020 (GHSA, 2022).	Website states that the ultimate goal is zero deaths on roadways. One interviewee noted that effort addresses safer people, recognizing it is a shared responsibility.
NC Vision Zero	Website, Environmental Scan - SHSO/SHSP	Website on the NC Vision Zero program with information on traffic safety issues. The site includes a distracted driving section with statistics, tips for distracted driving prevention, and other resources.	NC		The website notes that Vision Zero is grounded in the Safe System approach.
Vision Zero North Dakota	Website, Environmental Scan - SHSO/SHSP	Website for North Dakota's strategy to achieve zero deaths on their roadways. The strategy is focused on establishing a "culture of personal responsibility where motor vehicle fatalities and serious injuries are recognized as preventable and not tolerated."	ND		Website talks about a "culture of personal responsibility." Website uses the term "Vision Zero. Zero fatalities. Zero excuses."
Drive Smart Nebraska	Website, Environmental Scan - SHSO/SHSP	Website from the Nebraska Department of Transportation Highway Safety Office and Drive Smart Nebraska Coalition with resources on traffic safety issues including a distracted driving campaign toolkit.	NE		

Countermeasure	Sources of Information	Brief Description	Location	Evaluation Activities	Explicit Mention of Behavior Change Theories and / or Safe System Approach
Take Control of Your Destiny	Website, Environmental Scan - SHSO/SHSP	Campaign by the New Jersey Division of Highway Traffic Safety to remind drivers to avoid all types of distraction while driving. The website includes facts about distracted driving, media resources, and videos.	NJ		
Safe Roads for All NJ	Website, Environmental Scan - SHSO/SHSP	Website from the New Jersey Department of Transportation describing how the state is moving Toward Zero Deaths by using the 5E's: education, engineering, enforcement, EMS, and equity.	NJ		The website discusses an emphasis on promoting positive driving behavior. The website mentions moving toward zero death by integrating the 5Es of safety.
It Can Wait for 28 Challenge	Website, Environmental Scan - SHSO/SHSP	An awareness and law enforcement campaign developed by the Nevada Highway Patrol Office of Traffic Safety Zero Fatalities and the Las Vegas Justice Court to increase distracted driving awareness and stop phone use while driving. The "28" in the name is based on the idea that it takes 28 days to break a habit.	NV		
Zero Fatalities Nevada	Website, Environmental Scan - SHSO/SHSP	Website by Nevada's Departments of Public Safety and Transportation to get to Zero Fatalities on the roadway. The website has information on various traffic safety topics, including distracted driving facts and statistics, Nevada's cellphone law, and tips for the public and parents to stay focused on driving.	NV		Website lists key areas as safer roads, safer driver/ passengers, vulnerable road users, impaired driving prevention.
Ohio Distracted Driving Corridor	Environmental Scan - Organizations	Ohio's Department of Transportation used Section 148 HSIP funds to posts signs in a "Distracted Driving Safety Corridor." In addition to the signs, ODOT conducted a public education campaign and partnered with the Department for Public Safety to increase enforcement – which consisted mostly of distributing educational material to drivers versus issuing citations.	OH	An evaluation conducted by Simpkins (2020) found that all crashes and injury crashes declined 30% and 31%, respectively during the first 2 years of the program (GHSA, 2022).	
Ohio Distracted Driving Course	Environmental Scan - SHSO/SHSP		OH		

Countermeasure	Sources of Information	Brief Description	Location	Evaluation Activities	Explicit Mention of Behavior Change Theories and / or Safe System Approach
Oregon Impact	Website, Environmental Scan - SHSO/SHSP	Provides programs and resources, specifically aimed at teen drivers but also children and parents, raising awareness about the dangers of impaired and distracted driving. The website also includes a Distracted Driving Avoidance Course.	OR		
Park Your Phone	Website, Environmental Scan - SHSO/SHSP	Campaign from the Oregon Department of Transportation to raise awareness of the dangers of distracted driving. The website includes information about distracted driving, Oregon's distracted driving law, a distracted driving avoidance course for those who received a citation, and a media toolkit.	OR		
DRIVE to Zero Program	Website, Environmental Scan - SHSO/SHSP	DRIVE (Distracted, Reckless, Impaired, and Visibility Enforcement) is an outreach, education, and enforcement program of the South Carolina State Transport Police to prevent unsafe driving behaviors by highlighting the negative consequences of such behaviors.	SC		Website notes that program's goal is to "create a social climate that stigmatizes unsafe, distracted and impaired driving behaviors as socially unacceptable."
Save It for L8r	Website, Environmental Scan - SHSO/SHSP	Campaign by the South Dakota Department of Highway Safety to educate the public on the dangers of distracted driving.	SD		
Hands Free Tennessee	Website, Environmental Scan - SHSO/SHSP	Campaign by the Tennessee Department of Safety and Homeland Security in partnership with the Tennessee Department of Transportation and the Tennessee Department of Tourist Development to educate the public on the state's cellphone law. The site includes information about the law, videos, resources, and an FAQ.	TN		
Thumbs Down to Texting and Driving	Website, Environmental Scan - SHSO/SHSP	Communication and outreach campaign in Tennessee to raise awareness about the types, dangers, and illegality of distracted driving.	TN		

Countermeasure	Sources of Information	Brief Description	Location	Evaluation Activities	Explicit Mention of Behavior Change Theories and / or Safe System Approach
Talk. Text. Crash. and #EndTheStreakTX	Website, Environmental Scan - SHSO/SHSP	A Statewide public awareness campaign to educate the public on dangers and risks of driving distracted and raise awareness of state laws. A Campaign is part of #EndTheStreakTX, a social media and word-of-mouth campaign that encourages various safe driving behaviors.	TX		
Zero Fatalities Utah	Website Environmental Scan - SHSO/SHSP	Utah's website for Zero Fatalities: A Goal We Can All Live With. The website provides information on unsafe driving behaviors including distracted driving types, statistics, and videos.	UT		Website notes that zero fatalities are the only acceptable number.
Drive Smart Virginia	Website, Environmental Scan - SHSO/SHSP	Website with information and resources on distracted driving, a dedicated section about Virginia's phone use law, a sign-up page for a distracted/impaired driving simulator, and a section with information on an annual distracted driving summit. Drive Smart Virginia was established in 1995 by six insurance companies.	VA		
Drive Smart Virginia Distracted Driving Summit	Website, Stakeholder survey	Annual conference on how to address distracted driving through advocacy, enforcement, corporate policies, education, and research.	VA		
Phonedown.org	Website, Environmental Scan - SHSO/SHSP	Website dedicated to explaining Virginia's handheld phone law. The site includes facts about the law, an FAQ, and further resources.	VA		
Drive Well Vermont	Website, Environmental Scan - SHSO/SHSP	Website from the Vermont State Highway Safety Office with information on traffic safety issues including distracted driving statistics, videos, and prevention tips.	VT		
Target Zero Washington	Website, Environmental Scan - SHSO/SHSP, Organizations	Washington's website describes its plan to achieve zero deaths and injuries on its roadways by 2030.	WA		The website describes Washington's plan to achieve zero deaths and injuries on their roads by 2030.

Countermeasure	Sources of Information	Brief Description	Location	Evaluation Activities	Explicit Mention of Behavior Change Theories and / or Safe System Approach
Zero in Wisconsin	Website, Environmental Scan - SHSO/SHSP	Website that provides information on unsafe driving behaviors, including distracted driving types, statistics, and tips to stay focused while driving.	WI		Website notes its commitment to idea that simple changes in driving behavior and habits can prevent drivers from injuring themselves or others. Website notes State's goal is zero fatalities.

Communication and Outreach Targeted to Youth/Novice Drivers

Sources of Information

- Environmental scans (SHSO/SHSP)
- Foundational interviews
- Stakeholder survey
- Integrative interviews

Brief Description

This type of countermeasure involves various approaches to educating young and/or inexperienced drivers (and often their parents/guardians) on the statistics, types, and dangers of distracted driving. States may engage in one or more of the following activities:

- Educational messaging and curriculum (e.g., messaging on event tickets, social and print media, toolkits) video, social media, radio, and digital products)
- Pledges and parent-teen contracts to not engage in distracted driving
- National distracted driving campaigns
- Peer-to-peer education/programs, outreach, and resources
- Young driver education programs, driver's education training, driver improvement courses, and traffic safety education and training by law enforcement
- Teen task forces that meet to coordinate local and state activities and share ideas

- Increased parental involvement in their children's education and experience as young drivers
- Partnerships with law enforcement to raise awareness of distracted driving dangers and laws
- Hands-on training to young drivers (through driver education or more general community events)
- Revisions to driver education curriculum
- Education related to Graduated Driver Licensing for both teens and parents
- Elementary education programs
- Training of teens to become safety champions in their communities
- Training of high school students to serve as mentors to elementary and middle-school students
- Incentives for youth using awards and contests
- Distracted driving kits to schools
- Tools like go-karts and distracted driving goggles to educate young students

Geographic Location

Most information focused on United States (much of it state specific).

Evaluation Activities/Results Identified Through Data Collection Tasks

- The main source of evaluation activities/results for communication and outreach was NHTSA's Countermeasures that Work (Venkatraman et al., 2021). They examined several countermeasures for reducing distracted driving, including communications and outreach, and noted that distracted driving is a particular concern for teen drivers. The authors concluded that communications and outreach has not been determined to be effective because there has been limited or no high-quality evaluation evidence (especially as measured by reductions in crashes or injuries), despite being highly used (defined by the authors as in use by more than two-thirds of the states, or a

substantial majority of communities). This conclusion was for communications and outreach efforts overall, rather those directed at particular segments of the population.

- The conclusion reached by Venkatraman et al. (2021) was also voiced by some of the interviewees for this project. It was noted that research/evaluation is lacking to definitively say that this type of countermeasure is effective. It was also noted that education campaigns have not been greatly effective in Australia—while they have raised awareness about particular behaviors, people still engage in those behaviors.
- Evaluation activities/results identified in data collection tasks that pertained to a specific countermeasure included in Table E-2 are noted in the evaluation section of the table corresponding to that countermeasure, unless otherwise noted.

Table E-2: Countermeasures Related to Communication and Outreach Targets to Youth/Novice Drivers

Countermeasure	Sources of Information	Brief Description	Location	Evaluation Activities	Explicit Mention of Behavior Change Theories and / or Safe System Approach
Re:act	Website, Foundational interviews	An annual program for communication and graphic design students to create road safety campaigns to change the driving behavior of 17–25-year-olds. A winning campaign is selected by higher education, road safety, workplace safety and industry partners. The 2023 programs are currenting happening in Australia (Safer Speeds), and the U.S. and Chile (Distraction).	AU, U.S., CL		Website notes that program is guided by own proven behavior change methodology (in addition to other strategies, plans, and guidelines).
Put On The B.R.A.K.E.S. (Be Responsible And Keep Everyone Safe)	Website, Environmental Scan - SHSO/SHSP	A charity organization started by Doug Herbert who lost his two young sons in a traffic crash. The organization's mission is to prevent injuries and save lives by providing free hands-on training and education to teen drivers/parents.	U.S. (based in NC)		

Countermeasure	Sources of Information	Brief Description	Location	Evaluation Activities	Explicit Mention of Behavior Change Theories and / or Safe System Approach
AAA PROMise	Website, Foundational interview	A program intended to increase teen driver safety during prom and graduation season, by raising awareness of the dangers of distracted and impaired driving. Teens make a "PROMise" to not engage in those behaviors. Schools can order a free toolkit on the website.	U.S.		
Checkpoints	Website, Stakeholder survey	A resource for parents to assist them in helping their teen be a safe driver. The website includes videos about teen risky driving behaviors, resources for parents to help their teen be a safe driver, and a parent-teen driving agreement that some schools may incentivize (e.g., providing the teen a parking lot pass if the agreement is completed).	U.S.	Website notes that research has shown that teens who sign a parent-teen driving agreement got fewer tickets and reported fewer risky driving behaviors (e.g., speeding, tailgating).	
Ford Driving Skills For Life	Website, Stakeholder survey	A program that provides free advanced driving education to novice and teen drivers beyond standard driver education. The program elements are hazard recognition, vehicle handling, speed/space management, and distracted and impaired driving.	U.S.		
Kids Speaking Up for Road Safety	Website, Environmental Scan - Organizations	Lesson plans developed by the Casey Feldman Foundation to educate 2nd-6th graders about the dangers of distracted driving. Students are taught how to recognize distracted driving and speak up.	U.S.		

Countermeasure	Sources of Information	Brief Description	Location	Evaluation Activities	Explicit Mention of Behavior Change Theories and / or Safe System Approach
Safe Kids Worldwide	Website, Stakeholder survey	A nonprofit organization to protect children from preventable injuries at home, in vehicles and on the road, and in sports and at play. Safe Kids works with over 400 network members in the U.S. and partners in 33 countries.	U.S.		
National Teen Driver Safety Week	Website, Foundational interviews	NHTSA campaign that occurs October 15-31 to encourage parents to discuss safe driving behaviors with their teens. The focus areas include alcohol, belt use, passengers, speeding, and distracted and drowsy driving. Campaign resources are found on the website.	U.S.		
Thinkfast Interactive	Website, Integrative interviews	Evidence-based education program for teens on topics such as underage drinking, drug use, bullying, traffic safety, and distracted driving. The program uses technology to involve the audience and keep them engaged as safety messages are delivered.	U.S.	Website notes that since 2006, several SHSOs have contracted with ThinkFast Interactive to conduct local pre/post program evaluations. Reported findings: both middle and high school students demonstrate increased knowledge (20-30 points after programs in Alaska, Rhode Island, Tennessee, and Virginia); teen attitudes improved with regard to use of seat belts, and not engaging in talking/texting on cellphone while driving, speeding, and other risky driving behaviors; teens' intentions to intervene as a passenger increased.	

Countermeasure	Sources of Information	Brief Description	Location	Evaluation Activities	Explicit Mention of Behavior Change Theories and / or Safe System Approach
Thinkfirst	Website, Environmental Scan - SHSO/SHSP Stakeholder survey	ThinkFirst is part of the National Injury Prevention Foundation's educational programs aimed at helping people, especially children, teens and young adults, learn to reduce their risk for injury. The distracted driving section of the website includes tips to avoid distraction along with a pledge. ThinkFirst uses speakers who have been injured due to a distracted/impaired driving or unbelted crash to educate students and community members.	U.S.	Study of students in elementary school grades 1-3 found that program resulted in increased knowledge and awareness; findings support importance of early intervention. Critical role of parents is also noted.	
Save a Life Tour	Website, Environmental Scan - Organizations	The program intended to educate college and high school students on the consequences of unsafe driver behaviors, including distracted driving. The tour uses speakers, high intensity videos, interactive demonstrations, and simulators to illustrate the effect that poor choices made by drivers can have on them, their passengers and other roadway users. Students are asked to sign a pledge and the schools are provided with a banner that reinforces the tour's messages (GHSA, 2022).	U.S.	Students are surveyed prior to and after participating in the tour to assess their understanding of distracted driving (GHSA, 2022)	

Countermeasure	Sources of Information	Brief Description	Location	Evaluation Activities	Explicit Mention of Behavior Change Theories and / or Safe System Approach
Teens in the Driver Seat	Website, Environmental Scan - SHSO/SHSP, Stakeholder survey, Foundational interviews	A peer-to-peer driver safety program that is part of the Texas A&M Transportation Institute's Youth Transportation Safety (YTS) Program. The program provides information on distractions, drowsy driving, speeding, belt use, and impaired driving.	U.S.	Program effectiveness assessed through attitudinal surveys, field studies, focus groups, and program website analytics. Results: program participants increased awareness of common driving risks (40-200+%); participants' use of seat belts was 11% higher than controls; participants' cellphone use/texting was 30% lower than controls; website traveled increased 1,500% over 18 months; program was popular with teens and they considered the peer-to-peer approach to be productive and serve a number of beneficial purposes for them. (Henk, 2008).	Considered to represent a social norming approach, based on comments in interviews.
TRACTION	Website, Stakeholder survey	A youth traffic safety leadership program to promote safe driving behavior.	U.S.		
Young Drivers in Control	Stakeholder survey	An in-school presentation focused on empowering young drivers and providing them with the opportunities to take ownership of their choices, instead of telling them what to do. A more detailed online course is in development.	State name not provided		
Impact Teen Drivers	Website, Environmental Scan - SHSO/SHSP, Stakeholder survey	A nonprofit intended to educate teens, parents, and others about the importance of safe driving behavior through a variety of programs, presentations, train the trainer curriculum, and a map with state-specific resources.	CA		Website notes that approach is about creating a distraction-free driving culture.

Countermeasure	Sources of Information	Brief Description	Location	Evaluation Activities	Explicit Mention of Behavior Change Theories and / or Safe System Approach
Heads Up Georgia	Website, Environmental Scan - SHSO/SHSP	Campaign by the Governor's Office of Highway Safety that is a partnership with Ford Driving Skills for Life and Georgia Public Broadcasting to make teen drivers aware of the dangers of distracted driving. The campaign includes information about types of distraction, the hands-free law, a pledge to not engage in distracted driving, and testimonials.	GA		
Ready, Set, DRIVE!	Website, Environmental Scan - SHSO/SHSP, Stakeholder survey	This program focused on traffic laws, driver education, and other strategies to teach participants how to recognize, assess and change their risky driving behaviors (e.g., underage drinking, alcohol-impaired driving, distracted driving, improper seatbelt use) to decrease teen crashes. In FY 2021, 980 participants attended Ready, Set, DRIVE! activities, which included 45 classrooms.	LA	Program effectiveness measured by pre- and post-tests.	
Sudden Impact	Website, Stakeholder survey	A school-based program that provides students with classroom education and experiential learning at a trauma center regarding the impacts of vehicle crashes. Distracted driving is one component of the program.	LA		

Countermeasure	Sources of Information	Brief Description	Location	Evaluation Activities	Explicit Mention of Behavior Change Theories and / or Safe System Approach
Safe Roads Alliance	Website, Stakeholder survey	A non-profit organization that promotes safe driving for all drivers, teens, and parents. The organization provides information on various traffic safety topics including distracted driving. Website visitors can find more information about current programs and partnerships, as well as safe driving tips and information on Massachusetts's hands-free law. Safe Roads Alliance is partnering with In Control Family Foundation (a hands-on nonprofit) to offer ride-along demonstrations on distractions, speed, impairment, and other risky behaviors to high students.	MA		
Strive For a Safe Driver (S4SD)	Website, Foundational interviews	S4SD is a teen driving initiative to decrease serious traffic crashes, injuries, and fatalities among teens in Michigan. It is presented by Ford Driving Skills for Life (DSFL) and the Michigan Office of Highway Safety Planning (OHSP). All Michigan High Schools are eligible to apply.	MI	Noted in interviews that pre- and post-surveys show this to be an effective program.	
Student Distracted Driving Awareness Billboard Design Challenge	Website, Foundational interviews	TIA challenge for high school students, sponsored by State Farm. Michigan high school students created a billboard to educate the public about the dangers of distracted driving.	MI		

Countermeasure	Sources of Information	Brief Description	Location	Evaluation Activities	Explicit Mention of Behavior Change Theories and / or Safe System Approach
Oklahoma Challenge	Website, Environmental Scan - SHSO/SHSP, Foundational and Integrative interviews	The goal of Oklahoma Challenge is to increase teen traffic safety in Oklahoma. It is a program funded by the Oklahoma Highway Safety Office to bring traffic safety education to young people.	OK	Pre- and post-surveys are conducted. Mentioned in interviews that surveys have yielded positive results.	
Lesson Learned	Website, Environmental Scan - SHSO/SHSP	Campaign encouraging students/teens to watch real stories of South Dakota teens for a chance to win $10,000. The campaign coincides with National Distracted Driving Awareness month.	SD		
U in the Driver Seat	Website, Environmental Scan - SHSO/SHSP	Peer-to-peer education program, created by Texas A&M Institute, providing traffic safety education to college students to reduce crashes.	TX		
The Little Engine That Could	Website, Environmental Scan - Organizations	This was a partnership between AAA Washington State and Studio East to develop a live theater production of The Little Engine That Could tailored to children aged 3-10, as an early education prevention program about distracted driving. The musical was streamed instead of presented in person due to COVID restrictions. The program teaches children how to recognize distracted driving as a high-risk driving behavior and how to respond when they see a parent or caregiver engage in it (GHSA, 2022).	WA		

Driver Licensing Strategies

Sources of Information

- Environmental scans (SHSO/SHSP, other organizations)
- Foundational interviews

Brief Description

This type of countermeasure involves various licensing strategies that aim to reduce unsafe driving behaviors including the following:

- Texting and passenger restrictions in Graduated Driver Licensing (GDL) laws
- Revised driver licensing procedures
- More comprehensive driving exams
- GDL requirements for novice drivers

Geographic Location

United States

Evaluation Activities and/or Results Identified Through Data Collection Tasks

- The main source of evaluation activities/results for driver licensing strategies was NHTSA's Countermeasures that Work (Venkatraman et al., 2021). They examined several countermeasures for reducing distracted driving, including GDL requirements for beginning drivers. The authors concluded that overall, these requirements have been demonstrated to be effective by several high-quality evaluations with consistent results.

- However, they noted differences between studies examining passenger restrictions and those examining cellphone restrictions. They pointed to several studies showing that passenger GDL restrictions reduce teenage driver crashes and injuries. At the same time, results from an evaluation of a GDL cellphone restriction showed little effect of such a restriction on teen drivers' cellphone use, possibly due to teen perceptions that the risk of penalty for non-compliance is low.

Employer Education and Strategies

Sources of Information

- Environmental scans (SHSO/SHSP)
- Foundational interviews
- Stakeholder survey

Brief Description

Partnering with/encouraging/incentivizing employers and employees to implement hands-free and other cellphone policies and/or develop education/fatigue management programs for nighttime workers to reduce/eliminate distracted driving. Employers may use strategies such as providing distracted driving information to employees, signing pledges to not drive distracted, and letting employees build plans to prevent distracted driving.

Geographic Location

United States

Evaluation Activities and/or Results Identified Through Data Collection Tasks

- The main source of evaluation activities/results for employer education and strategies was NHTSA's Countermeasures that Work (Venkatraman et al., 2021). They examined several countermeasures for reducing distracted driving, including employer programs. The authors concluded that employer programs have not been determined to be effective because there has been limited or no high-quality evaluation evidence (especially as measured by reductions in crashes or injuries). In addition, their use is unknown (i.e., data are not available).
- Anecdotally, we heard from interviewees that these programs are effective in that employees share the practices with friends and family, and see behavior and attitude changes. However, we also heard that in one instance where

cellphone use while driving was banned during work hours, monitoring of phone use during a pilot study showed that phone use while driving just shifted from work to non-work hours.

- Evaluation activities/results identified in data collection tasks that pertained to a specific countermeasure included in Table E-3 are noted in the evaluation section of the table corresponding to that countermeasure, unless otherwise noted.

Table E-3: Countermeasures Related to Employer Education

Countermeasure	Sources of Information	Brief Description	Location	Evaluation Activities	Explicit Mention of Behavior Change Theories and / or Safe System Approach
Drive Safely Work Week™ Distracted Driving Module	Website, Environmental Scan - SHSO/SHSP	Drive Safely Work Week™ is an annual campaign sponsored by the Network of Employers for Traffic Safety. The campaign website includes materials such as fact sheets, social media graphics, a presentation, an employee pledge, and other information for employers to deliver the message of focused driving.	U.S.		
*National Safety Council Safe Driving Kit**	Website, Environmental Scan - Organizations	The National Safety Council has developed a safe driving toolkit to assist employers with implementing or strengthening cellphone bans.	U.S.		Website includes a link Road to Zero newsletter.
Network of Employers for Traffic Safety (NETS) program	Website, Environmental Scan - Organizations	Road safety polices and education for employers to provide to employees. There are campaign kits on the website for distracted driving, impairment, fatigue, speeding, etc.	U.S.		

Countermeasure	Sources of Information	Brief Description	Location	Evaluation Activities	Explicit Mention of Behavior Change Theories and / or Safe System Approach
Nebraska Employer Distracted Driving Education Campaign	Environmental Scan - SHSO/SHSP	In its SHSP, the National Safety Council, Nebraska, describes how it is implementing an education and awareness effort in five counties to decrease all types of distracted driving. It is working through employers, employees, and employee families/community members, focusing on employer/employee outreach.	NE		
Our Driving Concern: Texas Employer Traffic Safety	Website, Foundational interviews	Free training, education, and resources on unsafe driving behaviors including distracted driving.	TX		
Utah Network of Employers for Traffic Safety (NETS) Program	Website, Environmental Scan - SHSO/SHSP	Program from the Utah Safety Council. Purpose is to engage employers to prevent crashes on and off the job through education and training.	UT		
Washington State Distracted Driving Workplace Toolkit	Website, Environmental Scan - Organizations	Toolkit developed by the Washington State Traffic Commission that provides businesses with steps to improve employee safety regarding distracted driving in the workplace.	WA		

Survivor Advocates/Victim Impact Stories

Sources of Information

- Environmental Scans
- Foundational interviews
- Integrative interviews

Brief Description

This type of countermeasure involves the sharing of stories and testimonials from survivors and victims of distracted driving crashes with the public.

Geographic Location

United States

Evaluation Activities and/or Results Identified Through Data Collection Tasks

- Anecdotal evidence from interviewees that these stories and testimonials are effective and make an impact.
- Evaluation activities/results identified in data collection tasks that pertained to a specific countermeasure included in Table E-4 are noted in the evaluation section of the table corresponding to that countermeasure, unless otherwise noted.

Table E-4: Countermeasures Related to Survivor Advocate/Victim Impact Stories and Testimonials

Countermeasure	Sources of Information	Brief Description	Location	Evaluation Activities	Explicit Mention of Behavior Change Theories and / or Safe System Approach
EndDD.org	Website, Environmental Scan - Organizations, Foundational interview, Integrative interviews	A campaign of the Casey Feldman Foundation, created by Joel and Dianne Feldman after their daughter Casey was killed by a distracted driver. Volunteers deliver free presentations to schools and businesses. The foundation is the first to develop a distracted driving lesson plan for elementary school students.	U.S.		
StopDistractions.org	Website, Environmental Scan - Organizations	A nonprofit established by Jennifer Smith after her mother was killed by a driving talking on a cellphone. The nonprofit focuses on raising awareness about the dangers of distracted driving and advocating for state laws that address all aspects of distracted driving.	U.S.		
Distracted Driving Victims Car Display	Website, Environmental Scan - Organizations	A life-size car display by the Colorado Department of Transportation located at a marketplace where community members can look through the windshield and experience the stories of distracted driving crash victims.	CO		
The Kiefer Foundation	Website, Environmental Scan - Organizations, Foundational interviews	A foundation started to honor Mitchel Kiefer, a victim of a distracted driving crash. The foundation's mission is to end distracted driving through awareness, policy, and technology.	MI		
Hang Up and Drive	Website, Environmental Scan - SHSO/SHSP, Stakeholder survey	Hang Up and Drive is the website for distracted driving advocates and speakers Jacy Good and Steve Johnson. After a distracted driving crash killed her parents and left her partially paralyzed, she campaigned for a cellphone ban in PA, leading to many interviews and speaking events.	PA		
Project Yellow Light	Website, Integrative interview	A distracted driving peer-to-peer scholarship competition to honor 16-year-old Hunter Garner who died in a car crash. Applicants create a video, billboard, or radio PSA to encourage their peers to avoid distracted driving, specifically phone use while driving.	VA		

Other Behavioral/Educational Countermeasures

Examples of other behavioral/educational countermeasures are included in the table below.

Table E-5: Other Behavioral/Educational Countermeasures

Countermeasure	Sources of Information	Brief Description	Location	Evaluation Activities	Explicit Mention of Behavior Change Theories and / or Safe System Approach
Child-to-adult interventions	Stakeholder survey, Foundational interviews	Programs that teach child passengers intervene when a driver is distracted.	U.S.	Evaluation conducted for two programs – one implemented in a high school and one in an elementary school (the latter had too small of a sample for meaningful results due to COVID-related recruitment challenges. The high school program students were more likely to intervene with their parents/guardians, following a virtual distracted driving lesson, but further research is needed to examine subsequent driving behavior of the parents/guardians and students (NHTSA, 2022).	
Distracted Driving Virtual Reality Simulator	Stakeholder survey	A full-size Chevy Silverado with virtual reality goggles and other relevant stations including law enforcement, trauma, and victims' schools, workplaces, and communities.			
Motorcycle rider training	Environmental Scan - SHSO/SHSP	Education and training for current and new motorcycle riders, which may include skills training in a controlled environment, with an emphasis on unsafe driving behaviors including distracted driving.	AZ, NM		

Countermeasure	Sources of Information	Brief Description	Location	Evaluation Activities	Explicit Mention of Behavior Change Theories and / or Safe System Approach
Safe phone zones	Website, Environmental Scan - SHSO/SHSP	Designated rest or other areas advertised to the public as places to safely pull off the roadway to use a cellphone.	AZ, FL, IL, NJ, NY, NC, TX, VA, WV		
Passenger communication campaigns	Foundational interviews	Distracted driving campaigns that aim to motivate/promote passenger speaking up to a distracted driver.			
Traffic Safety Education (provided by law enforcement)	Environmental Scan - SHSO/SHSP	Traffic safety classes offered by a police department that are open to the public and available for local courts to use as a sentencing referral option for traffic offenders.	WY		

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Legislative/Law Enforcement Countermeasures

The synthesis of legislative/law enforcement countermeasures includes three types of such countermeasures identified during the course of the environmental scans, interviews, and surveys conducted in this project: 1) cellphone use while driving laws; 2) law enforcement; and 3) automated enforcement. In this appendix, we provide a general overview of each of these three countermeasure types. Specifically, for each countermeasure type to the extent possible, we provide the following:

- A report on where we obtained the information for the countermeasure type (i.e., which data collection task yielded the information)
- A brief description of the countermeasure type
- An identification of the geographic location(s) where the countermeasure type is being implemented or available
- A description of any evaluation activities and/or results identified through the data collection
- Notes of any explicit mention of behavior change theories/constructs and/or Safe System Approach elements or principles considered to have contributed directly to the development or implementation of the countermeasure type

It should be noted that given the focus of this project on non-scientific rather than scientific literature, it was beyond the scope of the project to review the scientific literature for evaluation information for every countermeasure identified. Rather, we only included evaluation information that came up as part of the environmental scans, interviews, and stakeholder survey conducted for this project. It should also be noted that behavior change theories/constructs and the Safe System approach were topics that rarely came up with regard to specific countermeasures or countermeasure types but were associated with distracted driving on a more general level. Therefore, there is little information about those topics in the appendix; however, the topics are discussed more generally in the body of the report. For each type of legislative/law enforcement countermeasure type, we tried to identify specific countermeasure examples currently in use or under consideration. When such examples were found for a given countermeasure type, they are included in a table following the overview of that countermeasure. Similar to the general overviews, we included in the tables, as available and appropriate,

the source of information, a brief description of the specific countermeasure, the geographic location where implemented or available, any evaluation information identified during the project data collection activities. When such information was not identified, the corresponding section of the table was left blank.

Cellphone Use While Driving Laws

Sources of Information

- Environmental scans (SHSO/SHSP, other organizations)
- Foundational interviews
- Stakeholder survey

Brief Description

Laws that prohibit handheld, texting, or any cellphone use while driving.

Geographic Locations

United States; Australia

Evaluation Activities and/or Results Identified Through Data Collection Tasks

- The main source of evaluation activities/results for cellphone use while driving laws was NHTSA's Countermeasures that Work (Venkatraman et al., 2021). They examined examined several countermeasures for reducing distracted driving, including cellphone and text messaging laws. The authors concluded that the effectiveness of cellphone and text messaging laws is still undetermined, with different methods of implementation producing different results. The authors cautioned that "the effectiveness of laws banning cellphone use has been examined in several research

studies. The results across types of phone use are inconsistent. Specifically, research examining prohibitions on hands-free phone use and texting have yielded mixed results in terms of reductions in phone use while driving and reduced crashes. There is some evidence that banning handheld cellphone use leads to long-term reductions in this behavior; however, it is unknown if drivers are simply switching to hands-free use. At this time, there is insufficient consensus across research findings to determine that this countermeasure is effective." (p. 236)

- This conclusion has been reached by other sources, as well. For example, Bloch (2022) noted a lack of consensus on the effectiveness of distracted driving laws such as hand-held and texting bans, with most studies suggesting that hand-held bans are somewhat effective in reducing hand-held phone use, but not pointing directly to reductions in crashes.
- Results from one recent study suggest that cellphone bans may be more effective for teen drivers. Flaherty et al. (2020) reviewed fatal crashes in the United States from 2007–2017 and concluded that primarily enforced cellphone laws were associated with a lower incidence of fatal crashes among 16- to 19-year olds. Handheld cellphone bans were effective for all age groups, with the greatest decline in fatal crash rates observed for 16-year old drivers. Novice driver all-cellphone-use bans were not associated with any declines in fatal crashes for drivers aged 16–19.
- Venkatraman et al. (2021) also looked at general distraction laws and concluded that there was limited or no high-quality evaluation evidence for their effectiveness. They cautioned that "laws that specifically target distracted drivers are not widely enforced, and this countermeasure has not been systematically examined. There is insufficient evaluation data available to conclude that the countermeasure is effective." (p. 239)
- Evaluation activities/results identified in data collection tasks that pertained to a specific countermeasure included in Table E-6 are noted in the evaluation section of the table corresponding to that countermeasure, unless otherwise noted.

Explicit Mention of Behavior Change Theories/Constructs

The Governor's Highway Safety Association (GHSA, 2022) noted that traffic laws set social norms and empower law enforcement to act on dangerous driving when they observe it.

Table E-6: Cellphone Laws

Countermeasure	Sources of Information	Brief Description	Location	Evaluation Activities
Texting ban – all drivers	Website, Environmental Scan - SHSO/SHSP	Law that prohibits all drivers from texting while driving.	AL, AK, AZ, AR, CA, CO, CT, DE, DC, FL, GA, HI, ID, IL, IN, IA, KS, KY, LA, ME, MD, MA, MI, MN, MS, NV, NH, NJ, NM, NY, NC, ND, OH, OR, PA, RI, SC, SD, TN, TX, UT, VT, VA, WA, WV, WI, WY (primary enforcement), MO, NE, OK, SD, (secondary enforcement)	See general overview for evaluation results on cellphone and text messaging laws overall.
Texting ban – novice drivers	Website, Environmental Scan - Organizations	Law that prohibits novice drivers from texting while driving.	AL, AK, AZ, AR, CA, CO, CT, DE, DC, FL, GA, HI, ID, IL, IN, IA, KS, KY, LA, ME, MD, MA, MI, MN, MS, NE, NV, NH, NJ, NM, NY, NC, ND, OH, OK, OR, PA, RI, SC, SD, TN, TX, UT, VT, VA, WA, WV, WI, WY (covered under all driver ban) MO: Primary law for novice drivers under 21 years of age.	See general overview for evaluation results on cellphone and text messaging laws overall.
Texting ban – school bus drivers	Website, Environmental Scan - Organizations	Law that prohibits school bus drivers from texting and driving.	AL, AK, AZ, AR, CA, CO, CT, DE, DC, FL, GA, HI, ID, IL, IN, IA, KS, KY, LA, ME, MD, MA, MI, MO, MN, MS, NE, NV, NH, NJ, NM, NY, NC, ND, OH, OK, OR, PA, RI, SC, SD, TN, TX, UT, VT, VA, WA, WV, WI, WY (covered under all driver ban)	See general overview for evaluation results on cellphone and text messaging laws overall.

Countermeasure	Sources of Information	Brief Description	Location	Evaluation Activities
Handheld phone use ban – all drivers	Website, Environmental Scan -SHSO/SHSP, Stakeholder survey	Law that prohibits drivers from any handheld phone use while driving.	AL, AZ, AR (school and work zones only), CA, CT, DE, DC, FL (school and work zones only), GA, HI, ID, IL, IN, LA (learner/intermediate licenses, drivers in school zones), ME, MD, MA, MI, MN, NV, NH, NJ, NY, OH, OK (learner/intermediate license), OR, RI, TN, TX (school crossing zones and public school property), VT, VA, WA, WV, WI (work zones only)	See general overview for evaluation results on cellphone and text messaging laws overall. The Insurance Institute for Highway safety (IIHS) examined the effects of comprehensive cellphone bans in California, Oregon, and Washington that prohibit most handheld cellphone use. Resulted indicated a significant reduction in rear-end crash rates in Oregon and Washington after those states strengthened their hand-held phone bans, but no such reductions in California (Reagan et al., 2023).
Handheld ban – novice/teen drivers	Website, Environmental Scan - Organizations	Law prohibiting teens and/or novice drivers from handheld cellphone use while driving.	AL: 16- or 17-year-old drivers with intermediate license for less than 6 months (primary) AR: Drivers over 18 but under 21 (primary) LA: Certain learner's or intermediate license holders (secondary) OK: Learner's permit and intermediate license holders (primary)	Flaherty, Kim, Salt, and Lee (2020) reviewed fatal crashes in the U.S. from 2007-2017 and concluded that handheld cellphone bans were effective for all age groups, with the greatest decline in fatal crash rates observed for drivers aged 16.
Cellphone use ban – all drivers	Website, Environmental Scan - Organizations, Foundational interviews, Stakeholder survey	Law that bans all cellphone use for all drivers.	No U.S. state currently bans all cellphone use.	

Countermeasure	Sources of Information	Brief Description	Location	Evaluation Activities
Cellphone use ban – novice drivers	Website, Environmental Scan - Organizations	Law that bans novice drivers from any phone use while driving.	AL: 16, or 17 with intermediate license less than 6 months (primary). AZ, AR, CA, (under 18 years of age, secondary) CO, CT, HI, KY, LA, MD, MA, NH, NC, ND, OH, OR, RI, TX, UT, VT (under 18 years of age, primary) IL, (under 19 years of age, primary) IN (under 21 years of age, primary) DE, KS, ME, TN: Learner or intermediate license (primary) DC: Learner's permit (primary) IA: Restricted or intermediate license, primary) MI: Covered under handheld ban (primary) MN: Drivers with learner under 18 or provisional license (primary) NE: Under 18 years of age with learner or intermediate license (secondary) NJ: Permit or provisional license (primary) NM: Learner or provisional license (primary) SD: Learner or intermediate license (secondary) WA: Learner or intermediate license (primary) WV: Drivers under 18 years of age with learner or intermediate license (primary) WI: Learner or intermediate license (primary)	See general overview for evaluation results on cellphone and text messaging laws overall. Flaherty, Kim, Salt, and Lee (2020) reviewed fatal crashes in the U.S. from 2007-2017 and concluded that novice driver all-cellphone-use bans were not associated with any declines in fatal crashes for drivers aged 16-19.
Cellphone use ban – school bus drivers	Website, Environmental Scan - Organizations	Law that bans school bus drivers from any phone use while driving.	AL, MO (secondary) AZ, AR, CA, CT, DE, DC, GA, IL, KY, LA, MD, MA, MI, MN, MS, NE, NJ, NC, OK, RI, TN, TX, UT, VA (primary)	
Safer Speed Limits law	Stakeholder survey	A law that allows greater flexibility in setting safer speed limits.	MI	

Law Enforcement

Sources of Information

- Environmental scans (SHSO/SHSP and other organizations)
- Foundational interviews
- Stakeholder survey

Brief Description

This countermeasure type involves using different strategies to promote and enforce distracted driving laws. States may employ or more of the following:

- High-visibility enforcement and coupling it with a national or state public education/media campaign
- Enforcement (high visibility and/or spotter/unmarked vehicle) in high crash areas during specific timeframes to increase perceived risk of a citation
- Overtime to officers to conduct enforcement
- Distracted driving courses and training for law enforcement
- Better procedures for completing crash reports to identify distracted driving crashes
- Increased fines and penalties for distracted driving particularly in areas with vulnerable users
- Strong, enforceable laws
- Stronger penalties and fines
- Courses, presentations, information to give at traffic stops

- Use of “ghost cars” also known as unmarked law enforcement vehicles—officers in these vehicles communicate distracted driving behavior to an officer in a marked law enforcement who will initiate a traffic stop
- Strategic enforcement around areas known for vulnerable road users

Geographic Location

United States

Evaluation Activities and/or Results Identified Through Data Collection Tasks

- The main source of evaluation activities/results for enforcement was NHTSA’s Countermeasures that Work (Venkatraman et al., 2021). They examined several countermeasures for reducing distracted driving, including high-visibility cellphone/text messaging enforcement. The authors concluded that high-visibility cellphone/text messaging enforcement has been demonstrated to be effective in certain situations. The main results noted were decreased cellphone use and increased public awareness and support. The authors cautioned, however, that while results are encouraging, the effect of such high-visibility enforcement on crashes is not certain. In addition, high-visibility enforcement efforts can be expensive and resource intensive (Bloch, 2020).
- Evaluation activities/results identified in data collection tasks that pertained to a specific countermeasure included in Table E-7 are noted in the evaluation section of the table corresponding to that countermeasure, unless otherwise noted.

Table E-7: Law Enforcement Campaigns.

Countermeasure	Sources of Information	Brief Description	Location	Evaluation Activities
Connect 2 Disconnect (C2D)	Website, Environmental Scan - Organizations	Collaboration between NHTSA, SHSOs and law enforcement to raise awareness of dangers of and legal penalties for distracted driving. C2D is a 4-hour national enforcement and awareness campaign coordinated by SHSOs and law enforcement agencies to enforce cellphone laws and reduce distracted driving crashes.	U.S.	
HiVe initiative	Website, Integrative interview,	"HiVE" is a high visibility enforcement program targeting high-crash intersection. Program was developed by Oro Valley Police Department who informed the public of the program goal and where officers would be conducting the enforcement.	AZ	Anecdotal evidence from interviews of 30% reduction in crashes at intersections after program implemented.
Phone in one hand, Ticket in the other	Website, Environmental Scan - Organizations	NHTSA awareness and high visibility enforcement campaign to reduce cellphone use while driving. Pilot programs were done in Connecticut and Hartford, Connecticut, and Syracuse, New York, from April 2010 to April 2011.	CT, NY	Results indicated that: police wrote 100-200 citations per 10,000 population for each wave in each site; drivers reported increases in awareness that cellphone laws were being enforced and recognition of the new slogan; observed handheld driver cellphone use declined from 6.6% to 2.9% in Hartford, and from 3.7% to 2.5% in Syracuse (Chaudhary, et al., 2012).
Stop Arm Violation Enforcement (SAVE) Grant Program	Website, Environmental Scan - SHSO/SHSP	Program launched in 2019 and funded by NHTSA to provide safe transportation routes for students going to and from school in Indiana. Grants are awarded to law enforcement agencies to conduct high visibility patrols targeting stop arm violations, and speeding and reckless driving around school buses and school zones when children are present. Follow-up investigations using on-board dash camera footage from school buses or other reported violations are also eligible activity and encouraged to deter stop arm violations.	IN	

Countermeasure	Sources of Information	Brief Description	Location	Evaluation Activities
Operation Ghost Rider	Foundational interview	Program conducted during National Distracted Driving Awareness Month in which a trooper rides in a regular vehicle (usually an SUV) targeting distracted drivers. The trooper will radio to a marked police vehicles if a distracted driving violation is observed, and the marked unit will initiate a traffic stop.	MI	Anecdotal evidence from interviews that program has been very effective program.
Survive the Drive	Website, Environmental Scan - SHSO/SHSP	High-visibility enforcement campaign in counties with high fatality rates on rural roads.	NC	
Operation Hang Up	Environmental Scan - SHSO/SHSP	A special enforcement effort to enforce distracted driving laws in New York. Patrols and checkpoints were increased, resulting in more than 16,000 tickets, including more than 2,000 tickets for distracted driving.	NY	
Distracted Driving Safety Course	Website, Environmental Scan - SHSO/SHSP	Ohio Department of Public Safety distracted driver course available to offenders who are guilty of driving distracted.	OH	
Distracted Driving Avoidance Course DDAC)	Environmental Scan - Organizations; Stakeholder survey	Course developed by Oregon's Department of Transportation that may be required for drivers receiving a distracted driving citation. Judges have a list of approved providers and can waive fines for drivers who complete an approved DDAC. Only available following a first conviction for driving while using a mobile electronic device and participants must score at least 80% to pass the 90-minute course. DDAC is not a diversion program because the violation is not removed from the driver's record. (GHSA, 2022).	OR	

Countermeasure	Sources of Information	Brief Description	Location	Evaluation Activities
Operation Hands Free	Environmental Scan - SHSO/SHSP, Organizations; Foundational interview	A program by the Tennessee Highway Safety Office (THSO) in partnership with the state law enforcement agencies where officers used a bus to observe distracted driving and other unsafe behaviors and communicate to offices in patrol vehicles. Local media covered the effort with press briefings. Since its inception other law enforcement agencies have duplicated the program without partnering with THSO.	TN	

Automated Enforcement

Sources of Information

- Foundational interviews
- Stakeholder survey

Brief Description

Cameras mounted in the infrastructure that can detect illegal phone use (and potentially other behaviors such as non-use of a seat belt and speeding).

Geographic Location

Australia

Table E-8: Countermeasures Related to Automated Enforcement Technology.

Countermeasure	Sources of Information	Brief Description	Location	Evaluation Activities
Acusensus Heads Up	Website, Foundational interview; Stakeholder survey	Patented technology that detects if a driver is illegally using a cellphone (as well as not using a seat belt or speeding). It can also "read" vehicle's license plate.	Company based in Australia	
Acusensus *Head Up Real time*	Website, Stakeholder survey	Technology that provides real-time alerts to law enforcement on drivers determined to be using a cellphone, speeding, not using a seat belt.	Company based in Australia	

Other Legislative/Law Enforcement Countermeasures

Examples of other legislative/law enforcement countermeasures are included in the table below.

Table E-9: Other Legislative/Law Enforcement Countermeasures.

Countermeasure	Sources of Information	Brief Description	Location	Evaluation Activities
GDL requirements for beginning drivers	Environmental Scan - Organizations	Elements of GDL intended to reduce likelihood of distractions for newly licensed driving that include passenger and cellphone restrictions.	U.S.	Demonstrated to be effective by several high-quality evaluations with consistent results in Countermeasures that Work (Venkatraman et al., 2021).
Law enforcement training	Environmental Scan - SHSO/SHSP, Stakeholder survey	Training on distracted driving as a contributing factor in crashes, that includes tools/resources for detecting and citing distracted drivers, collecting data, and providing education in the community.	DE, FL, MS, NM, OK, OR, SC, VA, WA	
Judicial/court outreach	Environmental Scan - SHSO/SHSP, Stakeholder survey	Providing judges/prosecutors with information/tools about distracted driving laws and crashes to assist them in adjudication.	KY, NM, OR	

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Technology-Based Countermeasures

The synthesis of technology-based countermeasures includes two main types of such countermeasures identified during the course of the environmental scans, interviews, and surveys conducted in this project: 1) phone applications; 2) dynamic message signs (DMSs), 3) other examples. In this appendix, we provide a general overview of each of these countermeasure types. Specifically, for each countermeasure type to the extent possible, we report on where we obtained the information for the countermeasure type (i.e., which data collection task yielded the information); provide a brief description of the countermeasure type; identify the geographic location(s) where the countermeasure type is being implemented or available; and describe any evaluation activities and/or results identified through the data collection; and note any explicit mention of behavior change theories/constructs and/or Safe System Approach elements or principles considered to have contributed directly to the development or implementation of the countermeasure type. It should be noted that given the focus of this project on non-scientific rather than scientific literature, it was beyond the scope of the project to review the scientific literature for evaluation information for every countermeasure identified. Rather, we only included evaluation information that came up as part of the environmental scans, interviews, and stakeholder survey conducted for this project. For each type of technology-based countermeasure type, we tried to identify specific countermeasure examples currently in use or under consideration. When such examples were found for a given countermeasure type, they are included in a table following the overview of that countermeasure. Similar to the general overviews, we included in the tables, as available and appropriate, source of information, a brief description of the specific countermeasure, the geographic location where implemented or available, any evaluation information identified during the project data collection activities. When such information was not identified, the corresponding section of the table was left blank. A table of other technology-based countermeasure examples that do not fit cleanly into either of the two countermeasure types is also included.

Technology-Based Phone Applications

Sources of Information

- Technology (tech) scan component of the environmental scan
- Stakeholder survey
- Integrative interviews

Brief Description

Technology-based phone applications refer to apps that, when installed to the driver's phone, have the potential to mitigate distracted driving in a variety of ways. Many focus on use of the phone itself, including providing real-time and post-drive feedback to the driver regarding phone use, blocking messages and/or calls during drives, or allowing for only hands-free messaging and calling while driving. Most often, these apps use telematics to collect driving data such as phone use, hard braking, hard acceleration, and harsh cornering. Often these apps are paired with an incentive program from an insurance company.

Geographic Location

Most of the apps identified in this project are available in the United States.

Evaluation Activities and/or Results Identified Through Data Collection Tasks

- The evaluation information identified for technology-based phone apps was done by or in conjunction with insurance companies who have implemented voluntary usage-based insurance (UBI). UBI requires drivers to either install a telematics device in their vehicle or use an application on their smartphone that collects and transmits driving information to the insurance company (e.g., miles driven, cellphone use). Cambridge Mobile Telematics (2023) reported that providing specific feedback on distraction to UBI drivers in the form of a specific feedback score (in addition to standard information on braking, speed, and acceleration) resulted in drivers being less distracted

than those who did not receive the distraction score. In a separate study of UBI drivers, they found that highly engaged drivers (those who interacted with the UBI app 20 times or more each month) were less distracted than unengaged drivers.

- Evaluation activities/results identified in data collection tasks that pertained to a specific countermeasure included in Table E-10 are noted in the evaluation section of the table corresponding to that countermeasure, unless otherwise noted.

Table E-10: Technology-Based Smartphone Applications

Countermeasure	Sources of Information	Brief Description	Evaluation Activities
AXA Drive Coach	App Store, Environmental Scan - Tech scan	App developed by AXA Belgique that monitors unsafe driving behaviors including phone use while driving. The app provides post-drive feedback to the user.	
Drive & Family Safety - OtoZen Driver Assistant	Website, Environmental Scan - Tech scan	App by Sensovium that provides parents with information about their teen's driving behavior. The app provides driving trip feedback factoring in speeding and phone use.	
Drive with Safety	Website, Environmental Scan - Tech scan	App for Safety Insurance customers in partnership with Cambridge Mobile Telematics that tracks and provides feedback on driving behaviors including phone use.	
Drivemode	Play Store, Environmental Scan - Tech scan	App by Drivemode, Inc. that allows users to use voice-enabled commands and large buttons to manage calls and messages while driving.	
Driver Distraction Alert	Website, Environmental Scan - Tech scan	App by Global Mobile Alert that alerts the driver of a nearby traffic light, school zone, or railroad crossing when on a hands-free call.	
Driver: Dash Cam & Cloud Sync	Play Store, Environmental Scan – Tech scan	App that turns the user's smartphone into a dashcam that provides forward collision alerts, trip details, and videos.	

Countermeasure	Sources of Information	Brief Description	Evaluation Activities
Driver's Seat	App Store / Play Store, Environmental Scan - Tech scan	App that rewards drivers with points for safe driving. The app monitors unsafe driving behaviors including phone use while driving.	
DriveScore - Save on Insurance	Website, Environmental Scan - Tech scan	App developed by Clear Score Technology Ltd. that could allow users to save on car insurance using the information provided. The app monitors unsafe driving behaviors including phone use.	
DriveWell® Platform	Website, Integrative interviews	Platform from Cambridge Mobile Telematics (CMT) that gathers and uses sensor data from IoT devices along with contextual data to understand vehicle and driver behavior.	In a study by CMT, two groups drove for 3 months with an app on CMT's DriveWell platform. The group receiving feedback (e.g., a behavioral score, information on hard braking and distracted driving) averaged 15% less hard braking events per hour than the group that did not receive feedback (CMT, 2023).
Drivewell Go	App Store, Integrative interviews	App by Cambridge Mobile Telematics that provides driver feedback on phone use while driving, braking, speeding, acceleration, and cornering. The app works with a DriveWell tag that connects to the app via Bluetooth to calculate vehicle maneuvers. This app is used as part of the Oklahoma Challenge's Safe Driver App Contest.	
Drivewise Allstate Mobile	Website, Environmental Scan - Tech scan	App by Allstate Insurance that provides a discount to customers for safe driving. The app measures unsafe driving behaviors including phone use while driving and provides feedback and real time alerts. There is also a Drivewise Canada app.	
ERIE YourTurn	Website, Environmental Scan - Tech scan	App by Erie Insurance provides its customers with a discount for safe driving. The app monitors unsafe driving behaviors including phone use.	

Countermeasure	Sources of Information	Brief Description	Evaluation Activities
Gait (Get a Driver Score)	Website, Environmental Scan - Tech scan	Phone application that provides the user a driving score based on risky driving behaviors including distracted driving (how often phone is picked up while driving).	
GoCarma	Website, Environmental Scan - Tech scan	App by Tower Insurance that tracks driving behaviors including handheld phone use.	
HiRoad	Website, Environmental Scan - Tech scan	App by HiRoad Insurance that provides drivers with driving scores and gives rewards for safe driving. The app monitors unsafe driving behaviors including phone use while driving.	
HUD widgets	App store, Environmental Scan - Tech scan	App by HUDWAY LLC. that provides information to the driver by turning a smartphone into a heads-up display in the vehicle.	
Just Drive	Website, Environmental Scan - Tech scan	App developed by Neha Husein that allows drivers to earn points for every minute driven without using the phone.	
KnowYourDrive	Website, Environmental Scan - Tech scan	App by American Family Insurance that monitors phone use among other risky driving behaviors and provides coaching feedback to the driver.	
Liberty Mutual Mobile	Website, Environmental Scan - Tech scan	App by Liberty Mutual Insurance that tracks driver behaviors including distraction.	
Life360: Find Family & Friends	Website, Environmental Scan - Tech scan	App designed for families and teens that provides, among other features, driving information such as top speed, rapid acceleration, hard braking, and phone use.	
LifeGift Drive	App store, Environmental Scan - Tech scan	App by LifeGift that detects phone use while driving, walking, or cycling and provides an alert to the user about getting home to their family safely.	
LifeSaver	Website, Environmental Scan - Tech scan	App developed by Life Apps LLC for use by fleets and the general public. The app deters distracted driving by locking the phone while driving and allowing for the driver to earn points and rewards for not using the phone while driving.	

Countermeasure	Sources of Information	Brief Description	Evaluation Activities
Mentor DSP by eDriving	Website, Environmental Scan - Tech scan	App by eDriving, LLC, for delivery service providers. The app measures and scores driving behaviors on unsafe driving behaviors including phone use while driving. Also available is Mentor Insight, which does not use does not use telematics data, but uses combined collision, incident, and license data to score drivers and provides this information to managers.	
MercuryGO: Safe Driving App	App store, Environmental Scan - Tech scan	App by Mercury Insurance that provides its customers with a discount for safe driving. The app monitors unsafe driving behaviors including phone use.	
Mobilio	Website, Environmental Scan - Tech scan	App developed by Dolphin Technologies GmbH that gives rewards (points) to users for not using a cellphone while driving.	
MyMix Tracking	Website, Environmental Scan - Tech scan	App by MiX Telematics designed for fleet drivers and companies. The app monitors harsh events and phone use during drivers and provides real-time feedback to the driver.	
N&Drive	App Store, Environmental Scan - Tech scan	App developed by The N&D® Group that tracks and provides feedback on driving behaviors including phone use.	
Nationwide SmartRide	Website, Environmental Scan - Tech scan	App by Nationwide Insurance that provides a discount to customers for safe driving. The app tracks unsafe driving behaviors and phone distractions.	
No Texting While Driving!	Play Store, Environmental Scan - Tech scan	App by Smalltalk Apps that allows users to create custom auto replies to incoming texts and have messages read aloud while driving.	
OnMyWay	Website, Environmental Scan - Tech scan	App by OMW Mobile Security Inc. designed for teens and their parents. The app provides a monetary incentive for not engaging in phone use while driving.	
Ping	Website, Environmental Scan - Tech scan	App that reads aloud texts and messages from a variety of platforms to users while driving.	
Ryde.Safe	Website, Environmental Scan - Tech scan	App by Jose Mateo Ludena that provides real time feedback on unsafe driving behaviors including phone use.	
Safe 2 Save	Website, Environmental Scan - Tech scan	App that rewards drivers who do not use a phone while driving with points that can be redeemed at businesses.	
Safe Drive	Play Store, Environmental Scan - Tech scan	App that blocks text/messaging application while users are driving.	
SafeGuide: Drive & Save	App Store, Environmental Scan - Tech scan	App developed by AXA Belgique that provides driving scores to users based on unsafe driving behaviors including phone use.	

Countermeasure	Sources of Information	Brief Description	Evaluation Activities
Safest Driver	App Store, Environmental Scan - Tech scan	App by Cambridge Mobile Telematics Inc. that provides feedback on unsafe driving behaviors including phone use while driving, and rewards drivers for not engaging in those behaviors.	
Safest Driver program	Website, Integrative interviews	Programs conducted in numerous cities/states starting in 2016 (e.g., Boston, Seattle, San Antonio, LA, and Oklahoma), in partnership with Cambridge Mobile Telematics. Programs last between 3-6 months but can run indefinitely. They offer prizes to participants in categories like least distracted, slow and steady, safest youth driver, to overall safest driver. Cities work with national and local businesses to fund the prizes (up to $20,000; Cambridge Mobile Telematics, 2023).	According to CMT (2023), an evaluation of Cambridge "Boston's Safest Driver Program in 2019 found that the program reduced distracted driving by 48%, speeding by 38%, and hard braking by 57%.
Signal	App Store, Environmental Scan - Tech scan	App by Farmers Group Inc. that provides its customers with a discount for safe driving. The app monitors unsafe driving behaviors including phone use.	
Speedometer by HUDWAY	Website, Environmental Scan - Tech scan	App by HUDWAY LLC. that tracks drivers' speed and provides audible alerts when the speed limit is exceeded.	
Steer Clear®	Website, Environmental Scan - Tech scan	App by State Farm that is part of a young driver program to reinforce positive driving behavior. The app provides trip details, educational modules, and a driving score based on phone use while driving, braking, acceleration, and cornering.	
Teen Safe Driver	Play store, Environmental Scan - Tech scan	App by American Family Insurance offered as part of its Teen Safe Driver Program. The app provides scores and trip details to the teens and parents including phone use while driving and other unsafe driving behaviors.	
Travelers IntelliDrive	Website, Environmental Scan - Tech scan	App by Travelers Insurance that provides its customers with savings for safe driving behaviors including not using a cellphone while driving.	
USAA SafePilot	Website, Environmental Scan - Tech scan	App by USAA Insurance that provides a discount to customers for safe driving. The app measures unsafe driving behaviors including phone use while driving and provides feedback to the driver.	
You in the Driver Seat	Website, Environmental Scan - Tech scan	App developed in conjunction with the Teens in the Driver Seat peer-to-peer safety program. The app awards points for safe driving behaviors and deducts points for phone use or speeding.	

Dynamic Message Signs (DMSs)

Sources of Information

- Environmental scans
- Stakeholder survey

Brief Description

Electronic signs placed along roadways to alert drivers in real time of traffic safety alerts, such as using a phone while driving or speeding.

Evaluation Activities and/or Results Identified Through Data Collection Tasks

- No evaluation activities/results identified for DMS overall.
- Evaluation activities/results identified in data collection tasks that pertained to a specific countermeasure included in Table E-11 are noted in the evaluation section of the table corresponding to that countermeasure, unless otherwise noted.

Table E-11: Example of DMS Countermeasures

Countermeasure	Sources of Information	Brief Description	Evaluation Activities
SaferStreet Solutions driver feedback sign	Website	Road sign developed by SaferStreet Solutions that uses near-infrared streams (NIRS) technology to detect distraction (phone use, eating/drinking) and seat belt use and displays message to driver to disengage that activity.	Results from a 4-week pilot study of drivers on a roadway in front of a park that was between two schools in Rochester, New York indicated that prior to sign placement, 7.1% of motorists were identified as using a phone while driving. After sign placement, 4.8% motorists were identified as using a phone while driving.

Countermeasure	Sources of Information	Brief Description	Evaluation Activities
Heads-Up Advisory Solutions: dynamic advisory signage	Stakeholder survey	This sign notifies drivers in real-time when they are using a phone and encourages them to stop through targeted roadside messaging.	
Variable Message Sign (VMS) messaging	Foundational interviews	Messages that inform drivers of other drivers' unsafe behaviors (such as phone use while driving) instead of typical messages such as "drive safely" or "distracted driving kills." Drivers will be faced with the cognitive dissonance of thinking that they are safe to use their phone while driving while simultaneously thinking a nearby driver is engaged in dangerous activity for doing the same thing.	

Other Examples of Technology-Based Countermeasures

Table E-12: Other Examples of Technology-Based Countermeasures

Countermeasure	Sources of Information	Brief Description	Evaluation Activities
Cellphone built-in settings	Environmental Scan-SHSO/SHSP/Organization, Foundational interviews, Stakeholder survey	Cellphone settings and apps that could mitigate distraction while driving. Settings such as Do Not Disturb and text-blocking apps, that could potentially be auto-defaulted when in a vehicle.	Anecdotal evidence from interviews that nationwide survey found that 81% of drivers in the U.S. are aware of phone features that limit calls and the texts coming in but 54% reported that they have never used them or set them on their phones.
Android Auto, Apple Carplay and similar systems	Foundational interviews	Systems that could be programmed to shut off a cellphone's functionality while the vehicle is in motion.	
Hazard detection and distracted driving training in simulators	Foundational interviews	Training/educating drivers about hazards and distraction using a simulator.	
User-activated Pedestrian Crossing Warning devices	Stakeholder survey	Devices that are activated by pedestrians to alert drivers to their presence and their intention to cross the roadway.	
Intersection Conflict Warning Systems	Stakeholder survey	Systems that alert drivers of approaching traffic at unsignalized intersections in an effort to reduce crashes.	

Countermeasure	Sources of Information	Brief Description	Evaluation Activities
HAAS Alert	Website, Environmental Scan- Organizations; Integrative interviews	The company's Safety Cloud service provides digital alerts to drivers (e.g.., fire and EMS, tow truck drivers, law enforcements) through vehicle infotainment center and navigation apps when they are near to roadside incidents and hazards.	

References

Cambridge Mobile Telematics. (2023). *The State of Distracted Driving in 2023 & the Future of Road Safety. A Data-Driven Analysis from Cambridge Mobile Telematics. 4th Edition.*