State Strategies to Reduce Highway and Traffic Fatalities and Injuries

A Road Map for States

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Executive Summary

THE PROBLEM

Motor vehicle crashes are a leading cause of death in the United States. In 2016, there were **37,461** traffic-related deaths. That number was 5.6% higher than in 2015. This follows the record number of traffic fatalities in 2015. In 2016, there were an estimated **4.6 million** medically consulted motor vehicle injuries.

MAJOR FACTORS OF THE INCREASE

Many factors have contributed to the historic rise in traffic-related deaths. Safety experts, researchers and policymakers in the field have identified three that stand out: increased exposure and mobility, risky road user behavior and, deficiencies in post-crash response.

SUPPORTING GOVERNORS' TRAFFIC SAFETY EFFORTS

With 39 states reporting an increase in traffic fatalities in 2016, traffic safety policy, programs, and practices remain a pressing concern across the nation—and governors are an essential part of the solution. The National Governors Association (NGA) supports governors and their staff in developing solutions to transportation, public safety and public health challenges.

THE ROAD MAP

This road map highlights existing efforts in the states and serves as a policy development tool for governors and their senior leadership who seek to improve coordination and bolster existing efforts across state agencies, including departments of public safety, transportation, public health, and emergency medical and trauma services. Potential policy development steps to consider include:

STEP 1	Assess the Situation
STEP 2	Coordinate with Key Agencies & Stakeholders
STEP 3	Set & Align Goals
STEP 4	Develop Strategies and Select Safety Interventions
STEP 5	Finalize Policies, Implement and Evaluate
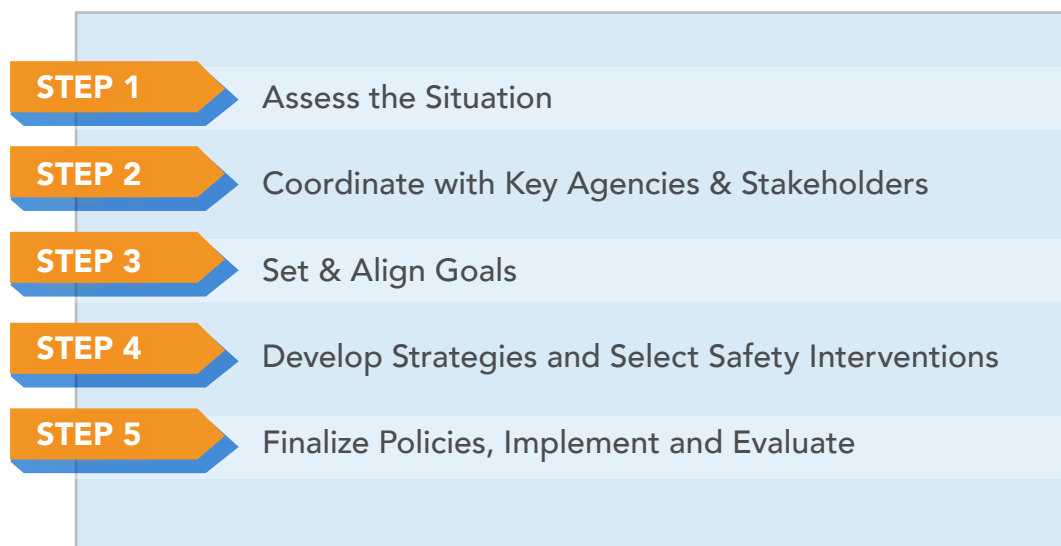
DEVELOP A SAFE ROAD USER FRAMEWORK

- Policies that permit violators of seat-belt-use-laws to be stopped and cited independently of any other traffic behavior

- Setting appropriate speed limits

- Policies that promote bicycle and motorcycle helmet use among all riders

- Graduated driver's licenses (GDL) policies that include restrictions for the full length of the learner's permit period, requirements for a period of supervised hours and effective restrictions for nighttime driving and for how and when the GDL holders driver passengers.

IMPROVE TRAFFIC SAFETY ENFORCEMENT

- Support targeted enforcement for speeding-related offenses

- Where authorized, use automated traffic enforcement, including automated speed enforcement in high-risk areas (e.g. school and work zones) and red light automated enforcement

- Increase the use of sobriety checkpoints and saturation patrols

- Support the deployment of drug recognition experts for impaired driving offenses

- Increase the number of driving while intoxicated (DWI) courts and encourage other courts to impose appropriate penalties

ENSURE SAFETY MANAGEMENT PLANNING

- Develop standard detection-enforcement methods for law enforcement to identify drug impairment, including from prescription drugs and marijuana

- Support trainings and informational sessions for judges, prosecutors, and emergency medical services and law enforcement personnel on the role of impaired driving, distracted driving, restraint use, aggressive driving and speeding in motor-vehicle related fatalities and injuries

- Host statewide safety summits for key stakeholders

- Develop, implement, and evaluate public education campaigns to improve public understanding of highway safety

Introduction

The National Highway Traffic Safety Administration (NHTSA) released data that 37,461 individuals died in traffic crashes in 2016, a 5.6 percent increase from 2015. This follows the record number of traffic fatalities in 2015, which saw the largest year-over-year increase in fatalities since 1966. Traffic crashes remain a leading cause of death by unintentional injury for people aged 1-54 in the United States. These data, and that of the past several years, demonstrate the need to continue targeted efforts to save lives and prevent injuries on our nation's roadways.

This road map is a tool to help states reduce traffic fatalities and injuries. It can help states assess their capacity to address the problem, determine how to align existing state and local agency efforts, improve public health and safety, and explore cost-effective safety interventions for implementation and evaluate their work.

> With 39 states reporting an increase in traffic fatalities in 2016,[1] traffic safety policy, programs and practices remain a pressing concern across the nation— and governors are an essential part of the solution.

Given that states are already working to improve traffic safety, some steps may overlap with current efforts and are designed to enhance these practices. For example, under the Fixing America's Surface Transportation Act, state departments of transportation are required to submit a multiyear Strategic Highway Safety Plan (SHSP) on behalf of the state to the Federal Highway Administration. The SHSP is designed to guide state investment decisions toward strategies and countermeasures with the most potential to save lives and prevent injuries on public roadways. This road map highlights these efforts and serves as a policy development tool for governors and their senior leadership who seek to improve coordination and bolster existing efforts across state agencies, including departments of public safety, transportation, public health and emergency medical and trauma services.

What to Expect

This road map is organized into the following sections:

- Background and Scope of the Problem

- Steps to Address the Increase in Fatalities

- Appendices of Supplemental Information, including State Implementation and Process Examples

How the Road Map Was Developed

This road map was developed through research and consultation with senior state officials and other national experts in the fields of transportation, public safety and public health. The National Governors Association Center for Best Practices conducted an experts roundtable that brought together over 20 state officials and safety experts from across the country to discuss strategies available to states to coordinate and enhance efforts to increase traffic safety.[2] The road map reflects the insights and experience of the many experts consulted during its development.

Background and Scope of the Problem

Motor vehicle crashes are a leading cause of death in the United States. In 2016, there were 37,461 traffic-related deaths.[3] That number was 5.6 percent higher than in 2015.[4] This follows the record number of traffic fatalities in 2015, which marked the highest number of traffic fatalities since 2008.

Although most of the research on traffic crashes has been based on fatal injuries, nonfatal injuries are also of major concern. In 2016, there were an estimated 4.6 million medically consulted motor vehicle injuries—that is, injuries serious enough that a medical professional was consulted.[5] However, not as much is known about circumstances leading to nonfatal crashes and their effects on injury severity because less data are available for nonfatal injuries.[6] Thus, states need to carefully consider how to gather more data, link data together and craft appropriate strategies with limited information and work to gather more data.

In addition to causing fatalities and injuries, traffic crashes impose a large financial and economic toll. In 2016, the estimated cost of motor vehicle deaths, injuries and property damage was $432.5 billion.[7] This is a 12 percent increase from 2015.[8] These costs include lost wages, productivity loss, medical expenses, administrative expenses[9] employer costs and property damage. In 2012, traffic crash injuries totaled $18 billion in lifetime medical expenses alone.[10]

States face two inter-related challenges: reducing the number of traffic fatalities and injuries, and identifying the causes of nonfatal traffic injuries in order to implement and develop more effective solutions.[11] To address these challenges, states must: coordinate state highway safety planning; enforce state policies and laws on traffic safety; and pursue cost-effective, evidence-based, data-driven safety interventions.

"It is recommended that the mechanism for approval of standards for programs including those dealing with accident records, driver education, licensing, performance and motor vehicle inspection, traffic controls, highway design and maintenance and surveillance of traffic be modeled generally..."

Proceedings of the National Governors Conference, 1966

> "... that the National Governors' Conference invite the National League of Cities, the United States Conference of Mayors and the National Association of Counties to join the Governors in sponsoring a national conference of state and local governments to define and clarify areas of traffic safety responsibility, and to determine the most effective courses of action with respect to priority needs and financing..."
>
> Proceedings of the National Governors Conference, 1966

Supporting Governors' Traffic Safety Efforts

The National Governors Association (NGA) supports governors and their staff in developing solutions to transportation, public safety and public health challenges. For decades, states have been seeking to make their public roadways safer.

During the National Governors' Conference in 1966, another period when states were seeing a historic spike in traffic fatalities, governors identified traffic safety as a top priority. In the decades since, states and safety professionals have researched driving behaviors, enhanced roadway engineering and identified ways to improve the safety of all persons on our nation's roadways. These efforts and advancements helped to build the evidence base as to which interventions are most effective and created opportunities for continued innovation. Today, governors are refocusing on improving traffic safety as states continue to place an emphasis on evidence-based strategies and cost-effectiveness and to foster environments for the testing and implementation of innovative new solutions.
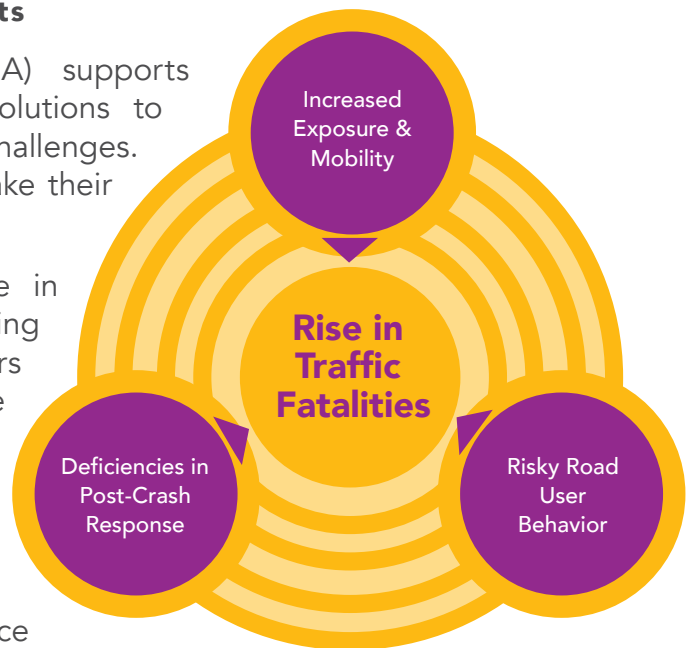
Major Factors for the Increase

A number of factors have contributed to the historic rise in traffic-related deaths. Safety experts, researchers and policymakers in the field have identified three that stand out: increased exposure and mobility, risky road user behavior and deficiencies in post-crash response.

Increased Exposure and Mobility

Over the last five to ten years, the U.S. economy has seen growth and recovery following the 2008 recession. As the economy has improved, the unemployment rate has declined and gas prices have dropped. These changes, in turn, encouraged individuals to take to the road—whether they are going to work, taking vacation road trips, riding motorcycles

Increased Exposure & Mobility

- In 2015 Americans travelled over 3.1 trillion miles, creating a new record high for total vehicle miles traveled.

- Economic recovery tends to correspond with an increase in the number of vehicle miles traveled, and, consequently, an increase in the rate of traffic related deaths.
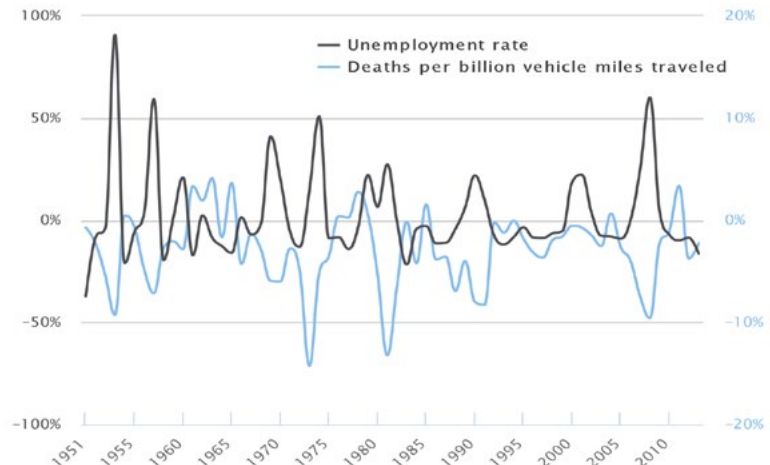
(Source: Insurance Institute for Highway Safety (2015) Status Report (Vol. 50, No.10))

or bicycles or taking public transportation. The Federal Highway Administration noted that in 2015, the U.S. passed its 2007 record of miles traveled per capita and that number continues to climb.[12] In 2016, vehicles in the U.S. traveled over 3.1 billion miles.[13] Studies indicate that, historically, economic recovery tends to correspond with an increase in the number of vehicle miles traveled and consequently an increase in the rate of traffic-related fatalities and injuries.[14]

As Americans are driving more miles, states and cities are encouraging—and residents are taking advantage of—alternative forms of transportation, such as walking and biking, to attain health, environmental and traffic congestion relief goals. These people, including motorcyclists, bicyclists and pedestrians, are placed at greater risk in traffic and are considered vulnerable road users.

> As a direct result of more overall use of roadways, traffic and exposure of persons on the roadways have increased.

As a direct result of more overall use of roadways, traffic and exposure of persons on the roadways have increased. With increased exposure comes increased risk for traffic crashes, and vulnerable road users experienced a significant number of traffic-related deaths in 2016:[15]

- 5,987 pedestrian fatalities;
- 5,286 motorcyclist fatalities; and
- 840 bicyclist fatalities.

Teen drivers (16 to 19 years of age) and older adult drivers (65 years of age and older) are considered at-risk road-user populations. Motor vehicle crashes remain the leading cause of death for American teens. Half of all teens will be involved in a car crash before graduating from high school.[16] Teen drivers are nearly three times more likely than drivers aged 20 and

Risky Road User Behavior

The main causes and contributors to traffic fatalities include the following risky road user behaviors:

- Impaired driving

- Unrestrained occupants

- Speeding

- Distracted driving (e.g. cell-phone use)

Pie chart showing: Other 6.1%, Distracted Driving 9.9%, Impaired Driving 29%, Speeding 27%, Unrestrained Occupants 28%
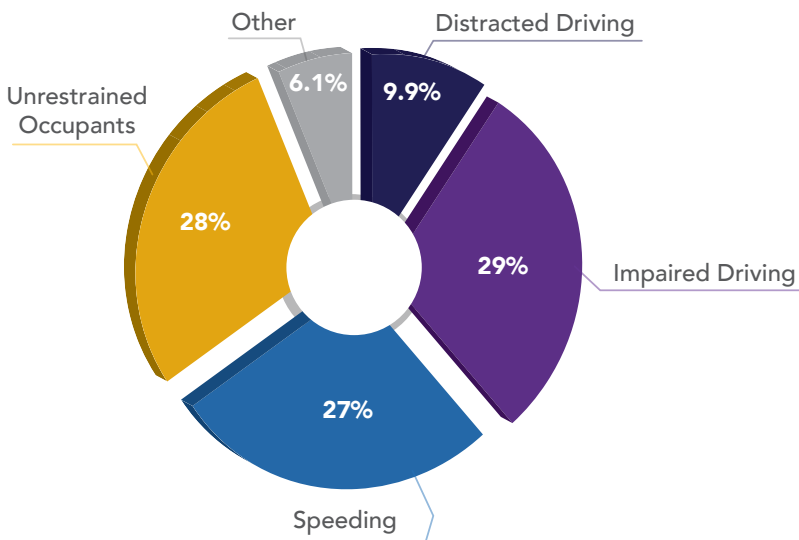
older to be in a fatal crash. In 2015, 2,333 teens in the U.S. were killed, and 221,313 were treated for injuries suffered in motor vehicle crashes in 2014.[17]

Also in 2014, more than 5,700 older adults were killed and more than 236,000 were treated for motor vehicle crash injuries.[18] This amounts to 16 older adults killed and 648 injured in crashes on average every day.[19]

Risky Road User Behavior

Traffic safety experts note that human choice and error are major contributing causes of traffic crashes. Impaired driving, not using a seat belt and speeding[20], represent a majority of the causes of traffic fatalities in 2015.[21] Additionally, there were 3,477 distraction affected traffic fatalities in 2015.[22]

While road users generally view drinking and driving, texting while driving and speeding as very serious threats,[23] their perceived level of risk from these behaviors is not reflected in how they act. Risky-road-user behaviors largely stem from a lack of safety culture.[24] A strong safety culture encompasses communities' beliefs, attitudes and norms that value safety and; where members of the community engage in serious public dialogue to seek ways to continually improve traffic safety.[25] Many states have identified strengthening safety culture as a priority. Risky behavior is difficult to change, but it can be counteracted by strengthening the safety culture through coordinated interventions and strategies. Most Americans express support for laws aimed at improving traffic safety, such as banning hand-held cell phone use and texting while driving.[26] Public support for such laws presents policymakers with a potential opening to pursue improved education, rules and enforcement.

> Half of all teens will be involved in a car crash before graduating from high school.

Deficiencies in Post-Crash Response

While policy, programs and practices often focus on prevention, post-crash strategies are also critical. Not all fatalities occur at the scene of the crash. Post-crash strategies that mitigate serious injuries can reduce the number of fatalities.

Fatalities occurring post-crash are in part attributed to circumstances of the crash itself, such as the severity of the injuries, age of the injured person and number of occupants in a vehicle. But these fatalities may also be affected by systemic circumstances, such as the distance to emergency medical services or trauma centers, gaps in emergency medical system communications and a lack of access to real-time data and data linkage systems (linking crash reports to medical data).[27] This data can inform law enforcement and first responders of where crashes occur in real-time, as well as historically, to improve understanding, aid in reducing response times, and ensure effective deployment of resources.[28]

Access to emergency medical and trauma services presents a challenge for rural communities. Studies have shown that the farther a fatal crash occurs from a Level 1 or 2 trauma center, the more likely it is that the driver will be listed as "died at the scene of the crash."[29] In more rural areas, persons may live more than 45 minutes away from a Level 1 or 2 trauma center.

Steps to Address the Increase in Fatalities

Understanding and identifying factors that contribute to the increase in traffic fatalities and injuries is the first step in addressing this problem. A state must then assess and identify its specific factors. Governors can assist in these efforts by ensuring coordination of key agencies and stakeholders. States are then positioned to set goals and develop action plans for targeted improvement. States can use effective strategies and safety interventions that create a safe-road-user framework, to ensure traffic safety laws and policies are enforced and prioritize safety management planning. Finally, states must develop a coordinated statewide work plan, implement and evaluate their efforts. This policy development sequence is a continuous improvement process and should be informed by data. Further, it must emphasize the importance of cross-agency communication, coordination and collaboration.
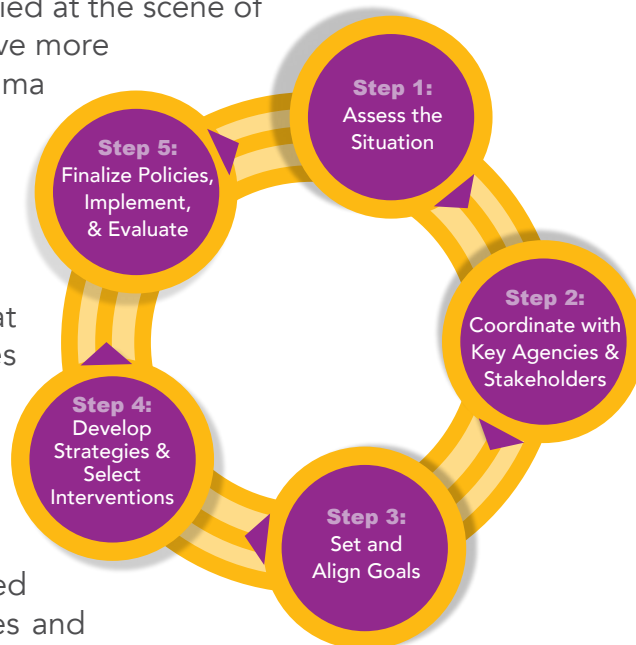
Step One: Assess the Situation

» **Collect Data and Review Existing Efforts**

Take an inventory of existing state efforts and high-level data to improve understanding of the problem and identify opportunities for advancement. This initial review should include:

- Strategic Highway Safety Plans
(See Appendix C on page 22.);

- Fatality Analysis Reporting System data and state crash injury and fatality data;
- Police reports and medical data; and
- State trauma services and emergency medical service plans.

» **Identify Problem Areas**

Review the collected information to identify gaps in data and areas with the greatest need for improvement.

Conduct a statewide environmental scan to understand challenges, weaknesses and opportunities. During this process, states should consider surveying transportation and public safety practitioners, holding focus groups and other activities to engage stakeholders to understand the environment inside and outside of state government.

As an example of how states can conduct environmental scans, the Centers for Disease Control and Prevention (CDC) provides a guide to assist states in assessing its graduated driver licensing practices.[30]

» **Review Existing Laws And Regulations**

Develop an inventory of current laws and regulations that have a direct impact on traffic safety. Cost-benefit analysis tools, such as the CDC's Motor Vehicle Prioritizing Interventions and Cost Calculator for States (**MV PICCS**),[31] can assist with this assessment. An assessment should not only take into consideration major factors that contribute to the increase in traffic fatalities but also take into consideration policies for beginning and older drivers, motorcyclists, bicyclists and pedestrians, as studies show these vulnerable road users are significantly affected by traffic crashes.

> Each entity involved must commit to the state's goals and objectives to ensure flow of information and collaboration.

Assessments of laws and policies should ask:
1. Do these laws include protections for drivers, passengers and vulnerable road users?
2. Have they been shown to be effective in reducing fatalities and improving overall safety?

In **Montana**, the Department of Transportation compiles an annual report that provides a description of characteristics for motor vehicle crashes on Montana's public roadways. The data are used to identify problem areas and trends related to highway traffic safety and provides a basis to help traffic safety specialists and partners develop a statewide plan.[32]

Step Two: Coordinate with Key Agencies and Stakeholders

Many entities, state and local agencies and stakeholder groups play a role in traffic safety. States should ensure that a clearly delineated lead entity takes ownership of statewide coordination. Each entity involved must commit to the state's goals and objectives to ensure

flow of information and collaboration.

Identify and engage the key decision makers. Ensure they are familiar with the problem, understand the high-level goals and are involved in implementing the state's plan. (See Appendix A on page 20.)
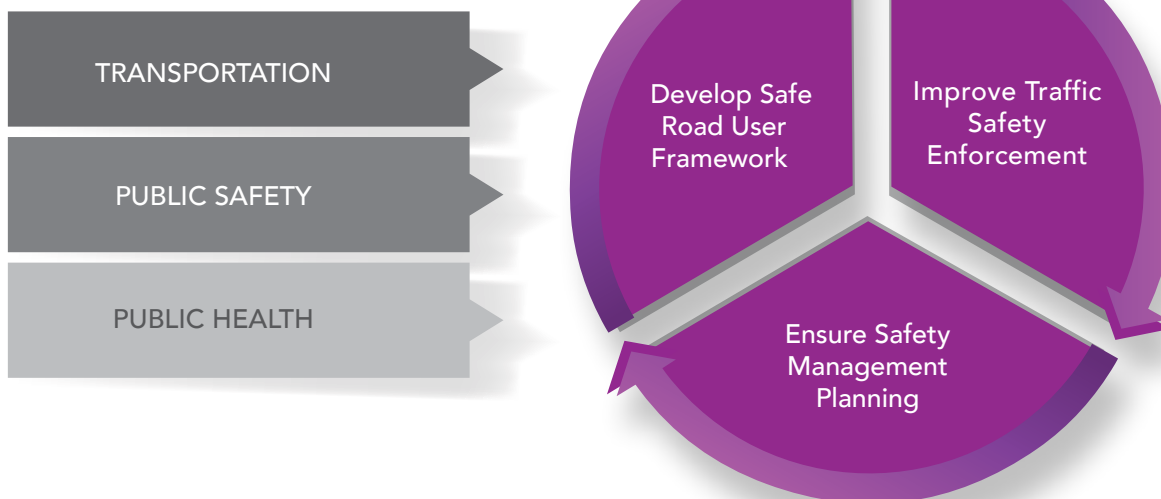
Step Three: Set and Align Goals

States should set clearly articulated target goals that are specific, measurable, achievable, relevant and time-bound. Target goals can draw from existing or future strategic highway safety plans but must reflect the governor's priorities for traffic safety. These goals should be emphasized as a priority across all affected agencies.

In addition, these goals direct the overarching policies that guide decision making and address the problem that the state is trying to solve. The state's policies should be consistent with, and complemented by, programmatic and implementation efforts. Each agency and entity involved should be aligned with, and included in, plans to reach the goal.
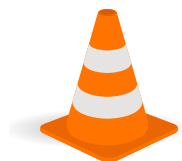
Minnesota launched its Toward Zero Death (TZD) program in 2003. TZD is the state's cornerstone traffic safety program, employing an interdisciplinary approach to decreased traffic crashes, injuries and deaths on Minnesota roads with the vision of reducing fatalities and serious injuries on Minnesota's roads to zero.[33] A 2015 report found that in 2013, Minnesota's fatality rate (the number of fatalities per 100 million vehicle miles traveled) was 0.7, the second-lowest rate in the nation (**Massachusetts** reported a rate of 0.6).[34] This was a 77 percent decline since 1975 and a 34 percent decline since 2001.[35]

State Strategies to Reduce Highway and Traffic Fatalities

TRANSPORTATION

PUBLIC SAFETY

PUBLIC HEALTH

Develop Safe Road User Framework

Improve Traffic Safety Enforcement

Ensure Safety Management Planning

Step Four: Develop Strategies and Select Safety Interventions

Reducing the number of highway and traffic fatalities requires communication, coordination and collaboration across state and local agencies. These agencies include public safety, transportation and public health officials.

For the purposes of this road map, public safety, transportation and public health include the following entities:

- Public Safety includes law enforcement (state patrol or state police and local law enforcement offices), emergency communications (9-1-1), fire departments, judicial officials and the courts.
- Transportation includes transportation departments, highway safety offices, departments of motor vehicles and infrastructure planning entities.
- Public Health includes departments of health and emergency medical and trauma services.

These agencies must work in concert with the governor's office to develop strategies and select interventions that will develop road user frameworks and improve traffic safety enforcement and safety management planning.

The following strategies include cost-effective, evidence-based interventions for reducing highway and traffic fatalities. This selection is not meant to be exhaustive; rather, it highlights the most effective interventions, policies and practices identified through research and consultation with experts.

To build a comprehensive action plan, states may consider and implement some, or all, of these strategies, depending on the nature of the problem, existing traffic safety framework and other state-specific considerations.

DEVELOP A SAFE ROAD USER FRAMEWORK

To reduce traffic fatalities, states should ensure a traffic safety framework is in place. This framework can be implemented through agency programs, practices and planning processes.

In developing such a framework, states should consider information gathered during the initial scan of existing laws and regulations. Do they include policies to address teen and older drivers, motorcyclists, bicyclists and pedestrians? It is important to pay close attention to policies affecting the major factors contributing to traffic fatalities most at-risk populations in your state, and review correlating policies that may address these factors and protect these vulnerable road users.

Develop Safe Road User Framework

Improve Traffic Safety Enforcement

Ensure Safety Management Planning

The following strategies and interventions inform laws, procedures and practices that imbed safe roadway use in the state's policies. These strategies are designed to address safety challenges involving drivers, passengers and vulnerable road users.

Strategies that Improve Safety for Drivers and Passengers

♦ Policies that permit violators of seat-belt-use-laws to be stopped and cited independently of any other traffic behavior;

♦ Implementation of primary seatbelt laws and ordinances;

♦ Increasing seatbelt-use penalties and fees;

♦ Setting appropriate speed limits;

♦ Implementation of youth occupant restraint policies and promoting the use of such restraints; and

♦ Encouraging the use of driver log books for commercial drivers.

Strategies that Improve Safety for Vulnerable Road Users

♦ Policies that promote bicycle helmet use among all riders;

♦ Policies that promote motorcycle helmet use among all riders; and

♦ Establishing a standard safe passing distance between a motor vehicle and a person on a bicycle.

Strategies to Ensure Adequate Training Standards and Safeguards for Beginning Drivers

♦ Graduated driver's licenses (GDL) policies that include restrictions for the full length of the learner's permit period, requirements for a period of supervised hours and effective restrictions for nighttime driving and for how and when the GDL holders drive passengers.

Strategies to Enhance Licensing Standards for Older Drivers

♦ In-person screening and testing for driver's licenses for older drivers and the ability to tailor licensing to specific needs, such as daylight driving only.

IMPROVE TRAFFIC SAFETY ENFORCEMENT

Studies and fatality data show that aggressive driving, impaired driving, distracted driving and speeding are the causes of many traffic crashes that result in deaths. The involvement of law enforcement, the courts and other public safety officials responsible for enforcing traffic laws is critical to maintain safety on public roads.

The following strategies and interventions support law enforcement's ability to effectively enforce laws when persons engage in illegal driving or roadway use. These strategies are designed to deter risky behavior by emphasizing appropriate sanctions and tools.[36] Law enforcement should be provided adequate resources to implement the following strategies.

Strategies to Target and Enhance Enforcement of High-Risk-Speeding Corridors and Areas with High Levels of Traffic Injury and Fatality Reporting

♦ Support targeted enforcement for speeding-related offenses.

♦ Where authorized, use automated traffic enforcement, including automated speed enforcement in high-risk areas (e.g., schools and work zones) and red light automated enforcement.

Strategies to Ensure Law Enforcement is Properly Trained, Equipped to Detect and Able to Implement Impaired Driving Enforcement

♦ Increase the use of sobriety checkpoints and saturation patrols;

♦ Support the deployment of drug recognition experts for impaired driving offenses;

♦ Enforce administrative license revocation or suspension if a driver fails or refuses to take a blood alcohol content (BAC) test;

♦ Use preliminary breath test devices to measure driver BAC; and

♦ Invest in and increase the capacity of state toxicology labs to address testing of marijuana and other substances.

Strategies to Ensure Drivers and Passengers are Wearing their Seatbelts in Accordance with the Law

♦ Support highly visible law enforcement efforts combined with a publicity strategy to educate the public on seatbelt use, including nighttime and child car seat, booster seat and seatbelt use.

Strategies to Support the Enforcement of Distracted Driving Laws

♦ Promote and utilize high-visibility enforcement of laws on texting and cell phone use to reduce distracted driving.

Strategies to Provide Judicial and Administrative Tools to Ensure Appropriate Driving-While-Intoxicated Penalties are Implemented

♦ Increase the number of driving-while-intoxicated (DWI) courts and encourage other courts to impose appropriate penalties;

♦ Allow for limits on diversion and plea agreements for repeat DWI offenders;

♦ Promote the use of alcohol ignition interlock devices and require them for first-time offenses;

♦ Consider license plate and vehicle impoundment penalties for DWI offenders;

♦ In partnership with emergency medical services, use alcohol screening and brief interviews to estimate the level and severity of alcohol use and to determine whether a person may be at risk for alcohol misuse and dependence; and

♦ Encourage alcohol problem assessments at the time of DWI arrests and refer to treatment as determined by a treatment professional.

> The involvement of law enforcement, the courts and other public safety officials responsible for enforcing traffic laws is critical to maintain safety on public roads.

ENSURE SAFETY MANAGEMENT PLANNING

Various state agencies are integral to strategic planning and safety management initiatives related to traffic safety and infrastructure growth. However, traffic and highway planning is not always conducted with a coordinated or collaborative approach.

It is vital for the governor to emphasize the importance of statewide and cross-agency collaboration on both the state and local level. This coordination includes ensuring that appropriate data sets are being collected, analyzed, linked with other data sets and shared with stakeholders; safety management goals and planning are properly aligned; and sufficient investments in infrastructure, road planning and innovative technologies (e.g. automated vehicles) are made. Highway Safety Offices should engage directly with governor's offices (e.g. chiefs of staff, policy directors, policy advisors). In addition, it is important that law enforcement personnel, judicial officials and other stakeholders are trained in and informed of safety efforts, given necessary support and updated on new and effective policies and strategies.

Develop Safe Road User Framework

Improve Traffic Safety Enforcement

Ensure Safety Management Planning

The following are strategies for managing traffic safety throughout the state. These strategies are designed to coordinate and strengthen safety partnerships for planning efforts; encourage technological and infrastructure innovation; manage data collection and ensure data analysis and accessibility; ensure training and education; and support outreach and public awareness.

Strategies to Coordinate and Strengthen Safety Partnerships for Planning Efforts

- Ensure there is a task force, commission or committee charged with safeguarding cross-agency strategic planning and implementation of the state's traffic safety goals. (See Appendix B on page 21.);
- Ensure the governor's involvement in the development of the Strategic Highway Safety Plan. (See Appendix C on page 22.);
- Strengthen and expand strategic highway safety planning and implementation activities. (See Appendix C on page 22.);
- Initiate and support multidisciplinary incident management planning, training and sharing of best practices;
- Establish partnerships with research entities (including universities and state health departments) for data collection, analysis and evaluation. (See Appendix E on page 25.); and
- Consider the safety rating of state vehicles before purchasing and use state vehicle fleets as models of safe driving practices.

Strategies to Encourage Technological and Infrastructure Innovation

♦ Support infrastructure, roadway improvements, effective interventions and innovations that provide safe driving environments for all road users. (See Appendix F on page 26.);

♦ Incorporate the explicit role of safety in the long-range transportation planning process; and

♦ Incentivize innovative vehicle safety technology, including autonomous vehicles, in road planning, design and regulation. (See Appendix G on page 27.)

Strategies to Manage Data Collection and Ensure Data Analysis and Accessibility

♦ Promote and support standards for data collection and accessibility. (See Appendix E on page 25.);

♦ Establish data clearinghouses, a central repository or an agency responsible for managing traffic safety data;

♦ Ensure availability of and access to linked data systems for transportation entities, emergency medical services, hospitals and law enforcement;

♦ Support the use of data analysis methods and tools at the state and local levels by stakeholders, including cost-effective analyses for programs, such as MV PICCS. (See Appendix H on page 28.);

♦ Perform road safety audits and assessments to evaluate risks for crashes;

♦ Use real-time and historical data to identify and evaluate high-risk or at-risk corridors when planning high-visibility enforcement efforts; and

♦ Encourage cross-agency information sharing to inform law enforcement about high-risk or at-risk corridors.

Strategies to Ensure Training and Education

♦ Authorize and train drug recognition experts to identify drivers who are impaired by drugs;

♦ Develop standard detection-enforcement methods for law enforcement to identify drug impairment, including from prescription drugs and marijuana;

♦ Support trainings and informational sessions for judges, prosecutors and emergency medical services and law enforcement personnel on the role of impaired driving, distracted driving, restraint use, aggressive driving and speeding in motor-vehicle related fatalities and injuries;

♦ Highlight state training programs and requirements; and

♦ Host statewide safety summits for key stakeholders. (See Appendix B on page 21.)

Strategies to Support Outreach and Public Awareness

♦ Develop, implement and evaluate public education campaigns to improve public understanding of highway safety;

♦ Conduct media and communications campaigns to increase public awareness and strengthen enforcement efforts; and

♦ Increase public awareness of traffic safety laws, such as seat belt usage, "move over" legislation, which requires motorists to change lanes when law enforcement or first responders are providing roadside assistance.

Step Five: Decide Policies, Implement and Evaluate

Finalize Priority Policies, Develop Work Plan and Implement

States should develop a work plan or identify an existing mechanism, such as the state's strategic highway safety plan or other statewide plan, to achieve the targeted goals. The plan should include:

- A process for coordinating the work of all agencies and entities involved;

- Evidence-based, data-driven interventions;

- Performance measures for evaluation; and

- An ongoing process for evaluation.

> States should develop a work plan or identify an existing mechanism, such as the state's strategic highway safety plan or other statewide plan, to achieve the targeted goals.
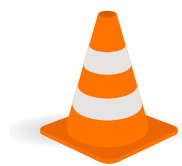
Monitor and Evaluate

Ensure that the strategy and intervention lead to the desired outcome. States may consider creating a logic model to help determine whether a strategy will have its intended effect. A logic model is a visual representation that shows how inputs (e.g., policy strategies and interventions) are expected to lead to outputs (e.g., immediate consequences of the policy), and how outputs are connected to outcomes (e.g., changes in the underlying problem).[37] The resulting "causal chain" depicted by the logic model is a clear road map for how the policy will solve the problem.[38]

The figure below illustrates a sample logic model.

STRATEGY:	INTERVENTION:	CHANGE:	CHANGE IN SOMETHING ELSE:	DESIRED RESULT:
Strengthen Traffic Safety Laws	Enact Primary Seatbelt Enforcement Laws	Law Enforcement Officers Issue Tickets To Unrestrainted Occupants	Increased Seatbelt Use	More Lives Saved

States may also consider using performance measures to monitor and evaluate implementation. Performance measures and other indicators track improvements and change using an identified data source. Such performance measures may already be included in strategic highway safety plans (SHSPs) and other safety plans; however, states may create additional performance measures tailored to the priorities of the governor and the needs of the state.

To assist in evaluation of its statewide safety plan, the **Pennsylvania** Department of Transportation developed the Highway Administration Performance Dashboard, which monitors high-level performance metrics. This dashboard allows staff to analyze data, follow trends and adjust procedures to achieve desired results. The plan includes performance measures identified in the Fixing America's Surface Transportation Act: the number of fatalities, rate of fatalities per 100 million vehicle miles traveled, number of serious injuries and rate of serious injuries per 100 million vehicle miles traveled.

Index of Appendices

Appendix A: Examples of Key Decision Makers and Stakeholders

Key Decision Makers

Governor; state transportation, highway safety, public safety and public health officials; attorney general, judges, legislators, county commissioners, mayors

Examples of Key Stakeholders[39]

Federal Agencies

Centers for Disease Control and Prevention, Federal Highway Administration and National Highway Traffic Safety Administration

State Agencies

Transportation, motor vehicle, health and human services, public health, trauma and emergency medical services, public safety, behavioral health and mental health, substance abuse, corrections, state police, education, aging, disability and related existing task forces

Professional Associations

Emergency medical, hospital, police chiefs and sheriffs, prosecutors, public defenders, state and local judges, trauma and advocacy groups

Local Entities

Local police departments; drug courts; county drug and alcohol services coordinators; drug treatment organizations; community drug prevention coalitions and task forces; family and peer support organizations; local departments of public

health, transportation, zoning and land use; injury health review boards; faith-based communities; fire departments

Educational Institutions

Universities, community colleges, school district superintendents, high schools, elementary schools, day cares

Private-Sector Entities

Technology and related transportation industries, restaurant associations, private transportation companies, business community, safety advocates and other related industries (i.e. beverage and where applicable, marijuana)

## Appendix B: State Approaches to Engaging Stakeholders

Many entities, agencies and stakeholder groups play a role in traffic safety. States should be sure to identify and engage stakeholders. Two ways that states can keep stakeholders involved are by creating task forces on traffic safety and holding statewide traffic safety summits.

Create a Task Force

States have found task forces, committees and commissions useful to maintain coordination and collaboration among state agencies and stakeholders. These bodies may be charged with ensuring cross-agency strategic planning of the state's traffic safety goals. States could consider either creating such groups or retooling or leveraging an existing one.

In creating a task force, commission or committee on traffic safety, states should:

- Designate highway safety professionals at the state and local levels as members;
- Ensure monthly communication between the governor's office and the highway safety director;
- Improve coordination among the public safety, transportation and public health communities to better develop, implement and evaluate state, regional and local safety plans; and
- Include a wide representation of stakeholders.
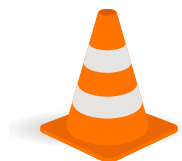
Arizona established the Governor's Fatality Task Force in 2017 to develop strategic measures to counter the increase in traffic fatalities experienced in the state. The Task Force is led by the Directors of the Governor's Office of Highway Safety, Department of Transportation, Department of Public Safety, Department of Liquor Licensing, Department of Insurance and Department of Health Services. The Task Force will develop near-term and long-term countermeasures to reduce traffic fatalities by analyzing cross-agency data. The agencies have begun the process of clarifying and breaking down data to identify root causes responsible for this increase, with the goal of finding potential solutions to reduce the trend downward. Current data trends indicate speed, impairment and failure to use seatbelts as significant factors in

the increase, coupled with an increase in pedestrian, motorcycle and bicycle fatalities. The Task Force will report back to the Governor's Cabinet by the end of 2017 and begin implementing projects and initiatives in 2018.

Colorado established the Colorado Task Force on Drunk & Impaired Driving in 2006 to generate more collaboration and consensus for effective solutions to the impaired driving problem in Colorado. The task force includes professionals representing prosecutors, safety advocates, human services, behavioral health, transportation, law enforcement, courts, defense attorneys and public defenders and researchers.

Convene Statewide Traffic Safety Summits

A statewide safety summit is an opportunity to convene traffic safety policymakers and stakeholders and to highlight the state's goals. Participants can share best practices, explore trends, discuss challenges and learn from experts.

Given the ongoing increase in fatalities, these summits should be hosted annually to ensure safety policymakers and stakeholders have an opportunity to discuss updates and changes. Each state's summit should promote a shared vision and goal and connect regional and local initiatives.
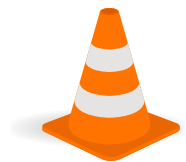
The state of **Nevada** holds an annual traffic safety summit to gather safety professionals, partners and advocates from across the state. The summit is focused on the goal of Zero Fatalities in Nevada. The summit also includes a Nevada safety update, workshops, trainings and plenary sessions on emerging and prevalent topics.[40]

Alabama held its first Safe Home Alabama Traffic Safety Summit in 2005. In that year, 1,148 people died on Alabama roadways. In 2010, this number was 848, a reduction of 26 percent. The Alabama traffic safety community is committed to reaching zero deaths on its roadways and continues to focus its summit on that goal.

Michigan has held annual traffic safety summits since 1995. Its 2017 summit focused on the "4 E's" of traffic safety—enforcement, education, emergency medical services and engineering—and explored emerging trends and new ways to keep road users safe.[41]

Appendix C: Background on Current State Planning Efforts

Currently, state departments of transportation develop plans regarding traffic safety programming and funding that are submitted to the U.S. Department of Transportation (DOT). In considering policies to improve safety on public roadways, states should review these existing plans, consider how they may better coordinate and correspond with programs and initiatives in other agencies (e.g., departments of public safety, public health

and emergency and trauma services) and develop policies and goals that are inclusive of these efforts and consistent across all agencies.

Strategic Highway Safety Plans

Strategic Highway Safety Plans (SHSPs) are developed by state departments of transportation to establish statewide goals, objectives and key areas of emphasis. States must review, evaluate and update SHSPs at least every five years and submit the plan to the Federal Highway Administration for approval.[42]

The governor's office should be an integral part of the SHSP planning process. SHSPs should incorporate a cross-section of agencies, entities, stakeholders and public and private partners. States should consider using the SHSP as a blueprint to develop statewide policy priorities and implement strategies to reduce fatalities and injuries.

Highway Safety Plans

DOT's National Highway Traffic Safety Administration (NHTSA) awards grants to states to support efforts to improve occupant protection, improve state traffic information systems, strengthen impaired driving countermeasures, decrease distracted driving, improve motorcyclist safety and enhance graduated driver licensing initiatives.[43] To receive funds, highway safety offices of the 55 states and territories must submit annual highway safety plans to NHTSA that outline programmatic priorities, performance measures and planned activities for the next fiscal year.[44]

Highway safety offices are often housed in the state's transportation department. The office obtains information about programs administered by state and local agencies, maintains (or has access to) information in state highway safety data systems and provides financial and technical assistance to other state agencies and political subdivisions to develop and carry out highway safety strategies and projects.[45] Highway safety offices should engage directly with governor's offices on planning efforts towards the statewide goals.

Pennsylvania uses the Strategic Highway Safety Plan (SHSP) process to create a coordinated, multiagency effort to sustainably reduce traffic fatalities and serious injuries. Pennsylvania's Departments of Transportation, Health, Education and Drug and Alcohol Programs as well as its State Police, Liquor Control Board and Pennsylvania Turnpike Commission participate. These agencies are part of a safety team that approves the SHSP, oversees implementation, administers accountability and meets quarterly to evaluate the plan. The SHSP evaluation process also includes a steering committee of over 40 stakeholders and partners.[46] Pennsylvania's plan targets Safety Focus Areas that have the greatest potential to reduce highway fatalities and serious injuries.[47]

In addition to these traffic safety plans that are submitted to the DOT, states also engage in statewide planning efforts focused on motor vehicle injury prevention. For example, the CDC funds 23 state health departments through the Core State Violence and Injury

Prevention Program (Core SVIPP). Core SVIPP helps states implement, evaluate and disseminate strategies that address the most pressing injury and violence issues including: child abuse and neglect, traumatic brain injury, motor vehicle crash injury and death, and intimate partner/sexual violence. The overall purpose of the Core SVIPP is to: decrease injury and violence related morbidity and mortality; and increase sustainability of injury prevention programs and practices. All 23 funded states are working in motor vehicle crash injury and death prevention. States are addressing various topics including graduated driver licensing and safe teen driving, increasing seat belt use, improving child passenger safety, preventing impaired driving, employee safe driving and data linkage (linking crash data to hospital and emergency medical service data).[48]

Appendix D: Involving the Governor

Ensuring public safety and the well-being of citizens is often seen as the primary responsibility of government. As states' chief executives, governors play a critical role in achieving that aim.

Encourage Statewide Collaboration

Collaboration is a key element of coordinated, effective safety planning. Governors can ensure a collaborative approach to traffic safety by prioritizing safety as a state goal, using their platform to raise awareness of traffic safety and ensuring a statewide approach to the rise in traffic injuries and deaths. Governors should be briefed on traffic fatality numbers and statistics, demographics of at-risk populations and encouraged to address the importance of traffic safety in public addresses.

These efforts should focus on improving injury prevention through cross-agency coordination of public safety, public health and transportation agencies and facilitating a climate of data sharing. To create a collaborative data-sharing environment, governors and their staff should be aware of strategies to increase information sharing, eliminate the barriers to achieving the state's goals and communicate information to stakeholders and the public.

Specifically, governors and their policy advisors can improve cross-agency collaboration by:
- Raising public awareness of the rise in the number of traffic fatalities;
- Identifying statewide and cross-agency strategies that the state can pursue;
- Promoting and encouraging the use of best practices and policies regarding safety;
- Increasing access to and organization of data systems across agencies to optimize their utility for addressing public health and traffic safety issues; and
- Encouraging a comprehensive, cross-agency strategic highway safety planning process.

Invest Adequate Resources

To effectively execute statewide plans to reduce traffic fatalities and injuries, states should provide adequate resources for traffic safety policies, programs and trainings.

Participate in Events and Activities

In addition to providing leadership and creating a vision, governors can bring awareness to traffic fatalities and injuries by participating in state-hosted events and activities, including:

- Attending task force meetings, summits and other stakeholder meetings;
- Visiting sobriety checkpoints and other high-visibility enforcement events with state and local law enforcement officials;
- Encouraging monthly briefings on traffic crash data; and
- Issuing traffic statements and safety messages from the governor's office.

Appendix E: Best Practices for Data Use

Data analysis is important to support policy efforts and inform decision making. Governors should empower officials to create data use agreements and share information among state agencies in a way that breaks down silos. Such efforts enable transportation, public safety and public health experts to better understand trends through data collection analysis, training and outreach. In addition, breaking down silos allows for effective data sharing and development of systems to link traffic crash data with medical injury data.

> Governors should empower officials to share information among state agencies in a way that breaks down silos.

Use data to drive and support policy decisions.
Data analysis can assist in identifying resource gaps and problem areas. Use these facts to inform, implement and support necessary policy changes, program implementation, and targeted messaging.

The state should encourage best practices and standards for data collection and accessibility that include:

- Ensuring data-informed decision-making;
- Emphasizing collection of-data on crashes;
- Ensuring data are available from different types of data sources;
- Securing real-time data that are collected and analyzed to help reduce injuries and fatalities;
- Improving reporting of severe injuries from traffic crashes;
- Linking law enforcement, emergency medical and transportation stakeholders to helpful data;
- Instituting data-use agreements to ensure data is shared between agencies; and
- Considering partnering with research universities to improve collection and analysis.

Utah uses a crash mapping system, Utah Vehicle Collisions,[49] to depict vehicle crashes in real time. This system helps to effectively disperse law enforcement resources to areas with the greatest need.

Maryland uses its Safety Information Database to house crash data, which includes detailed information about the roadway and critical elements for the engineers responsible for roadway improvements. All crashes resulting in personal injury, fatality or a vehicle being towed away are reported by local law enforcement officers to the State Police Central Records Division. The data are then entered into the Safety Information Database.

The **Delaware** State Police uses data to drive decision making daily in real time. Its program, State Police Enhanced Analytical Response, gathers real-time crash data, along with its criminal activity data, to review where incidents are occurring and determine the deployment of officers and other resources. The real-time data pinpoints current "hot spots" and is used in making decisions as to where troopers will be assigned.[50]

Tennessee's Department of Safety and Homeland Security developed a predictive analytics program, which delivers a suite of tools for law enforcement to inform deployment decisions. The program uses historical data on crashes, weather and events to predict how likely a particular kind of incidents is to occur in an area at a given time.[51] The tool can be used to determine when and where to conduct grant-funded activities, where law enforcement officers should be positioned during unobligated patrol time, and to assist supervisors when developing enforcement plans for the upcoming week.[52] After employing the predictive analytics program, the state's highway patrol saw a reduction in its average response time by 33% (from 2012 to 2015), the second lowest number of traffic fatalities in 2015 since 1963, and a decrease in the traffic fatality rate (from 1.47 per 100 million vehicle miles traveled in 2010 to 1.35 in 2016).[53]

Appendix F: Safety in Infrastructure Planning

Governors should support infrastructure, roadway improvements and innovations that provide safe road structures for all road users. Infrastructure plans should consider safe travel for all road users in design and implementation.

The following types of infrastructure and roadway designs contribute to road user safety.

For drivers and other motorists:
- Roundabouts;
- Speed management designs to reduce risk of driver, passengers and pedestrian fatalities; and
- Lane departure warning systems.

For pedestrians, bicyclists and other vulnerable road users:

- "Complete street" initiatives that include a design to improve roadways to promote safe speeds and reduce factors contributing to crashes with pedestrians, bicyclists and other vulnerable roadway users;
- Pedestrian safety zones; and
- Pedestrian access to transit improvements.

The **Massachusetts** Department of Transportation promotes "complete streets" —roadways that provide safe and accessible options for all modes of travel for people of all ages and abilities—through its Complete Streets Funding Program. This grant program accepted its first applications for funding in 2016 to encourage municipalities to regularly include complete streets design elements and infrastructure for locally funded roads. The department allocated $12.5 million for the first two years of the program.[54]

Appendix G: Safety in Innovative Technology

Governors welcome innovation and recognize that innovations such as autonomous vehicles and connected vehicle technology have the potential to revolutionize how Americans travel. States should consider these and other technologies when developing policies and plans.

Autonomous vehicles

Autonomous vehicles are an emerging technology that holds the promise of shorter commute times, fewer motor-vehicle-related deaths and injuries and greater worker productivity. Research on the potential benefits is still developing. However, early data suggests that by limiting the opportunity for human error, deployment of autonomous vehicles may reduce crashes. State agencies can foster an environment where autonomous vehicles are responsibly deployed in a manner that strengthens economic development and positions their states as centers for transportation innovation. Steps to take include ensuring law enforcement coordination during testing, providing comprehensive training for officers, exploring public-private partnerships and collaborating with federal fiscal policymakers.

> Governors welcome innovation and recognize that innovations such as autonomous vehicles and connected vehicle technology have the potential to revolutionize how Americans travel.

Connected vehicle technologies

These technologies are being developed to enable safe, interoperable wireless devices that communicate among vehicles, from vehicle to infrastructure and from vehicle to moving

parts of the traffic system. These communication technologies would provide data on the performance of the transportation systems, continual access to accurate information for travelers and reduce delays.[55]

Appendix H: Motor Vehicle Prioritizing Interventions and Cost Calculator for States

The Centers for Disease Control and Prevention offers an interactive calculator called Motor Vehicle Prioritizing Interventions and Cost Calculator for States.[56] This tool is designed to help state decision makers select and prioritize from among 14 effective interventions for motor vehicle injury prevention. The calculator includes the costs of choosing up to all 14 interventions while considering available resources.

Users input a state budget allotment for implementation and the tool provides state-level recommendations on which choices would prevent the most injuries, save the most lives and be the most cost-effective.

Endnotes

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