Traffic Safety Culture Primer

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PREFACE

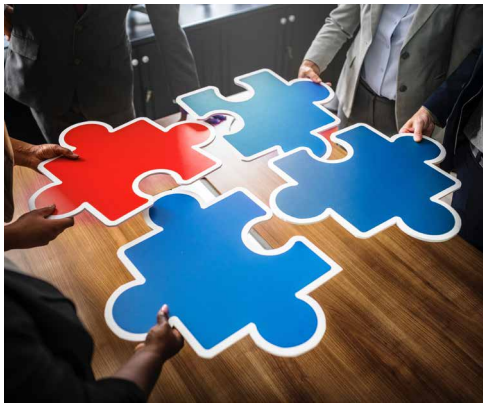
ABOUT THIS PRIMER

Traffic safety is important to us all. Too many people are killed or seriously injured by motor vehicle crashes. As a result, many of us have set a target of zero traffic fatalities and serious injuries. Our traditional focus on enforcement, education, emergency medical services, and engineering alone will not get us to this target.

In order to achieve a target of zero fatalities and serious injuries, it is necessary to create a "traffic safety culture" that prioritizes safety, encourages safe road user behavior, and facilitates cooperation among stakeholders. The way our society values traffic safety will determine our ultimate success.

Even with growing interest in traffic safety culture, applying this concept to improve traffic safety has been hindered by conflicting definitions and mixed understanding. As a result, it has been difficult for stakeholders and communities to fully embrace and address traffic safety culture in their traffic safety planning processes.

The purpose of this primer is to provide a definition of traffic safety culture and explain how it influences road user behavior and traffic safety. With this understanding, traffic safety stakeholders can communicate to colleagues, existing and new partners, and leaders about its importance. Ultimately, growing a positive traffic safety culture needs to be integrated into safety planning processes including Strategic Highway Safety Plans (among others). Resources allocated to safety programs included in these plans will create conditions to grow a positive traffic safety culture that is supportive of our goals of zero traffic fatalities and serious injuries.



ORIGIN OF THIS PRIMER

The Center for Health and Safety Culture (CHSC) at Montana State University is the primary author of this primer and its supporting tools. CHSC has a history of applied research on traffic safety culture at the local, state, national, and international levels. The need for this primer was identified by stakeholders participating in the Partnership for the Transformation of Traffic Safety Culture Pooled Fund, a Federal Highway Administration (FHWA) pooled fund project managed by the Montana Department of Transportation.

STRUCTURE OF THIS PRIMER

The primer begins by discussing the role of road user behavior in traffic safety, establishes traffic safety as a public health issue, and introduces the concept of **beliefs** as an important determinant of road user behavior.

The next section defines traffic safety culture as a system of beliefs about traffic safety. A basic model is presented that shows the relationship between belief systems and behaviors, which can affect traffic safety.

The following section discusses how viewing traffic safety through a lens of traffic safety culture is different than traditional approaches. The discussion includes the importance of developing strategies across the social environment to be effective in reaching traffic safety goals. A process for growing a positive traffic safety culture among road users and traffic safety stakeholders is outlined that includes data-driven decision making and evidence-based interventions.

To demonstrate this process, the subsequent section provides practical examples of ways to grow a positive traffic safety culture around impaired driving, speeding, aggressive driving, distracted driving, and seat belt use.

The primer then discusses specific actions traffic safety stakeholders can take to increase awareness of traffic safety culture and create conditions to support the effective use of this approach toward the vision of zero crash fatalities and serious injuries. This final section references various tools that are provided to support communication and outreach efforts.

The primer concludes with a discussion about the role of traffic safety culture in creating safe systems to support a vision of zero traffic fatalities and serious injuries.

INTRODUCTION

> *A zero deaths vision requires a change—a shift in culture both within transportation agencies and other organizations as well as within communities. Everyone must accept that fatalities are unacceptable and preventable.*[1]

TRAFFIC CRASHES ARE A PUBLIC HEALTH CONCERN

The social and economic costs of fatalities and serious injuries resulting from motor vehicle crashes are tremendous. In 2015, more than 35,000 individuals died in motor vehicle crashes in the United States resulting in nearly 1.5 million years of potential life lost.[2] Motor vehicle crashes are the leading cause of death of those ages 5 to 20.[3] The estimated annual economic cost of motor vehicle crashes exceeds $836 billion.[4]

The only acceptable traffic safety goal is to reduce fatalities and serious injuries to zero. Unfortunately, traffic safety is trending in the wrong direction. As shown in Figure 1, the annual number of fatalities have increased each year since 2014. It is time to explore new perspectives on traffic safety and develop innovative strategies to change road user behavior.

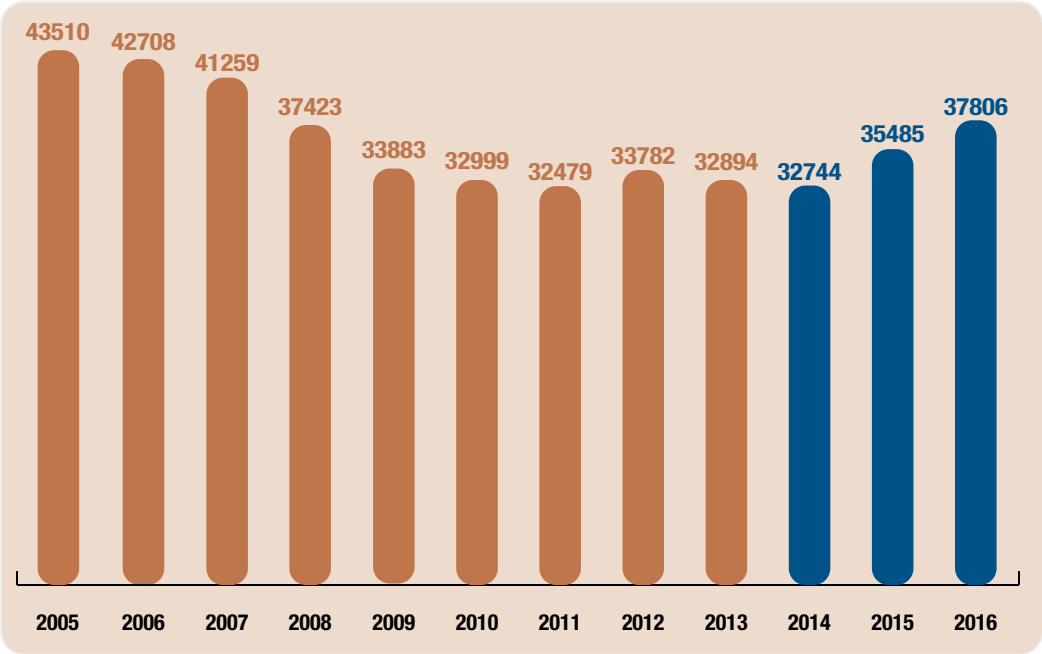


Figure 1. Total Motor Vehicle Crash Fatalities in US from 2005 to 2016[5]

WE MUST CHANGE BEHAVIORS TO REDUCE CRASHES

To improve traffic safety, we need to focus on those factors that contribute most to motor vehicle crashes. Driver behavior is most often the critical reason for a motor vehicle crash.

Speeding, aggressive driving, impaired driving, distraction, and not wearing a seat belt are the leading causes of crashes and fatalities. Each of these is a deliberate behavior. Deliberate behaviors are those we choose to commit, and decisions to commit deliberate behaviors can be changed.

However, improving traffic safety involves more than just changing driver behaviors. Passengers can speak up when they see drivers engaging in risky behaviors; families can establish safe driving rules; workplace leaders can establish policies and provide training on traffic safety; and community and state officials can pass and enforce sensible laws. These are examples of additional deliberate behaviors. And, just like a driver's decisions, the decisions of these stakeholders can be changed.

Since driver and stakeholder behaviors are critical to improving traffic safety, efforts should focus on creating conditions that increase safer decisions. To create such conditions, it is necessary to understand how decisions about deliberate behaviors are made and the role of culture in those decisions.

FACT

Based on data from police investigations of crashes, the National Motor Vehicle Crash Causation Survey concluded that driver behavior is the "critical reason" for

94% of crashes.[6]

HUMAN BEHAVIOR IS INFLUENCED BY BELIEFS

The human mind is amazing and complex. Our minds are aware of ourselves and our environments. Our minds form patterns of thoughts or beliefs every time we interact with someone or something. For example, we may have learned that wearing a seat belt is just something that everyone does. We also learn from our experiences, like if we drive too fast, we can lose control of the vehicle. We can also learn from the experiences of others, like hearing about a crash and learning that driving after drinking alcohol increases crash risk.

Beliefs help us interpret and understand the world, formulate goals, and make decisions. Beliefs influence our choice of behavior (Focus Box: What is a Belief System? p.4). Thus, if we want to change a behavior, we need to identify and change the beliefs about that behavior.[7] In other words, improving traffic safety requires changing behaviors, and changing behaviors requires changing beliefs.

Beliefs help us interpret and understand the world, formulate goals, and make decisions.

WHAT IS A BELIEF SYSTEM?

Our belief system represents the different types of beliefs we form through our experiences. Researchers have identified basic types of beliefs that influence our behaviors.

Values define what is important to us. Values determine the goals of our behaviors. For example, if we value safety (our own and our family's), we will evaluate/judge our behaviors based on their impact on safety. Through our experiences, we will determine that some environments (physical and social) are relevant to our values and others are not. For example, we may focus on the traffic system because of its importance to safety (Figure 1, p.1). In that environment, we may then avoid speeding because it jeopardizes our value of safety.

Assumptions represent our basic understanding of the aspects of the environment (system) we think are important. These are general beliefs about the conditions, boundaries, and roles that define the system in which behavior occurs. For example, to operate successfully in the traffic system, we may assume that traffic laws are necessary and that all road users are responsible to abide by them.

Beliefs are our perceptions about the physical and social conditions that influence our behaviors. Such beliefs may relate to our perceptions of what is normal or expected in our social environment. Beliefs can also relate to our perceptions of our ability to perform or refrain from certain behaviors. Finally, beliefs can relate to our perceptions about the physical and social consequences of our behavior. For example, we may anticipate physical harm from driving too fast on icy roads or social embarrassment from receiving a speeding ticket. Our beliefs influence our willingness and intention to behave.

Figure 2 illustrates how belief systems influence our choices that affect traffic safety. While this may seem simple, its complexity is in the many beliefs that form the belief system. This figure is insightful because it helps us to understand that in order to improve traffic safety, we must change behaviors, and to change behaviors, we must change beliefs. Therefore, it is important to explore where our beliefs come from if our goal is to change behavior. The social environment has an important role in the development of our belief system – and so – has a strong influence on our behavioral choices.

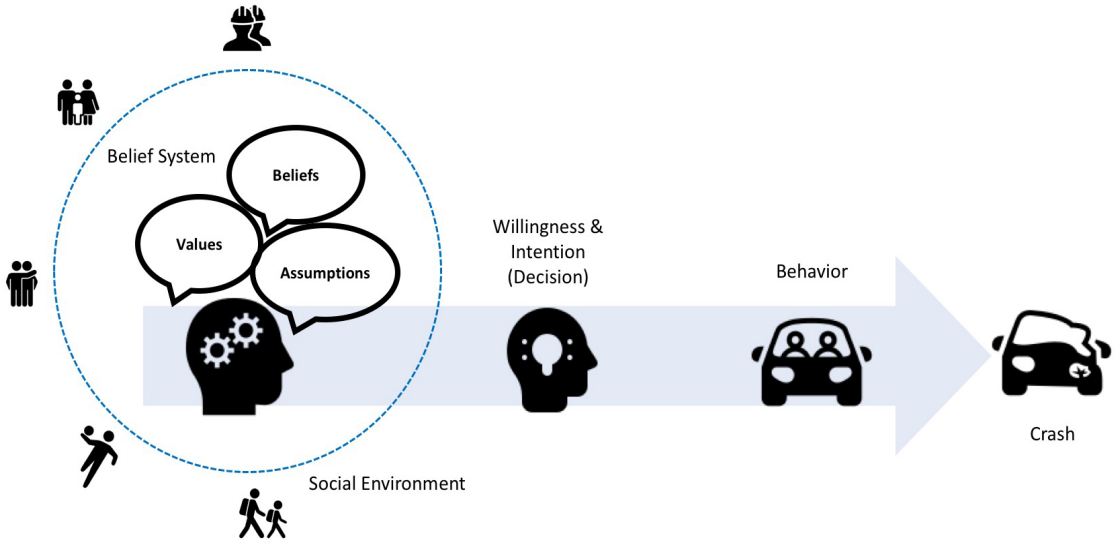


Figure 2. Simplified Model of Belief System, Behavior, and Crash Risk

OUR SOCIAL ENVIRONMENT INFLUENCES OUR BELIEFS

People are naturally dependent on relationships for survival and wellbeing. Relationships provide critical social connections with others. As infants, we do not choose those relationships – they are established by those who raise us. As we grow up, we exercise more choice in our relationships (for example, we choose our friends). In school, we are influenced by those around us including students, teachers, and other adults. As we leave school, we may enter the workforce and establish new relationships with our coworkers and supervisors.

Throughout our lives, we establish relationships and interact with others in many ways. Some interactions are extensive – as with our family and friends. Other relationships are frequent but may not be as intimate like those with our supervisors or colleagues at work. And, still other relationships may be rather infrequent but still influential – as with our healthcare provider or faith leader. These nested layers of relationships form our social environment (Figure 3). Each layer of our social environment has the potential to influence our beliefs.

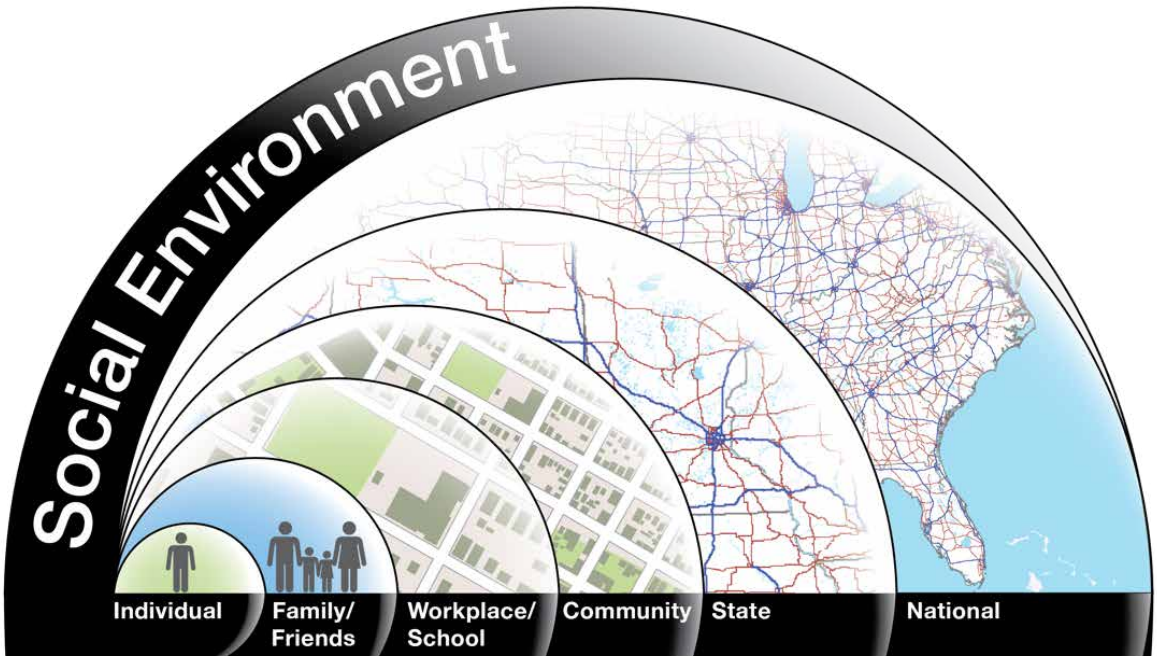


Figure 3. Illustration of the Layers of the Social Environment

We tend to share beliefs with the different groups to which we belong. Often, groups are identified by a shared belief system and common goals. Schools and workplaces create groups of people – each defined by a common goal. For example, a school has the goal of educating students and will establish and share certain beliefs to support that goal. A workplace may have a goal of successfully providing a certain product or service and will establish and share certain beliefs to support that goal. Mechanisms for sharing beliefs among members of a group can include formal training (like initial orientation training) as well as informal learning from colleagues and supervisors.

Forming relationships with groups is important to how we perceive and define ourselves. We form our social identity by identifying with some groups and not with others. Through our identification with a group, we are socialized to share the belief system of that group.

If our beliefs are different than those of the group, we may feel uncomfortable. If our beliefs are significantly different, we may leave (or be asked to leave) a group. Thus, if we want to remain within a group, we are socially motivated to think and behave in ways that are consistent with the shared belief systems of the groups with which we identify. As a result, our behaviors are influenced by the shared belief systems of the groups with which we identify.[8]

TRAFFIC SAFETY CULTURE

A system of beliefs shared amongst a group of people represents the culture of that group. Thus, the culture of a group influences the behaviors of individuals belonging to that group. Often, these belief systems are specific to a behavioral context. For example, our shared belief system or culture at work influences our work-related behaviors.

Similarly, groups can have a shared belief system specific to traffic safety-related behaviors. This belief system might include the importance of traffic safety and beliefs about wearing seat belts or driving after drinking. These beliefs are shared within the group and influence the belief systems and, therefore, the traffic safety-related behaviors of the group's members.

Therefore, we can define "traffic safety culture" as *the shared belief system of a group of people, which influences road user behaviors and stakeholder actions that impact traffic safety.* This may sound like a very abstract definition, but it is based on scientific theory (Figure 2, p.5) and uses valid data (Focus Box - What Does Data Driven Mean? p.9).

We can define 'traffic safety culture' as the shared belief system of a group of people, which influences road user behaviors and stakeholder actions that impact traffic safety. Road users include all participants in the roadway transportation system. Road user behaviors include actions that influence crash risk and crash severity. Importantly, this definition applies to stakeholder actions as well.

Traffic safety culture involves the belief systems of road users that influence their choice of behavior. Road users include all participants in the roadway transportation system (e.g., drivers, motorcyclists, passengers, pedestrians, bicyclists, etc.). Road user behaviors include actions that influence crash risk (e.g., speeding, driving impaired, following too closely, etc.) and crash severity (e.g., wearing a seat belt, wearing a motorcycle helmet, etc.).

FOCUS BOX - WHAT DOES DATA DRIVEN MEAN?

Traffic safety culture is not an ambiguous, "squishy" concept that can't be measured. As defined above, traffic safety culture is the shared belief system of a group of people which influences road user behaviors and stakeholder actions that impact traffic safety. The salient beliefs that influence various behaviors can be identified and measured using techniques well established in behavioral science. Traffic safety culture is well suited to data-driven approaches.

Data-driven approaches should be used in all aspects of improving traffic safety culture. Using data-driven approaches results in more effective decision making and better allocation of resources. Data-driven decision making refers to the use of valid data (rather than speculation) to guide decisions. The U.S. Department of Transportation's priority for their Strategic Plan (FY 2018-2022) is to use a "data-driven systemic safety approach to identify risks, enhance standards and programs, and evaluate effectiveness."[9] Similarly, the Substance Abuse and Mental Health Administration states that practicing effective prevention should include gathering and using data to guide all prevention decisions.

Consistent with these perspectives, the approach to growing traffic safety culture should be a data-driven process. Crash data should be used to identify and prioritize risky behaviors and contexts. Baseline and evaluation data about traffic safety culture should be collected using good scientific methods (e.g., questionnaires, interviews, focus groups). Traffic safety culture data should be analyzed based on a model of traffic safety culture (Figure 2, p.5) to identify which beliefs are most relevant to the prioritized risky behaviors. These beliefs then become the focus for strategies and countermeasures. Assessments should be repeated over time to evaluate the effectiveness of strategies and countermeasures in changing the identified beliefs.

Importantly, this definition also applies to the belief systems of stakeholders that motivate their actions that affect traffic safety. Stakeholders include traditional traffic safety stakeholders (e.g., elected officials, state departments of transportation, law enforcement agencies, healthcare providers, etc.) and non-traditional stakeholders (e.g., families, schools, workplaces, etc.) who can change the shared belief systems of the social environment.

Examples of Actions by Traditional Stakeholders

- Establishing effective traffic laws
- Allocating resources to traffic safety programs
- Improving response times of emergency medical services
- Engaging new partners in promoting traffic safety

Examples of Actions by Non-Traditional Stakeholders

- Families establishing rules about traffic laws including always wearing a seat belt, never driving impaired, and avoiding distractions while driving
- Schools (and other education organizations such as the American Association of Retired Persons and American Automobile Association) promoting best practices in driver education
- Workplaces establishing goals, policies, and training to achieve zero motor vehicle incidents

All the actions outlined above are the outcome of a supportive belief system – or a strong traffic safety culture. Individuals in each of these "groups" can take deliberate steps to grow a strong traffic safety culture among members of their group that support these actions.

THINKING AND ACTING THROUGH THE LENS OF TRAFFIC SAFETY CULTURE

Approaching traffic safety through the lens of traffic safety culture is different than traditional approaches. First, by thinking through the lens of traffic safety culture, we see that the way to improve traffic safety is to focus on growing shared belief systems that support protective behaviors and decrease risky behaviors. This may be more focused and strategic than traditional approaches.

Second, using a traffic safety culture lens expands our efforts to include growing shared beliefs that:

- Safe behavior is expected and common within all groups.
- Helping others to be safe is encouraged and expected.
- All traffic safety efforts are based on collaborative partnerships among stakeholders across the social environment.

Third, since traffic safety culture includes the shared belief systems of stakeholders, we must seek to change not only the traffic safety culture of road users but also the culture of all stakeholder groups that can act in ways to support traffic safety goals. This thinking expands the responsibility for traffic safety from relying on a single stakeholder to shared responsibility among all relevant stakeholders.

For example, let's think about improving seat belt use in a community. Traditionally, the approach might be an education campaign telling people about the risk of not wearing a seat belt coupled with high visibility enforcement. We may see improvements in seat belt use and often will see significant improvements during enforcement periods. However, unsafe behaviors can return when enforcement subsides.

Thinking about growing seat belt use through a cultural lens, we may shift our approach. Instead of just thinking of individuals and how to get them to wear a seat belt, we might think about different groups across the social environment and what actions they could take to improve seat belt use. Since often many people already wear a seat belt, our approach should include current seat belt users as well. Table 1 shows examples of actions different groups in the social environment could take to increase seat belt use. Growing these actions will require growing shared belief systems in each of these groups supportive of these actions. This may seem daunting. However, once these belief systems are established, the protective behaviors are much more likely to be sustained.

TABLE 1. EXAMPLE STRATEGIES ACROSS THE SOCIAL ENVIRONMENT TO INCREASE SEAT BELT USE

Group	Strategies to Increase Seat Belt Use
Individuals who already wear a seat belt	• Ask someone else to wear a seat belt
Families	• Establish family rules about always wearing a seat belt
Schools	• Include seat belt education in health class; promote asking friends to wear a seat belt
Workplaces	• Establish and train on workplace seat belt policies
Law Enforcement	• Model seat belt use by always wearing a seat belt • Consistently enforce seat belt laws (not just during campaigns) • Advocate for seat belt use in the community
Key Leaders	• Promote seat belt policies in public agencies • Advocate for seat belt use in the community

HOW UNDERSTANDING TRAFFIC SAFETY CULTURE CAN MAKE US MORE EFFECTIVE

Traffic safety culture has improved over the past 40 years. For example, shared beliefs about driving impaired have radically changed. Once considered acceptable ("here's one for the road"), driving under the influence of alcohol is now recognized as dangerous and inappropriate by most people.[10] Roadside surveys using biometric testing (Figure 4) have shown that the percentage of people driving under the influence of alcohol (at any concentration) has significantly decreased.[11] This is an important example of how traffic safety culture can improve.

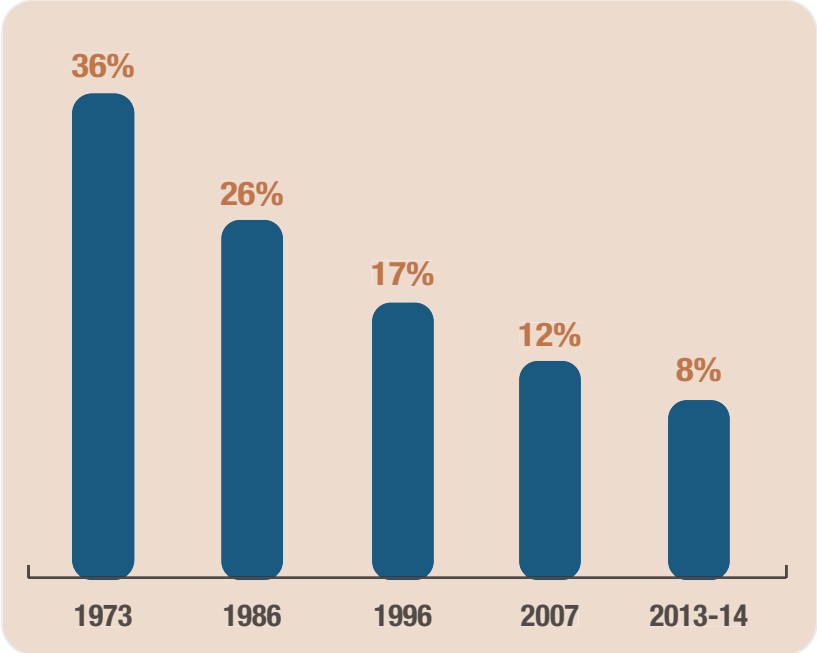


Figure 4. Percentage of Weekend Nighttime Drivers Positive for Any Alcohol[11]

Developing a better understanding of what traffic safety culture is and how it impacts behavior can help us be more effective at improving traffic safety in the future. First, an understanding of traffic safety culture teaches us that we must consider the entire belief system – not just one type of belief such as the perception of harm or the perception of getting caught. Traffic safety culture includes values, assumptions,

expectations, perceptions of what is common or typical (i.e., perceived norms), and our sense of control. By focusing on the entire belief system, we will be more *effective* in changing behavior than if we focus on just one type of belief.

Second, efforts to grow traffic safety culture inherently focus on the positive within an existing culture. We seek to strengthen and grow existing beliefs that support safe behaviors in a community. The key is to find which beliefs within a community are positively related to traffic safety and then grow those beliefs among all community members. By leveraging the positive aspects of the existing culture, changes are naturally more *acceptable and sustainable*.

Third, a cultural approach focuses on changing belief systems across the social environment. When multiple groups across layers of the social environment share beliefs supportive of traffic safety, a synergy is created that fosters and sustains these shared belief systems across the many groups. As new individuals enter this shared environment, their beliefs about traffic safety are influenced not by one group but by multiple groups. Safe beliefs and behaviors become *sustained* as the cultural norms in the entire social environment.

A PROCESS TO GROW TRAFFIC SAFETY CULTURE

Growing traffic safety culture is a process – not a single intervention or countermeasure. A process is different than an intervention or countermeasure. A process describes generalized steps, a context for performing those steps, and skills required to be successful. An intervention or countermeasure describes specific actions in a specific context. A process is generalized; an intervention or countermeasure is content specific.

As already discussed, traffic safety culture includes multiple beliefs held by many different groups. The beliefs we need to grow among adults about family rules are different than the beliefs we need to grow among law enforcement officers and courts about consistent enforcement (they are related but different). Therefore, growing traffic safety culture involves multiple interventions, strategies, and countermeasures. However, we also need a process to guide and align these efforts to grow shared beliefs supportive of a positive traffic safety culture.

Growing traffic safety culture is a process – not a single intervention or countermeasure. A process is different than an intervention or countermeasure. A process describes generalized steps, a context for performing those steps, and skills required to be successful.

Figure 5 represents a basic process to grow traffic safety culture. This process is similar to other strategic planning processes. The basic tasks and reasons behind each step are briefly described in Table 2 (it is beyond the scope of this primer to go into extensive detail on each step).

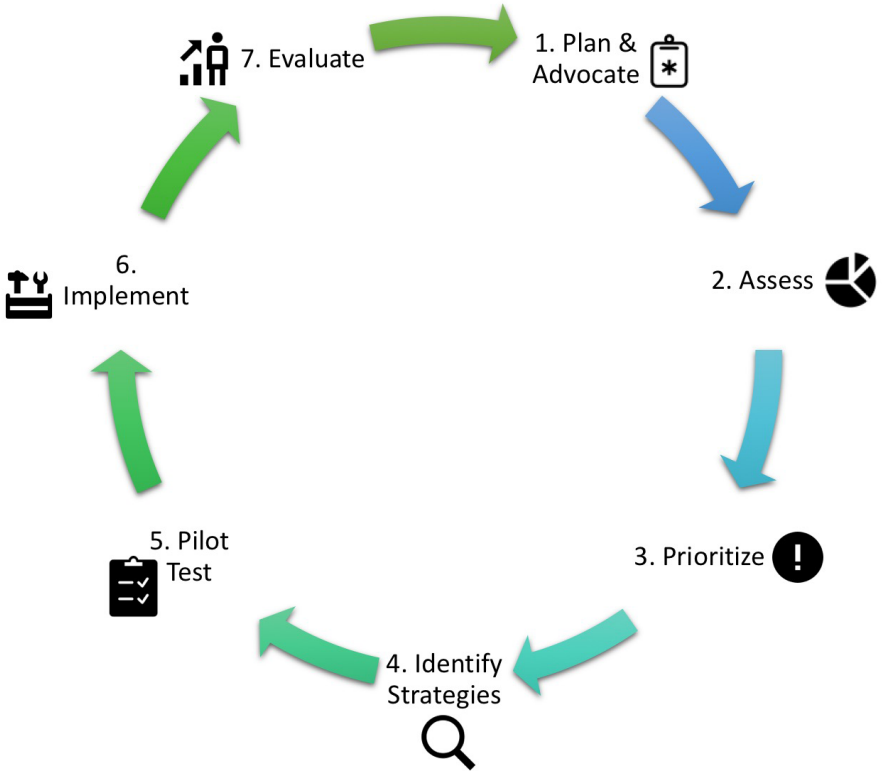


Figure 5. A Process to Grow Traffic Safety Culture

TABLE 2 . SUMMARY OF STEPS AND TASKS TO GROW TRAFFIC SAFETY CULTURE

Tasks	Why
Step 1. Plan and Advocate	
a) Raise concern about traffic safety behavior with key community stakeholders using national, state, or local data. b) Identify and recruit stakeholders across the social environment. c) Form a working group.	• Changing culture requires support from stakeholders and involves a community's entire social environment. • Changing culture takes time and is never complete. We should always be working on our traffic safety culture.
Step 2. Assess	
a) Gather local data about consequences and beliefs. b) Gather information about existing safety strategies and/or programs.	• Data-driven decision making will focus efforts on the most important safety issues. • Working on existing strategies may be faster and less expensive than developing new strategies.
Step 3. Prioritize	
a) Prioritize efforts based on consequences, changeability, and current strategies.	• Focused efforts are more effective (change is difficult).
Step 4. Identify Strategies	
a) Identify strategies to address priority issues. b) Adapt strategy and plan for pilot implementation within the community.	• Virtually all strategies will have to be adapted. Planning leads to better implementation.
Step 5. Pilot and Refine	
a) Implement and evaluate a pilot study of the strategy. b) Review how it went and what might be adapted before going large scale.	• Catching problems early saves time, builds trust, and avoids costly mistakes.
Step 6. Implement	
a) Implement the strategy across the community. b) Align laws, policies, and practices to support the strategy.	• Culture extends across the entire community; inconsistent support across the social environment will lead to individuals not using the new strategy.
Step 7. Evaluate	
a) Monitor adoption of the strategy. b) Monitor consequence and incident data.	• The goal is to improve safety. If strategies do not improve safety, they should be re-visited and perhaps adapted or new approaches taken.

Because we cannot address all aspects of traffic safety behavior at once (and issues within traffic safety will continue to evolve), this process will be repeated many times. In some contexts (let's say a small organization), this process could be implemented in a matter of months. When thinking about a community or state, this process will take years.

It is very important to recognize that culture does not change quickly (and in fact, if culture appears to change quickly, the change may not be real and may revert back soon in the future). Research on culture change within organizations shows that real, sustained change of culture in organizations of any significant size (i.e., over a few hundred people) typically takes more than five years.[12] While this time frame may seem daunting at first, it is affirming because it speaks to culture's lasting impact. Once culture is changed, the changes are likely sustained into the future.

Since using a cultural approach to improve traffic safety may be new to some stakeholders, it is valuable to consider conditions that make using a cultural approach more likely (Focus Box: What Conditions Promote Using a Cultural Approach to Traffic Safety? p.19). We (individually and collectively) can reflect on these conditions and seek ways to grow them in our organizations and communities.

EVIDENCE-BASED INTERVENTIONS TO CHANGE BELIEFS AND BEHAVIORS

The need for evidence about the effectiveness of interventions originated in medicine. Evidence-based medicine is defined as "the conscientious, explicit, and judicious development and use of current best evidence in making decisions about the care of individual patients."[13] The core concept is to use evidence about a treatment's effectiveness when creating a patient's treatment plan. Similarly, the U.S. DOT Strategic Plan (FY 2018-2022) states the need to "implement evidence-based risk elimination and mitigation strategies."[9]

FOCUS BOX: WHAT CONDITIONS PROMOTE USING A CULTURAL APPROACH TO TRAFFIC SAFETY?

- **Recognizing that growing traffic safety culture is a process.** Therefore, it is critical to invest in building the capacity of stakeholders to engage in an ongoing process and not view growing traffic safety culture as an intervention or countermeasure.
- **Growing traffic safety culture requires the combined actions of multiple stakeholders with shared safety goals.** Traffic safety agencies should leverage existing relationships and recruit new stakeholders across the social environment. Developing good group processes is critical to keeping stakeholders engaged.
- **Growing traffic safety culture needs a climate in which innovation is encouraged.** Agencies may benefit from examining their current internal culture to assess readiness for innovation within safety planning, including the use of a cultural approach to traffic safety. Innovation requires accepting failure, ongoing learning, and investing in efforts with longer timeframes.
- **Growing traffic safety culture as the foundation of traffic safety planning.** Getting to zero fatalities and serious injuries will require a shift in thinking like putting traffic safety culture as the foundation. For example, the Washington Traffic Safety Commission recognized that: "Reaching our Target Zero goal will only be accomplished through federal, state, and local partnerships leveraging innovation, research, and changes in the traffic safety culture of our state." This declaration allowed for resources to grow traffic safety culture.
- **Planning and preparing champions to guide and motivate the application of traffic safety culture.** It is critical to educate and recruit high-level leaders.

So, what is evidence of effectiveness?

It turns out evidence about the effectiveness of an intervention is quite complex. Classifying evidence for a strategy is much more than saying whether an intervention "works or not." Table 3 shows the U.S. Centers for Disease Control and Prevention (CDC) definition of seven levels of evidence.[14] For each level, there is knowledge about the effect of the intervention and scientific methods to establish the effect.

TABLE 3. SUMMARY OF CDC'S LEVELS OF EFFECTIVENESS

Level of Effectiveness	Effect	Scientific Methods to Establish the Effect
Harmful	Practice constitutes risk of harm	Any design with results indicating negative effect
Unsupported	Ineffective	True or quasi experimental design
Undetermined	Effect is undetermined	No research, no sound theory
Emerging	Expected preventive effect	Sound theory only
Promising Direction	Some evidence of effectiveness	Non-experimental design
Supported	Found to be effective	Quasi experimental design
Well Supported	Found to be effective	True experimental design

The challenge in gathering evidence for traffic safety-related interventions is that they often occur at the community level. For example, think about passing a law. The new law applies to everyone in a certain jurisdiction. It is not possible to conduct a random controlled trial (the gold standard of true experimental design) because we cannot randomly assign people to live or not live in a certain jurisdiction nor can we make the newly passed law applicable to randomly selected people (and not applicable to others). Gathering evidence using true experimental designs is very difficult with population level interventions.

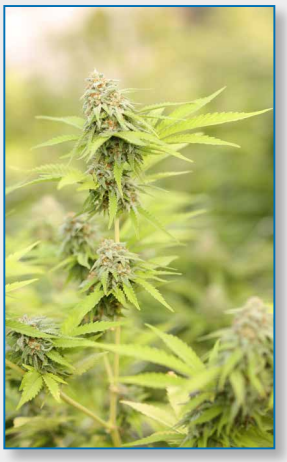
Even quasi-experimental designs are challenging with population level interventions. With quasi-experimental designs, communities may be assigned to be either an intervention community or a control community (i.e., a community where the intervention is not applied but where the beliefs and behaviors are still measured to allow for a comparison). However, rarely are funding levels adequate to use multiple intervention and control communities (if any). Thus, the comparison is still limited by other factors that are difficult to control.

However, the challenges of gathering evidence for strategies should not curtail innovation. Evidence-based strategies do exist (they were created and evaluated in the past). Indeed, many of these evidence-based strategies are currently deployed in our transportation system. Despite their evidence, crash fatalities and serious injuries are increasing (Figure 1, p.1), and we need to try new and innovative strategies to address the risk factors that these existing strategies are missing. The vision of zero traffic fatalities and serious injuries will not be realized using existing evidence-based strategies. This vision will require new ideas and ongoing innovation.

EXAMPLES OF GROWING TRAFFIC SAFETY CULTURE

This section presents examples that demonstrate using the traffic safety culture approach to address impaired driving and seat belt use. Both examples exemplify the traffic safety culture approach because (1) they are based on the understanding that behavior change results from a change in underlying beliefs; and (2) they involve the combination of actions from multiple stakeholders across the social environment (Figure 3, p.6).

Impaired Driving



The Washington State Traffic Safety Commission (WTSC) has set a target of zero crash fatalities and serious injuries (Target Zero). After using recreational cannabis was decriminalized in Washington State in 2014, WTSC observed an increasing trend of poly-drug use among drivers involved in fatal crashes. The most common combination of drugs used by drivers under the influence was alcohol and cannabis (DUICA). In response, WTSC decided to understand the traffic safety culture underlying DUICA behavior. The goal of the project was to measure the belief system associated with DUICA behavior and identify potential strategies to change this culture.

In this case, DUICA was defined as driving within two hours of consuming alcohol and marijuana ("Thinking back over the past 12 months, how often did you drive within two hours of consuming alcohol and marijuana?"). The two-hour window is standard for measuring driving after consuming impairing substances like alcohol or cannabis, but does not imply it is safe to drive after two hours after using drugs.[10]

A questionnaire was developed to measure a variety of beliefs about DUICA. This questionnaire was administered online to a representative sample of Washington state adult drivers (n = 870) ages 18 to 65 years. As shown in Figure 6, the results revealed that nine percent of the sample reported DUICA behavior in the past 12 months, which was lower than driving after consuming alcohol (DUIA) or cannabis alone (DUIC).

The beliefs shared by cannabis users who did report DUICA tended to reflect:

- More positive attitudes toward DUICA (including that it is safe)
- Stronger perceptions that DUICA is acceptable
- Stronger perceptions that DUICA is common
- Weaker perceptions that they can avoid DUICA

Such tendencies are relevant to the decision to DUICA, and therefore traffic safety. These beliefs may become the focus of relevant strategies with cannabis users to reduce DUICA behavior:

- Cannabis users who believed DUICA was acceptable were more than 4.5 times more likely to DUICA compared to those who believed it was unacceptable. Strategies to reduce DUICA should portray the actual norm that most people believe DUICA is unacceptable.
- Cannabis users who believed that most people DUICA frequently were 2.5 times more likely to DUICA. Strategies to reduce DUICA should portray the actual norm that most people do not DUICA.

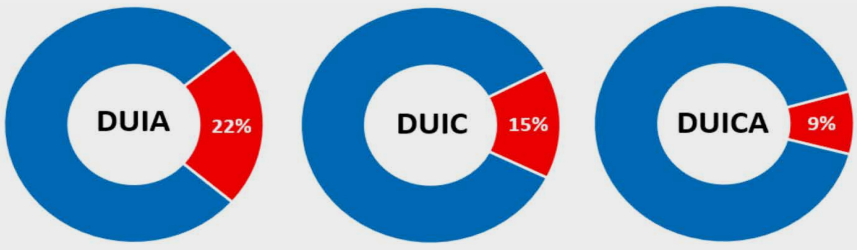


Figure 6. Percentage of Sample Reporting Impaired Driving in Past 12 Months

Seat Belt Use

In 2013, the Highway Safety Office within the Utah Department of Public Safety recognized that observed seat belt use in rural Utah counties was significantly lower than in urban areas. This meant too many citizens in rural Utah were at risk for serious injury or fatality. Traditional strategies used in urban settings had not been as effective at increasing seat belt use in rural areas.

Surveys were used to measure the traffic safety culture related to seat belt use in seven rural counties. In addition to the beliefs about seat belts from the general public, the beliefs and actions from stakeholders were also collected (including key leaders and law enforcement officers). The surveys revealed important beliefs (and actions) amongst both the public and stakeholders that needed to shift in order to reach the goals for seatbelt use:

- While most people believed they were responsible for asking others to wear a seat belt, many did not feel comfortable or confident in doing so.
- While nearly all law enforcement officers reported their agency had a policy about always wearing a seat belt, many officers reported they did not always wear a seat belt.
- Many adults (over 75 percent) reported their family had a rule about always wearing a seat belt, but far fewer (about 30 percent) reported their workplace had a seat belt rule.

The results were used to develop “toolkits” for county public health coordinators. These coordinators built local traffic safety coalitions by recruiting stakeholders from across the social environment. Each coalition worked on ways to promote:

- Getting people to ask someone else to wear a seat belt
- Family rules about always wearing a seat belt
- Seat belt education in middle and high school health classes
- Encouraging students to ask friends to wear a seat belt
- Seat belt policies in private workplaces and public agencies
- Seat belt use by law enforcement officers (as models for their communities)
- Consistent enforcement of seat belt laws (not just during campaigns)
- Advocacy for seat belt use in the community by key leaders and elected officials

Seat belt observations have shown significant increases in these pilot communities compared to other counties (final evaluation results will be available in the fall of 2019).

NEXT STEPS

This primer is intended as more than an information source; it is intended to be a call to action to actively engage in growing traffic safety culture. There are actions we can all take to create conditions to support the effective use of this approach in support of the vision of zero crash fatalities and serious injuries.

STEP 1: Develop Shared Understanding

The starting point is to create a shared understanding about traffic safety culture and its relationship to our traffic safety goals. Understanding becomes shared through conversations with colleagues, leaders, and stakeholders, as well as members of the communities we serve. To be effective, such conversations need to address important topics, challenge beliefs, and motivate us to learn more. In addition to creating shared understanding, these conversations can strengthen our relationships with others (stronger relationships will facilitate success). Table 4 lists questions that can be used to create effective conversations about traffic safety culture.

TABLE 4. QUESTIONS TO CREATE SHARED UNDERSTANDING ABOUT TRAFFIC SAFETY CULTURE

Raise Concern
• How do traffic crashes and their consequences impact our community? • What is our responsibility in reducing crashes? • What are the trends in reducing crashes, fatalities, and serious injuries?
Challenge Beliefs
• Are we being effective in reducing fatalities and serious injuries? Why or why not? • What are the barriers to us reaching the target of zero crash fatalities? • What might be some new ways to positively influence road user behavior?
Motivate Learning
• How do you define traffic safety culture? • How would you describe your community's traffic safety culture? • How do you know you are accurately perceiving your community's traffic safety culture? • What do you still need to learn about your community's traffic safety culture?
Strengthen Relationships
• What are our common goals around traffic safety? • How can we be more effective together in improving traffic safety culture? • What are out next steps?

STEP 2: Examine Your Organization's Traffic Safety Culture

We must examine our own culture before trying to change the culture of others. We will be neither effective nor authentic in our efforts to grow traffic safety culture in a community if our own organization's culture is not safe.

It is therefore necessary to start by examining our own beliefs and our organization's safety culture. According to the Federal Highway Administration, "the extent to which safety is valued and pursued by an organization indicates the strength of that organization's safety culture."[1] The value of safety in an organization is evident from the quality of its internal safety procedures (e.g., concern for worker safety, safety training programs, etc.) and the nature of its external safety programs (e.g., Vision Zero programs). Table 5 lists some questions that can be used to foster effective conversations about organizational safety culture.

TABLE 5. QUESTIONS TO EXAMINE ORGANIZATIONAL SAFETY CULTURE

Internal Safety Procedures
• How is the safety of employees a top priority with management? • How do employees and management work together to ensure the safest possible working conditions? • Are there compromises or shortcuts taken when worker safety is at stake? What are examples and why does this happen?
External Safety Programs
• How much do employees, supervisors, and leaders agree that no one should be killed or seriously injured while using our roadways? • How committed are most leaders in our organization to achieving the goal of zero traffic fatalities and serious injuries? • How much do you agree or disagree with the following statement? "Everyone in our organization recognizes that achieving the goal of zero traffic fatalities and serious injuries will require a change in traffic safety culture."

STEP 3: Find Opportunities to Focus on Traffic Safety Culture

Figure 7 shows how the Minnesota Department of Transportation (MnDOT) made traffic safety culture the center of their Strategic Highway Safety Plan (SHSP). This plan recognizes that traffic safety culture can influence all crash types and risk factors.

The overall goal of this plan is to create a positive traffic safety culture: "a positive traffic safety culture rejects roadway fatalities and life-changing injuries as a cost of doing business and values the life and well-being for all roadway users."[15] The plan identifies four key initial strategies based on the premise that "all of the fatal and serious injury crashes that occur on Minnesota roadways are fundamentally tied to the culture around traffic safety," which includes the following actions:

- Establish a traffic safety culture team
- Develop workshops for safety leaders and practitioners to establish a common understanding of traffic safety culture
- Complete baseline measurement of Minnesota's traffic safety culture
- Develop an action plan with recommended strategies across safety disciplines and partners

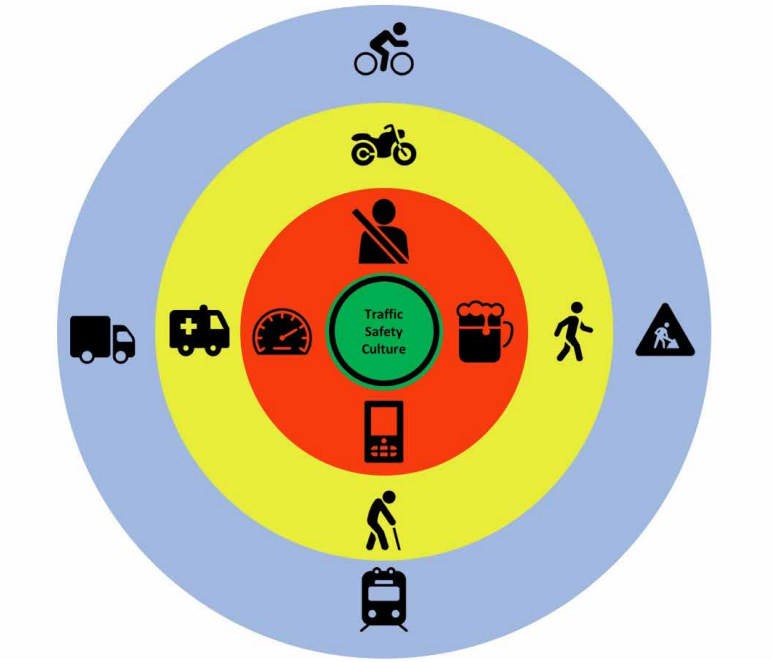


Figure 7. Traffic Safety Culture as the Central Concept in MnDOT's SHSP

VISION ZERO

The recent increase in traffic fatalities on U.S. roads reminds us all of the need to increase our efforts to improve traffic safety. As many states and localities adopt a vision of zero fatalities (and serious injuries), increasingly greater attention is being given to applying a safe systems approach to traffic safety that requires a change in the culture – both among road users and traffic safety stakeholder agencies.

The safe systems concept refers to an intentional approach for achieving a vision of zero fatalities. As shown in, Figure 8, a safe systems approach is one in which practitioners work to design, build, and maintain a transportation system that promotes safe road user behaviors (human factors) and protects all road users from physical harm (forgiving systems). All stakeholders in this system are responsible for reducing crashes (shared responsibility).

Both the vision of zero fatalities and the safe systems approach are based on a specific belief system. For example, the vision of zero fatalities values safety above all other priorities and assumes this target can only be achieved by integrating traffic safety efforts across all traffic safety stakeholders. This requires the formation of stakeholder partnerships and the integration of safety efforts, including behavioral strategies as well as engineering safer roads and vehicles.

As many states and localities adopt a vision of zero fatalities (and serious injuries), increasingly greater attention is being given to applying a safe systems approach to traffic safety that requires a change in the culture – both among road users and traffic safety stakeholder agencies.

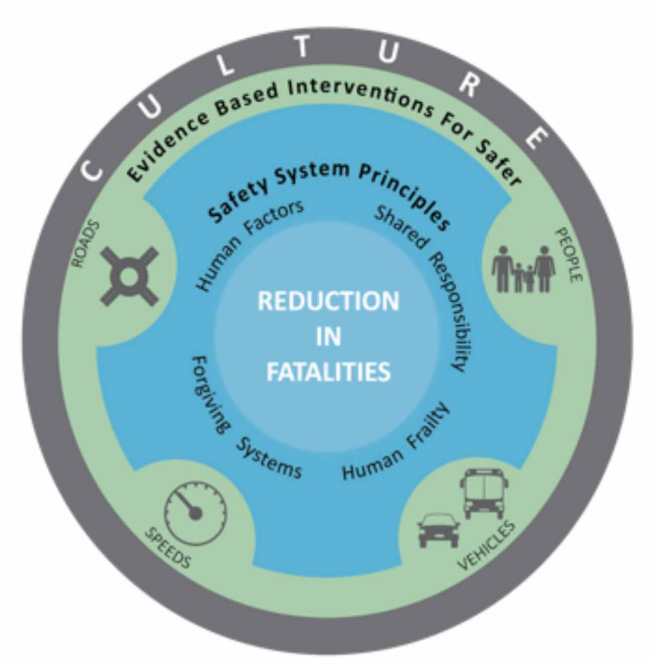


Figure 8. Representation of Safe System Approach to Traffic Safety

At the core of the vision of zero fatalities is the need for safe behavior by all road users. Thus, an important function of safety culture is for transportation stakeholders to measure the traffic safety culture of road users and develop strategies that transform this culture to encourage and sustain safer behaviors. Necessarily, this will result not only in road users choosing to be safer themselves, but also proactively helping other road users to become safer too. For these efforts to be effective, stakeholder organizations may need to begin by exploring their own internal culture to align it with the safe systems approach and vision for zero traffic fatalities and serious injuries.

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Traffic Safety Culture Primer

VISION ZERO
zero deaths · zero serious injuries

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