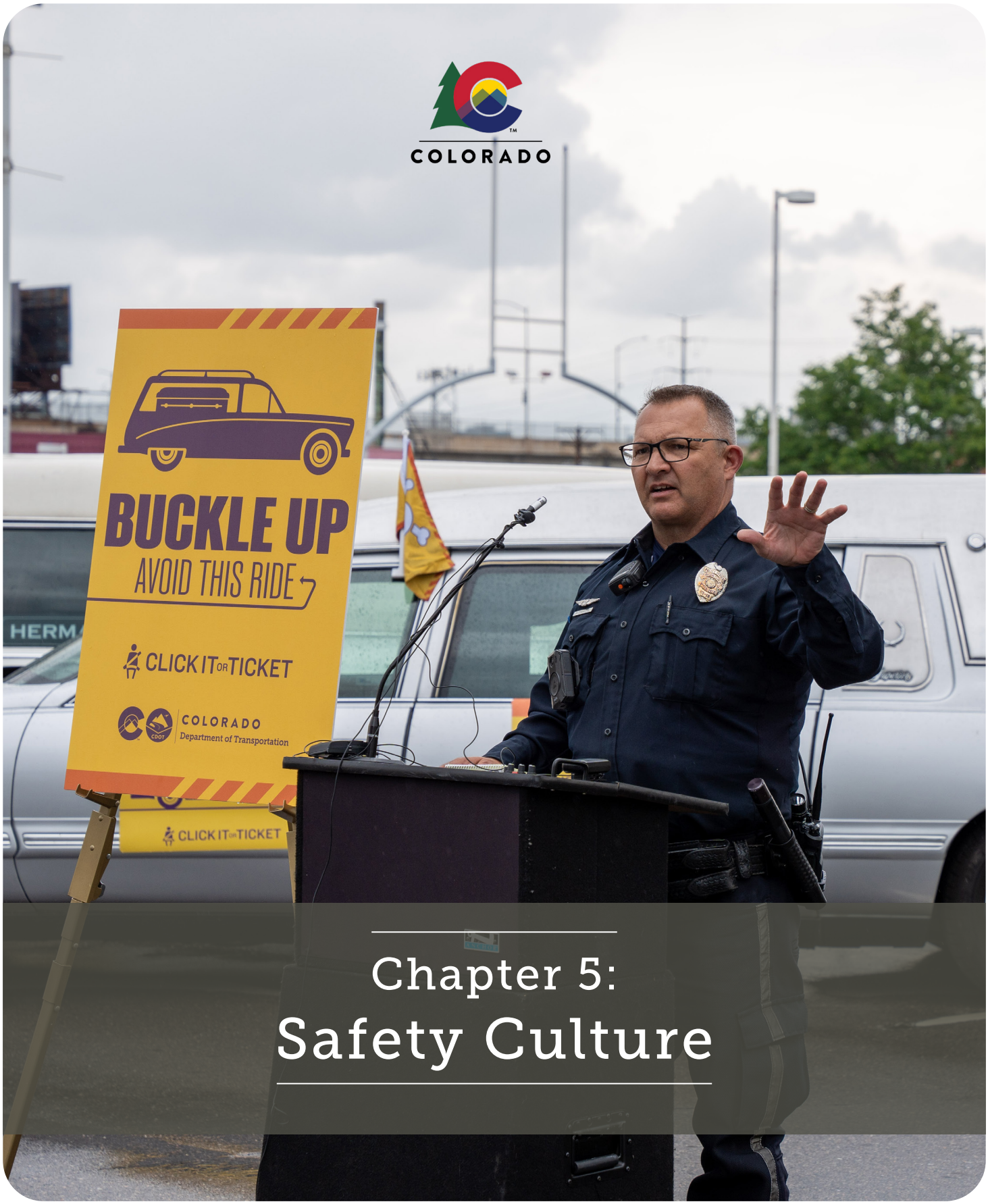

Chapter 5:
Safety Culture

Introduction

A strong transportation safety culture is fundamental to achieving zero fatalities and serious injuries on Colorado roadways. CDOT defines transportation safety culture as the shared values and beliefs of a group of people that influences behaviors that impact transportation safety.[2]

Transportation safety culture recognizes that different outcomes (i.e., safer consequences as reflected in fewer fatalities and serious injuries) require changes in behavior. Changing behavior requires shifting beliefs (see callout below: Beliefs Influence Behaviors). Thus, growing transportation safety culture involves growing foundational beliefs supportive of safer behaviors that improve consequences.

Beliefs Influence Behaviors

Decades of research has established that beliefs influence behaviors. Beliefs like:

- perception of risk (e.g., driving impaired increases the likelihood of crashing)
- what others expect (e.g., a young driver's understanding of what is acceptable to their parent or a worker's understanding of their supervisor's expectations)
- what is in our control (e.g., "I am comfortable asking someone else to use a seat belt.")

all have been shown to influence behavior.

This holds for driver behaviors (e.g., speeding) as well as behaviors by others involved in building a safe system such as planners, engineers, construction workers, law enforcement, leaders, elected officials.

Furthermore, this research has been used to develop interventions (e.g., training, coaching, rules/policies, media, countermeasures) to shift beliefs resulting in changes in behavior.

For example:

- Training on best practices to reduce potential conflicts at intersections grows the knowledge and skills engineers need to design safer intersections thus resulting in new behaviors by engineers.
- High visibility enforcement (HVE) supported by universal media increases the perception among drivers that they may be caught if they violate driving laws thus decreasing risky driving behaviors.
- Establishing family rules about always using a seat belt, never driving distracted or impaired, and following speed limits grows an understanding of what is acceptable and unacceptable thus increasing safer behaviors and decreasing risky behaviors.

Implementing the strategies described in this document requires growing beliefs supportive of various actions among many stakeholders. Collectively, these shared beliefs describe the transportation safety culture.

Beliefs

Transportation Safety Culture - shared values and beliefs of a group of people that influence behaviors that impact transportation safety.

↓

Behavior

↓

Consequences

2 Adapted from National Academies of Sciences, Engineering, and Medicine. (2018). A Strategic Approach to Transforming Traffic Safety Culture to Reduce Deaths and Injuries. Retrieved from: https://nap.nationalacademies.org/catalog/25286/a-strategic-approach-to-transforming-traffic-safety-culture-to-reduce-deaths-and-injuries

A strong transportation safety culture embraces and champions safety at all levels including elected officials, state and local transportation related agencies, public and private organizations, and the general public. Laws (and their enforcement), policies and practices in both public agencies and private organizations, and behaviors by the public all impact safety consequences.

Because of the variety and number of stakeholders involved in improving transportation safety, the task of growing transportation safety culture can seem overwhelming. However, it can be broken down by group (e.g., elected officials, agency/organization leaders, transportation planners, engineers, law enforcement, schools, families, individuals) and by behavior. For example, Table 5-1 summarizes examples of supportive safety culture to foster the High-Impact Focus Area strategies identified in this plan (along with associated outcomes and safety consequences). For more details on High-Impact Focus Areas, see Chapter 10.

Table 5-1: High-Impact Focus Area Strategies, Examples of Supportive Culture, Outcomes, and Consequences

Strategy	Examples of Supportive Culture	Examples of Outcomes	Consequences

 **Intersections**
» Reduce intersection conflicts.
» Perform Intersection Control Evaluations.
» Incorporate Vulnerable Road Users (VRUs) designs.
» Address high-risk locations.
» Improve traffic controls.
	» Prioritization of safety.
	» Knowledge about best practices.
	  » To reduce intersection conflicts.
	  » VRU designs.
	  » Traffic controls.
	» Shared expectations about using best practices.
		» Intersections that reduce the likelihood of high-energy and side impact crashes.
		» More separation in space and time of VRUs and vehicles.
			» Reduction in intersection-related fatal and serious injury crashes.

 **Off-system** » Local agency assistance. » Community-specific safety plans.	» Greater shared responsibility for safety. » Prioritization of safety. » Knowledge and skills in using proven countermeasures. » Knowledge and skills to complete safety plans.	» More local agencies using proven countermeasures. » More local agencies prioritizing safety in planning/design/build/maintenance phases.	» Reduction in fatal and serious injury crashes on off-system roads.
 **Impairment** » Polydrug impairment education. » High-visibility enforcement (HVE). » Address high-risk corridors.	» Greater shared responsibility for safety. » Knowledge about polydrug impairment among key stakeholders and partners. » Willingness, knowledge, and skills among law enforcement agencies and judicial systems to conduct HVE and adjudication.	» Increased knowledge about polydrug use and crash risk among public. » Increased perception of getting caught for DUI. » Fewer impairment-related crashes on corridors with high historical levels.	» Reduction in driving under the influence of multiple substances. » Reduction in impairment-related fatal and serious injury crashes.
 **Lane Departures** » Install traffic controls and safety barriers. » Improve roadway geometry.	» Prioritization of safety. » Knowledge and skills in traffic controls, safety barriers, and roadway geometry. » Shared expectations about using best practices.	» More miles of roadways with controls and safety barriers. » Fewer high-risk locations for lane departure due to roadway geometry.	» Reduction in run-off-the-road fatal and serious injury crashes.
 **Occupant Protection** » Media campaigns regarding proper use. » Education regarding a primary seat belt law.	» Knowledge about occupant protection and primary seat belt law among stakeholders and partners.	» Increase in beliefs supportive of always wearing a seat belt. » Increase in seat belt use. » More understanding of the benefits of a primary seat belt law.	» Reduction in unrestrained occupants killed or seriously injured in crashes.
 **Motorcycles** » Motorcyclist safety training. » Licensing and endorsement. » Increase helmet use.	» Knowledge and skills on best-practices for motorcyclist safety training. » Beliefs among motorcyclists of benefits of always using a helmet.	» Increase in safety skills and knowledge among motorcyclists. » Increase in motorcycle endorsements. » More motorcyclists always using a helmet.	» Reduction in fatal and serious injury crashes involving motorcyclists.

Colorado's Current Transportation Safety Culture

Transportation safety culture is challenging to measure because it involves people's values and beliefs. One way that Colorado monitors transportation safety culture among the public is through self-report surveys.

Since 2016, the Colorado Department of Transportation (CDOT) conducts an annual Driver Behavior Survey. This survey asks a representative sample of adult drivers in Colorado about their beliefs and self-reported behaviors regarding a variety of issues including seat belt use, speeding, distracted driving, impaired driving, motorcycle safety, and pedestrian safety. Observational data on seat belt use, distracted driving, and speeding provide additional understanding of road user behavior.

Concern of getting caught for violating traffic laws may reduce risky driving behaviors. Countermeasures such as high visibility enforcement seek to grow the perception of getting caught as a way to reduce risky driving behavior. Table 5-2 summarizes perceptions of getting caught from 2021 to 2024 gathered from the Driver Behavior Survey. The results indicate a decreasing trend for both lower- and higher-speed roads. For instance, the proportion of respondents with a perception of getting caught for speeding on a 65 mph road decreased from 53% in 2021 to 41% in 2024.

Table 5-2: Perception of Getting Caught

Very Likely or Somewhat Likely to get a ticket / DUI	2021	2022	2023	2024
Not using a seat belt at all over the next 6 months	50%	39%	40%	42%
Driving consistently over the speed limit on a local road where the speed limit is 30 mph	63%	59%	55%	58%
Driving consistently over the speed limit on a road where the speed limit is 65 mph	53%	42%	45%	41%
Drinking alcohol and the amount of alcohol in their body was more than what the law allows for drivers	72%	70%	68%	72%
Using cannabis and the amount of marijuana in their body was more than what the law allows for drivers	59%	54%	58%	59%

Source: CO Driver Behavior Survey: 2021 n=527, 2022 n=843, 2023 n=929, 2024 n=935

Another belief that may reduce risky driving is an individual's beliefs about how safe or dangerous the behavior is. Table 5-3 shows the percentage of Colorado adult drivers who strongly agree that they can drive safely under the influence of impairing substances (agreement with these statements potentially increases the likelihood of engaging in impaired driving). Unfortunately, the percentage has increased for those who believe they can safely drive under the influence of marijuana (from 9% in 2021 to 12% in 2024). On a positive note, the percentages have decreased for those who believe they can safely drive under the influence of alcohol (from 15% in 2021 to 9% in 2024) and prescription medications (from 16% in 2021 to 11% in 2024).

Table 5-3: Perception of Risk

Agree (Strongly or Somewhat)	2021	2022	2023	2024
"I can safely drive under the influence of alcohol"	15%	9%	9%	9%
"I can safely drive under the influence of marijuana"	9%	14%	11%	12%
"I can safely drive after using certain prescription medications (other than marijuana)"	16%	11%	8%	11%

Source: CO Driver Behavior Survey: 2021 n=527, 2022 n=843, 2023 n=929, 2024 n=935

Additionally, CDPHE conducts a biannual Healthy Kids Survey (https://cdphe.colorado.gov/hkcs) of high school students across Colorado. This survey measures self-reported behaviors such as texting while driving and impaired driving (Table 5-4) as well as related behaviors such as underage drinking and cannabis use (Table 5-5) which are associated with impaired driving. It also assesses beliefs predictive of risk (e.g., perception of harm) and protection (e.g., healthy expectations of important others such as parents).

Data reveal that self-reported traffic safety behaviors have remained stable or improved over the past decade, but that recent results indicate setbacks in driving while impaired (alcohol or cannabis) as well as texting while driving.

Table 5-4: Traffic Safety Behaviors Among Colorado High School Students

High School Student Behaviors	2013	2015	2017	2019	2021	2023
Usually or always used a seat belt	94%	93%	95%	95%	96%	96%
Driving under the influence of alcohol in the past 30 days (among students who drive)	8%	7%	6%	6%	4%	7%
Driving under the influence of cannabis in the past 30 days (among students who drive)	11%	10%	9%	11%	6%	7%
Texted or emailed while driving in the past 30 days (among students who drive)	36%	36%	36%	37%	32%	33%
Rode with a driver in the past 30 day who had been drinking alcohol	18%	16%	15%	16%	13%	NA
Rode with a driver in the past 30 day who had been using cannabis	20%	20%	19%	19%	12%	NA

Source: Healthy Kids Colorado High School Survey (https://cdphe.colorado.gov/hkcs)

Table 5-5: Substance Use Behaviors Among Colorado High School Students

High School Student Behaviors	2013	2015	2017	2019	2021	2023
30-day use of alcohol	31%	30%	29%	30%	24%	20%
Binge drinking (4/5 drinks in 2 hours)	17%	17%	16%	14%	13%	12%
30-day use of cannabis	20%	21%	19%	21%	13%	13%

Source: Healthy Kids Colorado High School Survey (https://cdphe.colorado.gov/hkcs)

These surveys provide greater understanding of Colorado's Transportation Safety Culture. Because these surveys are performed annually or biannually, they provide a way of assessing changes over time, identifying trends early, and evaluating potential effects of countermeasures.

Focus Areas

The Safety Culture Emphasis Area includes eight strategies in two Focus Areas: organizational and public. These two Focus Areas were selected based on stakeholder input, their potential to achieve improvement, and their potential impact on safety consequences.

Unlike other Emphasis Areas, the Safety Culture Focus Areas do not include Transportation Disadvantaged Index (TDI) maps nor specific crash reduction goals. Rather, the Safety Culture Emphasis Area contributes to the strategies (and their associated goals) included in each of the other Emphasis Areas.

Organizational Safety Culture

Strategies in this plan will be implemented by organizations at the state and local level. Therefore, successful implementation requires growing knowledge about this plan (and how organizations can contribute to strategies) and growing organizational safety culture. Organizations with strong safety cultures proactively elevate the importance of transportation safety by integrating safety into every aspect of programming and projects. For transportation-related organizations, safety is prioritized in the planning, scoping, design, construction, and maintenance of all projects and is a part of everyone's role regardless of job title. A key component is strong support from leaders, managers, and supervisors. Executive leadership must establish expectations prioritizing safety and hold those under them accountable to these expectations. Organizational leaders must translate safety into policies, practices, and every day behaviors and hold all staff accountable to these expectations.

Organizational Strategies

The strategies in this section focus on growing organizational safety culture by conducting assessments, building capacity among organizations, and fostering ongoing sharing of trends, best practices, and innovations.

SC1: Conduct organizational safety culture assessments

Build traffic safety culture at the community level by growing traffic safety culture within influential organizations.

Adoption of the strategies in this plan requires a strong safety culture among various organizations (transportation and non-transportation related). This strategy aims to grow safety culture among organizations by using an assessment to identify gaps and opportunities for improvement. Organizational safety culture assessments identify gaps in areas such as leadership, policy, training, and employee engagement and motivate improvement. Assessments provide organizations with concrete steps they can take to improve their safety culture and increase use of best practices to improve transportation safety. The Federal Highway Administration (FHWA) Organizational Safety Culture Self-Assessment Toolkit helps organizations adopt best practices to enhance safety, particularly in transportation-related activities.

SC2: Support local agency programs (LTAP and Safety Circuit Rider)

Continue to support the Local Technical Assistance Program (LTAP) and Safety Circuit Rider in their efforts to assist local agencies.

A significant portion of fatal and serious injury crashes occur on off-system roads. The Colorado LTAP provides a wide range of support to local agencies while the Colorado Safety Circuit Rider's mission is to provide safety-related technical assistance to local agencies developing infrastructure safety improvement projects located off the state highway system. The LTAP and Safety Circuit Rider will facilitate growth of safety culture among organizations by supporting local safety assessments and improvement plans; fostering improved communication and collaboration among local, regional, and state partners; and growing the skills and knowledge of staff by providing training and technical assistance to support the adoption of best practices and access to federal and state resources.

The Safety Circuit Rider's mission is to work hand-in-hand, boots on the ground, with local agencies to identify, diagnose, and treat safety deficiencies on the local roadway system. Safety on locally maintained ("off-system") roads is a significant issue statewide, and many local agencies lack the resources or technical expertise to perform this work without outside assistance.

Figure 5-1: CDOT's Safety Circuit Rider Program Supports Local Agencies and Colorado's Rural Areas. Source: CDOT

SC3: Expand public engagement

By providing training and technical assistance, build the capacity of organizations to successfully engage the public in two-way, productive conversations to grow shared understanding and responsibility.

Both roadway owners (e.g., state and local governments) and roadway users have a shared responsibility to improve transportation safety. Roadway owners are responsible for planning, design, education, and maintenance while users are responsible for the decisions they make using the system along with their engagement and support in its funding and design. Adopting shared responsibility is often inhibited by the separation between those impacting changes to the transportation system (owners) and those impacted by changes to the transportation system (users). Oftentimes, engaging in transportation planning and engineering conversations has required users to participate in limited ways (e.g., public meetings) and know certain terms/language and relevant data, excluding important community stakeholders from conversations about local safety concerns and projects. This strategy aims to build the capacity of organizations to successfully engage the public in two-way, productive conversations resulting in greater shared understanding and responsibility.

SC4: Consider communities with below average safety outcomes when making transportation safety investment decisions

Increase investment in communities with below average safety outcomes to reduce safety disparities by increasing awareness of community transportation safety needs and providing support to local agencies and organizations.

This strategy aims to address safety disparities in communities disproportionately impacted by traffic safety challenges by increasing investment and building a network of support for local agencies. It focuses on improving the skills of local agencies to procure funding and enhance infrastructure and safety programming for communities including but not limited to Vulnerable Road Users (VRUs), young and aging drivers, and other transportation system users as defined in Section 24-4-109 of the Colorado Revised Statutes.

SC5: Enhance collaboration and information sharing among traffic safety professionals

Continue annual Colorado Traffic Safety Summits to engage, educate, and inspire Colorado transportation professionals from a wide variety of organizations to be safety champions and advance traffic safety culture in their organizations and communities.

The Colorado Traffic Safety Summit is an annual event to engage, educate, and inspire Colorado transportation professionals from a wide variety of organizations to be safety champions and advance traffic safety culture in their organizations and communities. The Summit offers an opportunity for law enforcement, engineering, planning, education, public health, advocacy, emergency response, healthcare professionals and others to share recent trends, best practices, and innovative emerging approaches to improve transportation safety. The Summit grows shared knowledge, skills, and beliefs (i.e., transportation safety culture) supportive of this plan's strategies.

Public Safety Culture

Communities with a strong safety culture have a shared understanding of their responsibility to be safe roadway users including understanding the risks and benefits associated with transportation decisions, choosing to make safe choices while navigating the transportation network. For instance, drivers and passengers in these communities are more likely to wear seat belts, use child safety seats, or wear helmets while operating a motorcycle. They recognize that their own driving behaviors can negatively impact others and choose to obey traffic laws, slow down at work zones, drive the speed limit, reduce distractions, and never drive impaired. They also support efforts within their community to improve transportation safety and create expectations within their families, neighborhoods, and workplaces that promote transportation safety.

Public Strategies

SC6: Pilot community-level safety culture partnerships

Utilize community-level pilot projects to learn and demonstrate effective safety practices.

Behaviors related to engineering, post-crash care, law enforcement, and driving behaviors (e.g., impairment, speeding, distraction, seat belt use) have significant impact on fatal and serious injury crashes. Often, these behaviors can be most impacted at the community level. Somewhat new to transportation safety approaches, public health often uses community-level pilot projects to learn and demonstrate effective practices. These pilot projects may use different models (e.g., risk and protective factor models) engaging broad-based coalitions that address factors across the social environment (e.g., policy, law enforcement, funding, organizations, healthcare, schools, families, individuals) to improve safety. This strategy aims to improve transportation safety by partnering with public health on one or more pilot projects to grow traffic safety culture at the community level. Learning and demonstrating what's possible with a locally focused, public health project enables much broader and more effective programming in the future to reach more communities across Colorado.

Locally-Based Transportation Projects

Public health has used locally-based projects for over two decades to address issues such as substance use among youth, mental health, violence, suicide, obesity, and cardiac health. These approaches typically form local coalitions with stakeholders representing a variety of sectors including schools, workplaces, law enforcement, non-profits, elected officials, media, and healthcare. These coalitions gather data about local consequences, behaviors, beliefs, and contextual factors (like alcohol outlet density or availability of healthy food). The data are used to identify risk and protective factors. Best practices to reduce risk factors and increase protective factors that are appropriate for the community are selected (from published research) and implemented. Implementation is monitored to assure fidelity to the way the practices were designed, and evaluations are used to track progress and assess outcomes. Over time, the process is repeated. Lessons learned are gathered and shared with other communities to facilitate replication.

Figure 5-2: Bike to Work Day Rider Appreciation Station. Source CDOT

SC7: Educate through media campaigns

Create and distribute universal education using media campaigns and resources.

Educating the public about safe transportation practices, laws, risks, and benefits can be an effective way to grow transportation safety culture. This strategy develops, distributes, and promotes educational videos, stories, and information on a range of transportation safety topics including recently adopted laws, driver behavior, occupant protection, winter weather driving, and VRUs. This strategy includes partnering with new stakeholders and utilizes social media, billboards, videos, and school-focused materials.

SC8: Build capacity among the public

Expand on existing public engagement programming to build the capacity of the public to encourage two-way, productive conversations between everyday road users and government agencies by educating the public about ways to share concerns, transportation safety, and their role in growing a safer system.

Improving transportation safety culture includes growing shared responsibility among transportation system owners and users, reflecting both the importance of safety in system design and the behavior of users. However, many transportation system users may not know how, have the right level of knowledge or language, or be comfortable sharing concerns or engaging in conversations. This strategy aims to expand on existing public engagement programming to build the capacity of the public to encourage two-way, productive conversations between everyday transportation users and government agencies by educating the public about ways to share concerns, transportation safety, and their role in growing a safer system.