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Serious Crash Study

FATAL & SERIOUS INJURY CRASHES
DATA & DRIVER BEHAVIOR TRENDS

May 2024

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Introduction & Approach

The COVID-19 pandemic marked the onset of significant change throughout both the United States and the rest of the world. Every part of society was impacted, including healthcare, education, the workforce, and even our behaviors. Perhaps one of the most intriguing changes was seen within our transportation systems, where in the United States overall vehicle miles traveled (VMT) decreased by 11% in 2020, but traffic fatalities, and in several cases serious injury crashes, increased. Despite there being fewer drivers on the roads, some factor or set of factors impacting driver behavior contributed to an increase in these numbers.

In 2023, transportation staff at the Pikes Peak Area Council of Governments (PPACG) similarly recognized higher crash severity, potentially attributable to a generally unexplained shift in driver behavior. These trends were not returning to pre-pandemic levels and staff began to consider whether this might represent a potential long-term shift in driver habits. Furthermore, the charge was made to investigate if these changes associated with the pandemic period exerted a greater influence on traffic safety than other trends that pre-date the pandemic.

The factors currently impacting traffic safety may be unique and it's possible that traditional approaches will be less effective in dealing with them. Given the apparent differences from previous changes in serious crash trends, this study was commissioned to help define the persistent changes, target potential countermeasures, maximize investments, and capitalize on opportunities to address this growing problem.

The study utilized the following key questions as goals to guide research and recommendations:

1. What changes in drivers' risk-taking behavior have persisted since the pandemic?
2. Which changes are propelling the largest increases in serious crashes?
3. Are the increases in risky behavior during and after the pandemic/lockdowns similar in nature to increases occasionally seen before the pandemic?
4. To what extent have they been explained?

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5. Do the changes in the Pikes Peak Region reflect changes on the national and state level, or how do they potentially differ and to what degree?
6. Theoretically, are pre-pandemic countermeasures likely to be effective in the Pikes Peak Region if increased, or is some other approach needed?
7. If the new trends are different from previous trends that might appear outwardly similar, what kinds of countermeasures or messaging should theoretically be used that take into account the underlying differences?

The result of this study is not conclusive answers to every one of these questions, as data and other supporting information regarding this phenomenon are still being collected and evaluated. Rather, the study served as an opportunity to review and assess the scope of understanding that currently exists surrounding this issue and provide educated recommendations for strategies that could be piloted or employed moving forward. It may be years before the impact of the pandemic on traffic safety and changes during this period are fully understood, but strategic and educated choices can be made now to address these trends in the meantime.

To address these questions, the study team implemented a hybrid methodology approach that married a review of existing studies, reports, and reliable sources with stakeholder/expert interviews and data collection. The team organized the study into four phases: 1 – Literature & Scoping Review, 2 – Stakeholder & Expert Interviews, 3 – Public Survey Analysis, and 4 - Development of Recommendations & Countermeasures. The results of these four phases were combined and refined to produce this report and the recommendations contained within.

The study team convened to discuss findings from the scoping review, address pending questions, and prioritize areas of focus based on what initial research showed to be worth investigating further. One key question that arose was consideration of a pandemic timeline to better define pre- and post- pandemic time periods for the purposes of this study. While the study team agreed there might be multiple answers to this question, it was agreed that generally the start was 2020, keeping in mind that changes in behavior would take some time after the onset of the pandemic to appear. The post-pandemic period was generally defined as beginning in May 2021 when the CDC changed its guidance on social distancing, stating that fully vaccinated persons did not generally need to wear masks or stay six feet from others. The group also discussed the lag in data to support a full analysis of traffic safety trends, with most data at the time only going through 2021.



Phase 1 – Literature & Scoping Review

Results of the Literature and Scoping Review were naturally limited by the budget allocated for this study and resources available. The study team took a targeted approach in the search for sources, focusing on the most readily available information to support the study questions. The review is therefore not comprehensive in nature but provides a substantial base from which to document the current understanding and frame discussions for other phases of the study.

The scoping review in Phase 1 included an assessment of over 30 different reports, articles, and videos sourced through a query focused on key words and topics associated with the study questions. Sources were reviewed from federal agencies such as the United States Department of Transportation (USDOT) and transportation organizations such as the American Automobile Association Foundation for Traffic Safety (AAA). To widen the reach of our search to include behavioral and other relevant insights, sources were also gathered from organizations such as the American Psychological Association (APA), the National Center for Biotechnology Information (NCBI), and various news media sources. These sources were combined with available crash data to paint a picture of traffic safety locally and nationally as it relates to this study. At the inception of the study, several sources were limited by the amount of data and prior analysis completed at that time, due to how recently the pandemic had occurred. Some pieces of lagging data have been released since and are included here to the extent possible, but there are still gaps to fill when it comes to understanding traffic safety trends and driver behavior over the last few years.

What the Data Tells Us

Data from the Colorado Department of Transportation Crash Data Dashboard were reviewed to get a baseline understanding of crash trends, including those with fatalities or serious injuries, in the years prior to, during, and following the pandemic. Not surprisingly, the data shows that the number of total crashes in the PPACG region and throughout the state was gradually increasing through the year 2019, when in 2020 it took a sharp downward turn by 31% and 29% respectively. In the years following, the number of crashes increased in both the region and the state but did not quite return to pre-pandemic levels. In fact, the peak number of annual crashes recorded since 2020 represents only 91% of 2019 levels in the region and 80% of 2019 levels in the state (see Figures 1 and 2) (Colorado Department of Transportation, 2024). Additionally, during the pandemic years, there was a sharp drop in Daily Vehicle Miles Traveled (DVMT) in both the PPACG region and in the state in 2020. This is not an anomaly, as the pandemic lockdown kept most people at home and not driving at the rates pre- and post-pandemic. DVMT rates started climbing back to pre-pandemic rates starting in 2021.

While this slow growth trend may appear promising for crashes overall, serious injury and fatal crash numbers are following a different trend. Beginning in 2020, serious injury and fatal crashes increased rather than mirroring the decrease in total crashes overall. In the PPACG region, serious injury and fatal crashes combined increased by more than four% between 2019 and 2020 (see Figure 3). The increase was starker for fatal crashes alone with that number individually increasing by more than 14% in the same time period. The state overall saw an increase as well, but more so between the years of 2020 and 2021 where serious injury and fatal crashes increased by 26% (biased partially by the sudden eight% decrease in 2020). However,

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2021's levels also represented a 16% increase from 2019. The year 2022 represented a peak in fatal crash numbers for the last ten years at both the regional and the state level despite total crashes remaining 15 to 20% below pre-pandemic levels respectively. More recently serious injury and fatal crash numbers decreased in 2023, but they still represent a greater percentage of total crashes than they did prior to the pandemic (see Figures 4 and 5) (Colorado Department of Transportation, 2024).

According to data available through the National Highway Traffic Safety Administration (NHTSA) Fatality Analysis Reporting System, fatal crashes and associated fatalities increased at the national level as well beginning in 2020. Whereas fatal crashes decreased nationally in 2019, they increased by seven% year over year in 2020 and almost 10% year over year in 2021. National levels of crashes resulting in an injury actually decreased by 16% in 2020 and as of 2021 had not returned to pre-pandemic levels, representing a contrast with crash severity levels in Colorado and the PPACG region (National Center for Statistics and Analysis, 2023).

The data also provide some interesting insights into the types of behavior driving these trends. According to Colorado DOT's statewide crash summary, the top three driver actions cited in crashes in the PPACG region and the state between 2019 and 2023 (excluding those categorized as "No Contributing Action") were "Careless Driving," "Failure to Yield," and "Following too Closely." In terms of contributing factors (excluding those categorized as "No Contributing Factor" or "Other Factor"), "Distracted," "DUI, DWAI, DUID," and "Driver Inexperience" were the top factors listed for both the region and the state in 2019 and 2020. Starting in 2021 however, "Aggressive Driving" and "Looked/Did Not See" replaced "DUI, DWAI, DUID" and "Distracted" as top contributing factors (Colorado Department of Transportation, 2024).

Figure 1

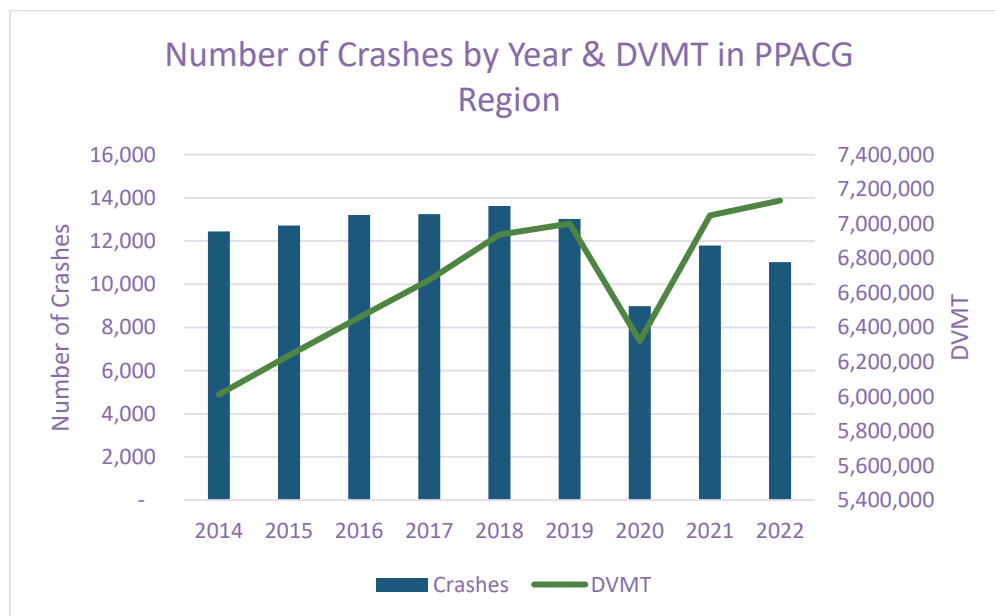


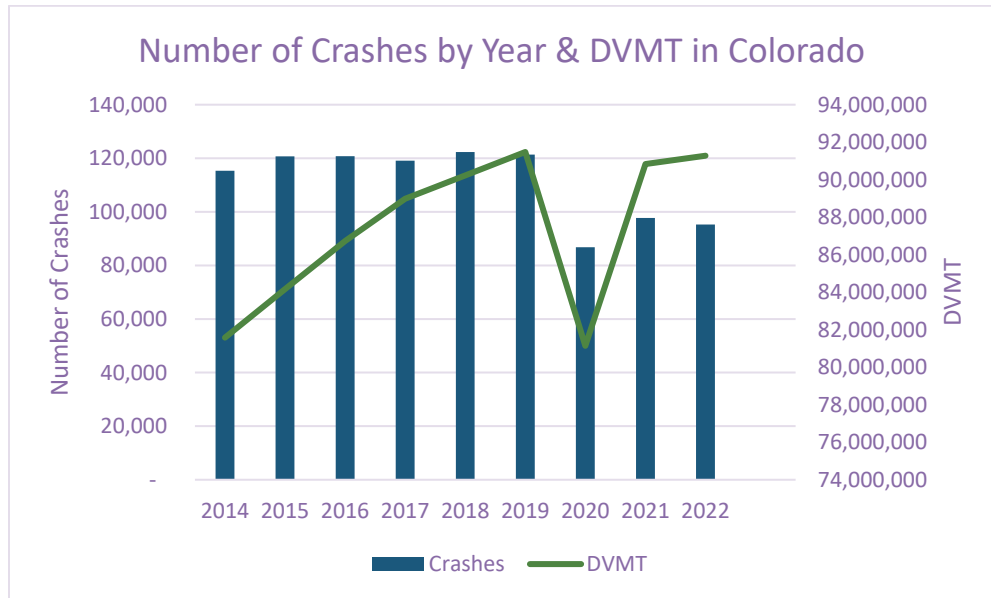
Figure 2

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Source: (Colorado Department of Transportation, 2024)

Figure 3

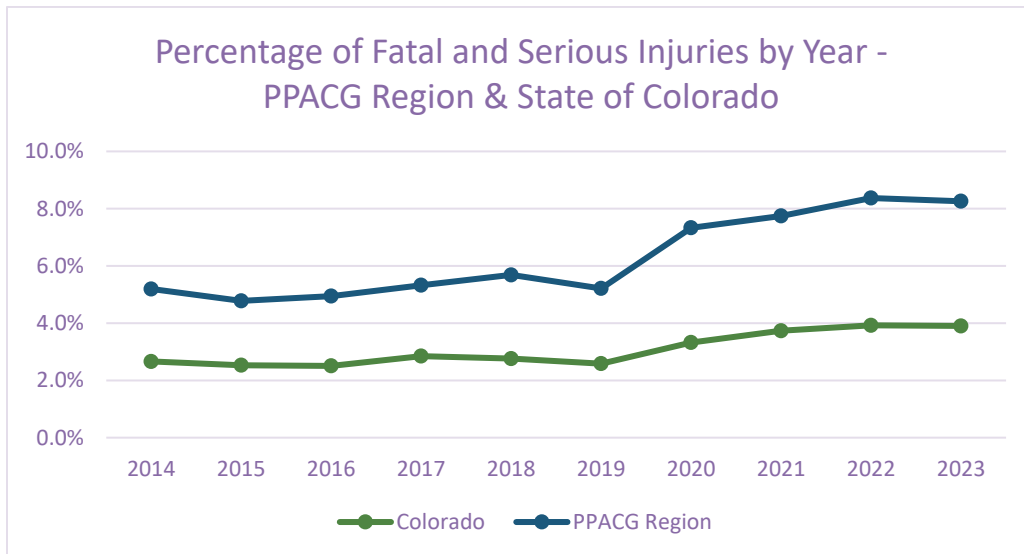


Figure 4

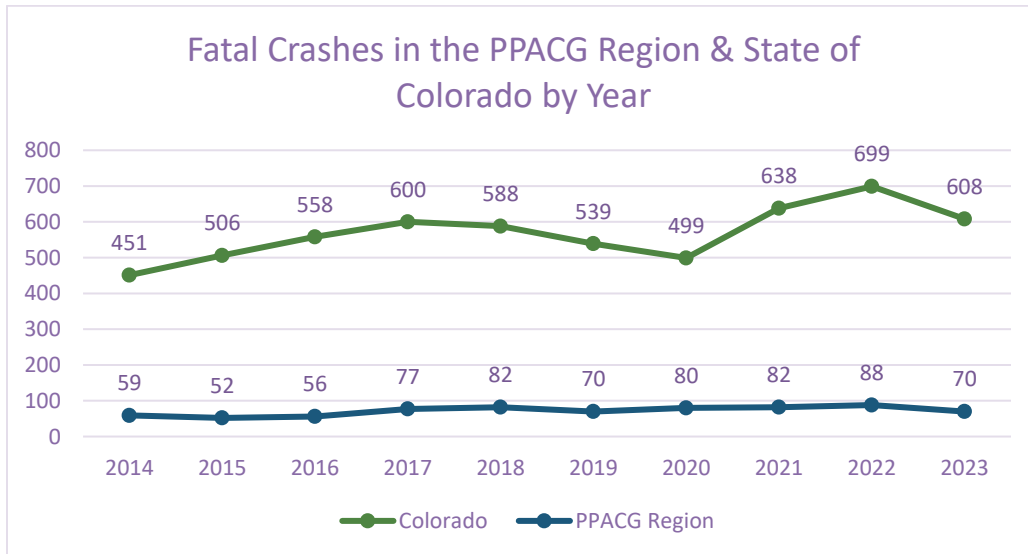
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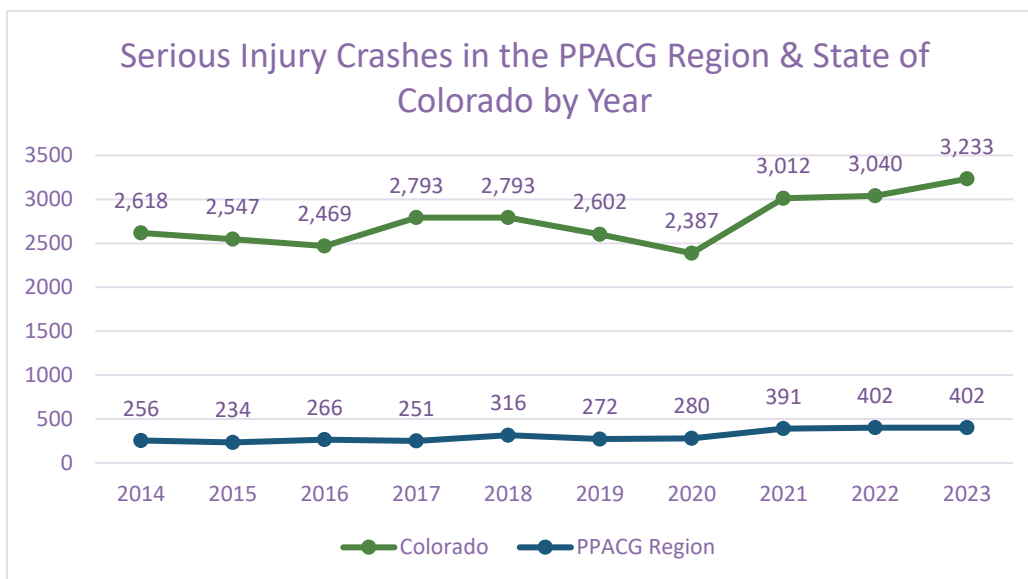
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Source: (Colorado Department of Transportation, 2024)

Figure 5



Source: (Colorado Department of Transportation, 2024)

Mirroring the drop of driving under the influence of drugs or alcohol from the top three contributing factors in 2021 and 2022, crashes attributed to DUI, at both the regional and the state levels, have generally been in decline beginning in 2020. Conversely, crashes where alcohol or drugs were suspected (but not classified as DUI) generally rose between 2019 and 2021, only beginning to trend back down again starting in 2022. Even with that recent downward trend, levels for both of those categories in 2023 were still higher than 2019 levels. Available data on non-motorist serious injuries and fatalities is generally unremarkable, sometimes varying greatly from year to year. The levels for both the region and the state did slightly begin to trend

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upward in 2021 and 2022 but were not out of the expected range based on the last 10 years of data (Colorado Department of Transportation, 2024).

NHTSA indicates that 39,007 people died in crashes on U.S. roads in 2020 and 42,939 in 2021. This represents the largest number of people killed in crashes on U.S. roads in any year since 2007 (National Center for Statistics and Analysis, 2023). Various possible explanations for this increase have been put forth, including increases in speeding made possible by reduced traffic congestion, reduced traffic law enforcement (Governors Highway Safety Association, 2020), and increases in use of impairing substances by drivers (Tefft B. C., Anorve, Kim, & Kelley-Baker, 2021). Overall, the number of traffic fatalities in 2020 was 2,387 (7.1%) more than expected based on pre-pandemic trends. During the eight-month period between May and December 2020, the number of traffic fatalities was 3,083 (12.1%) more than expected (Tefft & Wang, 2022).

Driver Behavior

Persistent changes in drivers' risk-taking behavior since the pandemic include speeding, alcohol use, distracted driving, unbelted driving, fatigue (all of these issues were occurring before the pandemic but have worsened) in addition to mental health concerns, increased stress, changes in peak hour times, lack of law enforcement, and license validity. It appears that the pre-pandemic issues such as speeding and driving under the influence are still responsible for many serious crashes, but they increased more rapidly during the pandemic. It's worth considering if issues created by COVID-19 (e.g., increased stress) may have influenced the commonality of speeding and driver aggression, among other factors.

Populations that were already more likely to show risky behavior were more present on the roads during the pandemic. People who reduced their driving the most during the lockdown phase of the pandemic were disproportionately middle-age and female, a relatively safe group of drivers. The 4% of drivers who started driving more during this period were largely young and male, the demographic statistically most likely to engage in risky driving behavior (Pappas, 2022). While most highly motorized countries in the world experienced fewer fatalities on their roads during the first year of the COVID-19 pandemic than in the recent past, the U.S. experienced significantly more, despite a substantial reduction in total driving (Tefft & Wang, 2022). Drivers overestimate how much time they'll save by speeding and grossly underestimate the increased crash risk at higher speeds. They also underestimate how long it takes to stop at high speeds. Researchers discovered that they could reduce this bias by providing information about how far a car travels during the split second it takes a driver to react (Pappas, 2022).

Seat belt usage is by far one of the most heavily supported strategies for reducing injury and fatalities in crashes. Seat belt laws exist in every state, but there is considerable variation between what those requirements look like and who is impacted by them. Even though seat belt usage is observed to be very high during the day, usage decreases significantly at night. Those killed in nighttime crashes are more likely to not be using a seat belt. Children also suffer increased risk due to more complex requirements beyond just the act of restraining or not restraining them in the car. Those restraining them may have difficulty doing so or an overconfidence in their ability to do so correctly resulting in a high percentage of errors. Additionally, if a driver does not properly restrain themselves, they are less likely to properly restrain any child passengers (Kirley, et al., 2023).

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The most recent Traffic Safety Culture Index published by the AAA Foundation for Traffic Safety provides some interesting insights into risky driving behaviors causing traffic fatalities. This report, published annually, is based on survey data collected from a probability-based sampling panel representative of the United States population and looks to investigate the public perceptions, attitudes toward, and engagement in unsafe driving behaviors. The 2022 report showed that almost all drivers believe that distracted driving (specifically using a cell phone while driving) is dangerous, but up to 38% of drivers admit to engaging in that behavior anyway. While most drivers surveyed think that running a red light or driving aggressively is dangerous, they do not share the same sentiment when it comes to speeding. The responses regarding impaired driving are interesting. Driving after drinking alcohol is perceived as dangerous by almost all of the respondents while driving after using marijuana is considered dangerous by 70%. Even though there was a difference in opinion between drinking and driving and using marijuana, only 6-7% of respondents indicated they had engaged in drinking or using marijuana before driving in the last 30 days (AAA Foundation for Traffic Safety, 2023).

Patterns derived from respondents who reported risky driving behavior were used to identify six unique profiles. Most of the respondents fell into the Safe Drivers profile group and speeding drivers were considered the second largest.

Table 1 – Six unique driver profiles who engaged in risky driving behaviors.

Driver Group	% who Engaged	Driving Behavior
Safe Drivers	41.2%	Few engaged in any risky driving behavior.
Distracted Drivers	15.0%	Predominantly engaged in all distracted driving behaviors.
Speeding Drivers	22.7%	Predominately engaged in speeding behaviors.
Distracted and Aggressive Drivers	17.3%	Predominately engaged in both distracted driving and aggressive driving behaviors.
Impaired Drivers	1.3%	Predominately engaged in impaired driving (e.g. drunk driving).
Most Dangerous Drivers	2.4%	Engaged in all risky driving behaviors.

Source: AAA Foundation for Traffic Safety, 2023)

Additionally, the Distracted, Aggressive, and Most Dangerous Drivers groups were estimated to be approximately 40 years of age, while Safe, Speeding, and Impaired Drivers were approximately 53 years of age. Men were more likely to be Speeding and Most Dangerous Drivers, while women were more likely to be Safe Drivers. Impaired Drivers were more likely to have less education and live in non-metropolitan areas than the other profile groups (AAA Foundation for Traffic Safety, 2023).

Other Factors

Several topics were pulled from research observations and presented as categories of focus. These included speeding, impairment (alcohol or drugs), unbelted driving, enforcement, distracted driving, demographics, and mental health. Each of these factors was identified in the literature and available resources as being problematic, but there was still limited information to support how much of a persistent problem they stood to be in a post-pandemic period. Unbelted driving was a multi-faceted concern with restraints for both the driver and for child passengers being opportunities for error or risk. Some even posited that misinformation

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may be leading drivers to believe that injury could be higher with the use of a seatbelt, a completely unfounded claim. Unbelted driving was also related to suspicions about changes in driver attitudes surrounding rules, laws or policies. It was theorized that some drivers may have had fatigue from government directives during this time and may be responding with an aversion to even basic seat belt usage laws.

The varying levels of enforcement resources across the region were emphasized again and the propensity for elected law enforcement officials to avoid unpopular policies was also brought up for consideration. Distracted driving was categorized as extremely hard to measure compared to factors such as speeding or impairment, supported by the fact that many people are driving distracted and never get pulled over or are involved in a crash. This unfortunately makes measuring the incidence of distracted driving inconsistent. A focused investigation into law enforcement discovered that several issues such as morale, increased retirement and resignation rates, a focus on low-level crime citations, and the suspension of community outreach initiatives greatly impacted the efficacy of enforcement during the core part of the pandemic. Outside of serious offenses, the directive given to law enforcement was to release offenders on a citation versus taking them into custody. It was also revealed that local recruitment of law enforcement made have shifted to a less frequent schedule and counties with fewer resources may be limited in the number of officers available to patrol to begin with. While a part of the scoping review focused on mental health as a factor impacting behavior, it was mostly driver focused. Mental health concerns could have a similarly detrimental effect on law enforcement officers.

Driver demographics are a frequent topic throughout research on traffic safety, with the riskiest behavior mostly being attributed to certain gender or age groups traditionally more likely to be involved in a crash. However, the resources available for review on pandemic and post-pandemic trends did not indicate that one particular demographic was exhibiting the behavior resulting in the higher fatality and serious injury rates. Most people were behaving this way. However, when turned around in consideration of countermeasures to address the behavior, some groups of people would be extremely difficult to positively influence compared to others. Similarly, addressing this behavior is partially dependent on its context. For instance, are drivers consistently demonstrating this risky behavior, or is it tied to an external influence on their day? Mental health concerns are broad and a difficult attribution to make in the case of driver behavior. There are different understandings of what falls into the category of mental health, and measuring mental health's influence on a daily basis or specific situation is almost impossible. However, it can't be ignored that the pandemic exerted a sense of general lack of control on society and could very possibly have resulted in driving while emotional, diminished empathy and care for others on the road, and attitude shifts to what could be perceived as rudeness or selfishness.

The topics are seen as falling into three different categories: driver characteristics, driver influences, and driver actions. Connections can be drawn between topics that fall within one or more of the categories. For instance, an observed and documented driver action is speeding, but mental health, impairment, or a variety of other driver influences could be compelling that action. And different driver characteristics, demographics, geography (urban vs. rural), etc., have a similarly relevant context. Structuring the next phase of the project around these categories would make it easier to understand risk behaviors and countermeasures that would make a real impact.

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Several other observations and statements were made throughout the course of the workshop. Driver education was a priority topic, but not in absence of consistent enforcement. Additionally, learned behaviors take a long time to unlearn and may require significant time investment to address. Changes in society beyond the COVID-19 pandemic, such as “fake news,” the dehumanizing nature of automobiles, and general attitude shifts, are exerting real and parallel influences as well. Locally to the PPACG region, it was acknowledged that the ever-changing diversity of road users could also be at play. This group includes long-time residents, new residents from other areas or states, tourists generally unfamiliar with the area or driving culture, the large military population (more likely to be young males), and college students living in the area for a shorter timeframe and also less familiar with local driving culture.

A portion of the discussion was dedicated to brainstorming the potential audience for the final report and recommendations. Law enforcement, EMS, drivers and other road users, passengers, local or state messaging departments (CDOT, Drive Smart, etc.), governing bodies, and traffic engineers were all named as potential populations of focus for this final report and recommendations. The team also made a commitment to establishing contact with other organizations such as the AAA Foundation to determine their level of interest and existing knowledge on this topic. From this list, the study team developed a priority list of stakeholders or experts for conducting interviews in phase 2. The initial list included the Colorado State Patrol, the Colorado Springs Major Crash Team, Colorado Springs Police Department, local sheriffs in both rural and urban jurisdictions, representatives from each county as well as several municipalities, a psychology/social science expert at a local university or national research center, a representative from the insurance industry, the AAA foundation, military installations, and potentially any relevant connections from industry including the Transportation Research Board (TRB), Institute of Transportation Engineers (ITE), or the Texas Transportation Institute (TTI). Many of these groups were successfully contacted and interviewed. Additional detail on the interviews is included in the next section.

1. Serious injury and fatal crashes are on the rise since the start of the pandemic even though the VMT in the region dropped significantly. Post-pandemic serious injury and fatal crashes continued.
2. Speeding and aggressive driving were top contributors to crashes in the region.
3. Drivers’ risk-taking behavior increased during the pandemic but also continued to increase after the pandemic.

3 Things to
Remember



Phase 2 – Stakeholder & Expert Interviews

Phase 2 built on the knowledge gained in phase 1 with direct feedback from local stakeholders and industry experts. This combination of interviewees was selected to balance out the literature findings from phase 1 with expert knowledge and firsthand observations from those impacted by the topic at hand locally. Interviewees from a variety of organizations and areas of expertise were included, representing the state DOT, county and municipal governments, national research centers, the AAA Foundation for Traffic Safety, law enforcement, the major crash team, and insurance experts. The diversity of those interviewed allowed for a wide range of perspectives on what would prove to be a very complex issue.

Prior to scheduling and facilitating interviews, a guide was developed to provide some additional context on the study for stakeholders/experts and outline baseline questions for guiding the discussions. Not every question was relevant to every discussion and facilitators left room for additional questions and topics to arise naturally throughout the meetings. These questions mirror the original study questions covering topics such as trends observed and persisting, demographics, enforcement, comparison to pre-pandemic trends, comparison to state and national trends, confidence in current approaches, potential new countermeasures, and existing research/data/resources that could further support our efforts.

The results of the interviews generally reflect the complexity surrounding driver behavior and serious crashes gleaned in the first phase. The different perspectives represented meant that each interviewee provided feedback through their own lens often resulting in very different anecdotes from meeting to meeting. Despite this variation, several common themes emerged across the conversations bringing to light shared experiences, reaffirming several findings from phase 1, and filling in gaps where research and data may currently be lagging. It's also worth noting that the perspective of national experts and the perspective of local stakeholders varies widely when it comes to context for the issue's impact locally. For instance, areas of focus at the national level or approaches that work well in other states may not apply as easily in the Colorado Springs region. Careful consideration must be given to evaluating the feedback from these interviews with a local lens and using this information to develop a context-sensitive approach.

The comments and overall feedback from stakeholder and expert interviews were reviewed, combined, and organized into categories following the focus area structure developed at the end of phase 1. The categories include driver characteristics, driver influences, and driver actions. Additional categories were added for comments relating to countermeasures and questions that interviewees posed to the study team for consideration. The following sections summarize the apparent themes derived from the phase 2 conversations in each of those categories.

Driver Characteristics

While many find it easy to anecdotally point fingers at one particular group or another, the experts interviewed would not identify one particular group driving the changes in driver behavior, calling it an across-the-board phenomenon. The impact, while pervasive, was not seen as homogenous across the country and impacts varied depending on the context of the locale in question. One researcher framed the issue instead through propensity for risk. Some drivers are more at risk of crashing, and some are more at risk of dying. The propensity for these groups to overlap greatly impacts what the serious crash fatality rate could

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be in any given situation. These factors combine to elicit different levels of risk in different contexts. For instance, those more likely to be at risk of crashing may not necessarily be contributing to the high fatality rate as they may not also be at an elevated risk of dying in a crash. Despite this there were some trends in driver characteristics mentioned that could potentially be meaningful in understanding persistence in increased traffic fatalities better. Overall, younger males drove more during the pandemic. There was also an overrepresentation of teen drivers, underserved and marginalized communities, vulnerable users, and those living in rural areas (Tefft & Wang, 2022). Many of these driver characteristics are not necessarily new to the discussion of risky driver behavior but rather they were more highly represented during the general time period of the pandemic. Other populations such as seniors, military personnel, and out-of-town drivers were also named as potential sources of increased risk locally, but evidence to support these was light or anecdotal.

Driver Influences

One potential factor influencing drivers is the increase in multi-modal interactions. Alternative modes are being utilized more regularly and consequently placing more vulnerable users (pedestrians, bicyclists, and especially motorcyclists) on the roadway. Both anecdotal reports from the interviews and fatality data show that motorcyclists are generally behaving more dangerously and have limited experience. Many of the stakeholders noted a general change in driver attitude, leaning toward invincibility. With the availability of Personal Protective Equipment (PPE) and spare time, high risk drivers were more easily mobilized. Enforcers experienced challenges preventing and stopping bad driving behavior because of the rising impression among drivers that it's not a big deal. Many of these behaviors were enabled by a general lack of (or perceived lack of) constraint during the height of the pandemic and curbing those habits post-pandemic is difficult. For instance, when traffic volumes went down during the pandemic there was excess capacity on the roads and many of the remaining drivers adjusted to driving more quickly. They now want to maintain the speed and travel time they became accustomed to during the pandemic. Changes in law enforcement visibility, due to both social unrest and resource availability, certainly impacted the perceived freedom and invincibility felt by these drivers during the pandemic and afterward. Similarly, many courts were much more lenient during the pandemic, reducing the perceived and actual consequences for risky behavior further. Locally, stakeholders have noticed unprecedented growth in the number of out-of-town drivers. There are consequently more people on the road impacting congestion and travel time, however significant that may be. While public messaging campaigns are a common tactic implemented to promote safety, outreach capacity has been limited locally. Some areas don't have the same resources for large and effective media campaigns, limiting outreach to combat bad or risky behavior.

Driver Actions

When asked about persistent changes in driver behavior, stakeholders and experts provided a robust list of behavioral actions they've observed or perceive to be increasing during and post-pandemic. Many of these, such as speeding, aggressive driving, impaired driving (including both alcohol and drug impairment), distracted driving, and lack of seatbelt usage, align with findings from the review of literature in phase 1 indicating clear evidence of their persistence in many areas locally and nationally. Other behaviors, such as running red lights, unsafe passing, and failing to yield to traffic controls were also mentioned but are supported to a lesser degree. They may also interrelate with other behaviors such as distracted or aggressive

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driving, indicating the factors attributed to serious and fatal crashes may not always be black and white or mutually exclusive. Locally, at least one stakeholder also felt driver behavior has changed for the worse in and around buses and school zones or crosswalks, presenting an enhanced level of risk to youth bystanders. Both the insurance experts and law enforcement representatives indicated a trend in uninsured drivers or lack of proper licensing/registration to drive. While this may not directly enhance risk of serious or fatal crashes, it may be a precursor to other more serious behavioral actions. For instance, a driver more willing to drive without insurance or licensing, exclusive of other external factors, may be more willing to exhibit aggressive, impaired, or distracted driving behaviors as well.

Questions for Consideration

In each of the interviews, the study team asked interviewees to describe the type of info they would like to see from the study or, put another way, what they are most curious about. The responses to this question varied. Some want to see data or trends documented including how many drivers are back on the roadway, the changes in seatbelt usage, the urban/rural split, and in general what the numbers are telling us. Other questions are less straightforward, alluding to reasoning behind trends or explanations for human behavior. This includes why pedestrians or drivers have a sense of invincibility, the factors driving crashes (despite improvements in vehicle safety), behavior correlated with demographics (assuming there is a correlation), and what residents of the local area are saying about speeding. Several of the questions align well with the questions already guiding the study. Others are worth consideration but may not be fully answerable within the scope of this study.

Phase 2 Brainstorming Session

At the conclusion of phase 2, the study team reconvened to review results and summaries of the stakeholder/expert interviews. The intent behind this session was to develop an understanding of the information collected up to this point, document reactions to the feedback, and brainstorm approaches or countermeasures to be explored as part of phase 3. It's important to note that despite their perceived level of support with staff and the study team, countermeasures must be evaluated against the research findings from phase 1 and the stakeholder/expert feedback from phase 2 before being considered a viable recommendation that should be pursued. Following suit with previous study work, the session discussion was organized around the themes of driver characteristics, driver influences, and driver actions. At the conclusion of the meeting, several topics were prioritized by the groups as being favored for the next phase. These broadly included a public messaging campaign, outreach at schools and targeting emerging drivers, church outreach, dynamic messaging that makes the audience think it's their idea, encouraging friendly interactions between drivers, and different approaches to policing. Specific to the school and church outreach, the group suggested creating template materials for distribution at each group/school and allowing them to design and lead their own programming utilizing those resources.

The study team also developed three survey questions to be distributed to the local public as part of the PPACG Traffic Safety Media Campaign. These questions were designed to collect a small sample of data for use in the study. The multiple-choice questions, documented in Phase 3, focused on the motivations influencing driver speeding and aggression and potential strategies that could be effective in reducing excessive speeding or aggression in drivers.

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1. Stakeholders felt that there was a general change in driver attitude, a sense of invincibility as drivers had less traffic on roadways and coincident reduction in law enforcement presence.
2. Younger males are the population noted as driving more during the pandemic and participating in risky driving behavior. The safest driving demographic were the ones who reduced their driving the most.
3. Stakeholders felt that poor driver actions increased since the onset of the pandemic. Aggressive driving, speeding, impaired driving, distracted driving, and lack of seat belt have persisted in post-lockdown. These behaviors take time to correct and to unlearn. It's common for everyone to develop some bad habits behind the wheel, but consistently working to improve these behaviors is crucial for safety on roadways.

3 Things to
Remember

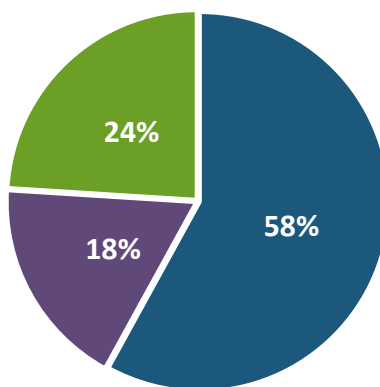


Phase 3 – Public Survey Analysis

Two sets of public survey questions were developed for this study. The initial multiple-choice survey was developed to accompany the PPACG Traffic Safety Media Campaign. This survey was intentionally short and targeted very specific topics that may be able to help inform the study team on public sentiment related to traffic safety and driver behavior at a superficial level. As previously mentioned, these questions mainly focused on driver motivation and strategies for addressing speeding and aggressive driving. PPACG received 2,555 responses over a two-month period. The results of these initial three questions are documented and discussed below.

PPACG Traffic Safety Media Campaign Initial Survey

Question 1 – What do you think motivates drivers to speed?



- They feel there is a lack of consequences.
- They haven't allowed enough time to get to their destination.
- They move with the flow of traffic and aren't aware they are speeding.

Responses regarding motivation for drivers to speed were pretty evenly split indicating there may not be one prevailing motivating factor. Perceived lack of consequences was a slightly more popular choice, but not enough to be truly significant. While this information is slightly helpful in affirming the answer choices presented, it does not necessarily get to the root of which factors may be more motivating than others.

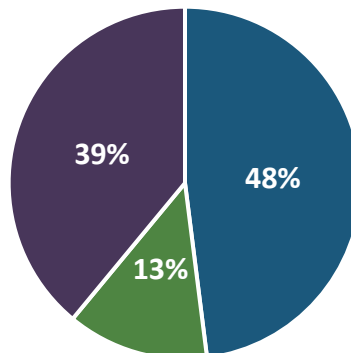
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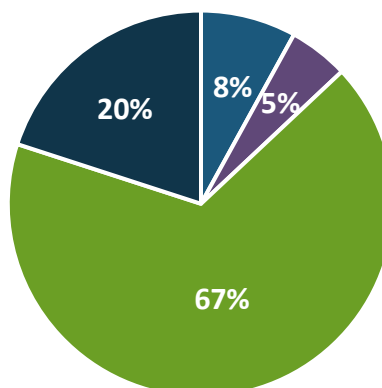
Question 2 – What do you think motivates drivers to drive aggressively?



- They are enabled by a sense of anonymity.
- They are overwhelmed by other issues.
- They feel a sense of competitiveness with other drivers.

Responses to the question on motivation to drive aggressively were certainly more revealing. The highest response was that they feel a sense of competitiveness with other drivers and drivers are enabled by a sense of anonymity.

Question 3 – Which strategies could be most effective in reducing excessive speeding and aggressive driving?



- Driver education/awareness.
- Outreach from people who influence drivers, such as their peers.
- Enforcement.
- Changes in roadway infrastructure or the driving experience.

A majority of the survey respondents feel that enforcement is the most effective strategy in reducing excessive speeding and aggressive driving.

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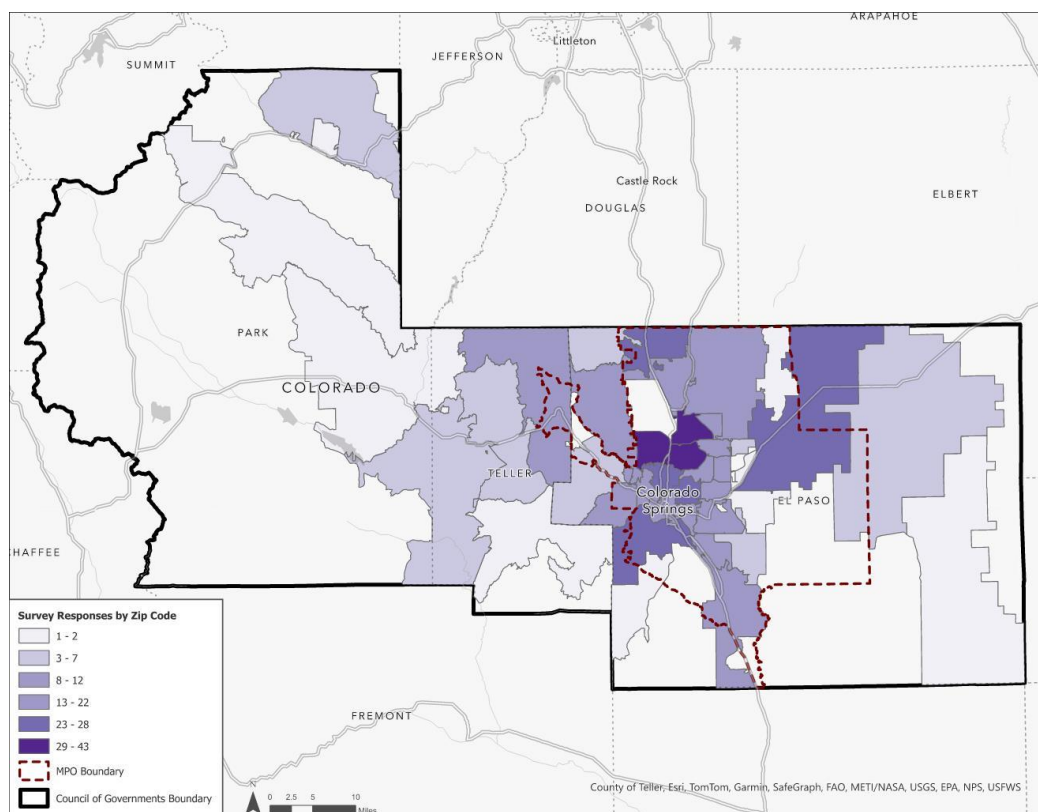
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Extended Survey Results

In January 2024, an extended survey was posted to the PPACG website for further analysis. These survey questions were derived from the initial three-question survey's results, allowing survey participants to respond to safety concerns in greater detail. The survey was formed around questions relating to understanding the public's awareness of increased crash rates as well as what could be done to decrease aggressive driving. The questions were created to understand what would motivate drivers to drive safer. The motivation factors included increased enforcement, signage, and education. The survey also asked what forms of education strategies would be the most effective and what age groups would benefit the most. Finally, the survey wanted to gauge the survey respondents' perceptions of enforcement, safety, emergency response and commute times before, during and after the pandemic. PPACG received 606 responses over a one-month period.

Question 1 – What is your zip code?

A majority of the survey respondents were located within the Metropolitan Area and El Paso County while some respondents were in the neighboring Teller and Park counties.



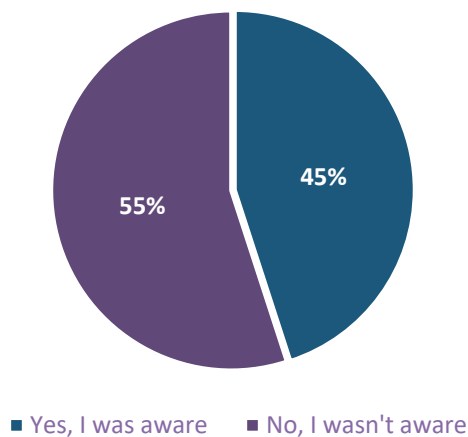
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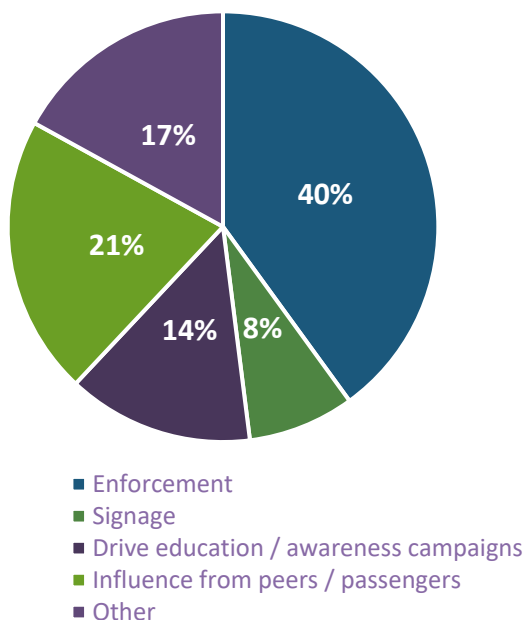
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Question 2 – Were you aware that during the pandemic (beginning in the third quarter of 2020) traffic fatalities increased nationally compared to the same quarter of the previous years, and that this was followed by a trend of increased fatalities?



Based on the 606 survey respondents, more than half were not aware that traffic fatalities increased since the start of the pandemic.

Question 3 – What do you think currently motivates drivers to drive safer? Select all that apply.



A large portion of the survey respondents feel that enforcement would be the best motivator for drivers to drive safer. According to research released by the NHTSA, the study confirms that when laws are enforced,

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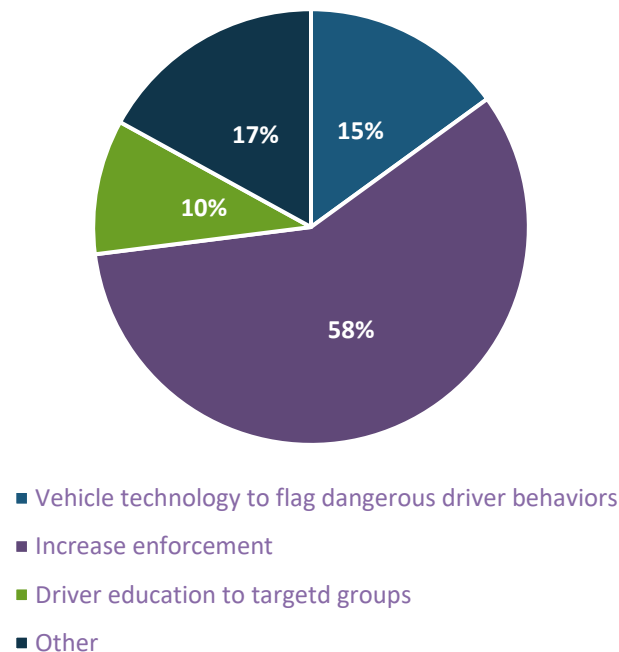
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positive behavior change often occurs. The other factors that may motivate drivers to drive safer are the influence from peers or passengers. This is especially important for future younger generations of drivers.

Question 4 – What intervention do you think would be most effective in promoting driver safety?



Over half of the survey respondents feel that increased enforcement would be the most effective in promoting driver safety. This may include having more police presence on roadways to promote compliance of traffic laws and preventing crashes. Visible police patrols act as a deterrent against reckless driving, speeding, and other traffic violations. Knowing that law enforcement is present encourages drivers to follow rules and regulations.



Question 5 – In your opinion, what has changed (if anything) since the latter half of 2020 that is causing some drivers to behave differently?

This was an open response question for all respondents to type in their opinions on driver behavior. To understand themes seen throughout the responses, the responses were inserted into a Word Cloud which is a graphical representation of word frequency that give greater prominence to words appearing more frequently in the source text. A Word Cloud can help uncover key insights, trends, and significant terms relevant to this study.

The Word Cloud showed these words were used the most within responses:



The responses had a common theme of “lack of enforcement.” Many people feel that there are no consequences for speeding and aggressive driving and therefore drivers are going to continue to drive aggressively. During the pandemic, there was a lot less traffic on the roadways and drivers were able to speed on open roadways. Another common theme was the sense of entitlement in drivers, a feeling that the traffic law does not apply to them.

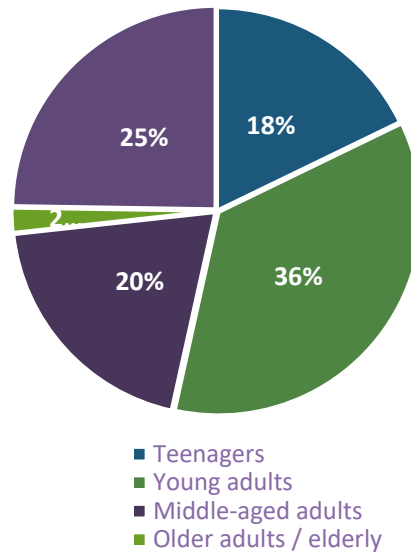
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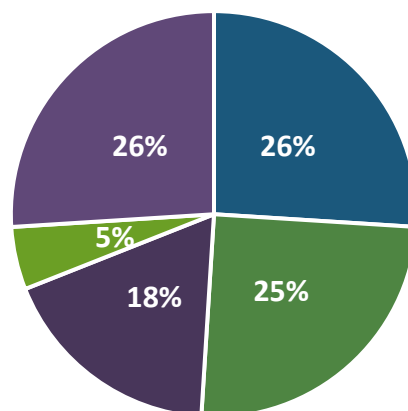
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Question 6 – Which populations would most benefit from driver education / awareness or other forms of outreach?



This survey question was split semi-evenly through the respondents' answers. The highest rating is that young adults would benefit from driver education and outreach while teenagers were on the low end of responses.

Question 7 – In your opinion, which driver education/awareness strategy would be most effective?



- Outreach in schools and other youth-oriented organizations
- Targeted regional media campaigns
- Messaging delivered through on-route signage
- Engagement at regional events
- Other

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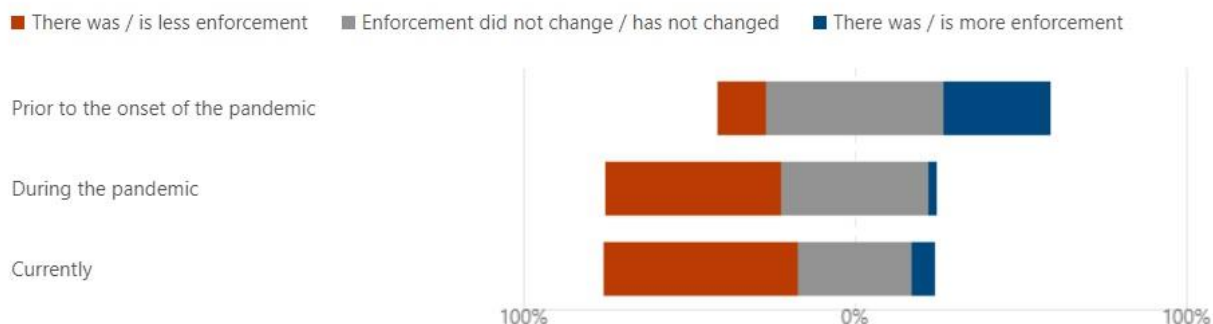
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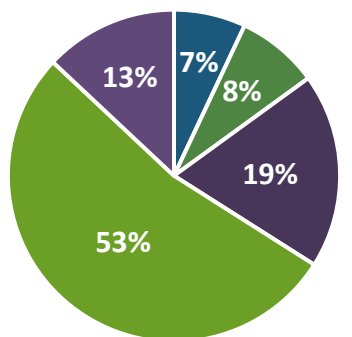
Effective driver education and awareness strategies were split evenly across survey respondents. Outreach in schools and other youth-oriented organizations, regional media campaigns, and others had nearly an even selection among the respondents.

Question 8 – What is your perception of traffic enforcement prior to, during, and after the pandemic?



Approximately 44% of survey respondents feel that traffic enforcement did not change before the pandemic and 32% feel there was more traffic enforcement before the pandemic. However, 52% and 58% respectively feel that there has been less traffic enforcement during and after the pandemic.

Question 9 – From your perspective, when is the most dangerous time of the day to drive?



- Early morning (4 a.m. - 8 a.m.)
- Morning (8 a.m. - noon)
- Afternoon (noon - 5 p.m.)
- Evening (5 p.m. - 9 p.m.)
- Night (9 p.m. - 4 a.m.)

The majority of survey respondents feel that the evening hours between 5 p.m. and 9 p.m. are the most dangerous to drive. This is likely due to the higher traffic volumes during this time of the day or that drivers may be more tired, fatigued, or distracted during this time of the day.

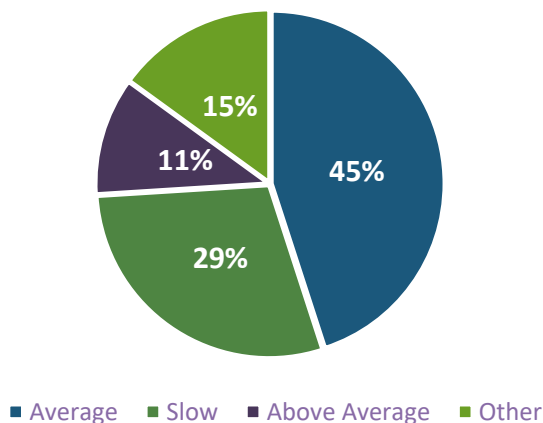
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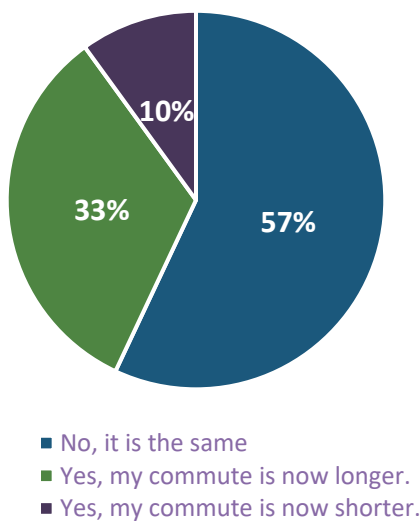
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Question 10 – How do you characterize the emergency response times in the area where you live?



Most survey respondents feel that the emergency response times in their area are average while 29% feel that response times are slower. This may be attributed to a decrease of first responders in certain areas.

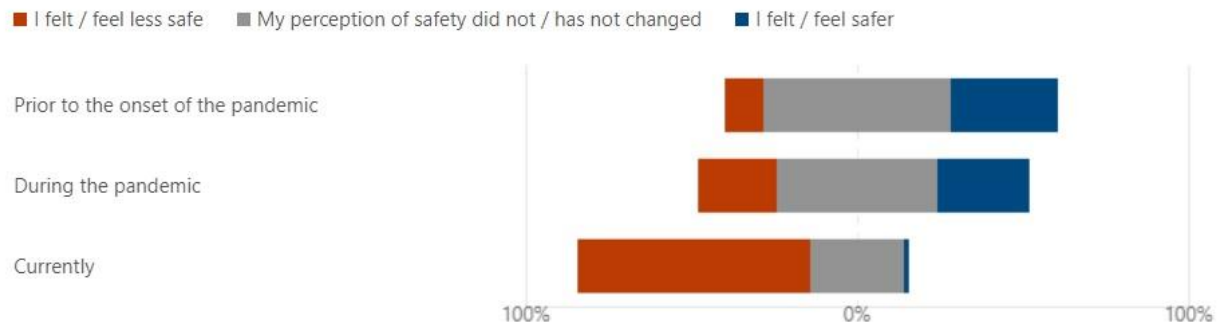
Question 11 – Has your average commute time changed since the onset of the of pandemic?



Most survey respondents' commute times have stayed the same since the pandemic. However, a third of the respondents say their commute time is now longer. A commute time might be longer because of population growth in the area or because a respondent has moved jobs or houses and now has a longer distance to commute.



Question 12 – What was/is your personal perception of traffic safety prior to, during, and after the pandemic?



When asked their perception of traffic safety relative to the pandemic, approximately 32% responded that they felt safer before the pandemic than they did during the pandemic or than they do now. About 70% said they feel less safe now than they did during or before the pandemic.

Question 13 – Please explain your reasoning for your answers to Question 12.

A majority of the respondents said that during the pandemic, there were fewer vehicles on the road, making drivers feel safer. Post-pandemic, drivers feel unsafe as they observe more aggressive driving throughout the region. The lack of enforcement is another common theme seen across the survey respondents' comments.



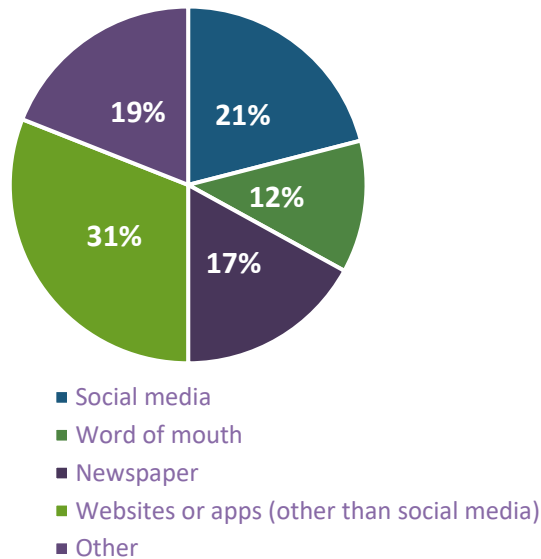
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Question 14 – Where do you primarily get your information from? Select all that apply.



There is generally an even split where survey respondents get their information. Websites or applications outside of social media were the most cited sources of information, while social media and newspapers followed.

1. Survey respondents feel that drivers that speed or drive aggressively have a sense of anonymity and are enabled due to lack of enforcement and consequences.
2. Of educational related countermeasures, respondents were split between campaigns in schools, regionally focused media, and on-route messaging.
3. Generally, survey respondents feel less safe on the roadways than they did prior to the start of the pandemic and would like to see more enforcement, which they feel will improve safety.

3 Things to
Remember



Phase 4 – Evaluation of Countermeasures

The literature review, conversations with stakeholders, and analysis of public survey results provided insight on potential strategies for addressing recent traffic safety trends. To develop recommendations supported by evidence and applicable to the PPACG region, the study team began evaluating potential countermeasures proposed and supported by the stakeholder conversations and survey results and aligning them with information gleaned during the initial scoping review. This structured evaluation of countermeasures was organized by connection with phases 1, 2, and 3, level of efficacy as determined by other evaluations (e.g., NHTSA), existing examples in other jurisdictions that support effectiveness, and local applicability (if different).

A consistent theme throughout the research was that influencing traffic safety begins with an understanding of how you can best influence driver behavior. The NHTSA considers understanding human behavior critical to the discussion surrounding countermeasures and their selection for traffic safety programs. While many countermeasures have proven to be effective in previous years, it stands that driver behavior is ever-changing and unpredictable. Changes in driver behavior, occurring naturally or due to external forces, may elicit the need for altered approaches to countermeasures or reexaminations of those relied on in the past (Kirley, et al., 2023).

Public Messaging Campaigns & Education

Public messaging campaigns, or mass media campaigns, can be unsuccessful (NHTSA), but they can be more effective when there is a specific target audience identified and the campaign is focused on a single-issue targeted communications goal. Highly effective campaigns require significant funding investment and careful planning to ensure the highest level of exposure for the message to the intended audience. Phase 1 identified what types of risky driving behaviors have increased in the PPACG region. These included speeding, distracted driving, alcohol use, and unbelted driving. Of these risky driving behaviors, public messaging should focus on these specific behaviors that have been worsening every year. Additionally, it's important to understand who is more susceptible to those risky-driving behaviors. In the literature review, young and male drivers were more likely to engage in risky-driving behaviors. Results from the Phase 3 public survey show that respondents feel that young and middle-aged adults would benefit most from driver awareness outreach.

Public Messaging Campaigns and Outreach	
Opportunities	Challenges
• Messaging through peer groups (Organizations of community, faith, special interest, etc.) • Messaging through social media, newspapers, etc. • On-route Messaging	• Some outreach may be viewed as ineffective due to time and methods for evaluating results • Identifying target populations and the most effective messaging platform

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Influencing behavioral change is difficult and public messaging campaigns face an uphill battle mired with the various assumptions people make about their own propensity for risk. Beyond just educating the public and distributing targeted information through these programs, success is truly defined by how well the campaign influences changes in specific actions. Unfortunately, many existing programs have not been evaluated and cannot be used as reliable examples of what will work in future campaigns (Williams, 2007).

Public outreach campaigns are considered effective in supporting changes in seat belt usage, but once again should be tied closely with enforcement (Kirley, et al., 2023). A targeted enforcement and publicity campaign in several southeastern states between 2008 and 2010 saw significant correlations between efforts to increase awareness and seat belt usage, specifically awareness of rural seat belt messages and perceived risk of a ticket for not buckling up. Males ages 18 to 34 specifically showed greater awareness of seat belt enforcement activity, indicating some effectiveness in directing efforts toward specific low-belt-use groups (Nichols, Chaffe, Solomon, & Tison, 2016). Similar efforts focused on pickup truck drivers, rural drivers, and tribal communities have also seen varying degrees of success (Kirley, et al., 2023).

Messaging and communications related to distracted driving are considered to be unproven or in need of further evaluation. Distraction can mean many things and not all are obvious or within the control of the driver, making campaigns targeting these drivers less meaningful when addressing this particular issue. Additionally, the efficacy of such campaigns is still unevaluated and unknown, but their chances for success are greatly increased by appropriate levels of funding.

Youth Outreach & Engagement

Young drivers have a higher chance of being involved in a crash due to inexperience and the higher chances of seeking risk-taking behaviors. Learning to drive requires a lot of attention, therefore safety considerations fall by the wayside. Young drivers are especially at risk during nighttime driving, driving under the influence, seat belt use, cell phone use, and passenger interactions. All of these risk factors are the top risky behaviors identified in Phase 1. It is especially important to educate young drivers about the consequences that could happen if they don't follow driving laws.

Youth Outreach & Engagement	
Opportunities	Challenges
• Bring back driver's education in schools. • Host school events for teenage drivers to understand the dangers when partaking in risky-driving behavior • Promote seat belt usage at young age • Involve youth in traffic safety in community activities	• Pushback from the community regarding some materials (e.g., graphic images of crashes, etc • Funding • Implementation struggles

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Driver's education in schools should be considered, as it provides teenagers with both driving skills and safe driving practices. Typically, this includes 30 hours of classroom instruction and six hours of behind-the-wheel practice, although it varies across states. There is some research showing there is no strong correlation between reductions in crashes and those who took driver's education classes. However, educating young drivers on the risks of driving may encourage them to drive more safely.

Youth programs are categorized by NHTSA as still unproven or in need of further evaluation. However, there is some level of success in youth outreach programs aimed at increasing seat belt usage (Kirley, et al., 2023). Many crash fatalities involve teenage drivers and outreach to this group is best when implemented prior to the start of their driving years. Driver education courses do this to a degree but are limited in scope (Williams, 2007).

The National League of Cities (NLC) recommends five different ways to effectively engage with youth to support traffic safety, including engaging youth organizations or youth leaders directly, making space for youth voices and empowering them to give feedback from their unique perspective, mobilizing local youth through a day of community education and action, determining where youth-involved accidents overlay with your high-injury network, and conducting a road-safety audit near schools (Kohler, 2023). Several resources exist for approaching youth engagement effectively and intentionally, including but not limited to the "Safe Routes for Youth" guide by the Safe Routes Partnership (Johnson, 2020) and the "Engaging Youth to Advance Safer Streets for All" guide by the Vision Zero for Youth Initiative (Collard de Beaufort, Marchetti, Smith, & Pullen-Seufert, 2023).

The current youth generation is more socially conscious than ever before, and they are eager to address traffic safety head-on by leading proactive approaches in their own communities. For instance, in Montgomery County, MD, youth partnered with the local DOT to establish the YOLO (You Only Live Once) campaign to encourage safe driving and walking behaviors. Social media is a popular medium for centering these voices in traffic safety. Facebook groups and the like are used to present supportive messaging in an organic and oftentimes humorous way (Johnson, 2020). Regardless of the medium used, centering youth voices in these conversations rather than choosing to see them only as victims of crashes will allow them to be equal partners in shaping the future of traffic safety. Engagement in schools can go beyond messaging and involve students in data collection, walk audits, and first-hand observations that will demonstrate the perils of risky driving far better than even an effective communication strategy.

Enforcement

To target the specific driving behaviors that were identified in Phase 1, implementing higher enforcement in the PPACG region could help address specific driving behaviors and improve road safety. Information gleaned from the public surveys also included high responses regarding increasing enforcement in the region. The public feels that one of the main deterrents to speeding is increased enforcement. Several comments highlighted that there is a sense of invisibility and no consequences for bad driving. Risky driving behaviors such as speeding, distracted driving, alcohol use, and unbelted driving were listed as top factors that contributed to serious injury and fatal crashes. Implementing countermeasures that target these specific risky-driving factors could improve road safety.

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Enforcement	
Opportunities	Challenges
• Increased officer presence on roadways • High-visibility enforcement (e.g., DUI checkpoints) • Speed safety cameras • Speed feedback signs • Variable speed limits	• Cost • Locations (where to install) • Officer safety

It is important to understand the opportunities as well as the challenges that are associated with some of these enforcement opportunities.

Speeding is one of the biggest factors when it comes to risky driver behavior and some successful countermeasures to reduce speeding are to install speed safety cameras and speed feedback signs. Speed safety camera systems have been found to improve safety and reduce speed and crashes; however, they can be expensive to implement. Speed feedback signs may be an effective strategy when trying to reduce speed. These signs can show drivers that they are speeding and may encourage some drivers to slow down. Additionally, these feedback signs may also suggest to drivers that speeds are being monitored or that enforcement is nearby. These speed signs have been shown to be effective in slowing drivers; however, high speeds may resume down the road or as soon as the signs are removed or relocated.

High Visibility Enforcement (HVE) can be used to target specific traffic safety issues such as speeding, impaired driving, distracted driving, seat belt use, and aggressive driving. HVE targets selected high-crash or high-violation locations, corridors, or geographic areas for enhanced enforcement. These enforcement campaigns should put drivers on notice that the enforcement is occurring, and that it is being done to improve safety (NHTSA). These have been extremely successful with impaired driving and seat belt usage enforcement campaigns.

Again, many who responded to the public surveys felt the need for more officers on the region's roadways. Based on stakeholder interviews, during the pandemic there were fewer officers patrolling the roads to minimize the potential exposure of COVID-19 between drivers and officers with agencies already understaffed. Although patrolling has increased post-pandemic, there is still opportunity to increase officer presence on roadways during certain times of the day. There are some challenges to identify the best time of the day when officers should be conducting traffic stops. Officers can be particularly vulnerable and exposed during traffic stops and working crash scenes. There are times of the day when it may be more dangerous for officers to conduct traffic stops, such as peak rush hour time frames. Not only is there increased traffic during these timeframes, but a traffic stop may distract drivers and potentially cause crashes. However, survey respondents felt that the most dangerous timeframe to be on the roadways is during the afternoon rush hour and into the evening (5 p.m. to 9 p.m.). Education and outreach may need to communicate the challenge and negative impacts of enforcement during peak traffic periods.

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The NHTSA guide on Countermeasures that Work highlights several related countermeasures, their effectiveness ratings, and investment requirements in terms of cost and time. As it relates to alcohol-impaired driving, there are several highly effective countermeasures. In the category of legislation and licensing, administrative license revocation or suspension, minimum drinking age laws, and open container laws are all rated five stars in effectiveness (Kirley, et al., 2023).

Alcohol-impaired driving and driving under the influence is still one of the highest factors driving crashes and fatalities. As mentioned, there was a substantial increase in fatalities attributed to DUI from 2020 to 2021 (14.2%), and these crashes represented almost one-third of all vehicle crash fatalities in the United States. There are a myriad of external factors contributing to these trends, ranging from infrastructure and road conditions to economic activity, meaning that trends in each state and the approaches needed to combat them varies greatly depending on the state and community in question. The NHTSA has categorized strategies to combat alcohol-impaired driving into four categories: Deterrence, Prevention, Communications and Outreach, and Alcohol Treatment. Deterrence is considered the most effective in changing behavior, relying on fear of apprehension and punishment to influence the general public. However, even this strategy has its flaws when the pathways to detection and conviction are not always straightforward (Kirley, et al., 2023).

Similarly, enforcement through publicized sobriety checkpoints is also highly effective. Finally, the guide lists other strategies such as alcohol ignition interlocks, alcohol problem assessment and treatment, and alcohol screening and brief intervention in this effectiveness level as well. Highly effective here means: “Demonstrated to be effective by several high-quality evaluations with consistent results” (Kirley, et al., 2023).

Drug-impaired driving presents similar challenges to alcohol-impaired driving; however, it is far more complicated and under-researched than alcohol-impaired driving. The impact of drugs on blood levels is unclear and not all drugs metabolize or impact the body in the same way. This makes measuring and detecting drug impairment very difficult in comparison. Some of the countermeasures that apply to alcohol-impaired driving might apply here as well, but these additional challenges warrant looking at this factor through its own lens (Kirley, et al., 2023).

Given the limitations on knowledge surrounding drug-impaired driving, it’s not surprising that effective and proven countermeasures to address this issue are limited as well. The NHTSA guide only lists three countermeasures and none of them is rated as demonstrated to be effective. Rather they are either likely to be effective or lacking evaluation evidence altogether. For instance, drug-impaired driving laws and education regarding medications are both rated as having no evaluation evidence, but as adhering to principles of human behavior with the potential for effectiveness. Enforcement of drug-impaired driving is rated slightly higher and considered likely to effective (Kirley, et al., 2023).

Infrastructure Changes

Along with education and enforcement, the third leg of traffic safety is engineering. Countermeasures here could include infrastructure changes to improve road safety. For example, in many environments, traffic calming is a set of measures that lessen the negative consequences of motor vehicles, change driving

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patterns, and enhance the conditions for vulnerable road users. There are locations where traffic calming strategies could be beneficial, including residential areas, school zones, commercial districts, transit stops, bicycle routes, streets with high-speed limits, areas with high crash rates, pedestrian zones, and mixed-use zones.

Potential countermeasures of this type will need to be evaluated strategically among the various jurisdictions and determine the most effective methods for the diverse contexts across the Pikes Peak region.

Infrastructure Changes	
Opportunities	Challenges
• Incorporating Traffic Calming measures in various high-risk zones or crash areas • Detailed safety analysis such as Safe Streets for All resulting in a Safety Action Plan	• Funding • Changing local design standards • Cost

Some research has been conducted on different types of traffic calming measures based on the main impact intended. Volume control measures are primarily used to manage the flow of traffic by diverting it away from certain areas or streets. These can be in the forms of road closures, one-way streets, and access restrictions. The other type is speed control measures which focus on reducing vehicle speeds to enhance safety and comfort for pedestrians, cyclists, and residents. Reducing traffic speeds and volumes can reduce the severity of crashes, especially those involving pedestrians and bicyclists. The World Health Organization (WHO) found that an increase in average speed of 1 km/h results in a 3% higher risk of a crash and a 4-5% increase in fatalities (WHO, 2004). Incorporating volume or speed control measures could decrease not only the number of crashes but the severity of crashes.

Context matters, and each location will require a tailored approach. Community input, data analysis, and collaboration with local authorities are crucial for successful implementation of traffic calming strategies.

1. A combination of education, enforcement, and engineering approaches will help improve the safety of the region's roadways.
2. Four countermeasure types were identified to help address driving behaviors being cited as responsible in crash trends: Public Messaging Campaigns & Education, Youth Outreach & Engagement, Enforcement, and Infrastructure Changes.
3. Education and enforcement can most easily be considered regionally, while each community may want to tailor these countermeasures to their specific needs and context.

3 Things to
Remember



Summary

This safety study was conducted by Olsson while working closely with PPACG to examine trends in driver behavior and resulting safety trends that have persisted since the pandemic. This purpose for the study mirrors national concerns that have resulted in numerous studies and directives.

Following the string of increased traffic fatalities with the onset of the pandemic and general pleas from the public and advocates, the federal government shifted its traffic safety focus from a driver-at-fault approach to a strategy more focused on critical external factors such as speed limits, roadway design, and technology (Marshall, 2022). The USDOT's Safe System's approach is a comprehensive and data-driven method to enhance safety. This approach has been adopted by the transportation community as an effective way to address and mitigate the risks on the complex transportation system. The Safe System approach incorporated the principles that death and serious injuries are unacceptable; humans make mistakes and are vulnerable; responsibility is shared; safety is proactive; and redundancy is crucial (USDOT, 2022). The five complementary objectives of the Safe Systems Approach include: safer roads, safer speeds, safer vehicles, safer people, and post-crash care. Applying the Safe Systems approach involves anticipating human mistakes by designing and managing road infrastructure to keep the risk of a mistake low; and when a mistake leads to a crash, the impact on the human body doesn't result in a fatality or serious injury. Road design and management should encourage safe speeds and manipulate appropriate crash angles to reduce injury severity (FHWA, 2024).

The progress report for the National Roadway Safety Strategy lists several accomplishments made since. In 2022, the USDOT launched the Safe Streets for All Grant Program and issued the Complete Streets Report to Congress. They also produced guidance such as the Vulnerable Road User Safety Assessment and advanced rulemaking efforts in areas such as speed limiters on commercial motor vehicles, pedestrian automatic emergency braking (AEB) for passenger cars, commercial motor vehicle AEB, and alcohol impaired driving prevention technology (United States Department of Transportation, 2023). Aligning local efforts with these federal initiatives and taking advantage of federal funding opportunities to implement infrastructure changes could be highly effective.

More recently, TRIP, a national transportation nonprofit sponsored by insurance companies, equipment manufacturers, and transportation industry businesses produced an examination of the surge in traffic fatalities beginning in 2020. This report, *Addressing America's Traffic Safety Crisis: Examining the Causes of Increasing U.S. Traffic Fatalities and Identifying Solutions to Improve Road User Safety* (TRIP, June 2023), identified significant national trends and potential countermeasures. The data in the appendix of the TRIP report indicated that between 2019 and 2022, Colorado experienced a 27% increase in traffic fatalities with a 1% decrease in VMT at an estimated societal cost for 2022 of \$36 billion. This compares to a 19% national increase in fatalities and also a 1% decrease in VMT, which puts Colorado in the top ten (or worst ten) of all state regarding increase in fatalities.

The study was conducted through a phased process and deliberate approach of research, interviews with stakeholders and a range of technical expertise, a detailed survey on public perceptions, and a professional collaboration to develop recommendations. The phases and outcomes are summarized below.

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Phase I - Literature & Scoping Review	Phase 2 - Stakeholder & Expert Interviews	Phase 3 - Public Surveys
<i>3 Things to Remember</i>	<i>3 Things to Remember</i>	<i>3 Things to Remember</i>
Serious injury and fatal crashes are on the rise since the start of the pandemic even though the VMT in the region dropped significantly. Post-pandemic serious injury and fatal crashes continued.	Stakeholders felt that there was a general change in driver attitude, a sense of invincibility as drivers had less traffic on roadways and coincident reduction in law enforcement presence.	Survey respondents feel that drivers that speed or drive aggressively have a sense of anonymity and are enabled due to lack of enforcement and consequences.
Speeding and aggressive driving were top contributors to crashes in the region.	Younger males are the population noted as driving more during the pandemic and participating in risky driving behavior. The safest driving demographic were the ones who reduced their driving the most.	Of educational related countermeasures, respondents were split between campaigns in schools, regionally focused media, and on-route messaging.
Drivers' risk-taking behavior increased during the pandemic but also continued to increase after the pandemic.	Stakeholders felt that poor driver actions increased since the onset of the pandemic. Aggressive driving, speeding, impaired driving, distracted driving, and lack of seat belt have persisted in post-lockdown. These behaviors take time to correct and to unlearn. It's common for everyone to develop some bad habits behind the wheel, but consistently working to improve these behaviors is crucial for safety on roadways.	Generally, survey respondents feel less safe on the roadways than they did prior to the start of the pandemic and would like to see more enforcement, which they feel will improve safety.

Phase 4 - Countermeasures		
<u>Public Messaging Campaigns & Education</u> Messaging through peer groups (Organizations of community, faith, special interest, etc.). Messaging through social media, newspapers, etc. On-route messaging	<u>Youth Outreach & Engagement</u> Bring back driver's education. Host school events for teenage drivers to understand the dangers in partaking in risky driving behavior. Promote seat belt usage at a young age. Involve youth in traffic safety in community activities.	<u>Enforcement</u> Increased officer presence on roadways. High-visibility enforcement (e.g., DUI checkpoints). Speed safety cameras. Speed feedback signs. Variable speed limits.
<u>Infrastructure Changes</u> Incorporating Traffic Calming measures in various high-risk zones or crash areas. Detailed safety analysis such as Safe Streets for All resulting in a Safety Action Plan.		

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The Final Three

As stated earlier, a consistent theme repeated in the research is that it requires time to change driver behavior through education- type countermeasures. Programs should target both today's drivers and those of tomorrow. Youth education can provide lessons for tomorrow's drivers and create opportunities for these young people to influence those they ride with today.

3 Things to
Remember

Enforcement is cited by many as the key to changing behavior and recent trends among some law enforcement agencies to increase visibility has proven effective, at least anecdotally, in reducing speeds. However, changing behaviors that were learned over the several years since the COVID pandemic will take time and continued efforts. If trends do not improve and local agencies and political leaders are committed to change, then new options should be considered such as additional enforcement funding, or other methods such as new technology (speed safety cameras, etc.).

A successful approach to achieving the behavior change required to see sustained positive results will require a multifaceted approach that must include enforcement, education, and engineering. Measurable results from different methods will also take time. Actions that are taken should be evaluated for effectiveness while given the proper time to achieve it. For example, education is a longer-term strategy than active enforcement, but may also be more sustainable. If immediate results are required, then actions that have immediate results should be considered. For any action, both the expected outcome and the timeline should be established.

Specific Recommendations

With the completion of the research, interviews, and collaboration with various agencies locally and across the country, the Study Team has prepared some specific recommendations for countermeasures and other actions that should be considered specifically for the Pikes Peak region. Countermeasure recommendations are based on best practices and multiple guidance sources including industry, agency and professional organizations.

Within the graphic on the following page, specific countermeasures are listed. Each is placed on a two-dimensional spectrum to visually indicate the level of control that may be available to apply them and the level of difficulty that may be encountered. The recommendations and their placement are based on an assumed desire for regional outcomes and are not on specific agencies or contexts.

The graphic is not meant to score or imply effectiveness of specific countermeasures. A theme also identified in this study is that there is little documentation of applied actions and the measured outcomes specifically relative to the observed phenomenon of post-COVID aggressive driving behaviors. The Study Team includes as one recommendation the need to establish expected outcomes from any implemented action and measure or at least consciously observe results.

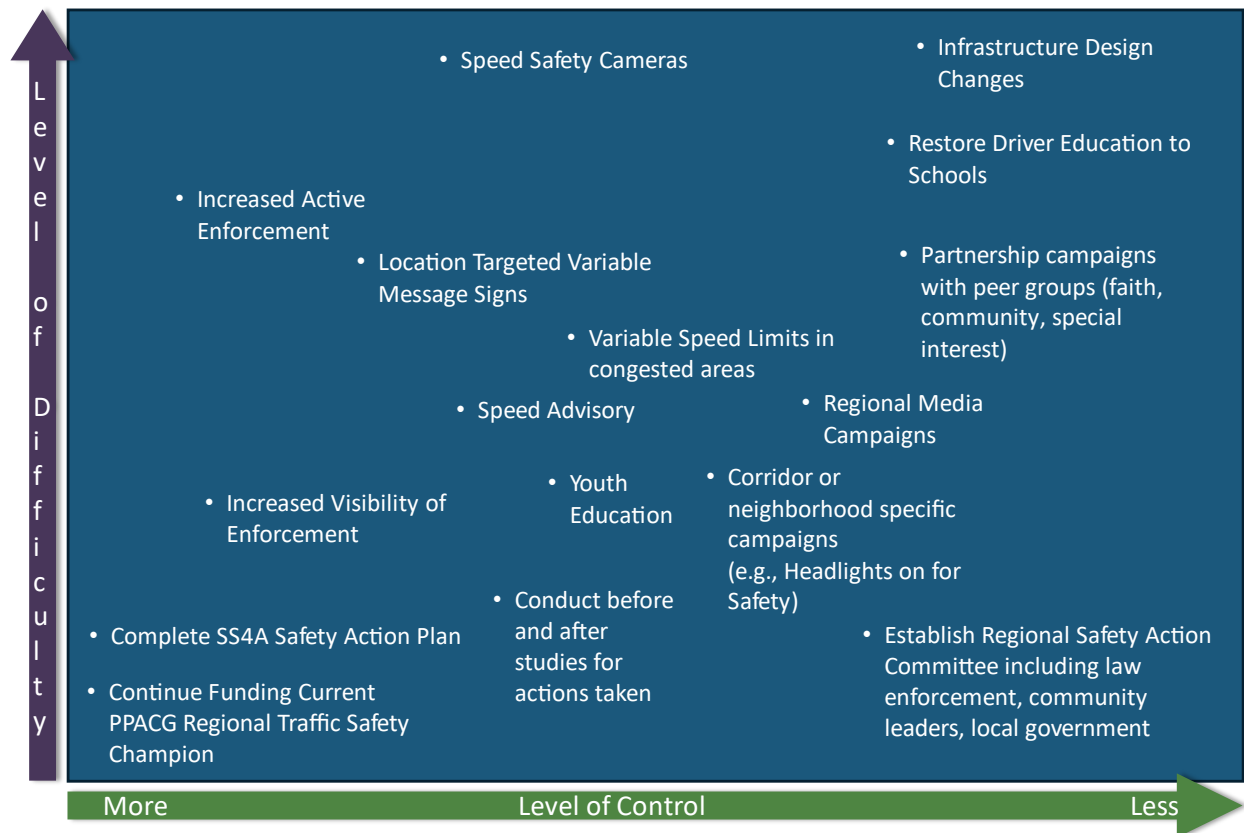
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Pikes Peak Region Recommended Countermeasures



The Study Team recommendations include:

- Things that should continue:
 - Funding for the PPACG Regional Traffic Safety Champion and school outreach
 - Multi-jurisdictional DUI Task Force
 - Drive Smart Colorado Traffic Safety Coalition
 - Increased visibility of enforcement vehicles
- Things that should expand/evolve:
 - Expand Safety Champion to a Safety task force or action committee
 - Use VMS to identify location specific driver awareness info when idle; e.g., instead of cunning but generic quotes, tell people how many rear-end crashes there were on I-25 last month.
- Enforcement Options:
 - Increased Active Enforcement at targeted locations should be considered where crashes are frequent
 - High risk corridors should be considered for speed safety cameras that do not require stops for citations. This option will have challenges, but if trends are not responding to other actions and we are serious as a region about change such options should be considered.
- New things to be considered:
 - Variable speed limits in congested areas or for weather or event-related needs

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- Partnerships for media campaigns with influence groups including those focused on faith, community, or other special interests
- Completion of a Regional Safety Action Plan as funded through the USDOT Safe Streets for All (SS4A) Grant awards should consider and further evaluate effective and sustainable countermeasures and other actions for addressing speeding and aggressive driving along with other causes for fatal and serious injury crashes.

Other Topics

The Study Team identified other potential topics that could be explored to evaluate causes for the observed trends of fatal and serious injury crashes. However, insufficient data and the limitations of this study's purpose and funding prevented further exploration.

Topics that were discussed as relevant and mentioned in initial investigations, but lacked additional information, research, or data, included:

- Increase in electric vehicles during this period where heavier vehicle weights could cause more serious harm in crashes
- Level of driver distraction driven by increase in car infotainment, self-driving features
- Trends in emergency response that may have negatively impacted crash outcomes
- Specific causal linkage of external societal influences and observed driver behavior

It is also noted that much of the research on driver characteristics, behavior, and influences focused on the time frame most directly related to the pandemic. While the crash trends remain, there is a smaller pool of information regarding more current information on driver characteristics and driver influences.

The Study Team has assumed that as VMT has returned to near pre-pandemic levels, then driver demographics has also returned to a similar overall makeup as prior. For example, during pandemic lockdowns we had less travel but more of it was done by the statistically least safe drivers and the demographic regarded as most safe also most reduced their travel. We assume this has rebalanced out, but there is less data available.

Similarly, pandemic lockdowns changed the overall driver demographic to overrepresent teen drivers, marginalized communities, and rural users. Pedestrian related fatal and serious injury crashes also grew in contradiction to the VMT trend (Governors Highway Safety Association, 2023).

If the overall driver demographic makeup has returned to a close copy of pre-pandemic conditions as VMT has done, then driver behavior and influences are trends that have persisted. The recommendations in this study reflect this conclusion. However, future studies should examine newer data sources to determine any contributory effects of driver characteristics.



A Unique Event

The COVID pandemic and the responsive actions certainly appear to be a trigger for the studied trends. Fatal and serious injury crashes relative to VMT remains elevated in comparison to pre-pandemic ratios. While other factors may contribute to the data observations. For example, the trends in increasing pedestrian related crashes started before the pandemic. However, the data tell us that the pandemic:

- Reduced traffic VMT to levels of 2014 and virtually eliminated the peak hour
- Reduced the safest driving and increased the least safe demographic
- Reduced enforcement
- Increased anxiety (lockdowns, home schooling, political unrest of 2020 election, loss of jobs, people were reinventing their lives)

The Study Team believes these conditions enabled the learning of unsafe driving behavior that has become habit. Changing these habits will take time and specific actions. However, the challenge is unique and somewhat unprecedented in the analysis of traffic safety. Rather than an apparent fault of technology, design, or external condition, or physical feature, the trend is partly driven by a noted increase in aggressive behavior. Crash report data and interviews with enforcement highlighted this trend.

This unique challenge may require uniquely designed solutions. Aggression and aggressive behavior are not the purview of traffic professionals and more appropriate expertise should be consulted. However, there were opinions offered by many of the resources consulted during the course of the research.

With the trends noted in crash statistics and the significant change in underlying reasons being related to behavior, discussions with stakeholders and within the Study Team provided a one clear direction. Reversing these trends and the underlying caused would rely on positively impacting the behavior of those willing to consider alternatives such as safer driving behaviors.

They study also identified an acknowledgement that there are generally three applicable groupings of drivers and that addressing the challenge should be appropriately targeted. Drivers can be grouped as:

1. Those who usually and consciously drive safe
2. Those who are reliably aggressive
3. A significant middle ground who can be influenced either way by observing others or understanding the consequences

Effective and sustainable countermeasures should not just target aggressive drivers. While it may be a longer term solution, countermeasures that effectively communicate to those in the middle helps change the character of the daily commute and reassures those who are already safer drivers. It also shines spotlight on those who continue aggressive behaviors as atypical.

A suite of countermeasures could be more effective if it considered post-COVID, post-lockdown, post-2020 statistics on crashes and the underlying behavioral factors. The study exposed concerns with traditional linear responses to crashes including aggressive enforcement without considering a more holistic approach.

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Concerns and potential responses that we heard and appear most relevant include:

Pre-2020 Typical Countermeasure	Post-2020 Concern	Adjustments
More aggressive enforcement	Aggressive enforcement by itself could trigger more distrust and aggression. The level of distrust between people and between authority/government and people is certainly elevated.	Enforcement such as writing citations for speeding may need to recognize this condition.
		“Maybe officers should start with something less challenging than ‘Do you know why I pulled you over?’, maybe start with a sincere ‘How are you doing today?’.”
		Effective enforcement requires communication e.g., we want you to get home safe, this is why we enforce speed limits and other requirements.
Generalized safety messages through non-specific statistics e.g., “XXX Fatalities this year”	Lack of specifics to reach those who can be convinced	Publicize the specific problem – the survey responses confirmed most did not know there was a trend.
		Publicize the responses being taken including education efforts, investments in infrastructure, and enforcement.
Target drivers directly	Taking a longer view to approach problem as learned behaviors	Enlist partners and peers to deliver the message. You may not reach the targets of education directly, but you may reach family, friends, or peers from faith, community, or interest groups.
		Continue and enhance efforts to reach tomorrow’s drivers and let them influence today’s drivers with whom they ride.
Prioritize spending of available safety dollars to roll out actions	Unsustainable and ineffective approach	Be deliberate, plan an action, expected outcome, and time frame for results
		Report on progress, do before and after evaluation of specific actions.



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