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Special Report

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To provide insight into important safety issues that arose during the early stages of the pandemic, it was necessary to rely on numerous alternative sources of data and information beyond those traditionally used in safety analysis. Similarly, shorter observation periods and more preliminary data were used. It is anticipated that, over time, additional data and analyses will add greater insight into changes in travel safety associated with the pandemic.

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16. Abstract The National Highway Traffic Safety Administration is reviewing national changes in roadway travel and changes in drivers' behavior that have occurred since the start of the COVID-19 public health emergency, with an emphasis on the second quarter (Q2) of 2020. Most important, we are learning about the impact on motor vehicle crashes and fatalities. This report draws from an array of sources to bring together as much information as possible to provide an understanding of our current traffic safety environment, and to better address our changing traffic safety needs. Prior economic downturns, such as the financial crisis of 2008, provide some comparison for reduced roadway travel and changes in travel patterns. As this report documents, although there are some similarities with that time frame, there are many differences in impact on speeding and other dangerous driving behaviors, such as reduced seat belt use. This report explores changes in countermeasure use including traffic enforcement and public communications and outreach. This report also examines the question of whether some people – who continued driving even when many communities had stay-at-home guidelines – may be inherently higher-risk drivers. The report draws on sources such as emergency medical services (EMS) and hospital trauma center data as we examine this issue.			
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Executive Summary

The COVID-19 public health emergency has revealed unique patterns concerning traffic safety when compared to previous times of economic uncertainty. Historically, economic downturns have resulted in fewer vehicle miles traveled (VMT) and crash fatalities as fewer drivers are on the road due to increased unemployment and other factors. Furthermore, previous economic downturns produced lower instances of risky driving behaviors like alcohol-impaired driving and speeding. While the United States experienced an economic downturn and sharp increases in unemployment in the second quarter (Q2) of 2020, traffic and behavioral patterns diverged from historical trends, creating unique conditions in traffic safety history.

Restrictions and guidelines related to the public health emergency ordered people to limit travel to essential work and errands. As a result, the country observed a sharp reduction in VMT and changes in trip-taking following these restrictions and guidelines. Additionally, there were reduced crashes and crash fatalities reported across States. However, the fatality rate during Q2 was 1.42 fatalities per 100 million VMT, markedly higher than the previously anticipated first quarter rate of 1.10 fatalities per 100M VMT, consistent with historical trends.

State and national data suggest that there were several factors contributing to the increase in the fatality rate. First, there is evidence of an increase in ejection rates among people who were in crashes, suggesting a decrease in the seat belt use rate of vehicle occupants. This increase was heavily tilted toward males, people 18 to 34 years old, and people in rural areas. Second, according to State data and other reports, speeding was more prevalent on the roads. The reduction in traffic volume coupled with community efforts to reduce law enforcement personnel exposure by implementing changes in law enforcement activity provided drivers a greater opportunity to speed. Additionally, there is evidence of increased alcohol use and higher drug use (including marijuana and opioids), and survey research indicating that many individuals have started or increased drug and alcohol use to cope with pandemic-related stress. Newly released research from five trauma centers revealed a higher prevalence of alcohol, cannabinoids, and opioids in crash victims during the public health emergency compared to before.

Several other factors known to influence roadway safety occurred as a result of the pandemic. Reductions in roadway volumes and associated congestion result in higher average travel speeds and greater speed variability. These conditions are known to influence travel safety as crashes are more likely with varying vehicle speeds and higher-speed crashes. Faster travel, whether or not actually exceeding the speed limit, increases the chance of fatalities in a crash. Furthermore, COVID-19's risks for older individuals were recognized as significantly more pronounced; hence this age cohort, characteristically safer and more risk-averse drivers, minimized their travel.

In summary, the evidence suggests that some drivers took risks that included speeding, driving impaired, and not using their seat belts. These drivers, along with a potential reduction in law enforcement and safety messaging, are possible factors that created an environment more conducive to risky driving and increased fatality rates.

Introduction

In the first quarter (Q1) of 2020, NHTSA estimated that the fatality rate per 100M VMT had risen year-over-year from a Q1 rate of 1.05 in 2019 to a projected rate of 1.10 in 2020 (National Center for Statistics and Analysis, in press). In that report, NHTSA reported a reduction in VMT of 264.2 billion miles – about a 16.6-percent decrease – in the first 6 months of 2020. During April, May, and June 2020, traffic safety professionals across the United States observed significant changes to traffic patterns, driver behaviors, and vehicle traffic mix related to the public health emergency. These circumstances provide the context for NHTSA’s preliminary traffic fatality estimates for the second quarter (Q2) of 2020. This report is a companion to *Early estimate of motor vehicle traffic fatalities for the first half (Jan–Jun) of 2020* (NCSA, in press) in which NHTSA projects a Q2 2020 fatality rate of 1.42 fatalities per 100M VMT despite the encouraging fact that the number of projected fatalities decreased by more than 300 people year-over-year, or 9,172 in Q2 2019 compared to an estimated 8,870 in Q2 2020. This is in comparison to the first quarter projected rate of 1.10 fatalities per 100 million VMT. The reported rise in the fatality rate during the height of the national health crisis (caused by a much larger decrease in the denominator than in the numerator) spurred an analysis of traditional academic literature, State databases, economic data, available “gray” literature such as corporate or State websites, and direct correspondence with researchers to identify potential relationships between these fatality rates and known and observed changes in pre- and post-crash factors. This report reveals the overlap between known behavioral risk factors, including seat belt use, impaired driving, and speeding, coupled with economic factors, highway traffic safety enforcement, and other proxies that have been previously shown to affect travel or crash risk.

Background

Analysis of Fatality Analysis Reporting System (FARS) data from 2008 showed a 10-percent decrease in fatalities from the previous year (Longthorne et al., 2010); some of the steepest decreases observed that year were for crashes involving young drivers 16 to 24 years old of passenger vehicles. Research shows that measures of economic health are associated with measures of traffic safety—for example, increases in unemployment rates are associated with reductions in fatal motor vehicle crashes (e.g., Cotti & Tefft, 2011; see Wegman et al., 2017, for a review). Studies that specifically focused on the Great Recession that began in late 2007 similarly found that increased unemployment (He, 2016) and decreased household median income (Noland & Zhou, 2017) were associated with reductions in both the number and rate of fatal crashes, but these reductions were larger than expected based on pre-2008 data. Research in this area has found that reductions in fatalities are not entirely explained by reductions in driving exposure alone. Instead, economic recessions are associated with other changes that contribute to the reduction of fatalities, including fewer riskier drivers on the road (Noland & Zhou, 2017; He, 2016) and fewer risky driving behaviors like alcohol-impaired driving and speeding (He, 2016; Wegman et al., 2017). Even so, Vingilis and colleagues (2020) speculate that the current public health emergency may reveal different patterns than previous economic recessions; and public health emergency-related increases in stress and anxiety, “free” time, alcohol and drug consumption, and opportunities for speeding may counteract the typical effects of economic recessions on traffic safety. Using this historical background as a guide, NHTSA seeks to conceptualize what we are seeing on the roads now, and understand how current patterns track with historical trends as they relate to traffic safety issues.

Observed Pre-Crash Factors

Unemployment

Census Pulse data (U.S. Census Bureau, 2020) indicate that about half of responding households experienced a loss of income throughout the quarter. The Bureau of Labor Statistics (BLS) seasonally adjusted unemployment rate shows monthly variation from a high of 14.7 percent in April to 13.3 percent in May and 11.1 percent in June (FRED [Federal Reserve Economic Data], 2020, August 7); other surveys by private entities show similar weekly unemployment results (ETC Institute, 2020). Unemployment rates during the peak of the national health crisis were higher than during the Great Recession, which reached their seasonally-adjusted peak of 9.5 percent in June 2009. When looking at changes to employment by sex and occupation, women experienced higher rates of unemployment regardless of job category. Differences between men's and women's year-over-year changes in unemployment rates are most apparent in the natural resources, construction, and maintenance category, in which men went from a 2019 rate of 3.5 percent to a 2020 rate of 9.1 percent, whereas women went from a 2019 rate of 9.6 percent to a 2020 rate of 11.5 percent (see **Figure 1**). Given the direct stimulus payments to households, traditional recessionary behaviors may not have been as relevant.

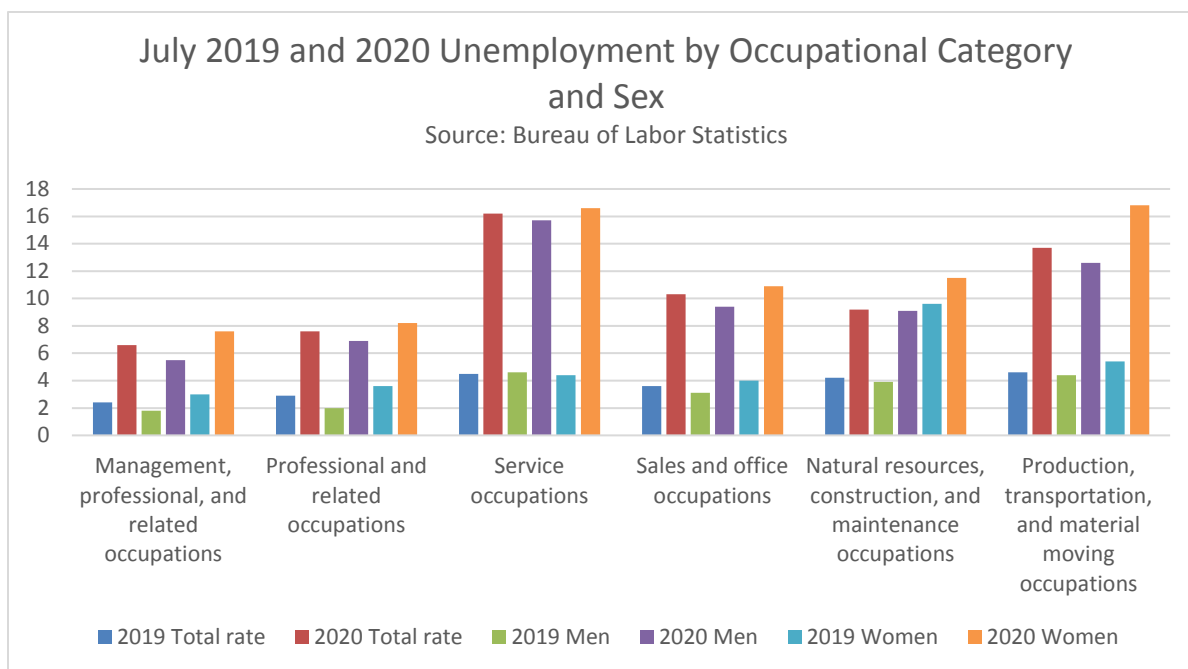


Figure 1: July 2019 and 2020 Unemployment by Occupational Category and Sex

Travel Patterns

Based on the historical experience discussed above, it would be expected that unemployment paired with stay-at-home orders and individual social distancing would change our trip-taking, and thus our exposure to crash risk. As indicated in the Early Estimate Report and in FHWA's June Traffic Volume Trends (2020), the VMT observed in Q2 2020 is much lower than that of 2019. It is important to note that June 2020 appears to recover to near-previous levels (see **Figure 2**) though still down 13.0 percent, year-over-year. Cumulatively, VMT for the first half of 2020 was 16.6 percent lower than that of 2019. Comparing the full year of 2008 with that of 2007, there was a 3.6-percent decrease in VMT year-over-year. Data presented by private companies such as INRIX (Schuman, 2020) and Waze (Waze Mobile, 2020) show

similar decreases in travel starting in mid-March, reaching its low in April at the same time as most stay-at-home orders were in effect, and slowly recovering through May and June. Interestingly, the drop in VMT was heavily skewed toward personal vehicles, which saw a drop of 46 percent in April, compared to a 13-percent drop in truck VMT over the same period (Pishue, 2020).

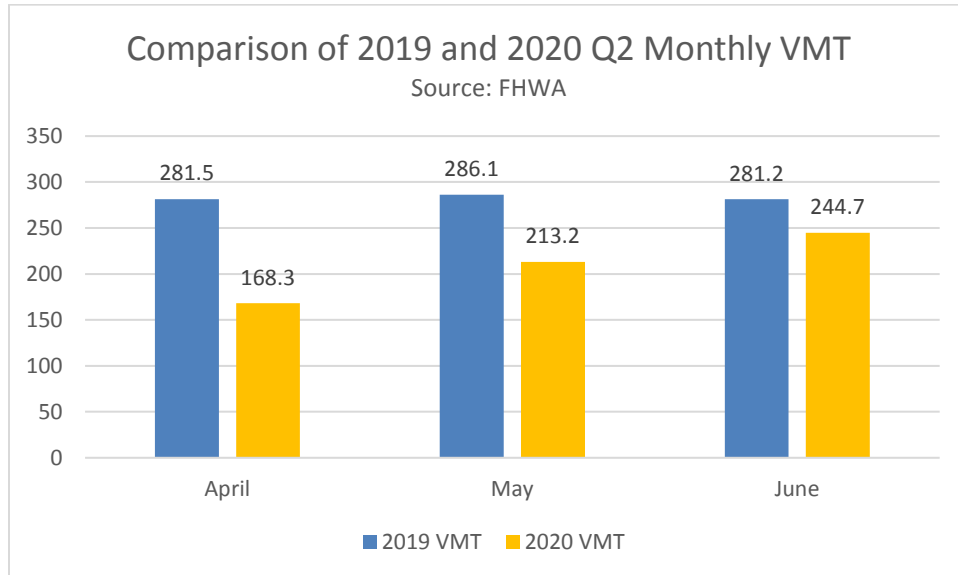


Figure 2: Comparison of 2019 and 2020 Q2 Monthly Vehicle Miles Traveled

While VMT increased, the number of trips taken per day remained much lower throughout Q2 (see **Figure 3**). Although the number of trips taken is trending upward, it is not yet approaching “normal” tripping (Bureau of Transportation Statistics, 2020a).

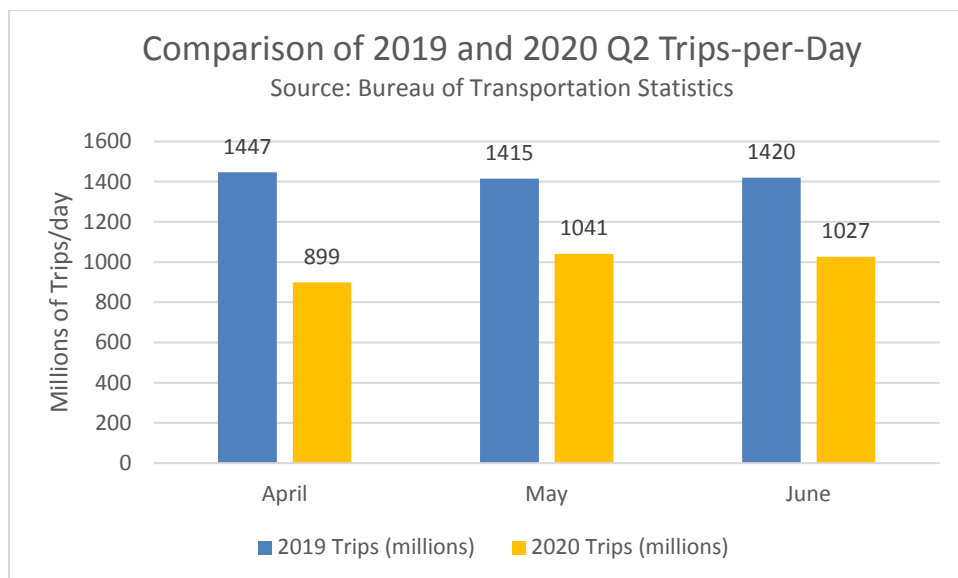


Figure 3: Comparison of 2019 and 2020 Q2 Trips-per-Day

Additionally, transit ridership was affected in a substantial manner; normally this translates to increased travel using passenger vehicles. According to the Federal Transit Administration (2020), transit ridership was down significantly during Q2. In July, transit ridership was increasing from its low point in April. At its lowest point, nationwide transit ridership was down about 85 percent, from about 32 million trips on a typical weekday to an estimated 4.8 million trips per weekday. The Bureau of Transportation Statistics (2020d) shows that the estimated number of unlinked rail trips dropped from 404 million trips in January to 74 million trips in June (see **Figure 4**). Similar dramatic drops can be found for fixed route bus transit and other transit modes (BTS, 2020b; 2020c). Although VMT rebounded in June, it is interesting to note that transit trips have not, as travelers have expressed the desire to avoid the potential exposure risks of shared travel.

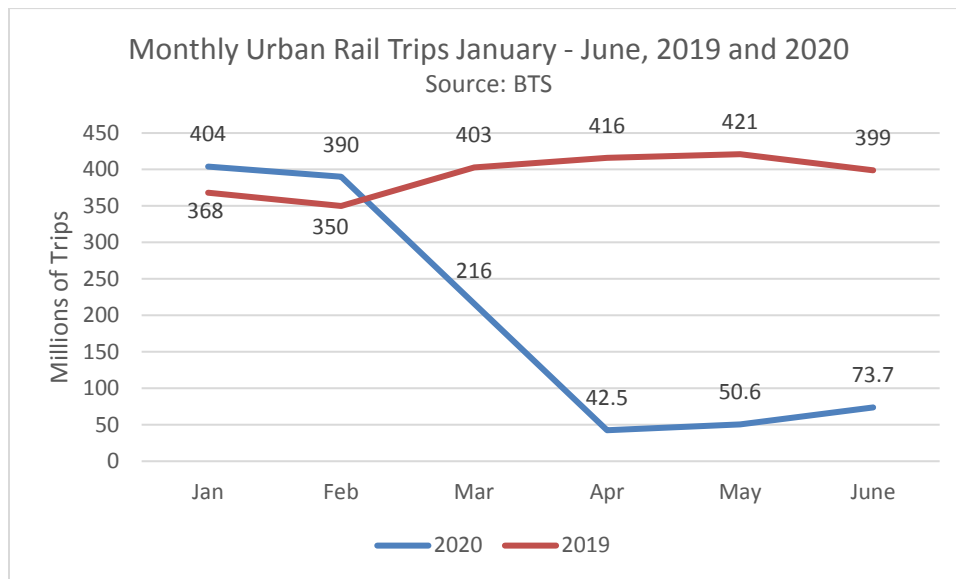


Figure 4: Monthly Urban Rail Trips January – June, 2019 and 2020

Gasoline deliveries also provide a metric for Q2 travel patterns. Data from the U.S. Energy Information Administration analyzed by the Federal Highway Administration (FHWA) suggest that the amount of gasoline supplied closely mirrored the sharp April drops in VMT and the slow increases in VMT observed throughout May and June (Office of Highway Policy Information, 2020). According to the U.S. Energy Information Administration, average gas prices remained below \$2/gallon throughout Q2. Based on this, there was no expectation of reduced travel because of the cost of gas. A modeling of roadway fatalities during the Great Recession by the National Academies of Sciences, Engineering, and Medicine (Blower et al., 2020) suggests that increases in the pump price of gasoline were associated with reductions in fatalities.

Vingilis and colleagues (2020) highlighted vulnerable road users such as bicyclists as a potential concern, and reports cited bicycle retail sales acceleration (NPD Group, 2020). NHTSA looked at the consistent year-over-year data available for bicyclist exposure under docked bikeshare ridership for changes in bicyclist exposure. The BTS data shows that bikeshare trips are down year-over-year in April, May, and June 2020 (BTS, 2020, June). Regarding pedestrians, Riggs (2020) noted that survey respondents reported an increase in bicycling and walking trips. This suggests a change in vulnerable road users' exposure; however, the impact of that change is unclear. Looking only at California data in the Transportation Injury Mapping System reported over Q2 (Safe Transportation Research and Education Center, 2020), there were fewer reported pedestrian crashes in 2020 (169) than in 2019 (256) as well as fewer reported bicyclist crashes in 2020 (150) than in 2019 (196).

Willingness to Stay Home

Assessing attitudes about staying home requires examination of non-Federal data sources. According to the Gallup polling organization (Gallup, Inc., 2020), 91 percent of those surveyed in early April avoided travel in the last 7 days due to the coronavirus, with a gradual decline to between 70 and 73 percent throughout the month of June (see **Figure 5**). The same report indicated that women were more likely to avoid public places (69%) than men (55%).

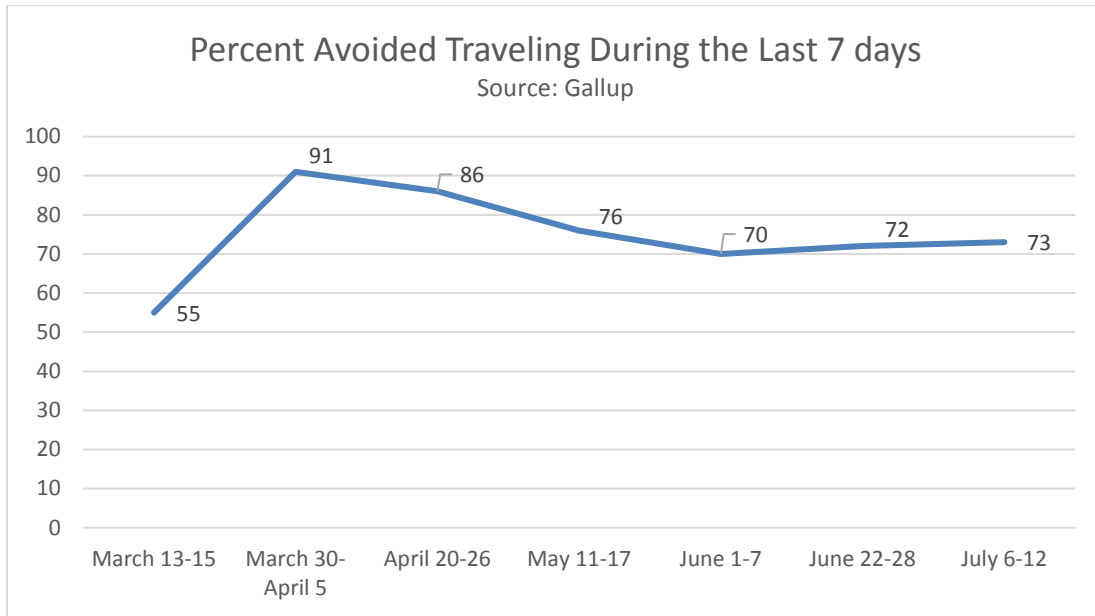


Figure 5: Percentage Avoided Traveling During the Last 7 Days

Preliminary unpublished research conducted by Capasso da Silva, Salon, and Pendyala (2020) suggests that those likely to *disagree* with the statement “Everyone should just stay home as much as possible until the coronavirus has subsided” were more likely to have traveled in the last 7 days, and to have traveled more days, than those who agreed with the statement (see **Figure 6**). Furthermore, COVID-19’s risks for older individuals were recognized as significantly more pronounced and hence this age cohort, characteristically safer and more risk-averse drivers, could have minimized their travel (a quarter of respondents had two or fewer trips in the previous week).

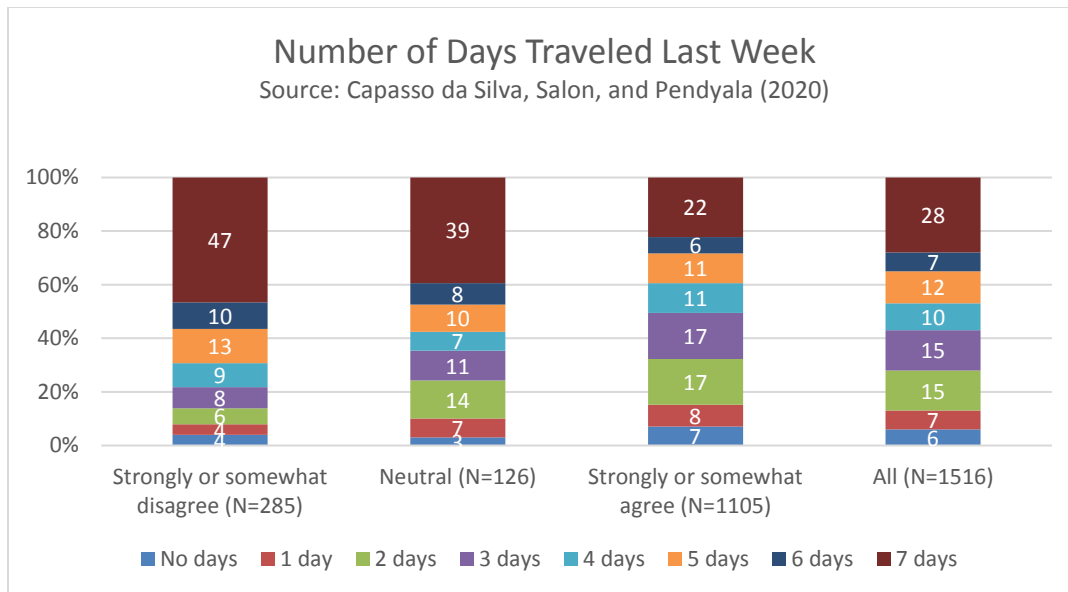


Figure 6: Number of Days Traveled by Car in the Last Week by Agreement With “Everyone should just stay at home as much as possible until the coronavirus has subsided.”

Vehicle Sales

A longer-term metric of safety is vehicle sales; newer vehicles have more safety technology features than older vehicles. U.S. Bureau of Economic Analysis data suggests that April’s steep drop in vehicle sales began to rebound in May and June but have not recovered to pre-2020 levels (FRED, 2020d). Among new vehicles sold in June, more than 75 percent were light trucks and vans, a 6-percent increase over 2019 figures (Alliance for Automotive Innovation, 2020). Reviewing sales of used vehicles, available data suggests that sales dropped through March and April of 2020, but recovered in May, robustly increasing in June and July (FRED, 2020d). Nevertheless, the lower number of new vehicles sold and the potential shift in fleet age is a concern going forward. National Center for Statistics and Analysis (2018) research shows that among all passenger vehicle (passenger cars, SUVs, pickup trucks, or vans) occupants involved in fatal crashes, the proportion who were fatally injured increases with vehicle age; that is, the proportion was higher among occupants of older vehicles as compared to the occupants of newer vehicles.

Law Enforcement

Just as the rest of the country has been affected by the public health emergency, so too has the law enforcement community. Of the more than 250 first responders who have died of COVID-19, NHTSA’s Office of Emergency Medical Services reports that approximately 65 percent are from law enforcement (internal NHTSA analysis, through September 7, 2020). Mindful of these risks and the high priority placed on protecting the public through social distancing, many agencies made changes to their traffic enforcement policies. According to a survey released by the International Association of Chiefs of Police (Lum et al., 2020), more than half of the more than 1,000 responding agencies established policies explicitly reducing proactive enforcement including traffic enforcement, in both March and May 2020 when the survey was fielded, and nearly three-quarters had policies mandating the reduction in physical arrests for minor offenses. Drawn from their regular communications with statewide law enforcement entities, NHTSA Regional Administrators (personal communication) shared States’ self-reported decreases in traffic enforcement, including decreases in seat belt enforcement, impaired driving enforcement, and speed enforcement. The Regional Administrators also indicated State entities were investigating fewer crashes

than in previous years. For example, California saw a drop in the weekly number of injury crashes investigated by the Highway Patrol compared to 2019, starting in mid-March 2020 and continuing through June 2020 (Safe Transportation Research and Education Center, 2020).

Analysis of data from other States suggests that while the number of crashes investigated by State police in 2020 was lower year-over-year in Q2, in some places fatalities were higher. The decrease in traffic enforcement activities during the national health crisis presents an opportunity to evaluate the safety benefits associated with enforcement.

Changes to driver licensing also occurred as a result of the public health emergency. According to the American Association of Motor Vehicle Administrators (2020), States took a variety of measures in their driver licensing operations: closing or reducing operations in driver licensing offices, extending the commercial driver licensing period for those whose licenses were to expire, reducing access to learner permits, reducing or eliminating road testing for new applicants, and in some States, allowing novice drivers full licenses without requiring road tests. Some of these countermeasures remain in effect at the time of this publication.

Risky Driving

In NHTSA's *Countermeasures That Work* (Richard et al., 2018), proven safety countermeasures to address risky driving include:

- Deterrence – which includes enacting, publicizing, enforcing, and adjudicating laws to discourage the behavior;
- Prevention – which aims to reduce the behavior or separate aspects of it (e.g., separate drinking alcohol from driving); and
- Communications and Outreach – which aims to inform the public of the dangers of the risky driving and to establish positive social norms around the behavior.

As noted above, enforcement of traffic safety laws was reduced in the first half of 2020. It is possible that drivers' perception that they may be caught breaking a law was reduced throughout Q2.

During Q2, NHTSA also modified its communications plans during the height of the nationwide lockdown orders to respond to local needs and concerns, including postponing certain public outreach campaigns on distracted driving and seat belt use until later in the year at the request of the States (Traffic Safety Marketing, 2020). To address this absence, NHTSA launched a special media campaign to reach drivers with messages about speeding and safety and implemented a three-phase targeted social media plan focused on strategic priority messages, including: protecting and supporting first responders; keeping truck drivers safe on the roads as they work long hours to deliver medical supplies, food, and other critical supplies; and reminding drivers not to drive dangerously. The Coronavirus Aid, Relief, and Economic Security (CARES) Act authorized NHTSA (2020b) to provide flexibility to the States, including waiving the requirement for States to participate in the *Click It or Ticket* campaign throughout fiscal year 2020. The extent to which State communications and outreach changed year-over-year is not known at the time of this publication.

Public health emergency-related restrictions and guidelines suggested or ordered people to limit travel and exposure to essential work and errands (e.g., driving to the grocery store). Individuals could follow these orders and guidelines and stay at home, maintain their usual routines, or increase discretionary travel on a less-congested roadway network (or in the case of essential workers, continue traveling to and from work). Some people had to travel due to job requirements, family needs, or economic concerns. However, other people who are *less risk-averse* may have engaged in their usual driving routine and habits or additional discretionary trips—or reduced their usual driving by less—while *more risk-averse* people remained home and off the roads, or restricted their out-of-home activities and driving by a greater

degree. Individuals who are not risk-averse tend to engage in risky driving behaviors, such as not wearing seat belts, speeding, and driving while impaired (e.g., Wilson, 1990). In short, the stay-at-home orders may have led the population of drivers during the height of the health crisis to have been smaller but more willing to take risks. There is evidence, discussed below, that seat belt use as a fraction of overall drivers declined, and that speeding and impaired driving increased proportional to total driving from the beginning of stay-at-home orders in March 2020 in comparison to previous years. Thus, drivers with greater risk tolerance may have contributed to the worse safety outcomes on a per-VMT basis.

Belt Use

In 2019, the national seat belt use rate was 90.7 percent (NCSA, 2019). However, in 2018, 43 percent of fatally-injured occupants were unrestrained (NCSA, 2020). Individual State's data have pointed to a trend of reduced seat belt usage during Q2 months in 2020. For example, Virginia experienced a 15.4-percent increase in the number of unrestrained fatalities between January 1 and May 21, compared to the same period in 2019 (Virginia Department of Transportation, 2020). Minnesota also reported a higher proportion of unrestrained fatalities from January 2020 to June 2020 compared to 2019 (see **Figure 7**) (Office of Traffic Safety, 2020).

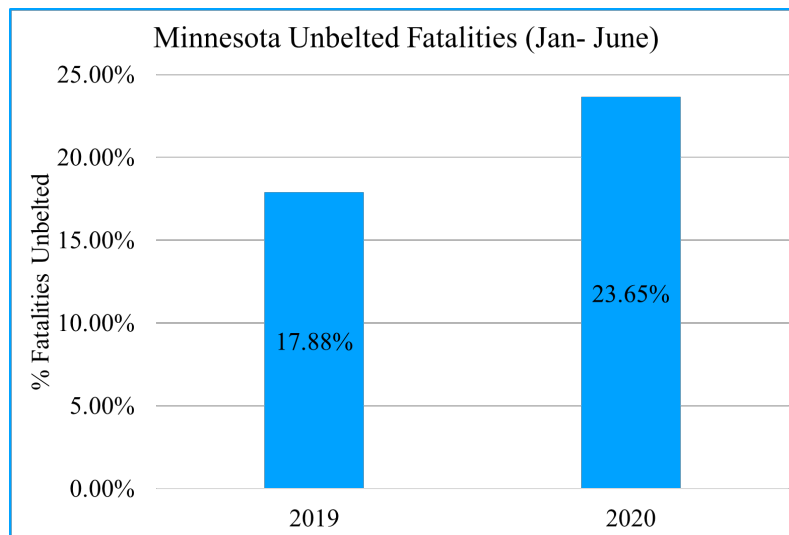


Figure 7: Minnesota Unbelted Fatalities for January to June, 2019 and 2020

NHTSA's National EMS Information System (NEMSIS) is a database comprised of EMS data from 48 States and Territories. NEMSIS collects and stores data from emergency 911 calls and responses for each State, including details about EMS treatment of patients who were injured in motor vehicle crashes. NEMSIS data can be used as a surrogate for seat belt use when examining the vehicular ejection rate, as ejections are most frequently caused by lack of seat belt use or, in some cases, improper seat belt use. Ejections per 100 crashes in which EMS was called to the scene drastically increased following the start of States' stay-at-home orders (noted with * in **Figure 8**) and were much higher compared to the same time frame in March 2019 (NHTSA, 2020a). The peak ejection rate in April 2020 was double the ejection rate in April 2019. Furthermore, the data indicates that ejection rates were higher for males, people aged 18-34, and those in rural locations (using modified USDA urban influence codes). This population of drivers was known to have lower seat belt use rates prior to the public health emergency (Beck et al., 2017; Li & Pickrell, 2019).

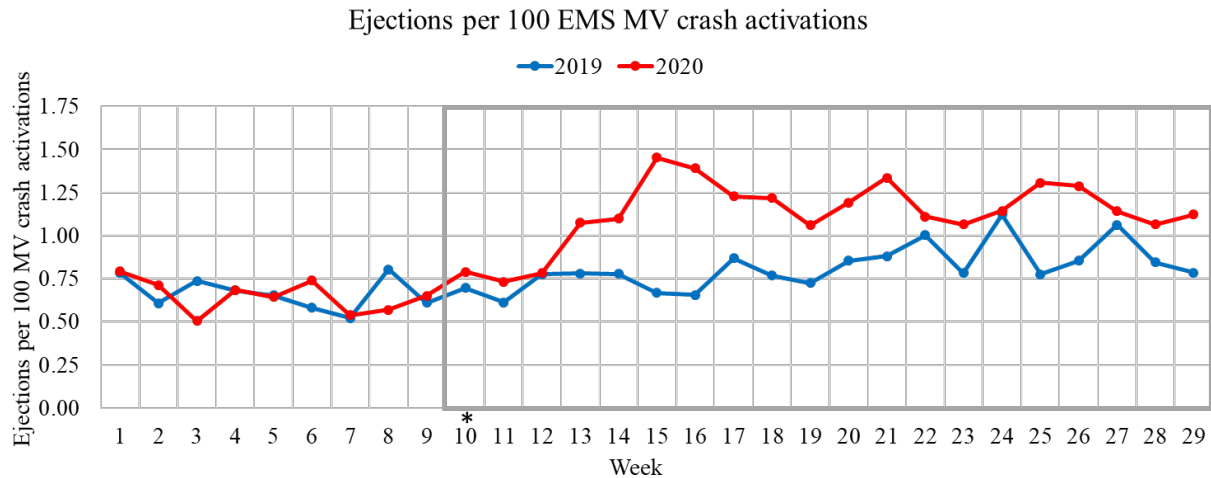


Figure 8: Ejections per 100 EMS Motor Vehicle Crashes (Source: NEMSIS)

In addition to demographic characteristics (**Figure 9**), several psychological factors are associated with low belt use rates (see Jans et al., 2015, for a review). Drivers who do not always wear seat belts are, on average, more impulsive, less averse to risk and less perceptive of risk, which may be why these drivers are more likely to engage in other risky driving behaviors such as speeding and other traffic violations (Hunter et al., 1993; Wilson, 1990) and alcohol-impaired driving (Jewett et al., 2015). Drivers who do not always wear seat belts are also less likely to believe that others wear seat belts or to perceive social pressure to wear a seat belt (Jans et al., 2015; Sheveland et al., in press).

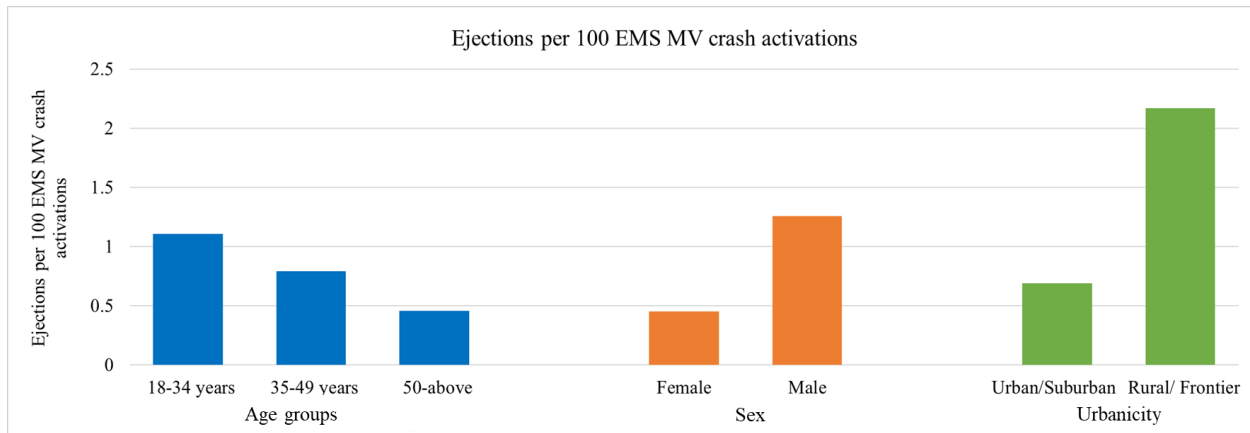


Figure 9: Ejections per 100 EMS MV Crashes by Age, Sex, and Urbanicity (Source: NEMSIS)

Speeding

In a national survey of drivers' speeding attitudes and behaviors, Schroeder and colleagues (2013) identified three clusters of drivers with similar driving characteristics (speeders, sometimes speeders, and non-speeders). They reported that half of the 16- to 20-year-old respondents were classified as speeders, as compared to 15 percent of drivers 65 or older. This classification was based on the pattern of responses across six speeding behavior questions. In that survey, younger drivers and male drivers were more likely than older drivers and female drivers to report that they had been stopped for speeding in the last 12 months. The drivers classified as speeders were also more likely to report engaging in other risky driving, such as not wearing seat belts, drinking and driving, and using cell phones and texting while driving.

An analysis of instrumented vehicle data from the 2nd Strategic Highway Research Program (SHRP2) conducted by Richard and colleagues (2020) revealed three types of speeding behavior: momentary speeding, cruising speeding, and riskier speeding. The riskier speeding observed in the SHRP2 data was characterized by higher speeds and more variation in speeds (compared to other speeding types), and speeding for long durations of time per speeding episode. This riskier speeding was most evident in young adult drivers and drivers with a measurable propensity for risk taking and sensation seeking.

In April and May 2020, news outlets reported large increases in the number of drivers cited for excessive speeds across the country. For example, the *Atlanta Journal Constitution* reported that the Georgia State Police cited 140 drivers for speeds over 100 miles per hour (mph) in one 2-week period (Wickert, 2020); the *Los Angeles Times* reported that citations for speeds over 100 mph had increased by 87 percent (McGreevy, 2020); and, the *Chicago Tribune* reported an increase of 14 percent in speeding citations from automated enforcement (Wisniewski, 2020). Virginia observed that from March 13 to May 21, 2020, speed-related fatalities made up about 50 percent of the overall fatalities, compared to 42 percent in the same period in 2019 (Virginia DOT, 2020).

In August, the North Carolina Department of Transportation published a report on crash and fatalities observed during the public health emergency. It observed decreases in crashes in urban areas, but crashes in rural areas dropped only through April before returning to the baseline in June. Unfortunately, the rural *fatal* crashes were up in April. The change in fatalities on this roadway type is concerning, particularly in light of a Longthorne and colleagues (2010) finding that in 2008, at the start of the Great Recession, fatalities in rural areas declined more significantly than the fatalities in the urban and suburban areas.

NHTSA examined FHWA National Performance Management Research Data Set (NPMRDS) (Center for Advanced Transportation Technology, 2020) data on speeds, which showed that AM and PM rush hour 50th percentile speeds increased over historical levels throughout Q2, suggesting that traffic was moving faster, especially on urban interstates. The decrease in VMT indicates that there were more open roads that provided the opportunity to speed—and as we have seen, traffic safety enforcement activities were also limited at that time. In a meta-analysis, Elvik (2005) found a 10-percent change in the mean speed of traffic was likely to have a greater impact on traffic fatalities than a 10-percent change in traffic volume, and that increased driving speed increased the risk of crashes and the severity of injuries resulting from those crashes.

NHTSA also explored FHWA NPMRDS data for changes in speeds on rural and urban roads by month by percentile speed. **Figure 10** shows the changes in speeds 2019 to 2020 from April to June across three types of roads. We note dispersion (difference between 1st and 99th percentile speeds) on rural major collectors. We also found that although there was less dispersion for urban interstates, most drove faster. This suggests traffic was flowing more freely on urban interstates, and there was more dispersion in speeds especially for lower volume roads.

The reduction in traffic volume, particularly during the earlier months of the public health emergency, coinciding with a reduction in law enforcement activity, created a driving environment with a much greater opportunity to speed. Drivers tend to speed more when they are comfortable doing so, and this aligns with observed increases in traffic speed during the public health emergency. This is also reflected in State-reported increases in speeding-related fatalities. Reductions in roadway volumes and associated congestion result in higher average travel speeds and greater speed variability. These conditions are known to influence travel safety as crashes are more likely with varying vehicle speeds and higher speeds (NHTSA & FHWA, 1997 and Gao, Xu, Li, and Yang, 2019). Faster travel, and varying speed conditions, whether or not actually exceeding the speed limit, increases the chances of fatalities in any resultant crashes.

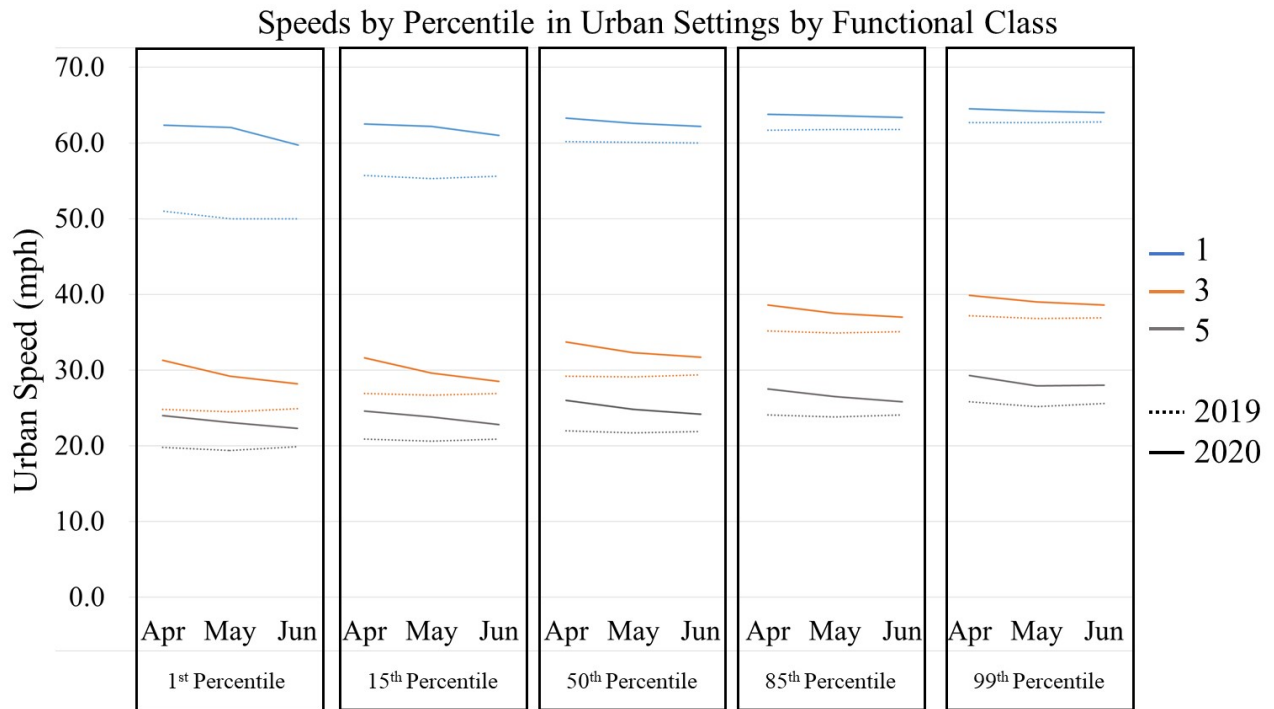
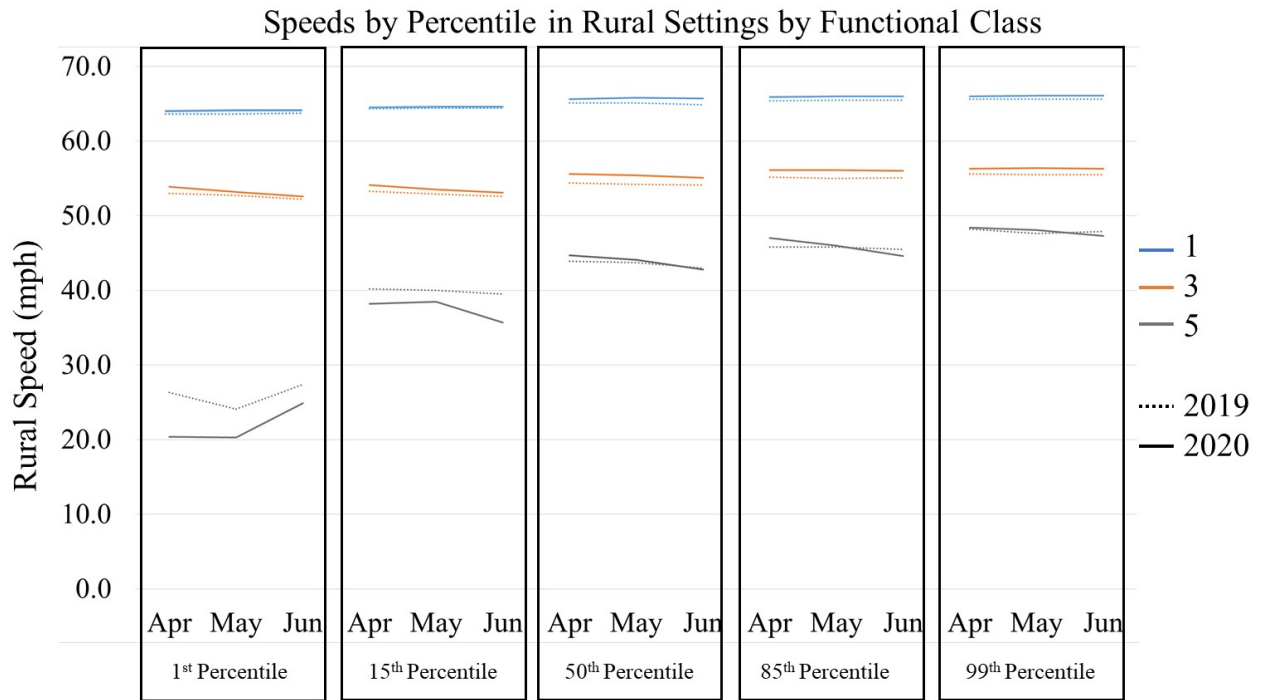


Figure 10: Changes in Rural and Urban Road Speeds for April-June (Months 4-6) 2019 to 2020 by Percentiles by Roadway Classification (1,3 & 5¹). Source: NPMRDS

¹ Roadway classifications are: 1. Interstates; 2. Other freeways and expressways; 3. Other principal arterials; 4. Minor arterials; 5. Major collectors; 6. Minor collectors; and, 7. Local roads.

Impaired Driving

In 2018, the last year for which complete data is available, alcohol-impaired driving fatalities represented 29 percent of U.S. road traffic deaths (NCSA, 2019). Impaired driving remains a priority concern for NHTSA.

NHTSA examined the Census Bureau's seasonally adjusted² wholesale sales of alcohol and observed a steep decrease in overall sales in April; in May and June sales recovered to all-time highs (see **Figure 11**) (FRED, 2020b). Retail sales suggest a slightly different picture, with a steep increase of sales in March, a slight decrease in April, and a return to highs in May and June (see **Figure 12**). This occurred at the same time that the Nielsen Company (2020) reported that April on-premises sales were down between 67 and 75 percent throughout the month. Taken together, these data suggest that consumers were buying and consuming more alcohol throughout Q2 than they were prior to March 2020, but not doing so in bars or restaurants.

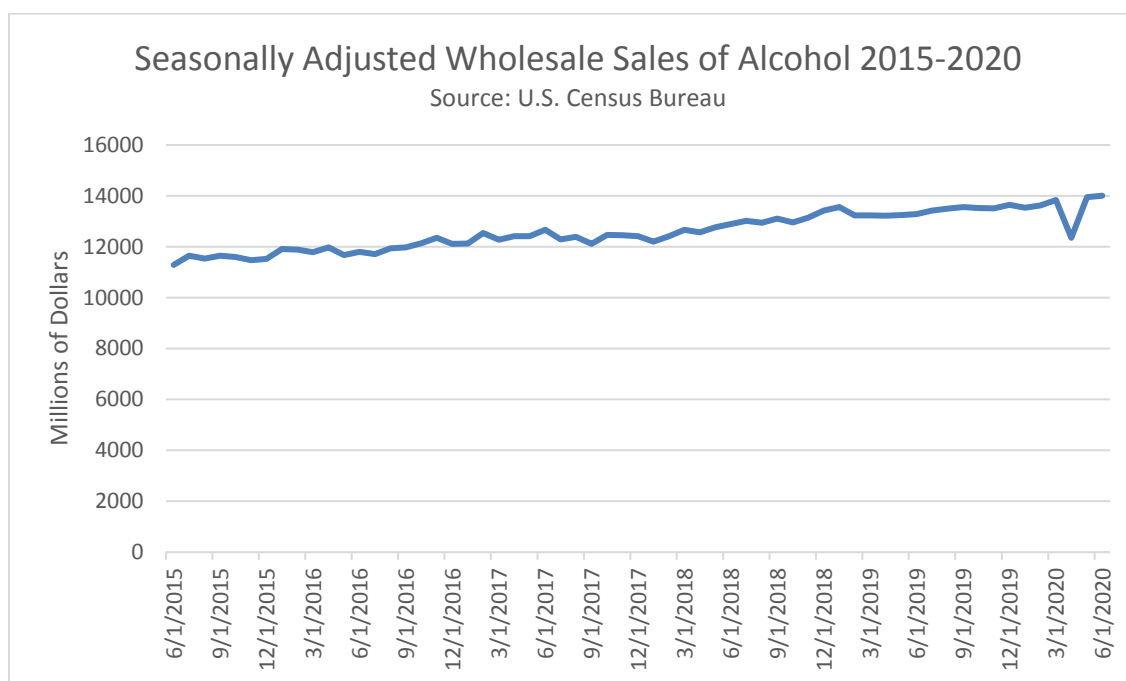


Figure 11: Seasonally Adjusted Wholesale Sales of Alcohol 2015-2020

² Seasonal adjustment is a method of data-smoothing that is used to predict economic performance or company sales for a given period.



Figure 12: Seasonally Adjusted Retail Sales of Alcohol 2015-2020

In 2008, impaired-driving crashes dropped 10 percent from their levels in 2007 (NCSA, 2009). In the National Academies of Sciences, Engineering, and Medicine modeling study (Blower et al., 2020) of the factors contributing to the decrease in fatalities during the recession, researchers observed a 3.5-percent reduction in beer sales from the 2007 mean to the 2011 mean, and attributed a 0.7-percent reduction in predicted fatalities to the reduced sales. The historic trend of alcohol sales dropping during recessionary periods did not occur in Q2.

Alcohol is not the only impairing substance of concern. The Colorado Department of Revenue (2020) reports increased marijuana sales tax revenues year-over-year (see **Figure 13**), suggesting greater consumption year-over-year in Colorado. Likewise, other States, including Washington (Washington Department of Revenue, 2020) and Oregon (Oregon Department of Revenue, 2020) saw significant increases in their marijuana sales tax revenues year-over-year.

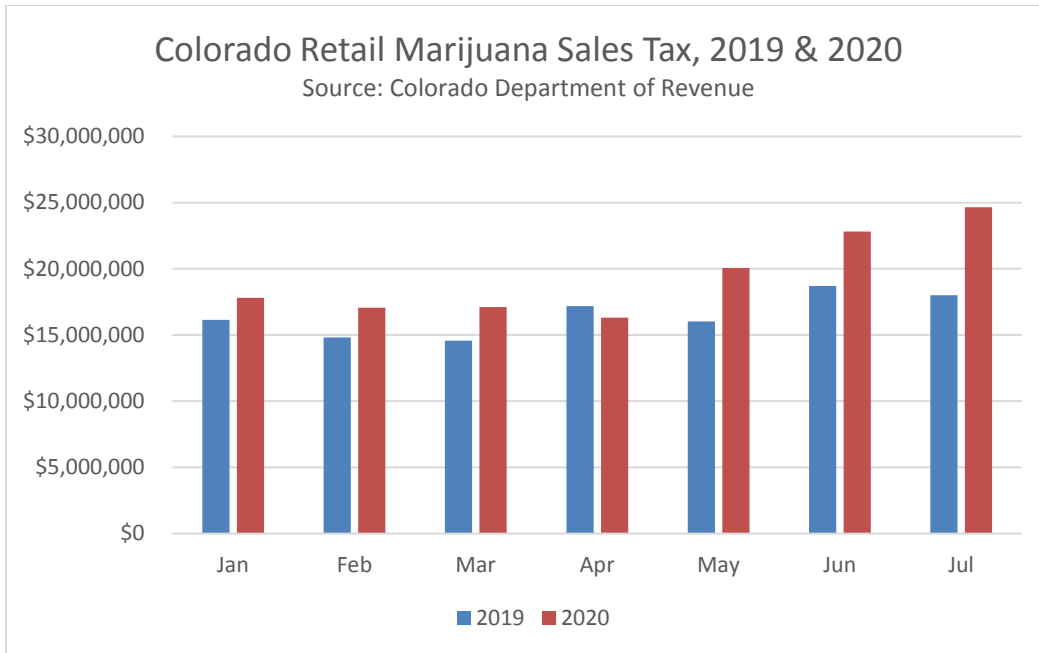


Figure 13: Colorado Retail Marijuana Sales Tax, 2019 and 2020

NEMSIS (NHTSA, 2020a) data shows a higher rate of opioid-related EMS activations (responses to emergency calls) throughout 2020 than was observed in 2019 (see **Figure 14**). This increase is more pronounced starting in Week 10 (March) and reached its peak in Week 18 (late April). The rate remains consistently higher than both 2019 and pre-March levels.

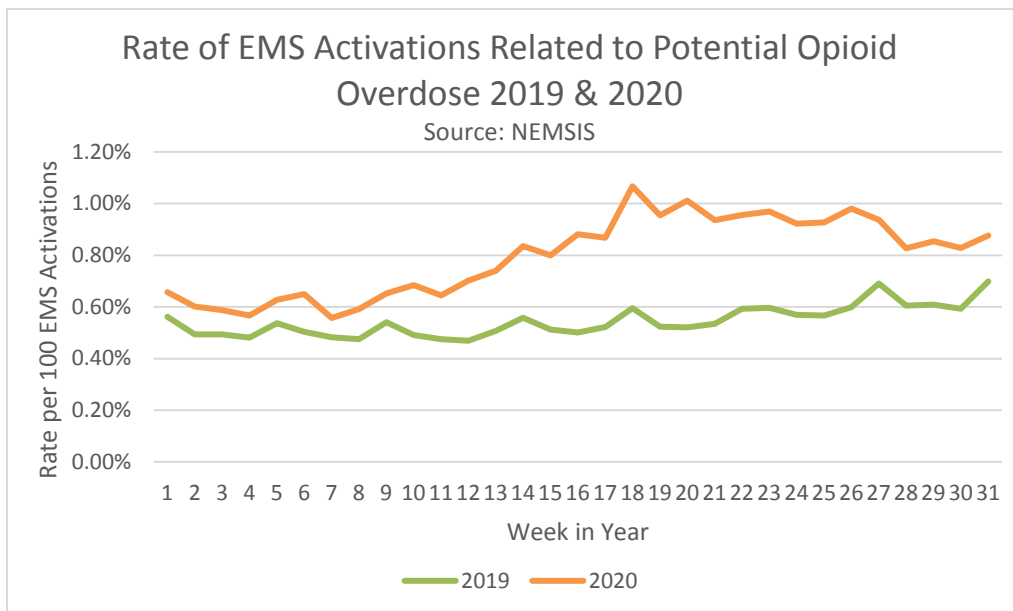


Figure 14: Rate of EMS Activations Related to Potential Opioid Overdose 2019 and 2020

The overall context of substance use during Q2 is also informed by a Czeisler and colleagues (2020) survey of adverse mental health effects during the COVID-19 public health emergency. Overall, 13 percent of respondents to their survey indicated that they had started or increased substance use to cope with pandemic-related stress or emotions. However, among respondents 18- to 24 years old, that rate was nearly 25 percent. This is not the only evidence of drinking behaviors identified in the research. A survey sponsored by Responsibility.org (2020)³ found that about two-thirds of respondents were drinking about the same or less alcohol during the public health emergency, but that 23 percent were drinking more during the stay-home orders. This data points to increased opportunity for people to drive impaired by alcohol or drugs, but does not, by itself, necessarily indicate that they did so.

Understanding the traffic safety effects of these factors in light of the reductions in VMT discussed above requires an understanding of the prevalence of alcohol and drug use among the driving population. NHTSA has conducted significant research on these topics. In the 2013-2014 National Roadside Survey (Berning et al., 2015), researchers found that 8.3 percent of weekend nighttime drivers were positive for any amount of alcohol, and 1.5 percent had a blood alcohol concentration of .08 g/mL or higher. Results also indicated 22.4 percent of weekend nighttime drivers tested positive for any drug (including over-the-counter, prescription, or illegal); 12.6 percent of such drivers were positive for THC. It is important to note that the presence of a drug does not necessarily indicate impairment (Compton & Berning, 2015).

NHTSA is now examining the prevalence of alcohol and other drugs in serious injury and fatal crashes. An interim report on drug prevalence and risk among road users (drivers, passengers, and other road users) injured in motor vehicle crashes and treated at trauma centers or who died as a result of the crash, Thomas et al., (in press) analyzed blood samples from patients in five trauma centers who were treated from September 10, 2019, to July 18, 2020. Using March 17 as the cutoff between pre-COVID-19 and COVID-19 periods, the researchers tested the samples for evidence of drug and alcohol use among seriously and fatally injured road users, which included drivers, passengers, bicyclists, pedestrians, and micromobility users.⁴ Table 1 (Positive by Drug Category) shows significantly higher prevalence of alcohol, cannabinoids (these results are for the active components of marijuana), and opioids during the public health emergency compared to before. Prevalence of antidepressants was significantly lower during the public health emergency. In addition, there was a significant increase in the proportion of people testing positive for more than one category of drugs during the public health emergency. It is important to note these results speak to the person being *positive* for the drug; researchers do not have information on whether the person was *impaired* by the substance.

³ Foundation for Advancing Alcohol Responsibility, known as Responsibility.org, formerly known as the Century Council, is a Virginia-based American nonprofit organization founded in 1991 and funded by a group of eight distillers with the aim of eliminating drunk driving and underage drinking, and which promotes responsible decision-making regarding alcohol use.

⁴ “Micromobility” refers to the range of small, lightweight vehicles operating at speeds typically below 15 mph and driven by the users personally.

Table 1. Positive by Drug Category

Drug Category	Before (N= 1,880)		During (N= 1,123)	
	n	%	n	%
Alcohol	400	21.3	302	26.9*
Cannabinoids	402	21.4	350	31.2*
Stimulants	190	10.1	115	10.2
Sedatives	158	8.4	95	8.5
Opioids	142	7.6	145	12.9*
Antidepressants	37	2.0	5	0.4*
Over-the-Counter	43	2.3	18	1.6
Other Drugs	27	1.4	20	1.8
At Least 1 Category	959	51.0	714	63.6*
Multiple Categories	341	18.1	267	23.8*

^Active THC (Δ -9-THC or 11-OH-THC)

*Significantly different ($p < .05$) compared to the Before period.

The documentation of changes in prevalence of drugs and alcohol among seriously injured people during this unique window provides a critical insight to understanding the changes in behavior and fatalities in Q2. However, as similar data was not available from prior years, any effects due to typical monthly or seasonal variations are not known. Because this is a convenience sample, data collection may not be uniformly distributed throughout the year and may not have been the same each month.

Discussion

The traffic safety patterns that occurred since the start of the public health emergency, and in particular in Q2 of 2020, were dramatically different from any past example. The observed Q2 decreases in VMT, trip-taking, and transit use, paired with self-reports of people avoiding travel would have led NHTSA to expect significant decreases in fatalities and lower fatality rates. While the decreases in fatalities were observed, fatality rates increased. Understanding the characteristics and context of what happened will be critical for identifying and selecting appropriate countermeasures. The key observations highlighted in this report include observed changes in:

- Traffic volumes and vehicle mix, VMT, and speeds;
- Proportion of seat belt use and drug- and alcohol-involvement among crash-involved road users; and
- The deployment of key traffic safety countermeasures including enforcement, communications and education.

This report suggests an overlap between “traditional” risk-taking groups and those who were more likely to take trips during Q2. It also highlights the need to address rural road safety, where significant increases in speeds and traffic fatalities occurred. It should come as no surprise that, in addition to changing the way we work, the way we travel, and the way we interact with others, the public health emergency has also changed the way we have to look at traffic safety. This provides an opportunity to work collaboratively with a wide variety of governmental and non-governmental stakeholders to better identify the causes of the changes to traffic safety, and to identify and pursue necessary and appropriate countermeasures. It is imperative to apply strong and effective countermeasures to those who are at the highest risk of crashing, and to recognize the importance and leverage the value of effective law enforcement in deterring risky driving and reducing motor vehicle crashes.

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