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Global Changes to Driver Behavior Amid COVID-19

Siby Samuel and Yovela Murzello

Department of Systems Design Engineering, University of Waterloo, Waterloo, N2L3G1, Ontario, Canada

ABSTRACT

Road safety has remained a primary issue worldwide since the advent of automobiles. Significant advances have been made over the past several decades that have led to substantial improvements in safety. However, the recent spread of COVID-19 and subsequent social distancing measures, including travel bans and partial/complete lockdowns worldwide, has caused a dynamic shift in driver behavior, particularly those elements of behavior most associated with safety in general and crashes in specific. The current article aims to identify the critical changes to safe driver behavior in the post-COVID-19 era, reflect upon the behavioral factors driving this change, and suggest potential countermeasures to mitigate the unexpected change in driver behavior. A recent literature review shows that critical behavior changes include increased excessive speeding accompanied by a reduction in congestion, and a rise in distracted driving incidents. This unexpected shift in driver behavior necessitates the exploration of countermeasures that promote safer driver behavior. The findings may have potential implications for policymakers, researchers, and the public.

Keywords: COVID-19, Driver behavior, Speeding, Congestion, Driver distraction, Vulnerable road users

INTRODUCTION

In December 2019, a cluster of novel pneumonia cases was identified in Wuhan, China, caused by a novel coronavirus initially named 2019-nCoV and now officially labeled SARS-CoV-2 (Guo *et al.*, 2020). Subsequently, several such clusters were identified elsewhere around the world across all continents. On March 11, 2020, the World Health Organization declared COVID-19 a pandemic (Cucinotta and Vanelli, 2020). Preliminary research in Singapore and other countries indicated that effective social distancing interventions coupled with improved personal hygiene could potentially control the spread of COVID-19 in humans (Koo *et al.*, 2020). As a result, several countries imposed social distancing policies, albeit to different extents and varying degrees of success (Dalton, Corbett and Katelaris, 2020). Research notes that the effectiveness of quarantines and social distancing measures may depend on the credibility of local public health institutions (Lewnard and Lo, 2020). Subsequent waves of the virus are expected to lead to further and extended social distancing (Evenett and Winters, 2020). Social distancing policies, including border closures, have directly impacted air travel, cruises,

public transport (Gössling, Scott and Hall, 2020), and the limiting of social connectivity has had effects on safety, operations, and emissions from a transportation systems perspective (Wilder-Smith and Freedman, 2020). While recent papers have explored the impacts of the pandemic outbreak on travel mobility and behavior, including the reduced demand for travel and change in the type of activities (De Vos, 2020), few have considered what it might mean for driver behavior and safety in the near-immediate term. The current commentary identifies three crucial characteristics of post-pandemic driver behavior consisting of two negative trends, including 1) an increase in speeding behaviors, 2) a greater propensity for distracted driving; and one positive trend 3) a reduction in congestion. A discussion is presented along with future steps to tackle the negative trends in driver behavior.

IMPACT ON DRIVER BEHAVIOR

Increase in Speeding Behaviors

Speeding increased at the onset of the COVID-19 pandemic and has only continued since. Following the lockdown and extended social distancing policies, cities and towns across North America and globally have witnessed an increase in speeding and speeding-related crashes. Waterloo Regional Police has reportedly laid 669 driving charges, mostly speeding-related, between April 17 and April 29, and the offenders have included commercial vehicles and passenger cars (Banger, 2020). Compared to the same time last year, stunt driving charges that comprise operating vehicles well over 50 km/h above the speed limit have increased by 721% (Baker, 2020). In 2020, 285 stunt driving offenses were observed, nearly double the 143 offenses observed in 2019. There was also a 40% increase in ticketing, with 10,189 speeding tickets handed out in 2020 compared to the 7,253 tickets issued in 2019 (Hill, 2021b). According to a road safety report by Waterloo regional police, speeding charges are up 78% as officers have already laid 4,573 speeding tickets till May 2021, while the year-to-date average is 2,562. However, fewer stunt driving charges have been laid so far, with 124, compared to 169 in the same period in 2020 (van Rooy, 2021). Across Ontario police issued 88,142 speeding tickets and 796 stunt driving charges in the first ten months of the pandemic, an increase of 151% and 222%, respectively (D'Andrea, 2021). An investigation by Amberber et al. (2021) into vehicle speeds on the frontage of 11 schools found 31% greater odds of speeding during school activity times (8 am – 4 pm) after schools were closed on March 14, 2020, and before the start of the academic year (2020-21). However, in 2021, Toronto's speed trap devices showed that almost 8,000 fewer tickets were issued in April than March which might be attributed to the stay-at-home emergency orders issued at the beginning of April (Braun, 2021).

Analysis was conducted on statistical data from the Ontario Court of Justice (2022). A comparison of offences in the province showed a 108% increase in the number of speeding tickets issued from July 2020 to June 2021 compared to the number of tickets issued in 2019. Moreover, for the same time periods, there was a 40% increase in the number of charges disposed for stunt driving/racing with 3,853 more charges disposed between July 2020

to June 2021. A relatively lower congestion with large numbers of people working remotely could have led to the significant increase in stunt driving incidents and speeding. However, further research is needed to pinpoint the exact factors driving this increase in driver speeds.

Increase in Distracted Driving

With reduced congestion comes a tendency for distracted driving. A study examining external distractions (electronic billboards) suggested that drivers that were under-stimulated by the environment (such as when traffic volumes are low) are more likely to look for entertainment in the form of distraction (Dukic *et al.*, 2013). In the five weeks following the announcement of lockdown orders, Zendrive notes that drivers' use of cellphones behind the wheel is up 38% from pre-lockdown numbers and, perhaps relatedly, hard braking was also up by 20% (Wilson, 2020). Analysis of a subset of over 86,000 collisions from a dataset of thousands of collisions showed that 57% of all crashes in 2020 involved phone use (Zendrive, 2020). According to a new report from Root Insurance, drivers seem to be more tolerant of distracted driving. Around 30% of motorists now believe they can drive safely while using their mobile phones compared to 24% in 2020. Approximately 64% of motorists reported checking their phones while driving. Moreover, 54% of people reported having trouble concentrating when they drive after video calls. Additionally, 41% of drivers who kept a mask in their cars stated that masks could be a distraction when driving (Malacarne, 2020). Between Jan. 1 and May 1, 2021, Waterloo regional police issued 395 distracted tickets that were more than double the number of tickets issued in the same period last year (Hill, 2021a). Traffic safety systems specialist Westcotec notes that distracted driving could become the norm soon due to the perceived overreliance on digital communication platforms in the aftermath of the pandemic (Middleton, 2020).

In a road safety survey by Vanlaar *et al.* (2020), 4.2% of respondents reported they were more likely to be distracted while driving during COVID-19, and 2.2% of Canadians indicated they were more likely to drive within two hours of using drugs during the pandemic, as compared to before COVID-19. With dangerous driving behaviors, there was an overall reduction in drinking driving. A small percentage of Canadians (2.4%) admitted they were more likely to drink and drive; however, the majority of respondents indicated there was no change in this behavior (75.4%), and 22.2% reported they were less likely to drive within two hours of consuming alcohol during the pandemic (Vanlaar, Woods-Fry and Robertson, 2020).

Decrease in Congestion

Speeding and congestion may situationally go hand in hand. Especially outside peak hours, differences in desired speeds are important for traffic congestion (Verhoef, Rouwendal and Rietveld, 1999). The pandemic witnessed a dramatic decrease in the overall volume of cars on the roadway. In Toronto, there was a decrease in road transportation and a simultaneous

reduction in road traffic collisions. Following the state of emergency initiation, traffic volumes fell to a congestion index of 17%, compared with 72% one year earlier (Bubbers, 2020). For instance, an analysis of the open data highway traffic volume provided by Alberta Transportation (2021) showed a 13% decrease in the AADT from 2019 to 2020.

DISCUSSION & FUTURE STEPS

Depending on the pandemic duration and associated factors, including developing multiple successful vaccines, the driver behaviors noted above are likely here to stay for the near term – quite the new normal. Therefore, policymakers and safety practitioners may need to consider a cohort of education, engineering, or enforcement-based countermeasures to improve driver behavior. While we observe positive trends globally with congestion, the story is quite the opposite with safe behaviors (especially those associated with crashes such as excessive speeding and distraction). Increases in distractions among drivers and pedestrians simultaneously accompanied by drastic increases in driver speeds amid reduced congestion may be the perfect recipe for undesirable, unsafe situations.

Pre-COVID19, researchers globally have effectively used cognitive training interventions to train novice and young drivers on tenets of hazard anticipation, hazard mitigation, and attention maintenance, three higher-order cognitive skills critical to maintaining safety on roadways (e.g., McKenna, Horswill and Alexander, 2006; Pradhan *et al.*, 2009; Crundall *et al.*, 2010; Yamani *et al.*, 2016; Unverricht, Samuel and Yamani, 2018). These training programs have been evaluated in simulator-based laboratory environments and on open roads (Pradhan *et al.*, 2009; Taylor *et al.*, 2011). Further, these training interventions have demonstrated effectiveness over the long term, up to a year after training (Taylor *et al.*, 2011). With observed increases in speeding and distracted driving, higher-order cognitive skill training programs can play a critical role in not only educating drivers about the negative impacts of speeding and distractions but also reinforce the importance of sufficiently scanning the forward roadway for potential conflicts in a shared roadway system (Samuel and Fisher, 2019). Additionally, enforcement countermeasures such as automatic speed enforcement, red-light running camera traps, more prohibitive tickets and citations, and even modified policy legislation may prove effective at reducing excessive speeding by drivers and may also combat increases in distracted driving (Elias, Ghafurian and Samuel, 2019). Researchers may also explore engineering countermeasures (speed calming measures, pavement markings, signage), but these typically tend to be more expensive to implement and may take time for widespread adoption. However, pavement marking treatments such as crosswalks and advanced yield marking signs with sign prompts have proven effective at improving pedestrian safety, especially at marked midblock crosswalks (Houten *et al.*, 2002; Huybers, Houten and Malenfant, 2004; Gómez *et al.*, 2011; Samuel *et al.*, 2013; Gomez *et al.*, 2014). Traffic alerts implemented using Heads Up Displays and Head-Mounted Displays have also been demonstrated to improve drivers' hazard anticipation skills (Zhang *et al.*, 2016;

Hajiseyedjavadi *et al.*, 2018) and may offer a practical solution due to the proliferation of automated and connected vehicle technologies.

Future studies should empirically study these changes in driver behavior and identify the magnitude of impact so that practitioners may effectively tailor the existing countermeasures to meet the current needs. Research also needs to understand whether these new trends in behavior differ across age and gender. Study of crash data pre-and post- pandemic would reveal additional characteristics at the microscopic level that can further inform policy and decision making. Research should also explore the impact of pandemic lockdown and distancing on novice driver training framework and the Graduated Driver Licensing (GDL) framework. Interruptions to junior operators' education or driver training may have an indirect and adverse impact on road safety

SUMMARY

In summary, the extended lockdown and social distancing imposed due to COVID-19 have impacted driver behavior in several different ways, both positive and negative. Some of these changes (such as the positive trends), including reduced congestion, might be temporary, while some others, such as increases in speeding and distracted driving, may be here to stay for the immediate long term and therefore present safety-related challenges and concerns. While further research is needed to understand better the extended consequences of the pandemic on driver behavior, there remains a clear need to mitigate the negative impacts on safety. Whether we use targeted training interventions, outreach campaigns, stringent enforcement measures, or innovative engineering solutions, it would be prescient to consider and develop a robust plan to remediate unsafe driver behaviors sooner rather than later. Given the undue strain on the healthcare system in the aftermath of COVID-19, a visionary plan to remediate aberrant driver behaviors can buy us time and save lives while simultaneously illuminating a pathway to economic recovery.

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