

Mitigating Rage Behind the Wheel

*Understanding Modern Road Rage and Considerations
for Regional Policy Solutions*

Heather Schmidt, M.PA
Heather Schmidt Consulting Services



INTRODUCTION

Rage behind the wheel - colloquially known as “road rage” - has been on the rise in recent decades, with marked increases since the onset of the COVID 19 pandemic. In fact, over half of traffic collisions today involve at least one driver exhibiting anger-related behavior. An abundance of research has been done on the issue, though a consensus over what to do about it remains elusive. This is perhaps due to the heterogenous nature of the problem: subjects exhibiting or involved in collisions and road rage often rise to the level of incident for any number and variability of reasons. From a policy standpoint, this can create difficulty in finding solutions that may be implemented and tested for efficacy in reducing the problem at the community level. This White Paper will briefly discuss collisions and road rage as they are understood in the modern context (post-COVID 19); it will then offer considerations for regional policy solutions to the problem of road rage; finally, it will outline externalities should the crisis continue to be ignored. For the purposes of discussion, road rage will be defined hereafter as anger behind the wheel rising to incident (e.g. risky behavior, perceived aggression toward another vehicle, etc.).

UNDERSTANDING ROAD RAGE IN THE MODERN CONTEXT

Driving behavior (Ghosh, Hernandez, & Al-Bdairi, 2024)¹ classified as “risky,” and resulting in an increase in injury and severity of traffic accidents, has been on the precipitous rise since the onset of the COVID-19 pandemic. As traffic congestion and

¹ Ghosh, S., Hernandez, S., & Al-Bdairi, N. S. (2024). Understanding the role of the COVID-19 pandemic on risky driving behavior and injury severity of drivers: Embracing heterogeneity in means and variances. *International Journal of Transportation Science and Technology*. <https://doi.org/10.1016/j.ijtst.2024.09.002>

miles driven overall decreased, speeds and severity of traffic collisions (Ghosh, Hernandez, & Al-Bdairi, 2024) increased, in some cases as much as 87%-108% (speeds) and 2.63%-15% (severity). Risky driving behavior is certainly not a new problem for law enforcement and policymakers to grapple with. For decades, the problem has been prevalent in society; however, it is (Lopestrone & Biondi, 2022)² indisputable that since early 2020, it has reached epidemic levels of its own.

Notably, multiple survey studies conducted since 2020 have yielded concerning contradictions in self-reporting by drivers on the issue. The majority of drivers report (Lopestrone & Biondi, 2022) not engaging in risky behaviors behind the wheel, while the majority of drivers also report witnessing other drivers engaging in them. This suggests an increased lack of self-reflection or awareness, as well as decreases in personal accountability amongst drivers. Other studies point to contradictions of contributing factors, for example in one study specific to variables contributing to risky driving behaviors (e.g. age, gender, occupant number, time of day, and so on) found (Lopestrone & Biondi, 2022) that younger drivers are less prone to negative behaviors, while numerous other studies have found (Hawley, 2024)³ the opposite to be the case. This highlights the difficulty in crafting solutions at the policy level.

Nevertheless, across numerous studies conducted in the years since the onset of the COVID-19 pandemic, (Hawley, 2024) anger or rage behind the wheel as a contributing factor to risky behavior and subsequent collisions is present in over 50% of

² Lopetrone, E., & Biondi, F. N. (2022). On the effect of covid-19 on drivers' behavior: A survey study. *Transportation Research Record: Journal of the Transportation Research Board*, 2677(4), 742–750. <https://doi.org/10.1177/03611981221103866>

³ Hawley, R. E. (2024, May 17). *Road rage statistics and facts in 2024*. Bankrate. <https://www.bankrate.com/insurance/car/road-rage-statistics/>

reported incidents. This suggests that by mitigating road rage, over 50% of collisions may therefore be prevented. We must then focus on a meta-analysis of road rage and conditions that it arises from.

Rage As a Natural Consequence of Anger

Drivers that experience and express anger behind the wheel (American Psychological Association, n.d.)⁴ are more likely to then act on that anger. For the purposes of this discussion, anger behind the wheel is defined as yelling, swearing, or feeling an intensity of negative emotions; whereas, road rage (Bjureberg & Gross, 2021)⁵ becomes the natural consequence of that anger and is defined as a broader set of actions perceived by others, such as swerving, jake-braking, and so on. Anger does not necessarily result in road rage; however, appropriate mitigations must be applied either by the individual or by external sources, or it may become the natural consequence. Researchers have noted two distinct changes in test subjects since the onset of the COVID-19 pandemic relative to anger and its natural elevation towards rage (Bjureberg & Gross, 2021): (1) anger is more commonly selected by the individual as a regulator of other negative emotions (e.g. guilt, fear, etc.), and (2) the normalization of expression of anger has increased the incidence of rage as a natural consequence.

⁴ American Psychological Association. (n.d.). American Psychological Association. <https://www.apa.org/topics/anger/road-rage>

⁵ Bjureberg, J., & Gross, J. J. (2021). Regulating road rage. *Social and Personality Psychology Compass*, 15(3). <https://doi.org/10.1111/spc3.12586>

Rage As a Result of Hyper-Individualism and Competition In the Workplace

Numerous studies have highlighted the impact of competition in the workplace as a primary motivator of road rage. The concept (*Road Rage Factors*, n.d.)⁶ of “making good time” and having arbitrary deadlines, even to attend private affairs (versus career-related) have coincided an increase in road rage incidents. As the economy’s volatility has only worsened since the onset of the COVID-19 pandemic, more than (Miller, 2024)⁷ one-third of Americans now work more than one job to make ends meet. Thus it is reasonable to understand that pressure to meet deadlines and arrive in specific places at specific times has certainly heightened for a fair percentage of people. Moreover, the increased normalization of (American Psychological Association, n.d.) personal responsibility and hyper-individualism has coincided rises in attitudes that test subjects report as contributing factors to their own individual anger behind the wheel. Examples of the latter include drivers that perceive their lives as of higher value than others sharing the road. Often these drivers report ruminating while driving about personal difficulties in comparison to others, a problem that is replicable in other venues (e.g. the workplace, social media, etc.) that have been studied at the community level.

⁶ *Road rage factors*. Arrive Alive. (n.d.). <https://www.arrivealive.co.za/road-rage-factors>

⁷ Miller, J. R. (2024, August 6). *More than a third of Americans have second jobs: “it’s been tough for sure.”* Newsweek. <https://www.newsweek.com/americans-side-hustles-survey-1930416#:~:text=Personal%20debt%2C%20high%20cost%20of,every%20day%2C%22%20he%20said.>

Rage As an Indicator of Poor Health

Certainly, health status has become increasingly impactful on the attitudes and behaviors of drivers since the onset of the COVID-19 pandemic. Today, (Beusekom, n.d.)⁸ roughly 1 in 7 working-aged adults report ongoing suffering from Long COVID, a condition constituting a variety of symptoms lasting 6 or more months after the acute stage of the disease. Long Covid sufferers often report experiencing brain fog, cognitive impairment, and emotional dysregulation - all obvious contributing factors to both exhibiting or receiving aggressive driving reactions. Other health indicators that may impact driving behaviors and aggressive behavior that have risen since 2020 include (Mayo Foundation for Medical Education and Research, 2025)⁹ auto-immune disorders, which have risen to an estimated 7% of the US population, as well as (USAFacts, 2023)¹⁰ dementia, which is now present in as many as 10% of Americans over the age of 65.

⁸ Beusekom, M. V. (n.d.). *Studies: 1 in 7 US working-age adults report long COVID, with heaviest burden on the poor*. CIDRAP. <https://www.cidrap.umn.edu/covid-19/studies-1-7-us-working-age-adults-report-long-covid-heaviest-burden-poor>

⁹ Mayo Foundation for Medical Education and Research. (2025, January 6). *New study calculates autoimmune disease prevalence in U.S. - mayo clinic news network*. Mayo Clinic. <https://newsnetwork.mayoclinic.org/discussion/new-study-calculates-autoimmune-disease-prevalence-in-u-s/#:~:text=The%20findings%20indicated%20that%20about,Graves'%20disease%20and%20autoimmune%20thyroiditis.>

¹⁰ USAFacts. (2023, August 31). *How many Americans have alzheimer's disease and dementia?* <https://usafacts.org/articles/how-many-americans-have-alzheimers-disease-and-dementia/>

Rage As the Burden of Climate and Environment

Climate control within a vehicle has long been shown (*Does Hot Weather Fuel Road Rage?*, 2016)¹¹ to impact driver behavior. As temperatures rise - overall, due to climate change, and seasonally, such as during summer - a tendency to anger more quickly out of heat-induced irritability is more common. In fact, in the United States, during heat waves, (*Does Hot Weather Fuel Road Rage?*, 2016) car crashes are known to increase by as much as 7.7%. Other seasonality factors that impact anger behind the wheel may also be attributable to increased congestion on the roads due to schools and members of the community being on vacation.

Since the onset of the COVID-19 pandemic, summer-related heat wave phenomena have been observed around the globe. Heat records continue (Masters, 2025)¹² to be broken through out the summer months around the United States as well, and NASA has confirmed (NASA, 2025)¹³ that 2024 was the hottest year ever recorded or observed through carbon dating. Carbon dioxide in the atmosphere is now (Lindsey, 2025) at 50% higher than pre-industrial levels, with more carbon in the air per cubic meter than at any point in history. The impacts of this on human health and cognitive

¹¹ *Does Hot Weather Fuel Road Rage?*. Association for Psychological Science - APS. (2016, August 4). <https://www.psychologicalscience.org/news/motr/does-hot-weather-fuel-road-rage.html>

¹² Masters, J. (2025, June 27). *May 2025 was the planet's second-warmest on record " Yale climate connections*. Yale Climate Connections. <https://yaleclimateconnections.org/2025/06/may-2025-was-the-planets-second-warmest-on-record/>

¹³ NASA. (2025, January 10). *Temperatures rising: NASA confirms 2024 Warmest Year on record*. NASA. <https://www.nasa.gov/news-release/temperatures-rising-nasa-confirms-2024-warmest-year-on-record/>

function cannot be understated. Most notably (Mallinson et al., 2022)¹⁴, increased air pollution of PM2.5 is linked to a 0.53% increase in violent crimes, and increased agitation and aggression, including anger behind the wheel.



¹⁴ Mallinson, F., Morgan, S., Boudreau, J., Cunningham, A., Huang, J., Prakash, A., Marcone, V., Zakarian, N., Huntington, C., Lapporte, E., Maldonado, V., Halstian, M., Bernd, L., Hydock, E., Koteskey, T., Ozharat, Z., Smith, C., Sung, C., Albert, M., ... Lucioni, R. G. (2022, March 1). *How air pollution acts as a force multiplier for aggressive behavior, and what can be done about it*. Georgetown Security Studies Review. <https://georgetownsecuritystudiesreview.org/2022/03/02/how-air-pollution-acts-as-a-force-multiplier-for-aggressive-behavior-and-what-can-be-done-about-it/#:~:text=Inflammation%20of%20the%20brain%20impairs,cognitive%20effects%20of%20pollution%20cyclical.>

CONSIDERATIONS FOR REGIONAL POLICY SOLUTIONS

Policymakers are often reticent to engage in policy solutions to road rage due to a lack of public support or understanding of these big picture (intersectional) problems that act as contributive factors. Moreover, law enforcement (Bergal, 2021)¹⁵ faces numerous challenges in responding to road rage in progress, as well as often encountering a difficult time gathering evidence and having a very limited number of statutory laws relative to the issue from which they may garner jurisdiction and authority to enforce. Even basic education campaigns specific to the topic of road rage are low on the list of priorities for regional public organizations, in spite of the fact that (Hawley, 2024) anger behind the wheel is to blame for an average of 1,035 fatalities and over 12,500 injuries annually.

Nevertheless, numerous strategies being implemented by localities around the country are now evidencing overall improvements in traffic collisions and stress reduction.

Public Art

In communities where public art has been strategically placed in high congestion and pedestrian-heavy areas, traffic collisions have been found (Velie,

¹⁵ Bergal, J. (2021, July 13). *Cops scramble to deal with Deadly road rage during pandemic • stateline*. Stateline. <https://stateline.org/2021/07/13/cops-scramble-to-deal-with-deadly-road-rage-during-pandemic/>

2022)¹⁶ to reduce by as much as 17%. Additional data has found (Asphalt Art Safety Study - Bloomberg Professional Services, n.d.)¹⁷ public art reduces crash-related injuries by 37%, as well as an observed 25% reduction in driver and pedestrian conflict. While some cities have experimented with large scale art, such as a billboard or mural, other options include small installations in the public right of way, painted or decorated utility boxes, or direct-to-asphalt artwork, in particular in areas with higher levels of congestion or centered near city-centers and places of work (e.g. office buildings). Investment in public art through grant programs, or city- or county-commissioned programming therefore offers a data-backed policy to reduce road rage.

Health and Wellness Fairs

Health and wellness fairs and incentives are so directly tied to a reduction of stress and other mental health problems that private organizations all over the United States have incorporated them into their regular programming for employees. Community health fairs (Murray et al., 2014)¹⁸ eliminate economic disparity in

¹⁶ Velie, E. (2022, April 20). *Public art decreases traffic accidents by 17%, report finds*. Hyperallergic. <https://hyperallergic.com/725316/public-art-decreases-traffic-accidents-report-finds/>
#:~:text=Public%20Art%20Decreases%20Traffic%20Accidents%20by%2017%25%2C%20Report%20Finds

¹⁷ Asphalt Art Safety Study - Bloomberg Professional Services. (n.d.). <https://assets.bbhub.io/dotorg/sites/43/2022/04/Asphalt-Art-Safety-Study.pdf>

¹⁸ Murray, K., Liang, A., Barnack-Tavlaris, J., & Navarro, A. M. (2014, March). *The reach and rationale for Community Health Fairs*. Journal of cancer education: the official journal of the American Association for Cancer Education. <https://pmc.ncbi.nlm.nih.gov/articles/PMC3909725/>

addressing health and wellness issues in the same way corporate health fairs do. Community health fairs have an observed impact on (Murray et al., 2014) stress reduction, anxiety, anger management, as well as physical health such as blood pressure, asthma and other chronic upper respiratory conditions - all of which impact anger behind the wheel. Policymakers may consider funding and offering health and wellness fairs specifically designed to address contributing factors to road rage, including offering information for drivers to become educated on early, individual mitigation strategies to self-regulate the anger-to-rage transference.

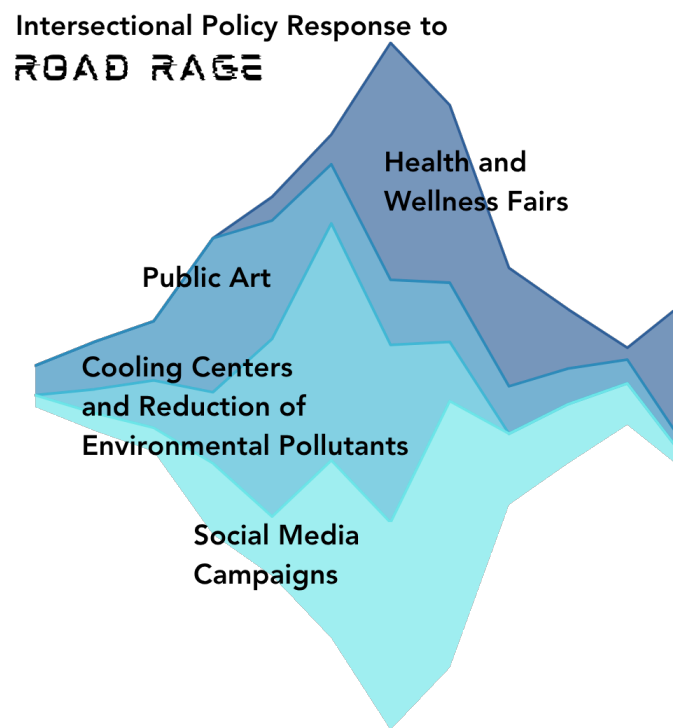
Social Media Campaigns

Social media campaigns on their own have been found to be ineffective at addressing road rage; however, when coupled with other strategies, they offer a powerful tool in public education on identifying and preventing anger behind the wheel. Studies on these types of campaigns have also been found to be mostly effective in specific demographics, for example in younger drivers. In the broader context of road rage policymaking, public organizations may select social media as a supplementary location to distribute other materials (for example, offer a stress reduction seminar over Instagram or YouTube as an alternative to attending a seminar at a health and wellness fair in person).

Cooling Centers and Reduction of Environmental Pollutants

In the face of global climate change, regional policymakers may reduce overall health and irritability factors that lead to anger behind the wheel, and subsequent road rage, by offering adaptability measures to help constituents better manage temperature and other seasonal changes that may lead to anger. One significant

finding in recent years (Bedi et al., 2022)¹⁹ has been the impact of cooling centers on the reduction of overall heat-related illness, fatalities, and mental health complications. By offering public locations for constituents to cool down, overall mental wellness is achieved, thus reducing the state of irritability that heat induces. Improving ventilation in public spaces (Mallinson et al., 2022) is also tied to improved health outcomes, including mental wellness and cognitive function. Policymakers may offer incentives to local businesses and other organizations to upgrade ventilation and purifiers in their buildings, as well as to polluters to implement cleaner infrastructure as an investment in the community's overall wellness. Grant programs and upgrading ventilation systems in publicly owned facilities are additional options.



¹⁹ Bedi, N. S., Adams, Q. H., Hess, J. J., & Wellenius, G. A. (2022, September 1). *The role of cooling centers in protecting vulnerable individuals from extreme heat*. Epidemiology (Cambridge, Mass.). <https://pmc.ncbi.nlm.nih.gov/articles/PMC9378433/#:~:text=conditioning%20at%20home.,17,effectiveness%20and%20guide%20appropriate%20implementation.>

CONCLUSION: THE PRICE OF DOING NOTHING

There is no evidence to suggest the rise of road rage and its deleterious impacts are stopping anytime soon. And the externalities have begun to pile up on consumers, law enforcement, and the public in general.

The number (Hyde, 2022) of people fatally shot every year in road rage incidents has increased since the onset of the COVID-19 pandemic. Moreover, weapons use overall has (Hyde, 2022) increased in rate compared to pre-pandemic years, with regional law enforcement agents grappling with increases in use of firearm, strong-arm, and vehicular weapons during incidents. This places both the general public (bystanders) and law enforcement in harm's way, and increases the costly burden of weapons collection and processing after the fact.

Road rage is cited as one of the primary contributing factors of auto insurance rate increases since 2020, as well. And this does not only apply to individuals who have been found guilty of, or that have been cited for, exhibiting road rage. Rates across the board (*Road rage and auto insurance*, n.d.)²⁰ have risen since early 2021 in the entire United States as a result of the increase in traffic accidents resulting from reckless driving.

With thousands of people being injured or killed by road rage-related incidents every year, it is imperative that policymakers and law enforcement begin to develop new strategies to mitigate rage behind the wheel. With the potential to reduce accidents by as much as 50%, the cost of doing nothing will continue to plague both

²⁰ *Road rage and auto insurance*. Insurance Information Institute. (n.d.). <https://www.iii.org/article/road-rage-and-auto-insurance#:~:text=Road%20rage%20incidents%20are%20not,incident%20in%20the%20first%20place.>

public organizations and the general public until a more proactive, evidence-based policy strategy is implemented.

