

ALTERNATIVES TO RE-CENTER ROAD SAFETY IN TRANSPORTATION  
ENFORCEMENT

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# **Alternatives to Re-Center Road Safety in Transportation Enforcement**

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It is also important to note that the author identifies as a White man. He does not experience the same aggression and targeting that many others in the United States do. He does not frequently drive and has been stopped by police just once, during which he let go with only a warning. However, he feels that it is essential to leverage his position to push for equity in traffic safety so this conversation does not continue to wax and wane from the forefront of planning. Many readers may already be experts on this material from their own personal experience.

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## Executive Summary

Transportation has become the most policed aspect of daily life in the United States. The most frequent interaction between police and civilians is at traffic stops. However, many stops are not necessary for road safety. The discretionary power police officers use for traffic stops are infrequently related to preventing injuries and deaths on the road. When combined with significant racial disparities found in policing – including that Black drivers are more likely to be stopped, searched, and shot than any other racial or ethnic group – the system can be devastating for people of color.

Citing these issues, in July 2020, following years of grassroots activism and sparked by the Black Lives Matter protests in response to the May 2020 murder of George Floyd, the City of Berkeley passed an omnibus motion to reimagine public safety. Part of this policy package includes removing the police from traffic enforcement in Berkeley, thereby establishing the first local government operated traffic enforcement system in the United States.

This paper explores the motion passed by Berkeley and incorporates other practices from an international review of road safety practices and conversations with road safety professionals to develop recommendations for jurisdictions looking to implement alternative traffic enforcement strategies. Recommendations are made that re-center road safety in traffic enforcement. This includes re-evaluating the role of enforcement in Vision Zero (the ethical imperative to eliminate all serious injuries and fatalities on the road), relying on automated technologies such as road safety cameras, and decriminalizing violations unrelated to traffic safety for all modes of transportation.

The full list of recommendations, including opportunities from and challenges to implementation, is presented on the next page. The list is not in priority order and jurisdictions implementing reform should tailor solutions to their local context.

Table of Recommendations to Re-Center Road Safety in Transportation Enforcement

Recommendation	Opportunities	Challenges
Reframe traffic enforcement within Vision Zero	<ul style="list-style-type: none"> <li>– Progressive safety culture among professionals and advocates</li> <li>– Growing interest in and commitment to Vision Zero</li> <li>– Explicit incorporation of commitments to equity and community engagement</li> </ul>	<ul style="list-style-type: none"> <li>– Shifting priorities of the public and elected officials</li> </ul>
Rely on automated technologies	<ul style="list-style-type: none"> <li>– Unbiased administration of the vehicle code</li> <li>– Education of road users about safe speeds, safety culture</li> <li>– Free police officers to complete other community-based work</li> </ul>	<ul style="list-style-type: none"> <li>– Equitably placing road safety cameras</li> <li>– Removing fine-based enforcement models</li> <li>– Avoiding community surveillance</li> <li>– Will require state legislative changes to install</li> </ul>
Move traffic enforcement operations out of the police department	<ul style="list-style-type: none"> <li>– Develop feedback between road safety and road engineering</li> <li>– Free police officers to complete other community-based work</li> </ul>	<ul style="list-style-type: none"> <li>– May require state legislative changes</li> <li>– Disinterest from police department</li> <li>– Danger narrative that weapons are needed at traffic stops</li> </ul>
Decriminalize violations unrelated to traffic safety	<ul style="list-style-type: none"> <li>– Quickly reduce disparities in traffic enforcement</li> <li>– Precedent for success already set in United States</li> </ul>	<ul style="list-style-type: none"> <li>– May require state legislative changes</li> <li>– Disinterest from police department</li> </ul>
Ban stops of non-vehicular road users	<ul style="list-style-type: none"> <li>– Quickly reduce disparities in traffic enforcement</li> <li>– Improve safety outcomes for vulnerable road users</li> </ul>	<ul style="list-style-type: none"> <li>– May require state legislative changes</li> <li>– Disinterest from police department</li> </ul>
Improve data collection of crashes and stops, test for disparities	<ul style="list-style-type: none"> <li>– Capture all dimensions of disparities</li> <li>– Develop a system of accountability</li> </ul>	<ul style="list-style-type: none"> <li>– Properly collecting data on race/ethnicity</li> <li>– Transparency in data collection, storage, usage</li> </ul>
Balance downstream effects	<ul style="list-style-type: none"> <li>– Socioeconomic equity for fines opposed</li> </ul>	<ul style="list-style-type: none"> <li>– Removing fine-based enforcement models</li> </ul>

## Introduction

Transportation has become the most policed aspect of daily life in the United States. The most frequent interaction between police and civilians is at traffic stops; over 20 million people are stopped every year on the road, representing over 80% of police-initiated contacts. (1). Many people perceive these stops as a necessity for road safety and accept police presence on the road. But the police do not have an inherent role in traffic safety. Traffic enforcement and police presence grew from the mass adoption of motorized vehicles in the early 20<sup>th</sup> century and has morphed into a system of criminalization. (2). Many tools that police use are no longer primarily for preventing injuries and deaths on the road. When combined with significant racial disparities found in policing – including that Black drivers are more likely to be stopped, searched, and shot than any other racial or ethnic group – the system can be devastating for people of color. (3).

The City of Berkeley is hoping to address these issues by reimagining public safety. In July 2020 the City passed an omnibus motion that includes revisions to transportation enforcement strategies such as decriminalizing minor violations, reducing warrantless consent searches, and moving safety operations from the police department to a new transportation department. (4). This paper explores the recommendations passed by Berkeley and incorporates others from an international review of alternative road safety practices and conversations with road safety professionals to develop a guide for jurisdictions looking to reframe road safety within traffic enforcement.

First, the role of traffic enforcement in the United States is examined. A focus is put on the inequitable outcomes of enforcement for Black drivers, including a discussion on what safety means and whose safety is in mind when policies have been put in place. Then the recommendations passed in Berkeley are explored and put in context through locations with similar implementations. The motivations behind changes to traffic enforcement are discussed and recommendations for alternative enforcement are made that center road safety in all aspects of traffic enforcement (before, during, and after driver arrest or ticketing). This includes re-evaluating the role of enforcement in Vision Zero, relying on automated technologies such as road safety cameras, and decriminalizing violations unrelated to traffic safety for all modes of transportation through the adoption of a safe systems approach. Lastly, the implementation of the recommendations is examined, looking at what has happened since Berkeley's omnibus motion was passed in July 2020 and the barriers preventing further reform.

## The Role of Enforcement in Transportation

Traffic stops have become routinized in society, but that does not mean they are entirely a product of road safety regulation. Rather, the increased level of interaction with law enforcement represents a shift to policing as a mode of governance that did not exist before automobility.

### The Connected History of the Automobile and Enforcement

The first automobiles on American roads were a toy for the wealthy and a curiosity to others. Public perception shifted though in the early 1900s as innovations in mass production and pressure from special interest groups marketed cars as all-purpose family machines. (5). Advertisements and pop culture associated the car with individual experience and success, thereby providing drivers freedom and mobility. (6). However much liberating potential the automobile had, it primarily created chaos on the streets; cities that had been built for walking and horse-drawn carriages were barraged by much heavier and faster vehicles.

Soon after cars became prevalent rules were established to organize how automobiles used the road and curtail reckless driving. Although it directly contradicted the perceived notion of freedom, regulations such as vehicle registration, licensing, speed limits, stop signs, and lane markings cropped up in the early 20<sup>th</sup> century. (7). These road rules and designs did help manage vehicular travel, but different regulations came from local municipalities and state governments. So, the rules varied from place to place, city to city. As neighborhood boundaries were dissolved with increased automotive mobility no one was able to obey every traffic law on the books. The small-town honor system that governed the roads and public interactions no longer maintained order because even supposed “good citizens” were caught violating traffic laws. (8). Community leaders began to rethink how streets were governed and looked towards increased enforcement as a solution.

A well-documented early example of this shift towards increased and more visible law enforcement comes from Berkeley, CA. From 1905 to 1932 police chief August Vollmer stressed the idea that more men were needed to control road safety from automobiles. (9). Instead of relying on drivers to change behaviors in response to new rules on the books, Vollmer’s officers were put in high visibility locations (with standardized uniforms, and on motorized patrols for the first time) to deter errant behavior. In effect, the profession turned from keeping the peace to criminalizing behavior. If drivers could not follow the road rules on their own, they would be ticketed.



This paradigm created a feedback loop that encouraged more enforcement. A push for more patrolmen led to more people stopped and fined for violating traffic laws, which in turn funded more police departments to hire more patrolmen. For example, from 1902 to 1912 the Los Angeles Police Department had a 33 percent increase in patrolmen per person and a 2,200 percent increase in traffic arrests per 100 people. (10).

A growing epidemic of traffic fatalities brought the public on board with the narrative that more police and patrolmen were necessary for road safety. From 1913 to 1932 deaths from car crashes increased 500 percent, causing some newspapers to liken the loss of life on the road to that of World War I. (11). Particularly horrifying was the number of pedestrians, especially children and the elderly, who were struck and killed by motorists. Over 60% of automotive fatalities in the 1920s were children, who were often hit while playing in the street. (12). The street was seen as a public space at this time so at first the automobiles were the intruders, but pressure from automotive business interests shifted the blame in road collisions to the pedestrian. (13). Who could use the street was redefined through advertisements and educational campaigns that created even more opportunities for enforcement. Not only did motorists have to obey traffic laws but pedestrians could be cited for “jaywalking” and were forced to cede use of the street to the car.

The passage of the 18<sup>th</sup> Amendment in 1919, which established the prohibition of alcohol, added to the increased police presence on the roads. Bootleggers used intercity roads to transport alcohol and drivers on these freeways were targeted and stopped as part of a national crackdown on vice. One of the first major judicial rulings on police power at traffic stops came after law enforcement officials pulled over George Carroll in Michigan and found liquor when searching his vehicle. *Carroll v. United States*, 267 U.S. 132 (1925) established that with respect to privacy, cars are different than a home and that warrantless searches of an automobile are legal so long as there is probable cause. (14).

Continued judicial deference was given to the police as the car fully established itself in the American lifestyle. *Terry v Ohio*, 392 U.S. 1 (1968) sanctioned the practice of stop-and-frisks (where drivers are temporarily stopped, questioned, and searched for contraband) noting that it did not violate the Constitution’s prohibition of unreasonable searches and seizures so long as the officer has “reasonable suspicion.” (15). What is suspicious to an officer can be subjective though, and such a ruling considerably expanded the discretionary power of the police. Even more leeway was given in *Whren v United States*, 517 U.S. 806 (1996), which concluded in a unanimous opinion that an officer's motive (even if racially based) had no bearing on the constitutionality of police action. (16).

Following *Whren*, a law enforcement officer can stop a vehicle so long as there was a violation of the traffic code. And with the plethora of rules in the vehicle code, the ruling further justified pretextual policing, a practice that involves stopping hundreds of vehicles just to find contraband in one.

Thus, despite being associated with unprecedented mobility and freedom, the mass adoption of the car in American society limited privacy and empowered policing. As legal historian Sarah Seo writes in her book *Policing the Open Road*, “the contradiction of the automobile as both the preeminent symbol of American values and an object of extensive policing threw into sharp relief the vexing conundrum of discretionary policing in a society based on the rule of law.” (17). The car helped legitimized police authority and provided a means for proactive policing that determined guilt on the road and not in a court of law. (18).

### Discretionary Stops and the Myth of Broken Taillights

Today, traffic law enforcement is intended to influence the behavior of road users to promote safer behavior. Enforcement covers the entire process from observation of traffic laws to initial response and engagement to the possible arrest or ticketing (including prosecution and assessing penalties). (19). In the United States, police officers respond to a few categories of scenarios on the road. The first is traffic injuries, where officers arrive at the scene after a crash to investigate, ticket, or arrest. Another is clearly observed traffic safety violations. This comprises dangerous driving like drunk driving or texting and driving that can benefit everyone by removing the offender from the road. The last scenario is pretextual traffic stops where officers use their discretion in pulling over vehicles. (20).

In the first two scenarios, the police can effectively address issues of traffic safety due to hazardous behavior because their actions are clearly defined. The definitions of violations and actions taken after a crash leave less room for subjectivity. Problems arise, however, when there are opportunities for bias in the process.

Discretionary traffic stops (also called investigatory or pretextual stops) therefore present a major issue. Instead of being a tool to save lives they are frequently used by police to find collateral issues. (21). The practice is based on the broken windows theory, a now-disproven idea that claims a link between disorder and crime. (22). This method of enforcement was supposed to stop urban decay by catching criminals before they had the chance to commit crimes. The argument is that increased police-citizen contact can create and maintain order in urban environments, so minor

infractions such as tinted windows, objects hanging from rearview mirrors, and broken taillights are used to justify full searches of vehicles.

These minor violations have little to no relation to road safety though. Many are hyper-technical descriptions leftover from the early days of automobility when additional regulations alone were thought to encourage safe driving behavior. (23). The expansive nature of traffic codes creates opportunities for subjective judgements and allows officers to stop vehicles without explicit safety violations. Rather, factors often associated with higher risk of accident severity are non-enforceable, such as vehicle size and road design, or comprise multiple factors that are not singularly addressed in the vehicle code. (24). The *Handbook on Road Safety Measures* even explicitly notes that “no effects on accidents have been found of most types of police patrol,” further indicating that many of the traffic stop practices have another motivation. (25).

Despite the lack of connection to road safety, law enforcement officials justify pretextual stops by claiming that they are necessary to protect the community from other types of criminal activity. However, there has been no empirical proof that order-maintenance policing is effective in combating crime. (26). Rarely is the outcome of an arrest or recovery of drugs or weapons from traffic stops based on non-moving violations: of the 3% of stops that lead to a search, only one third lead to finding contraband and only one half of those contraband finds lead to an arrest. (27). Ron Davis, former Director of the United States Department of Justice unequivocally argues “there is no evidence that just increasing stops reduces crime.” (28).

In many places law enforcement officials and officers recognize that practices intended to improve road safety have morphed into a tool for other police actions. Jerry Wiley, a former police captain in Birmingham, Alabama, was frustrated how “over the decades [his] department used the traffic stop as a means to address crime issues.” He adds that, “when [officers] are going from call to call while emphasizing arrests and citations, [they] aren’t preventing a lot of crime. [Police officers] have ended up just being a reactionary force that arrest people after they committed a crime, rather than preventing them from committing the crime in the first place.” (29).

There has recently been increased understanding that factors of collision have nothing to do with equipment violation, but that does not mean that the broken taillights mentality has been entirely phased out. Rather, ticket writing is subsidized by over \$600 million per year in federal highway safety grants. An investigation into traffic stops by the New York Times found that “for all the billions spent to promote ticket-writing by police, there is little evidence that it has helped achieve the grants’ primary goal: reducing fatal car crashes.” (30).

Terrifyingly, this is exactly the issue. Traffic stops are ripe with opportunities for abuse of power. Police officers are given great deference in how they perform traffic stops, which can lead to disparities in who is being stopped and searched, why and where these stops happening, and the economic impacts and burdens of these stops. (31).

### The Actual Harm to Communities of Color

There is a preponderance of evidence that discretionary traffic stops demonstrate racial bias and are a persistent source of racial and economic injustice. Significant racial disparities can be found in the data from the agencies where sufficient information was collected and standardized. (32). Black drivers are five times as likely to be stopped and searched as white drivers, even though contraband (i.e., illegal drugs, weapons) is found less often in the vehicles of Black drivers. (33). Similar outcomes exist for Hispanic drivers, who are stopped at similar rates as white drivers but are searched more often despite these searches being less likely to yield contraband than white drivers. This indicates that police require higher levels of suspicion to search white drivers than Black or Hispanic drivers and are therefore performing intentionally discriminatory action.

It is not just a few “bad apples” either. A study exploring traffic stops in North Carolina found that 30% of officers stopped Black drivers at least twice as much as white drivers, but only 3% stopped white drivers at least twice as much as Black drivers. (34). Collective attitudes shared amongst police officers and institutional norms, not a few officers displaying subconscious biases, perpetrate a system where Black drivers unjustly raise more suspicion than white drivers.

Constant surveillance on the road and targeting of non-white motorists is unfair, humiliating, and dangerous. During traffic stops there is a difference in the language police use between white and Black drivers, even when controlling for officer race. Data from body cameras shows that police officers are more likely to use informal titles, and less likely to mention the word “safety” or apologize with Black drivers compared to white drivers. (35). And data from the Department of Justice indicates that Black people are more than twice as likely to experience nonfatal threats or use of force during interactions with the police. (36). Harassment on the road is a salient experience for Black drivers and it should not be surprising when continued use of investigatory traffic stops furthers mistrust and generates anger.

Police presence on the road has also created cycles of poverty and violence centered around the car. About a quarter of police shootings begin with a traffic stop, with Black people being more

likely to be shot during these stops than any other racial or ethnic group. (37). Sandra Bland, a 28-year-old Black woman, was found dead in a Texas county jail three days after she was stopped and arrested by a Texas state trooper for not signaling when she changed lanes. This was not her first experience with the police; Bland had been arrested for outstanding traffic fines and convicted for driving under the influence multiple times, trapping her in criminality because she still had to drive to access family and work on a suspended license. (38). Philando Castille, a 32-year-old Black man living in St. Paul, MN, was shot and killed by a police officer after being pulled over for a broken taillight. Prior to this deadly encounter he had been stopped by the police at least forty-five times and been assessed over \$6,000 in fines. (39). Like many low-income drivers, he had spent years fighting fines, fees, and license suspensions because of targeted and racialized policing.

The automobile as the site of violence is not a new phenomenon. Cell phones and body cameras have recently captured a horrifying number of examples of abuse at the hands of the police, but this trauma has been present since Black Americans began driving. (40). Nor are these issues confined to driving. Pedestrian and cyclist fatalities have increased 46% over the last decade, with unequal crash outcomes across the population. (41). A disproportionate amount of traffic violence is borne by communities of color. Compared to white pedestrians, indigenous people are three times as likely to die on the road, while Black and Hispanic pedestrians are two times as likely to be killed while walking. (42). To make matters worse, case studies exploring traffic enforcement of pedestrians and bicyclists find no relation between where tickets are being issued and where people are being injured and killed. (43). The lack of connection between safety outcomes and stops made of non-motorists, who often do not pose a major danger to other street users, indicates that these stops are being used subjectively to search for drugs, guns, or other contraband.

The frightening experience of “driving while Black” or “walking while Black” is a bitter, everyday reality. The fear and existence of bias on the road is omnipresent because police enforcement of traffic is such an ingrained part of travel in the United States. (44). For these reasons we need alternatives to systemic issues of discrimination in traffic enforcement. We need a new system that redefines public safety to prioritize marginalized groups and ceases police activity using traffic concerns as a pretense.

## Alternative Traffic Enforcement

The City of Berkeley, CA has already taken steps to support equity in transportation by adopting alternative methods of enforcement. In July 2020, following years of grassroots activism and sparked by the Black Lives Matter protests in response to the May 2020 murder of George Floyd, the Berkeley City Council passed an omnibus motion to reform policing. (45). The first step directed police to only conduct traffic stops for violations related to public safety (i.e., speeding, running a red light). (46). This means Berkeley police can no longer stop drivers for non-moving and minor violations (i.e., broken taillights, expired registration). These types of traffic stops are typically used for pretextual stops and searches that have disproportionately been targeted at Black drivers. (47).

Proof for the success of this decriminalized version of traffic enforcement has been demonstrated in North Carolina. In response to a consistently high crash rate Fayetteville, NC changed its traffic enforcement policy to reduce stops based on technical equipment violations. Support from the local government and the police chief required officers to prioritize safety stops and collect GPS data on all stops so a more comprehensive database could be used alongside the City's Crash Analysis Reduction Strategy program. (48). Compared to neighboring cities that did not impose new policies Fayetteville saw a reduction in all motor vehicle crash outcomes (both injuries and fatalities) while simultaneously reducing economic and racial burdens of traffic stops. (49). Additionally, non-traffic crime did not significantly change, another indication that investigatory traffic stops were not actually preventing crime and minimizing traffic enforcement may not have negative externalities.

Berkeley's new traffic enforcement policy also requires police officers to receive written permission before conducting a search without a warrant. Berkeley's policy is modeled on similar reforms enacted in North Carolina in Fayetteville, as well as Durham and Chapel Hill, where the number of consent searches dropped by 75% after legislative intervention. (50). Most people are unaware that they can say "no" to being searched, so requiring drivers to sign a form evens the power balance and makes people more cognizant of their rights. As an extra layer of protection, the explicit written permission also ensures that outcomes of traffic stops do not solely rely on the word of the police against the driver.

As a third step, which has received national media attention, Berkeley has proposed decoupling the police from transportation enforcement. The omnibus motion directs Berkeley to create a new, non-police traffic officer program within the department of transportation, called

BerkDOT. (51). This will transfer most traffic enforcement duties from the police to civil servants, who include engineers, planners, and administrators with professional backgrounds and education in road safety. The details have yet to be finalized, but operations that have been discussed for transfer include stopping and ticketing road safety violators, non-criminal collision investigation, operating traffic safety technology (i.e., red-light cameras), and parking enforcement. (52). By moving to the transportation department Berkeley will be able to operate roadway planning, maintenance, and engineering alongside enforcement. This can create a positive feedback loop between identifying unsafe locations and redesigning the streets via a safe systems approach.

While Berkeley's plan for traffic enforcement is the first such operation in the United States, it is not a novel concept. In New Zealand, traffic enforcement was undertaken independently by both the New Zealand Police and the Traffic Safety Service (Te Manatū Waka, in Māori) until 1992. (53). Unlike the United States, where small town enforcement was abandoned as boundaries blurred with the growth of the automobile, many New Zealand communities retained control of traffic enforcement. Traffic officers were appointed by local governments and handled road offenses and assessing traffic tickets. Typical duties involved stopping drivers for violations, like failure to yield and speeding, although in the late 1960s traffic officers were granted the ability to arrest offenders presenting immediate dangers, such as drunken driving. (54). Police officers also had jurisdiction over enforcement but left most work to traffic officers – they primarily enforced traffic laws in remote locations not covered by traffic officers and led investigations of crashes that resulted in injury. A reason for this separation is because the police are a national force in New Zealand, so their focus was larger than patrolling for road safety violations. (55).

Local taxes fund traffic officers so as interest in expanding enforcement grew in the mid-century many rural areas that lacked necessary funding consolidated. The Traffic Safety Service grew out of this centralization, and over the decades even more urban local bodies requested takeover by the national department to get access to federal funding. Eventually this merger comprised all local traffic officers but concerns over the efficiency of two federal agencies performing the same job quickly followed. In 1992 the Traffic Safety Service was absorbed by the police to alleviate financial concerns. (56). Today, New Zealand Police (Ngā Pirihimana o Aotearoa, in Māori) conduct all aspects of traffic enforcement. They frequently work with the Transport Agency (Waka Kotahi, in Māori) to set speed limits, deliver safe infrastructure improvements, and educate road users. (57).

It is difficult to identify whether the solely police-run traffic law enforcement system has created a safer environment. Data tolling the deaths on New Zealand roads indicates that fatalities

rose from 69 per year in 1921 to 843 per year in 1973. They were steadily over 500 per year until 2000, but dropped to 318 in 2020. (58). At face value there appears to be a decrease in road deaths since the merger in 1992, but conclusions cannot be drawn without statistically testing police enforcement of the traffic laws in isolation of vehicle technology improvements. Additionally, New Zealand police do not routinely carry firearms, and with just over 1 gun-related death per 100,000 people since 2000 there is less public concern over abuse of power. (59). A report from 2007 that evaluates the demerging of traffic enforcement from the police cites a positive public perception of the police. (60). Motivations given in the report for demerging were prioritizing police resources towards serious crime and removing the revenue generation aspect of road policing – no concerns over road safety or discrimination are mentioned, however present they may be. (61). The report instead concludes that the risks, costs, and difficulties associated with transitioning back to a two-agency system make it not worthwhile.

Efficiency and budget concerns are also the motivation for reduced police involvement in traffic safety in other countries. In Germany, the involvement of local authorities in speed enforcement is to improve efficiency. Twelve of the sixteen German states grant local authorities the ability to control speed enforcement. (62). The police retain the ability to stop motorists, but local authorities designated as assistant police officers can check the functionality of road safety cameras. Private companies or individuals can assist in setting up the cameras but are prevented from any further work to ensure there is no financial incentive linked to camera use. In the state of Rhineland-Palatinate, local authority is granted the additional right to stop offenders. However, this operation is extremely limited in scope. Local authorities can only carry out traffic checks if they need to establish the identity of the person driving too fast. The ability to stop or arrest a driver is restricted to police officers in uniform and carrying a weapon. But according to local police, drivers almost never get pulled over because speed enforcement is operated by cameras. (63).

Enforcement is also separated from the police to improve efficiency in the United Kingdom, where certain police duties have been appointed to traffic officers since 2004. Traffic officers are citizens employed by the Highways Agency and have the authority to stop and direct traffic and the ability to place and operate traffic signs. (64). They do not have the power to arrest and are limited in scope to freeways and arterials. Nearly all traditional traffic enforcement operations are performed by the police, making UK traffic officers a decriminalized safety team focused on maintaining highway mobility. The motivation for their role was also unrelated to equity or racial disparity and



appears to be another example of delegating specialized tasks to local authorities to increase efficiency and reduce budgets.

A conversation with a Swedish road safety professional about bias in traffic enforcement shed more light on the non-discussion of disparate impacts of enforcement. They mentioned that Swedes were surprised when they learned road safety reform was connected to harassment of the Black community. (65). Although socioeconomic concerns are present in enforcement outcomes in Sweden (i.e., who can afford fines and penalties associated with violations) there was no link made between traffic enforcement and over-policing until it was brought up as part of the Black Lives Matter movement in the United States. For them road safety is about building trust and proactively dealing with safety by first fixing the environment.

This idea is captured in the Vision Zero approach initially developed in Sweden in 1997, which recognizes that road users make mistakes, and we must build in safety buffers so mistakes do not cost someone's life. (66). Vision Zero is an ethical imperative for all road safety measures that says one death on the road is too many, and has been replicated in varying ways internationally as locales seek change. For example, in the United States the focus has historically been on driver behavior, where specific and general deterrence through enforcement is meant to reduce unsafe actions by increasing the perceived costs and decreasing perceived benefits of committing offenses. (67). Under Vision Zero transportation planners have been re-evaluating road safety with the understanding that the goal of a transportation system is not just to provide efficient mobility but to ensure access to equitable, sustainable, and safe mobility. This represents a paradigm shift, reframing safety from a conversation about preventing collisions to preventing injury, death, and the trauma associated with loss. (68).

Vision Zero is a multi-disciplinary approach to road safety, best captured in the five "E's" that are traditionally used to describe Vision Zero: Evaluation, Engineering, Education, Encouragement, and Enforcement. This cross-cutting, systems approach is how Oslo, Norway has drastically improved road safety over the last two decades. After committing to Vision Zero in 1999 they dropped to only 1 death and 33 serious injuries in 2019. (69). Political and public buy-in was the key element for these road safety improvements. Oslo not only made top-down changes to road design standards that prioritized slower and pedestrian-friendly streets (including establishing a car-free city center) but also received community support in educating vulnerable road users about the changes and encouraging mode shifts to reduce car traffic. Also, there was a clear de-emphasis on enforcement; Oslo transferred traffic-controlling authority from the police to local government in

2015 and as a result was able to better create targeted safety solutions. Engineering is the priority in Vision Zero, and it shows in Norway where street improvements have created a safer environment without relying on forcing drivers to change behaviors.

This is not to say that enforcement does not play a role in road safety. There are some hazardous behaviors that have become less widespread due to a combination of enforcement and education. Traffic stops for safety violations (i.e., drunk/drug driving, texting and driving, dangerous overtaking) remain a crucial tool for saving lives. As mentioned above, this is because safety violation stops are clearly defined and police action in such scenarios explicitly address a dangerous driving offence. Pivoting entirely away from enforcement may also have unintended consequences. An example comes from Northern Kosovo, which had little to no enforcement of traffic laws following the NATO intervention in the Federal Republic of Yugoslavia in 1999. A 2013 study compared driving behavior in Northern Kosovo to neighboring Serbia, where traffic enforcement operates on the traditional paradigm, and found that “drivers in Northern Kosovo drive faster, exceed speed limits more frequently, use seat belts less frequently, drive after exceeding the legal limit for alcohol more often, commit aggressive and ordinary violations more frequently and are generally involved in more risky situations.” (70).

While there is still a role for enforcement in traffic safety, it does not require the version that exists in the United States today. The current approach is focused on deterrence, where the perceived and actual risk of detection is meant to change driver behavior. This system treats violations as a deliberate offense and uses hidden patrols to catch offenders. However, studies indicate that unmarked checkpoints and unannounced mobile patrols are less effective at sustaining reduced road violations (i.e., speeding) than clearly labeled road safety cameras or publicly announced waves of increased enforcement. (71). The latter, also called high visibility enforcement, is the direction many traffic enforcement agencies are moving in, especially for safety concerns like drunk driving. This can be seen in Finland, where drunk driving violations were cut in half (from 0.33% to 0.14%) after the risk of being caught drunk driving increased considerably in the late 1970s. (72).

Nonetheless, enforcement alone cannot permanently reduce violation rates. Even Finland’s drunk driving enforcement strategies require the whole array of Vision Zero tactics (i.e., new road designs, identification of vulnerable groups and dangerous intersections, political support) to sustain improved road safety. (73). This is largely because traffic enforcement interventions to prevent drunk driving, speeding, or other dangerous road behavior suffer from a phenomenon known as the

“halo effect.” Although the perceived risk of detection may increase within the vicinity of a known patrol car, the change is transient and local in nature. (74).

High visibility enforcement also invites subjectivity, which as discussed above only creates more problems. Pretextual traffic stops, which have no relationship with road safety, account for most police-initiated contacts and their discretionary nature creates opportunities for bias that have disparate impacts on low-income and Black Americans. (75).

For this reason, transportation safety activists and others have been calling for the removal of “Enforcement” from Vision Zero. The lack of certainty regarding the effectiveness of enforcement raises issues with regards to its incorporation. (76). The pressing concern of increased enforcement to support Vision Zero is that such actions have led to over-policing of communities of color, who are already burdened by unequal access to transportation. (77). Cultural anthropologist, Adonia Lugo, PhD, has called attention to the issues of exclusion in Vision Zero. (78). She writes that street safety needs to start with a conversation on what safety means, and whose safety we have in mind. The Vision Zero framework assumes we all face the same safety problems, which reinforces the invisibility and burdens of people of color and low-income residents who may not have access to the same vehicles and roads as white and upper-income people. Vision Zero “stems from its overlap with but disconnect from the moment of Black Lives Matter” and the continued reliance on enforcement increases “opportunities for police to apply their biases to street users... Vision Zero should put support for police violence reform front and center, pointing out that we need police officers to be sources of community help rather than harm.” (79).

A traffic stop may be an inconvenience for white, middle-class Americans but for others the continued targeting and surveillance can be life altering. People have lost their jobs, gone to jail, and been killed over minor vehicle infractions. Then there are the lasting personal and emotional experiences drivers of color face from traffic stops. Increased police encounters have been linked to chronic stress and symptoms of post-traumatic stress disorder in Black Americans. (80). At a minimum, the fear of harassment and fear of financial burdens from traffic tickets has eroded faith in the police. The mutual mistrust between citizens and police worsens cooperation and engagement with government services. People who feel that the system is unjust are less likely to vote, less likely to request aid they may be entitled to, and less likely to call emergency services. (81). Re-establishing the role of traffic enforcement in society as a road safety measure and not a crime prevention tool is necessary to create healthier communities and re-gain trust in institutional support.

## Recommendations to Center Road Safety in Traffic Enforcement

To create safer, more equitable transportation for all road users, the following recommendations should be implemented by local and state governments.

### Reframe Traffic Enforcement Within Vision Zero

The emphasis on an ethical imperative to reduce serious injury and death on the road indicates word choice matters for Vision Zero. There is a need to update the core goals of the policy to acknowledge that existing enforcement policy is unsafe for people of color. Recently, there have been efforts to do this and reduce reliance on enforcement by replacing that “E” in Vision Zero with Equity and Engagement.

Equity acknowledges the history of unjust transportation and engineering policy and allocates different levels of resources and opportunity to individuals or groups of individuals to support them where they are. (82). Committing to equity also involves hiring a workforce that reflects the diversity of the place that is being planned and constantly investing in the education of that workforce. (83). Transportation planning and engineering is a field still dominated by white men. For this cohort, understanding and empathizing with marginalized identities and experiences will require new perspectives. Vision Zero inherits the biases and path dependence of the existing transportation system, so planning that designs roads for where people are is necessary to reduce and eliminate serious collision outcomes.

Engagement is another essential element often missing from traditional Vision Zero approaches. In Sweden, there is top-down political support for road safety. Politicians, planners, and engineers are held accountable for serious and fatal crashes due to the failure of infrastructure design because Vision Zero is treated as a moral obligation. The United States, on the other hand, takes death on the road as an unfortunate consequence of modern mobility. Deadly car crashes are called “accidents” and the vehicles (and even pedestrians and bicyclists) are blamed in the media instead of the motorists or the road design. (84). Too often community stakeholders in the U.S. lack defined roles in the planning process and their ambiguous place in Vision Zero minimizes diverse perspectives. Bottom-up support is necessary to empower stakeholders invested in racial justice. (85). Establishing engagement as a core tenet of Vision Zero can bring more voices and ideas to the table, thereby identifying currently unmet road safety needs and generating grassroots political support for increased and sustained funding.

## Rely on Automated Technologies

Road safety cameras are proven to reduce death and serious injuries on the road. This automated enforcement tool is an unbiased administrator of the vehicle code because it does not rely on human discretion. The cameras are placed in fixed locations with clear signage to inform road users of dangerous environments and create new social norms with respect to appropriate speeds. (86).

This framework fits within Vision Zero and recognizes that many roads exceed safe speed levels and are dangerous by design. This differs from typical speed enforcement in the United States where mobile, covert cameras are operated by police officers. In this system tickets and fines from violations of the road rules are used to increase the perceived costs of unsafe behavior. However, this improperly targets individuals and incentives increased discretionary enforcement, which has been shown to enable racial profiling that disproportionately targets people of color as well as the poor. (87).

Investment in road safety cameras can remove subjectivity from the road and emphasize transparency and fairness in traffic safety. Clearly marked cameras help indicate that the goal is to educate road users on safe speeds and are not “speed traps” to generate revenue. Additionally, automated enforcement allows for operation at locations where stopping vehicles would be dangerous. Continuous and consistent operation, without the presence of a traffic enforcement officer, creates more safety coverage while protecting traffic officers who now have more time available for other duties. (88).

Road safety cameras are not a panacea though. For many locales installing these cameras is actually illegal. Only 16 states and Washington, D.C. allow automated speed enforcement programs, the majority of which are limited by restrictions on roadway classification or location (i.e., can only operate on streets with speeds from 30-50 mph, or must be placed within a school-zone). (89). And in places that do allow road safety cameras sustained safety improvements will require the full range of Vision Zero’s E’s, including engineering to design safe systems for drivers, bicyclists, and pedestrians.

Additionally, there are concerns that increased surveillance on the roads could bring more harm to already vulnerable communities. Placement of road safety cameras or fines imposed that are too steep could exacerbate inequalities. (90). Therefore, planners and engineers must ensure there is active engagement and transparency regarding road safety cameras.

## Move Traffic Enforcement Operations out of the Police Department

The interest in alternative traffic enforcement is not to say that the solution is no enforcement. There is still a role for enforcement in traffic safety, but it does not require the deterrence-based model that exists in the United States today. A bold way to accomplish this is to move traffic enforcement operations out of the police department. Operations could move to a transportation department, like the system being enacted by Berkeley, or if one doesn't exist to the locality's public works or planning department where road safety professionals are employed. This will shift responsibility from crime-deterrent police officers to safety-oriented planners and engineers. The focus of road safety interventions can then fit within the Vision Zero framework that prioritizes eliminating unsafe driving environments over deterrence of unsafe behaviors. Transportation planners and engineers, who are familiar with speed thresholds and road geometries, can then incorporate information from moving-violation traffic stops and road safety cameras to target locations for safety improvements.

Additionally, non-police traffic officers will be unable to carry weapons. The ability to be armed is often cited as a reason for keeping police officers on traffic enforcement duties, but there is little evidence to support the danger narrative that weapons are needed during a traffic stop. Excluding crashes, the odds an officer is killed at any vehicle stop are less than 1 in 3.6 million, and even lower for minor infractions. (91). Context is more important in the outcome of traffic stops and removing the opportunity for conflict (by eliminating stops through road safety cameras or deescalating situations with unarmed officers) may further reduce harm to road safety officers and road users. Hopefully, separating police action from traffic safety can redevelop relationships between police and communities while also prioritizing safety through design on the road.

## Decriminalize Violations Unrelated to Traffic Safety

As noted by Epp, Maynard-Moody, and Haider-Markel in *Pulled Over*, “virtually all of the wide racial disparity is concentrated in one category of stops: discretionary stops for minor violations of the law.” (92). As discussed above, imposing stricter guidelines has been demonstrated to make people less reliant on stereotypes when making decisions. (93). Making a distinction between safety stops (enforcing road rules to reduce likelihood of a collision, i.e., speeding, running a red light/stop sign, drunk driving) and investigatory stops (using the road rules as a pretext to look

inside a vehicle, i.e., equipment violations, expired registration, not wearing a seatbelt) will limit the opportunity for subjectivity and harassment on the road.

### Ban Stops of Non-Vehicular Road Users

Vision Zero encompasses more than just drivers. Pedestrian and cyclist fatalities must also be eliminated to achieve Vision Zero. Although they represent fewer (as an absolute number) serious and fatal injuries than motorists, pedestrians are inequitably burdened by traffic violence. A study of relative vulnerability in California found that pedestrians suffer over 35 times more injuries than they inflict, and bicyclists suffer nearly 15 times more injuries than they inflict. (94). Despite this burden, bicyclists and pedestrians are often targeted for “unsafe” road behavior. Traffic law enforcement issue citations and tickets for jaywalking and riding bicycles on sidewalks that are less about safety and more about crime prevention strategies. This enforcement deepens mistrust and poverty, especially in neighborhoods where historical disinvestment and other factors have created disparities in the availability of safe active transportation infrastructure. (95). Penalizing cyclists and pedestrians is not the answer to readily preventable deaths. Slower speed limits, wider sidewalks, and improved street lighting are standard, low-cost (compared to large infrastructure projects and especially when combined with costs of loss of life), and easy to implement engineering solutions that directly address road safety and should be prioritized within Vision Zero.

### Improve Data Collection of Crashes and Stops, Test for Disparities

Many traffic enforcement programs rely on data to identify locations in need of safety interventions. However, the traditional focus on deterrence and crime control reinforces the need for increased policing, rather than safety-focused evaluation and engineering. Programs like Data Driven Approaches to Crime and Traffic Safety (DDACTS) that use traffic stop hot spot techniques to identify high crime areas ignore the social implications of policing. (96). They do not analyze who is being arrested and where data-driven strategies are implemented, allowing algorithmic bias to influence policy and decision-making.

A stronger method for focusing on traffic safety and properly testing for disparities is Connecticut’s “preponderance of evidence” approach. (97). This system combines continuous data collection, a variety of statistical techniques, and forums with officers and community members to initiate interventions. Because no single methodology can capture all dimensions of disparities, this

approach combines tests like the “veil of darkness” analysis (stop rates should be equal across demographics regardless of time of day and officer visibility) and “hit rate tests” (vehicle search rates should yield contraband at equal rates across demographics) to identify enforcement activities or departments that have disparate impacts. (98).

For many places this will require collecting new information. Often, data on location, race/ethnicity, and violation type are missing from traffic reports. In many places there is no data at all: only 22 states and Washington, D.C. require the collection of data at traffic stops. (99). To illuminate whether there is discrimination present localities must collect information on demographics, reasons for stops, and the universe of all stops (i.e., not just people who were stopped and given a citation or arrested). (100).

This is not an easy task, but there are already guides developed to implement effective data strategies. A strong example is the “Toolkit for Equitable Public Safety” developed by the Center for Policing Equity. (101). Their toolkit contains a checklist of data collection practices for law enforcement agencies, which includes not only the time and location of the stop, but whether a search was performed, the number of officers present, and the background (i.e., race/ethnicity, sex, age, military experience) of each officer. It also outlines statistical tests to perform and practices to implement that can change the culture of enforcement to one centered around community safety. The guide is also adaptable so localities that are just starting and those that have already implemented changes to traffic safety enforcement can step in at different points based on their experience and political landscape. It also points to strategies for governments to set aside time and resources (including, but not limited to staff labor and community member compensation) for short- to long-term implementation and monitoring/evaluation, which is essential for sustained success.

### Balance Downstream Effects

Traffic enforcement includes the whole process from before and during a traffic stop to the arrest, ticketing, and subsequent judicial process. Discussions on alternative transportation enforcement often focuses on the stop itself, but the over-enforcement of transportation can create cycles of poverty due to fines and fees from tickets, especially for people of color who are disproportionately stopped on the road.



Some countries have implemented practices to address issues regarding the socioeconomic impact of penalties, such as fines and license suspensions, associated with road safety violations. In Finland fines for moving violations are set based on the severity of the violation and the taxable income of the offender. (102). This model supports principles of social justice by better connecting the penalty of a violation with a behaviorally changing force. In Estonia, a pilot program gives drivers caught speeding the option to wait on the side of the road with a law enforcement officer instead of paying a fee. (103). The length of the “time-out” is dependent on how fast the offender was traveling over the speed limit. The effectiveness of this policy is still unclear, but it does present an alternative option to burdening low-income motorists with fees.

The fees and judicial cost following a traffic stop require review when evaluating equitable impacts of enforcement. As mentioned above, particular concern is that automated enforcement could exacerbate inequalities if fines imposed are too steep. Communities looking to implement reforms should develop programs that integrate statistical analysis and dialogues with community members to ensure there are methods of feedback for improvement of enforcement strategies. Data-driven planning requires transparency with regards to the methods of collection and processing. Results should be shared and explored with professionals and stakeholders to identify lasting solutions for equitable approaches to traffic safety. This way communities can benefit from road safety and avoid monetary violence associated with traffic penalties.

## Implementation: Opportunities and Challenges

Many jurisdictions and transportation organizations have begun enacting changes in line with the above recommendations. Most movement has occurred within transportation planning departments, consulting firms, and non-profits that have updated their language to better capture the goals of Vision Zero. A report by Sarah Brown details how active transportation thought leaders, including the Vision Zero Network, the National Association for City Transportation Officials (NACTO), and the Association of Pedestrian and Bicyclist Professionals (APBP) have re-framed enforcement within their goals of Vision Zero. Following the murder of George Floyd in May 2020, themes on safety and policing within organizational mission statements shifted from “performance measures” and “data driven enforcement” to “transition away from the ‘Es’” and “data transparency and collection.” (104). This is an excellent first step in addressing the issues within Vision Zero and

re-orienting safety goals with respect to who is most vulnerable. Changing safety culture among professionals is a significant shift and can spur further advocacy from politicians and the public.

However, more time is needed to see extent to which and how these new statements are implemented. In many jurisdictions there are legal barriers to enacting the above recommendations. The biggest hurdle appears to be relying on road safety cameras; as mentioned above only 16 states and Washington, D.C. allow automated speed enforcement programs. (105). Furthermore, the majority of these are limited in scope and have roadway restrictions (i.e., can only operate on streets with speeds from 30-50 mph) or must be placed within a school-zone. This severely limits the benefits of road safety cameras, which should be placed to mitigate unsafe design and not just in specified locations. California in particular has not approved of speed enforcement program, hindering the potential of Berkeley's proposal. The city is advocating for a change to the state law, but this year a bill by state senator David Chiu to test road safety cameras through a pilot program was not even brought up for discussion in the legislature. (106).

California state law also does not permit civilian traffic enforcement. This is a serious setback for City of Berkeley and their goal to transition road safety operations from the police department to a new transportation department. (107). The city is strongly advocating to change the state regulations, but this will take time. According to the city's timeline, the final structure of the new Berkeley Department of Transportation (BerkDOT) would not come before the Berkeley City Council until June 2024 with actual implementation thereafter. Until then, the city is actively involved in community outreach to best assess the needs of its residents within this plan and establish methodology for rigorous data collection, analysis, and measurement to test for disparities.

The City of Berkeley has made a major step though, and in February 2021 the City Council voted to limit traffic stops that can be performed by police officers. The final details are being discussed with the city's new chief of police, but the plan is to eliminate stops for minor traffic violations (i.e., equipment violations, expired vehicle registrations) and focus on stops that have immediate safety implications (i.e., excessive speeding, driving under the influence). (108). This change in traffic enforcement operations should reduce opportunities for bias-based decisions and demonstrate to the public that traffic stops are grounded in safety, not revenue generation.

Other jurisdictions in the United States are also working to limit the discretionary power of the police in traffic stops. In October 2020, the State of Virginia passed legislation that decriminalizes jaywalking and bans traffic stops based on minor infractions like tinted windows and the smell of marijuana. (109). In October 2021, the Driving Equality Act was passed in Philadelphia,

PA, making it the first major city in the country to prohibit police officers from stopping vehicles for traffic violations that do not pose an imminent safety risk. (110). Importantly, a companion bill was also passed that requires the police department collect and publicly release information for all vehicle stops. As mentioned above, many places do not collect the proper information to test for disparities in enforcement, so requiring increased data collection and sharing it with the public for accountability will re-enforce the need for safety-based evaluation and engineering.

More work must come, especially from a state and federal level, to shift the safety culture in the United States from behavior-based deterrence to safe systems design. An example of something on the horizon is alcohol ignition interlocks, which require drivers to verify that their blood alcohol content (BAC) is below the legal limit (via a breathalyzer) before their vehicle can be turned on. This technology has been used since the mid-1980s in many places to successfully prevent repeat offenders from continuing to drive drunk. (111). The devices have never achieved widespread use in the United States, even though drunk driving is a major road safety issue. (112). Alcohol ignition interlocks are rarely (if ever) installed in vehicles by the manufacturer, and judges often fail to order their installation due to lack of resources to monitor compliance and poor integration between the judiciary and motor-vehicle departments. (113). This could change though, with a mandate for automakers to equip new vehicles with drunk driving prevention technology attached to the new federal legislation, Infrastructure Investment and Jobs Act of 2021. (114). New policies like this will remove dangerous drivers from the road, thereby preventing injuries and death on the road while also freeing police officers from unsafe traffic enforcement duties.

Although change may be difficult (due to political reluctance, legislative hurdles, or general skepticism) localities interested in improving road safety outcomes should take any opportunity to chip away at the existing enforcement paradigm. Reliance on deterrence-based enforcement is a just a short-term solution. We will never enforce our way out of a safety problem. The only way to ensure long-term road safety goals, aligned with those in Vision Zero, is to re-invest in engineering, equity, and engagement. Rather than focusing on enforcement, safety mitigation efforts should prioritize safe systems designs through community collaboration and evaluation. By doing so we can enable police officers to respond to more community-driven calls, eliminate scenarios that selectively target and burden low income communities and people of color, and make our roads safer for drivers, bicyclists, and pedestrians.

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tracked down criminals on the road. In one episode, titled “Missing Mexican Sheiks”, the Los Angeles Police set up checkpoints and check the registration of passing vehicles to identify two thieves identified primarily by their “dark complexion.” As the story unfolds the narrator furthers the idea that stopping vehicles and delaying traffic was necessary because these nonwhite bodies were a threat to public safety and white automobility. Racialized policing made it so that, ironically, driving stripped people of color of their freedom of mobility.

9) Seo, *Policing the Open Road*, pp. 64-69.

10) *Ibid.*, pp. 111.

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13) Schmitt, A. *Right of Way: Race, Class, and the Silent Epidemic of Pedestrian Deaths in America*. Island Press, 2020, pp. 63-75;

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Seo, *Policing the Open Road*, pp. 138. The Fourth Amendment to the Constitution prohibits unreasonable searches and seizures, but it was established in *Carroll v. United States* that an “officer could arrest a person without a warrant based on his own determination of legal cause” because the use of motor vehicles on the public highways is a privilege. This rule is called the “automobile exception” and established a lower threshold for searching vehicles than searching other private property, such as a home.

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17) Seo, *Policing the Open Road*, pp. 159.

18) Lipsky, Michael. *Street-Level Bureaucracy: The Dilemmas of the Individual in Public Service*. New York: Russell Sage Foundation, 1983. <https://muse.jhu.edu/book/15025>. This type of governance is akin to Lipsky’s “street-level bureaucrats” in that the way police officers deliver benefits (i.e., letting drivers go with a warning) and sanctions (i.e., traffic tickets) impacts the lives and opportunities of the public. “Every extension of service benefits is accompanied by an extension of state influence and control.”

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The broken windows theory was first published by James Q. Wilson and George L. Kelling in a short article in *Atlantic Monthly* in 1982. They suggested that there was a link between disorder and crime, and symbols of disrepair in a community invites more broken windows. It built off a 1969 study by Stanford University psychologist Philip Zimbardo who abandoned two cars in New York, NY and Palo Alto, CA. The New York neighborhood historically had a lot of crime, and the car there was stripped of parts in 10 minutes. The car in Palo Alto was initially left untouched but was also quickly disassembled after Zimbardo smashed the windshield. Wilson and Kelling suggested police can prevent crime by focusing on visible signs of disorder (e.g. broken windows, graffiti, littering). In an era of high crime this one-stop-stop solution for preventing violent behavior by identifying misdemeanors seemed like a golden ticket. New York Mayor Rudy Giuliani and his police commissioner William Bratton brought the theory to a national stage when they implemented a “quality-of-life initiative” based on broken windows. Crime in the 1990s went down, so at first glance it appears that the method worked. But the premise caused more harm than good; there was an increase in reports of police misconduct and the policy morphed into “stop-and-frisk”, which was later found unconstitutional because of the way it singled out young Black and Hispanic men. The broken windows policy seemed doomed to tragedy because even the authors of the original study foresaw how giving police increased discretion could be abused. Kelling and Wilson write, “how do we ensure ... that the police do not become the agents of neighborhood bigotry? We can offer no wholly satisfactory answer to this important question.” Despite the flawed implementation, which could have been interpreted as more community-integrated engagement instead of targeted aggression, the theory continues to be a popular justification for pretextual policing.

- 23) Transport Hartford Academy. *2021 Northeast Multimodal Transit Summit: Communities and Traffic Enforcement*, 2021. <https://www.youtube.com/watch?v=ZTrIhxXO-HQ>. “The motor vehicle code was written in such a way that it is virtually impossible for anybody to get behind the wheel of a vehicle and not be having some technical violation...oftentimes before they even turn the car on.”

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28) Lafraniere, and Lehren, “The Disproportionate Risks of Driving While Black.”

29) Wiley, J. “Traffic Stops Make Poverty a Crime, Retired Birmingham Police Captain Says.” *al*, Mar 31, 2021. <https://www.al.com/opinion/2021/03/traffic-stops-make-poverty-a-crime-retired-birmingham-police-captain-says.html>. Accessed Nov 12, 2021;

Similar sentiments were shared in a private conversation with a former San Francisco Police Officer. The officer was more hesitant to police reform, giving examples of how officer discretion provides accommodation to compliant drivers and can be used to identify chronic offenders. However, they did emphasize that education and prevention are the main goals of traffic enforcement, noting that unless a driver is drunk or just committed a crime there is no need to pull them over right then and there.

- 30) McIntire, M., and M. H. Keller. “The Demand for Money Behind Many Police Traffic Stops.” *The New York Times*, Oct 31, 2021. <https://www.nytimes.com/2021/10/31/us/police-ticket-quotas-money-funding.html>. “In 2019 there were 33,244 fatal crashes nationwide, up from 30,296 in 2010. Traffic safety experts say targeted enforcement works, but improvements in automobile technology and highway engineering account for much of the progress since the 1970s and ’80s, when annual fatal crashes routinely exceeded 40,000.” Additionally, the article writes that “a hidden scaffolding of financial incentives underpins the policing of motorists in the United States, encouraging some communities to essentially repurpose armed officers as revenue agents searching for infractions largely unrelated to public safety.... many municipalities across the country rely heavily on ticket revenue and court fees to pay for government services.”

Transport Hartford Academy. *2021 Northeast Multimodal Transit Summit: Communities and Traffic Enforcement*. A pilot strategy performed in Camden, CT directed police officers to stop vehicle searches for 6 months. In that span the crime rate declined 5% and traffic crashes declined 15%, indicating that the city’s previous crime reduction strategy of stopping, ticketing, and searching vehicles for technical equipment violations was unsuccessful in not only improving safety but also in reducing crime.

- 31) Singla, A. “Cities with More Black Residents Rely More on Traffic Tickets and Fines for Revenue.” *Mic.*, Oct 30, 2019. <https://www.mic.com/life/cities-with-more-Black-residents-rely-more-on-traffic-tickets-fines-for-revenue-19281379>. The American criminal justice system runs on an offender-funded model, where the application of broken taillight theory places the burdens of fees and fines on individuals. On average, local governments do not rely much on revenue from fines and forfeitures, like traffic citations, but there are disparities in where fines are doled out and who bears the burden of their cost. Often, these offender-funded systems are more common in communities with more Black residents;

Conner, M. “Racial Inequity in Traffic Enforcement.” Enforcement includes ticketing and arrest, but also extends to adjudication and sentencing. The latter part of this system sees “Black and Latino people far more likely to be arrested, receive less favorable plea offers, and harsher punishments than similarly situated white people, across all types of crime.”

- 32) *Stanford Open Policing Project*. “Some states don’t collect the demographic information of the drivers that police pull over. States that do collect the information don’t always release the data. Even when states do provide the information, the way they track and then process the data varies widely.”

- 33) *Ibid.*;

Lafraniere, and Lehren, “The Disproportionate Risks of Driving While Black.”

- 34) Baumgartner et al., *Suspect Citizens*, pp. 125-147. The problems associated with traffic stops are systemic. “Racial disparities in searching and the use of investigatory traffic stops are to blame for these tensions, and they result from the collective behavior of a great many police officers, not a deviant few.”



- 35) Voigt, R. et al. “Language from Police Body Camera Footage Shows Racial Disparities in Officer Respect.” *Proceedings of the National Academy of Sciences* 114, no. 25 (June 20, 2017): 6521–26. <https://doi.org/10.1073/pnas.1702413114>.
- 36) Davis, E., Whyde, A., and Langton, L. “Contacts Between Police and the Public”. *US Department of Justice Office of Justice Programs Bureau of Justice Statistics Special Report* (2018): 1-33. Retrieved from: <https://www.bjs.gov/content/pub/pdf/cpp15.pdf>.
- 37) Seo, *Policing the Open Road*, pp. 5-8. In 2015, “27 percent of police killings of unarmed citizens began with a traffic stop.”;
- McCann, A. et al. “Police Shoot Far More People than Anyone Realized, a VICE News Investigation Reveals.” *Vice News* (blog), Dec 12, 2017. <https://news.vice.com/en/article/xwvv3a/shot-by-cops>. Accessed Nov 12, 2021;
- Thompson, C. W. “Fatal Police Shootings of Unarmed Black People Reveal Troubling Patterns.”;
- Stein, R. et al. “Before the Final Frame: When Police Missteps Create Danger.” *The New York Times*, Oct 31, 2021. <https://www.nytimes.com/interactive/2021/10/30/video/police-traffic-stops-danger-video.html>. Accessed Nov 12, 2021. “Officers have killed more than 5,000 civilians since Sept. 30, 2016,” at a rate of more than one per week. In many encounters the situations were non-violent but escalated due to “officer-created jeopardy.”
- Kirkpatrick, D. D., S. Eder, K. Barker, and J. Tate. “Why Many Police Traffic Stops Turn Deadly.” *The New York Times*, Oct 31, 2021. <https://www.nytimes.com/2021/10/31/us/police-traffic-stops-killings.html>. Accessed Nov 12, 2021.
- 38) Seo, *Policing the Open Road*, pp. 5-8;
- Nathan, D. “What Happened to Sandra Bland?,” *The Nation*, Apr 21, 2016. <https://www.thenation.com/article/archive/what-happened-to-sandra-bland/>.
- 39) Baumgartner et al. *Suspect Citizens*, pp. 12-16.
- 40) Townsend, J. “How the Green Book Helped African-American Tourists Navigate a Segregated Nation.” *Smithsonian Magazine*, Apr 2016. <https://www.smithsonianmag.com/smithsonian-institution/history-green-book-african-american-travelers-180958506/>. Accessed Nov 12, 2021. Early Black motorists relied on the *Negro Motorist Green Book* to navigate Jim Crow on the road and avoid “sundown” towns that relied on police officers to ban people of color from staying overnight. “Paula Wynter, a Manhattan-based artist, recalls a frightening road trip when she was a young girl during the 1950s. In North Carolina, her family hid in their Buick after a local sheriff passed them, made a U-turn and gave chase. Wynter’s father, Richard Irby, switched off his headlights and parked under a tree. ‘We sat until the sun came up...my sister was crying; my mother was hysterical.’”;

Woo, E. “Rena Price Dies at 97; Her and Son's Arrests Sparked Watts Riots.” *Los Angeles Times*, Jun 22, 2013. <https://www.latimes.com/local/obituaries/la-me-rena-price-20130623-story.html>. Accessed Nov 12, 2021. A traffic stop sparked the urban uprising in 1965 in Watts, a segregated neighborhood in south-central Los Angeles, when the police pulled over Marquette Frye, a 21-year-old Black man suspected of driving under the influence, and arrested him with force. Not only did abusive police action incite violence, but it perpetuated a cycle of poverty for the impacted family. “Price never reclaimed her 1955 Buick, the car her son had been driving...by the time she located it at an impound lot, the storage fees had exceeded its value.”;

Harris, D. A. “Driving While Black: Racial Profiling on Our Nation's Highways.” *American Civil Liberties Union*, Jun 1999. <https://www.aclu.org/report/driving-while-Black-racial-profiling-our-nations-highways>. Accessed Jul 27, 2021. Protesting for freedom in transportation became a central part of the civil rights movement, with Freedom Rides and the famous march across the Edmund Pettus Bridge in Selma, AL. During this time police used traffic violations to put activists in jail, prompting prominent Black leaders to stop driving entirely. In the 1980s racial profiling continued the roads as the war on drugs encouraged the targeting of motorists of color by furthering the misconception that most drug users and dealers were Black and Hispanic.

41) Domonoske, C. “Roads Are Getting Deadlier for Pedestrians; Fatality Rates Are Worse for Minorities.” *NPR*, Mar 23, 2021. <https://www.npr.org/2021/03/23/980438205/americas-roads-are-getting-deadlier-and-fatality-rates-are-worse-for-minorities>. Accessed Nov 12, 2021.

42) Kaufman, E. J., and Wiebe, D. J. “Racial Disparities in Pedestrian Deaths in the United States, 1999–2015.” *Injury Prevention* 23 (2017): A38-A39;

Coughenour, C., Clark, S., Singh, A., Claw, E., Abelar, J., and Huebner, J. “Examining Racial Bias as a Potential Factor in Pedestrian Crashes.” *Accident Analysis & Prevention* 98 (2017): 96-100. The lack of safe road design in majority non-white neighborhoods, especially on reservations, is a major cause of the disproportionate pedestrian safety outcomes. Bias against yielding to Black pedestrians in the crosswalk is also shown to result in more injuries on the road compared to white pedestrians.

43) Sanders, T., K. Rabinowitz, and B. Conarck. “Walking While Black.” *ProPublica*, Nov 16, 2017. <https://features.propublica.org/walking-while-Black/jacksonville-pedestrian-violations-racial-profiling/>. Accessed Nov 12, 2021. A study in Jacksonville, FL uncovered that Black pedestrians were nearly three times as likely to receive a ticket as White pedestrians. Many of these tickets were issued for jaywalking, a violation that does not have a basis in traffic safety;

Barajas, J. M. “Biking Where Black: Connecting Transportation Planning and Infrastructure to Disproportionate Policing.” *Transportation Research Part D: Transport and Environment* 99 (Oct 1, 2021): 103027. <https://doi.org/10.1016/j.trd.2021.103027>. In Chicago, the presence of bike infrastructure lowered the incidence of ticketing, but this infrastructure is disproportionately absent from majority Black neighborhoods. Furthermore, bicycle safety needs and locations with increased police enforcement of cyclists were not associated with high-risk crash areas.

- 44) Holt, B. “‘We Don’t Have the Benefit of Doubt’: The Fear of Driving While Black.” *The Guardian*, Apr 22, 2021. <https://www.theguardian.com/us-news/2021/apr/22/fear-of-driving-while-Black>. “With roadside interaction one of the most repeated precursors to a fatal police shooting of a Black person, the parents of Black drivers are equipping their children with extra precautions.”;
- Harris, “Driving While Black.” “Because traffic stops can happen anywhere and anytime, millions of African Americans and Latinos alter their driving habits in ways that would never occur to most white Americans. Some completely avoid places like all-white suburbs, where they fear police harassment for looking ‘out of place.’ Some intentionally drive only bland cars or change the way they dress. Others who drive long distances even factor in extra time for the traffic stops that seem inevitable.”
- 45) Raguso, E. “Berkeley Council Approves ‘Omnibus Motion’ on Police Reform.” *Berkeleyside*, Jul 15, 2020. <https://www.berkeleyside.org/2020/07/15/berkeley-council-approves-omnibus-motion-to-reform-policing>. Accessed Nov 12, 2021.
- 46) Vaughn, “Berkeley City Council Passes Sweeping Reforms.”
- 47) Gosselin, K. “Traffic Enforcement and Collisions in Berkeley, CA from 2015 to 2019.” <https://sites.google.com/view/saferstreetsberkeley/home>. Accessed Jul 30, 2021. In 2019, Black drivers accounted for 34% of vehicular traffic stops in Berkeley, CA. The city’s population is only 8% Black, and the disparity cannot be explained simply by non-residents driving through Berkeley. Further indication that the decision for these stops is racially motivated: Black drivers in Berkeley are 2.5 times more likely to be searched but are less likely to be arrested than white drivers. Additionally, Black pedestrians and cyclists are stopped at a rate 4.5 times the percent of the population, indicating that discrimination is pervasive across all modes of transportation.
- 48) Fliss, M. D., Baumgartner, F., Delamater, P., Marshall, S., Poole, C., & Robinson, W. (2020). Reprioritizing traffic stops to reduce motor vehicle crash outcomes and racial disparities. *Injury epidemiology*, 7(1), 1-15.
- 49) Ibid.
- 50) Baumgartner et al., *Suspect Citizens*. pp. 195-213.
- 51) Sandler, “Berkeley Will Become 1st U.S. City to Remove Police From Traffic Stops.”
- 52) Statements shared in private communication with a member of WalkBikeBerkeley, the advocacy organization that pushed forward the vision for BerkDOT;
- Gerhardstein, B., K. Parolek, and D. Owens. “Opinion: We Will Have Safer Streets without the Police: Our Vision for BerkDOT.” *Berkeleyside*, Mar 4, 2021. <https://www.berkeleyside.org/2021/03/04/opinion-we-will-have-safer-streets-berkeley-ca-without-the-police>. This article outlines additional suggestions for BerkDOT operations. “We envision these unarmed BerkDOT traffic monitors...would conduct stops and issue citations for the sole purpose of advancing road safety.” “They wouldn’t be able to detain, search, or

arrest people like the police can, and they wouldn't conduct criminal investigations." It is unclear what the plan is for enforcement of explicitly dangerous behavior, such as drunk driving. A proposed idea is to delegate all traffic stop capabilities to unarmed BerkDoT traffic officers but have police officers respond as backup to situations that are deemed too hazardous. This would also not prevent police officers from performing traffic stops that pose an imminent danger, but limits their scope to serious offenses.

"Environmental Services – DOWNTOWN BERKELEY." Accessed Nov 12, 2021.

<https://www.downtownberkeley.com/dba-services/environmental-services/>. The use of police as backup for unarmed civilian work is similar to how the city currently operates their ambassador program in downtown Berkeley. Ambassadors provide services such as offering directions, picking up litter, and addressing problematic street behavior. They are unarmed and are not authorized to stop or arrest people, that confrontation is left for the police in serious incidents.

- 53) Swarbrick, N. "Road Accidents - Promoting Road Safety." *Te Ara - the Encyclopedia of New Zealand*. <http://www.TeAra.govt.nz/en/road-accidents/page-3>. Accessed Jul 31, 2021;

Woods, J. B. "Traffic Without the Police." *Stanford Law Review* 73, 2021.

- 54) Wilson, P. R., and D. Chappell. "The Effects of Police Withdrawal from Traffic Control: A Comparative Study." *The Journal of Criminal Law, Criminology, and Police Science* 61, no. 4 (Dec 1970): 567-572. Traffic officers "detected and prosecuted almost all nonmoving traffic violations, and the majority of minor moving violations. In more recent years these officers were also given power to arrest drunken drivers. However, after effecting an arrest, the driver had to be taken directly to a police station to be dealt with by the police. In any subsequent court action, the arresting officer would act only as a witness, prosecution of drunken drivers remaining a police function."

- 55) Griffiths, C. "Road Policing: Proactive Management of Police and Media Attitudes," In *Australasian Road Safety Research Policing Education Conference, 2005, Wellington, New Zealand*. 2005. "The general (non-criminal) public rarely came into contact with Police Officers prior to 1992 in any capacity other than as victims or witnesses. Prior to 1992, Police officers were not even issued with ticket books...and ticket writing was simply not part of the New Zealand Police culture."

- 56) Woods, "Traffic Without the Police."

- 57) "2019-2021 Road Safety Partnership Programme." *NZ Transport Agency*, 2021. <https://www.nzta.govt.nz/assets/planning-and-investment/nltp/2019-21-Road-Safety-Partnership-Programme.pdf>.

- 58) "Te Marutau – Ngā mate i ngā rori: Death on NZ Roads Since 1921." *Te Manatū Waka*, 2020. <https://www.transport.govt.nz/statistics-and-insights/safety-road-deaths/death-on-nz-roads-since-1921/>. Accessed Jul 31, 2021.

- 59) Alpers, P. and Picard, M. “New Zealand — Gun Facts, Figures, and the Law.” *Sydney School of Public Health, The University of Sydney*. <https://www.gunpolicy.org/firearms/region/new-zealand>. Accessed Jul 30, 2021.
- 60) “De-merging Traffic Enforcement from Police Analysis of Information to Review Costs and Benefits.” Report Prepared for the State Services Commission. *New Zealand Institute of Economic Research*, 2007. <https://nzier.org.nz/publication/de-merging-traffic-enforcement-from-the-police-analysis-of-information-to-review-costs-and-benefits>.
- 61) “Road Traffic Injury Deaths and Hospitalisations.” *Environmental Health Intelligence New Zealand*. Accessed November 12, 2021. <https://ehinz.ac.nz/indicators/transport/road-traffic-injury-deaths-and-hospitalisations/>. According to Environmental Health Intelligence New Zealand, Māori and Pacific people have higher rates of road traffic injury hospitalizations than other ethnic groups. And Māori and people living in areas with socioeconomic deprivation have higher mortality rates from traffic injury. Although police violence may not be at the forefront of traffic safety in New Zealand, the roads there have inequitable outcomes and must be addressed.
- 62) Heidstra, J., Goldenbeld, C., Gelau, C., Makinen, T., Jayet, M., and Evers, C. “Traffic Law Enforcement by Non-Police Bodies.” *Europe: The “Escape” Project*, 2000. [http://virtual.vtt.fi/escape/escape\\_d4.pdf](http://virtual.vtt.fi/escape/escape_d4.pdf).
- 63) Statements shared in private communication via email with staff at the Rheinland-Palatinate Police University.
- 64) “Traffic Management Act 2004, c. 18, Part 1.” *Traffic Officers*. <https://www.legislation.gov.uk/ukpga/2004/18/part/1>. Accessed Jul 19, 2021.
- 65) Statements shared in private communication with traffic safety professional.
- 66) Tingvall, C., and Haworth, N. “Vision Zero—An Ethical Approach to Safety and Mobility.” In *6th ITE International Conference Road Safety & Traffic Enforcement: Beyond 2000*, Sep 1999;
- Belin, M. Å., Tillgren, P., and Vedung, E. “Vision Zero—A Road Safety Policy Innovation.” *International Journal of Injury Control and Safety Promotion*, Vol. 19, No. 2, 2012, pp. 171-179.
- 67) “What Is Vision Zero?” *Vision Zero Network*. Accessed November 12, 2021. <https://visionzeronetwork.org/about/what-is-vision-zero/>;
- Leading Causes of Death Reports. *Centers for Disease Control and Prevention*. <https://www.cdc.gov/nchs/fastats/leading-causes-of-death.htm>. Accessed July 30, 2021. The existing deterrence-based model is not working. Despite improvements in safety technology, policy, and enforcement, we continue to have unsafe roads in both absolute and relative terms. Injury from traffic crashes is the leading or a major cause of death and disability for Americans;

Traffic Safety Facts Annual Report Tables. *NHTSA*, May 25, 2021.

<https://cdan.nhtsa.gov/tsftables/tsfar.htm>. Accessed July 30, 2021. More than 35,000 people are killed and over 2.7 million are injured on roads in the United States every year.

- 68) “Managing Speed.” *World Health Organization*, 2017. Available from: [http://www.who.int/violence\\_injury\\_prevention/publications/road\\_traffic/managing-speed/en/](http://www.who.int/violence_injury_prevention/publications/road_traffic/managing-speed/en/). A key tenet of Vision Zero is designing road systems around the human tolerance to physical force. There is a strong statistical relationship between speed and safety for both probability of a crash and the outcome of a crash;

Howard, E. “Implementing a 'Safe System' Approach to Road Safety in Victoria.” In *Proceedings of the Australasian road safety research, policing and education conference* 8, no. 2 (2004). Safe systems are those that recognize not only that people make mistakes, but that reducing kinetic energy of collisions can prevent tragic outcomes;

Persaud, B. N., Retting, R. A., Garder, P. E., and Lord, D. “Safety Effect of Roundabout Conversions in the United States: Empirical Bayes Observational Before-After Study.” *Transportation Research Record* 1751, no. 1 (2001): 1-8. A classic example of designing a system for safe mobility is the roundabout. Although dreaded by many drivers due to confusion over merging into the circle, that exact phenomenon makes them significantly safer than four-way stop intersections;

Elvik, R. “Effects on Road Safety of Converting Intersections to Roundabouts: Review of Evidence from Non-US Studies.” *Transportation Research Record* 1847, no. 1 (2003): 1-10. The roundabout is designed to make drivers slow down and pay attention to their surroundings, thereby creating an environment where if collisions do happen, they are less likely to cause serious injury or death. The traditional safety approach aims to prevent all collisions, but what matters is human lives. We may not be able to prevent all damages to vehicles and property, but those are replaceable.

- 69) Hartmann, A., and Abel, S. “How Oslo Achieved Zero Pedestrian and Bicycle Fatalities, and How Others Can Apply What Worked.” *The City Fix*, Oct 13, 2020. <https://thecityfix.com/blog/how-oslo-achieved-zero-pedestrian-and-bicycle-fatalities-and-how-others-can-apply-what-worked/>. Accessed Jul 30, 2021.
- 70) Stanojević, P., D. Jovanović, and T. Lajunen. “Influence of Traffic Enforcement on the Attitudes and Behavior of Drivers.” *Accident Analysis & Prevention* 52 (Mar 28, 2013): 29–38.
- 71) Elliott, M. and Broughton, J. “How Methods and Levels of Policing Affect Road Casualty Rates.” *Transport Research Laboratory (TRL)* 65, 2005. “Stationary and highly visible policing appears to be the most effective method for reducing violations and accidents...mobile policing methods are less effective, especially when unmarked police vehicles are used.”;

Kallberg, V., Zaidel, D., Vaa, T., Malenstein, J., Siren, A., and Gaitanidou, E. “Police Enforcement Policy and Programmes on European Roads.” *PEPPER*, 2008. “In general, the

effects of speed enforcement increase when enforcement is visible and connected to local publicity.”

- 72) Mäkinen, T. et al. “Traffic Enforcement in Europe: Effects, Measures, Needs and Future.” *Escape Project* (2003): 41;
- Luoma, J. and M. Sivak. “Why Is Road Safety in the U.S. Not on Par with Sweden, the U.K., and the Netherlands? Lessons to Be Learned.” *European Transport Research Review* 6, no. 3 (Sep 2014): 295–302. Random breath testing has also been shown to have significant road safety effects in the Netherlands and Sweden: “it has been found in the Netherlands that each doubling of the number of random breath tests since 1986 was associated with a 25 % decrease in drink-driving offenses...[and] in Sweden, the proportion of injury crashes involving drunk drivers was reduced from 14 to 9 % after the introduction of random breath testing in the 1970s.”
- 73) Wilson, K. “Another City Eliminated Non-Driver Deaths In 2019,” *Streetsblog USA*, Feb 11, 2020. <https://usa.streetsblog.org/2020/02/11/another-city-eliminated-non-driver-deaths-in-2019/>. “No pedestrians died in Helsinki last year, down from nearly 60 in 1970.”;
- Murray, J. “How Helsinki and Oslo Cut Pedestrian Deaths to Zero.” *The Guardian*, Mar 16, 2020. <https://www.theguardian.com/world/2020/mar/16/how-helsinki-and-oslo-cut-pedestrian-deaths-to-zero>. Along with narrower driving lanes, Helsinki has also built dozens of roundabouts and installed speed bumps since the 1990s to reduce speed.”
- 74) Elliott and Broughton. “How Methods and Levels of Policing Affect Road Casualty Rates.”;
- Norbury, F. “Roads Policing and Its Contribution to Road Safety.” *PACTS*, 2020. <http://www.pacts.org.uk/wp-content/uploads/Roads-Policing-Report-FinalV1-merged-1.pdf>. Accessed May 14, 2021.
- 75) Baumgartner et al. *Suspect Citizens*.
- 76) Bjørnskau, T., and R. Elvik. “Can Road Traffic Law Enforcement Permanently Reduce the Number of Accidents?” *Accident Analysis & Prevention* 24, no. 5 (Oct 1, 1992): 507–20. “...we have not found any studies that show that traditional police enforcement alone produces permanent effects on violation rate,” so any attempts at enforcing road traffic legislation will be at best halfhearted;
- Carr, A. F., J. F. Schnelle, and R. E. Kirchner Jr. “Police Crackdowns and Slowdowns: A Naturalistic Evaluation of Changes in Police Traffic Enforcement.” *Behavioral Assessment* 2 (1980): 33–41. During a natural experiment in the 1970s when the police in Nashville, TN went on strike, there was no change in traffic fatalities or injuries, indicating that enforcement was not an essential mechanism for improving road safety.
- 77) Blumenberg, E. “Social Equity and Urban Transportation.” In Giuliano, G. and Hanson, S. (4th Eds.) *The Geography of Urban Transportation*. Guilford (2017): 332-358.

- 78) Lugo, A. “Unsolicited Advice for Vision Zero.” *Urban Adonia*, Sep 20, 2015. <http://www.urbanadonia.com/2015/09/unsolicited-advice-for-vision-zero.html>. Accessed May 13, 2021.
- 79) Ibid.
- 80) Hertzman, C., and T. Boyce. “How Experience Gets under the Skin to Create Gradients in Developmental Health.” *Annual Review of Public Health* 31 (2010): 329–47;
- Hirschtick, J. L., S. M. Homan, G. Rauscher, L. H. Rubin, T. P. Johnson, C. E. Peterson, and V. W. Persky. “Persistent and Aggressive Interactions with the Police: Potential Mental Health Implications.” *Epidemiology and Psychiatric Sciences* 29 (2020).
- 81) Desmond, M., A. V. Papachristos, and D. S. Kirk. “Police Violence and Citizen Crime Reporting in the Black Community.” *American Sociological Review* 81, no. 5 (2016): 857–76;
- Epp, C. R., S. Maynard-Moody, and D. P. Haider-Markel. *Pulled Over: How Police Stops Define Race and Citizenship*. The Chicago Series in Law and Society. The University of Chicago Press, 2014.
- 82) Blumenberg, E. “Social Equity and Urban Transportation.”;
- Conner, M. “Racial Inequity in Traffic Enforcement.” An example of inequity for non-automotive road users: “In U.S. cities, 89% of high-income communities have sidewalks, while only 49% of low-income communities do. At the same time, Black and Latino Americans, who live in low-income communities at higher rates than white Americans, are twice as likely to be killed while walking.”;
- Barajas, J. M. “Not All Crashes Are Created Equal.” *Journal of Transport and Land Use* 11, no. 1 (2018): 865–82. In absolute numbers, bicycle crashes are most likely to involve White victims. On a per-capita and per-distance basis, Black bicyclists face the greatest chance of being in a crash. There are also other economic and ethnic disparities in bicycle crashes. An increase in poverty rate by 1 % is equated with a 3.7% increase in bicycle crashes. And an increase in low-English proficiency by 1% is equated with a 1.4% increase in bicycle crashes.
- 83) Transportation. “Can Vision Zero Work in a Racist Society?” *Vision Zero Cities Journal*, Oct 23, 2018. <https://medium.com/vision-zero-cities-journal/can-vision-zero-work-in-a-racist-society-43daad4a8561>.
- 84) Schmitt, *Right of Way*, pp. 47-62.
- 85) Baumgartner, et al., *Suspect Citizens*, pp. 32. “...controlling for the rate and the size of the city, greater political empowerment of the Black community generates lower rates of racial disparity in the police department.”;
- Abonour, R. “Vision Zero’s Enforcement Problem: Using Community Engagement to Craft Equitable Traffic Safety Strategies.” *University of California Institute of Transportation Studies*, 2018. <https://doi.org/10.17610/T6MS3Q>.



- 86) Belin, M., P. Tillgren, E. Vedung, M. Cameron, and C. Tingvall. "Speed Cameras in Sweden and Victoria, Australia—A Case Study." *Accident Analysis & Prevention* 42, no. 6 (November 1, 2010): 2165–70.
- 87) McIntire and Keller. "The Demand for Money Behind Many Police Traffic Stops." "Many municipalities across the country rely heavily on ticket revenue and court fees to pay for government services, and some maintain outsize police departments to help generate that money." "Although federal officials say they do not impose quotas, at least 20 states have evaluated police performance on the number of traffic stops per hour, which critics say contributes to overpolicing and erosion of public trust, particularly among members of certain racial groups.";
- Stanford Open Policing Project*;
- Seo. *Policing the Open Road*;
- Baumgartner et al., *Suspect Citizens*.
- 88) Woods, "Traffic Without the Police."
- 89) Rodier, C. J., Shaheen, S. and Cavanagh, E. "Automated Speed Enforcement for California: A Review of Legal and Institutional Issues." *UC Davis: Institute of Transportation Studies*, 2007;
- "Automated Enforcement Overview." *National Conference of State Legislatures*. Accessed November 14, 2021. <https://www.ncsl.org/research/transportation/automated-enforcement-overview.aspx>.
- 90) McIntire and Keller. "The Demand for Money Behind Many Police Traffic Stops."
- 91) Woods, J. B. "Policing, Danger Narratives, and Routine Traffic Stops." *117 Mich. L. Rev.* 635, 2019;
- Kirkpatrick, et al. "Why Many Police Traffic Stops Turn Deadly."
- 92) Epp et al. *Pulled Over*.
- 93) Baumgartner et al. *Suspect Citizens*;
- Fliss et al. "Re-prioritizing Traffic Stops".
- 94) Grembek, O. "The relative vulnerability index: a framework for evaluating multimodal traffic safety." *SafeTREC*, 2012.
- 95) Barajas, J. M. "Biking Where Black."
- 96) "Data-Driven Approaches to Crime and Traffic Safety (DDACTS)." *NHTSA*. <https://one.nhtsa.gov/Driving-Safety/Enforcement-&-Justice->

Services/Data%E2%80%93Driven-Approaches-to-Crime-and-Traffic-Safety-(DDACTS). Accessed Jul 30, 2021.

- 97) Transport Hartford Academy. *2021 Northeast Multimodal Transit Summit: Communities and Traffic Enforcement*;
- Ross, M. B., J. J. Kalinowski, and K. Barone. “Testing for Disparities in Traffic Stops: Best Practices from the Connecticut Model.” *Criminology & Public Policy* 19, no. 4 (2020): 1289–1303.
- 98) Ibid.
- 99) Pryor, M., P.A. Goff, P. Heydari, and B. Friedman. “Collecting, Analyzing, and Responding to Stop Data: A Guidebook for Law Enforcement Agencies, Government, and Communities.” *Center for Policing Equity and Policing Project at New York University School of Law*, 2020. “Even in states where these data are collected, many agencies store data in ways that make it difficult—if not impossible—to standardize and analyze, which in turn makes it difficult to identify patterns of behavior and inform changes to policy or practice.”
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