



# Perceptions of surveillance: Exploring feelings held by Black community leaders in Boston toward camera enforcement of roadway infractions

Lindiwe Rennert

Department of Geography and Environment, London School of Economics, Houghton Street, London WC2A 2AE, UK

## ARTICLE INFO

### Keywords:

Camera enforcement  
Racial justice  
Policing  
Streets  
Policy reform

## ABSTRACT

Roadway camera enforcement programs have been found to effectively reduce vehicle travel speeds, as well as decrease the number and severity of collisions. Despite a wealth of evaluative research confirming this enforcement approach's aptitude at promoting safer roadway behavior, fewer than 50 % of US states currently host camera-based programs. Public opposition is frequently cited as the cause for the slow proliferation of this enforcement strategy. However, with public demand for police reform having an increasing presence on the national political stage, how might feelings toward camera technology currently stand among groups most marginalized by existing enforcement systems, and how might those feelings vary by type of enforcement application? Through a series of focus groups, this work centers Black voices on matters of surveillance and roadway enforcement by discussing sentiment toward camera programs with Black community leaders. This discussion is contextually situated in Boston, Massachusetts, where legislation that would allow for camera enforcement of roadway infractions is actively being deliberated in the State Senate. Findings culminate in a list of right-sizing and procedural recommendations for policy makers hoping to gain support for camera enforcement, improve roadway safety, and advance racial equity in our systems of policing and governance.

## 1. Introduction

Cameras are used around the world to enforce traffic laws and regulations, improve roadway safety conditions, and cultivate behavior change. Camera enforcement programs collect photographic data via combined radar and image capturing technology mounted either on roadway and sidewalk infrastructure or on-board vehicles (e.g. buses, squad cars) (Rodier & Shaheen, 2007; Tang et al., 2022). This data can be used to determine speed, to serve as visual evidence of a violation, or to discern – either through license plate imaging or both plate and driver imaging – whom to cite with a corresponding infraction.

Much effort has gone into evaluating the impact of camera enforcement (CE) programs on roadway behavior and safety outcomes. A San Jose, California study found a 15 % reduction in the share of speeding 10mph or more over the speed limit following the introduction of speed-enforcement cameras (Davis, 2001). Paradise Valley, Arizona and National City, California saw 40 % (Institute of Transportation Engineers, 1999) and 51 % (Berkuti & Osburn, 1998) reductions in crashes, respectively, after camera introduction. Pulling from 35 studies across 11 non-US countries, the Cochrane Collaboration's report – widely acknowledged as a leading effort in international review of

roadway CE systems – found camera implementation corresponded with an overall reduction in instances of speeding over the posted speed limit ranging from 8 % to 70 %, reductions in accounts of crashes in the vicinity of cameras of 8 % to 49 %, and decrease in the proportion of crashes resulting in fatalities or serious injuries ranging from 11 % to 44 % (Wilson et al., 2010).

Single occupancy vehicles are not the only travel mode with roadway CE applications. Bus-only lanes, which have “the potential to significantly improve bus speeds and reliability (Cesme et al., 2018),” are highly dependent on adherence to space use regulations to deliver their full benefit. Additionally, perception and/or awareness of lacking bus lane enforcement has been found to increase violation rates, further diminishing the effectiveness of the lane (Gavanas et al., 2013; Kepaptsoglou et al., 2011). A New York City-based assessment found that in the absence of CE, between 30 % and 50 % of buses traveling in bus lanes face some sort of significant obstruction, negatively impacting trip times (Safran et al., 2014). However, since implementing CE, NYC bus speeds along routes featuring bus-only infrastructure have increased 34 % (Frost, 2019). Observing similar service benefits, Birmingham, UK found a decrease in observed bus lane offenses of 60 % and a decrease in average bus trip times of 32 % after switching from in-person to camera

E-mail address: [L.rennert@lse.ac.uk](mailto:L.rennert@lse.ac.uk).

<https://doi.org/10.1016/j.cities.2023.104308>

Received 27 October 2022; Received in revised form 27 February 2023; Accepted 20 March 2023

Available online 3 April 2023

0264-2751/© 2023 The Author(s). Published by Elsevier Ltd. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

enforcement (Wiggins, 1998).

Despite a wealth of success statistics for car-based safety and transit performance alike, uptake of camera enforcement in the US has been comparatively slow. With fewer than half of the country's states hosting CE programs of any kind, the US lags far behind nations generally thought of as its infrastructural peers (European Road Safety Observatory, 2018). As of July 2021, just 19 states and Washington D.C. have speed CE programs in operation, while D.C. and 22 states use red-light cameras (National Conference of State Legislatures, 2021). San Francisco and New York stand as the only two municipalities running system-wide CE programs for their bus lanes (Fox, 2020; Goffman, 2018), with fewer than a handful of cities – such as Los Angeles (Linton, 2021), Seattle (Trumm, 2020), and Philadelphia (Murphy, 2020) – preparing to pilot the approach on a select few of their bus-only roadway segments.

Somewhat counterintuitively, this straggling posture has increased over time. Roadway CE programs were once far more widespread in the US than they are today. In 2012, the number of municipalities hosting CE of speeding violations, red-light running, or both peaked at 533. As of January 2022, that number dropped by 37 % totaling just 338 municipalities (Insurance Institute for Highway Safety & Highway Loss Data Institute, 2022). While this decrease in application has been attributed, in part, to difficulty of program management and several cases of fraud (Albanese, 2018; Morain et al., 2016), by far the dominant opposing force to the expansion of CE programs has been negative public opinion (Turner & Polk, 1998; Ralph et al., 2022a). The perceived strength of public disapproval has even motivated legislators in some states to go so far as to ban camera use for roadway enforcement entirely (Morain et al., 2016; Short, 2019).

Despite this decommissioning trend over the last decade, interest in CE is on the rise. Discussion of its potential is active in legislative halls across the country (Romaine, 2022). This swell in CE conversation has two primary sources of fuel. Firstly, the country is in the midst of a movement of police reform garnering significant attention at the national level. 2022 was a record breaking year with respect to police violence. Police killed 1192 people, nearly 100 a month, making it the deadliest year on record since data began being tracked nationwide in 2013 (Mapping Police Violence, 2023). Additionally, awareness of, and outrage at, the starkly disproportionate share of these deaths represented by Black people – 26 % compared to the 13 % of the national population that they comprise – has increased. This exists against the backdrop of the highly visible justice work conducted by Black Lives Matter Movement participants and other racial equity advocates in recent years. Combined, these factors have resulted in a surge in financial, legal, and policy resources for enforcement reform (Aspinwall & Weichselbaum, 2020; Department of Justice, 2022; Eder et al., 2021; Levin, 2023; Romaine, 2022).

Secondly, roadway safety is worsening. Deaths on US roads reached a record high in 2021, with 42,915 people losing their lives in collisions that year (Laris, 2022). Cyclist and pedestrian deaths in particular have soared as compared to pre-COVID rates (Snider, 2022). While the pandemic-driven changes to travel behavior have undoubtedly contributed to the worsening of these numbers, pre-pandemic roadway safety was similarly in a consistent state of decline since the 1980s (Zipper, 2022). Conditions are presently so dangerous that Transportation Secretary Pete Buttigieg has declared the country in a state of roadway safety crisis (Yen, 2022).

With this alignment of timeliness and urgency comes opportunity for policymakers committed to improving roadway safety and behavior. Before them stands the chance to gain significant ground in support for alternatives to in-person officer enforcement. As the appropriateness of roadway camera enforcement stands as more of a political, even emotional question than a technical one – given that opposition persists against copious positive performance evaluations – an enriched understanding of public perception may be what is needed for this strategy to achieve more extensive viability. They are further faced with the opportunity to improve upon persistent race-based injustices. Key to

that is learning directly from those communities thus far most harmed by enforcement practices. This work seeks to facilitate exactly that.

The following section explores existing literature on public opinion toward CE, and closes by posing a research question that targets key gaps. Section 3 discusses the motivation behind the choice of Boston as a case study, then details data collection and analysis methodologies. Section 4 delivers findings, while Section 5 concludes with a collection of recommendations and discussion of study limitations.

## 2. Literature review

Several studies have attempted to gauge public opinion of CE of traffic violations in the US. The majority of these focus on red-light running and speeding violations, and collected their data via random sample phone surveys (e.g. Freedman et al., 1990; Hu & McCartt, 2016; Maccubbin et al., 2001; Retting et al., 1999; Retting et al., 2008). One of the most extensive nationwide surveys, conducted by the National Highway Traffic Safety Administration, found that 69 % of participants supported CE of traffic violations, 15 % disapproved of it, and 16 % had undecided feelings on the subject (Boyle et al., 1998). This particular survey further strove to understand views held by those opposed by presenting participants with an optional selection of potential concerns to self-align with. Primary objections found were:

- Violation of (data) privacy rights/government infringement
- Revenue generating system; government money-grab
- Camera systems feel intentionally deceptive
- Potential for camera error

These specific concerns have been widely corroborated by other studies from across the country.

From Chicago (Kidwell & Richards, 2014) to Los Angeles (Price, 2019), San Mateo, California (ibid) to Washington DC (Cicchino et al., 2014), nearly all examinations of public opinion highlight perceived privacy violation as a hurdle for CE program implementation. Turner and Polk (1998) suggest that making minor adjustments to CE processes could help dampen feelings of privacy infringement. They recommend that rear license plate imaging be used exclusively, as opposed to front-of-vehicle imaging that can capture faces, and that the image captured not be mailed to the public along with the citation as seeing the image may serve to alarm. The research team of Fries et al. (2012) suggests that some privacy concerns may stem from the fact that there are no nationwide data privacy and protection standards that police departments or transportation agencies have to adhere to. They recommend establishing Federal regulations to combat this. Studies from Freedman et al. (1990) and Retting et al. (1999) speak to factors that impact this concern. Their respective studies find that familiarity with CE is associated with fewer privacy worries, and that privacy concerns lessen significantly from a pre-implementation to post-implementation phase of a CE program. These findings host implications for the value of awareness campaigns and proof-of-concept demonstrations.

Much like privacy worries, concerns that camera enforcement is first and foremost a revenue generation tool are rampant across the public opinion literature. Several factors feed this perception of government money-grabbing. Ralph et al. (2022b) note that news media stokes this fire with sensationalist headlines that often cast the government against the public. Phrasing of CE-related fines ‘lining government pockets’ or ‘filling government coffers’ is not uncommon. Other research uncovered that the fact that private camera operating companies, in some cases, get a sizable cut of CE-related revenue contributes to the public feeling like cameras are being used for profit under the guise of safety (Rodier & Shaheen, 2007). Additionally, the literature highlights claims from the public of feeling that information in public space (i.e. signage alerting roadway users of nearby cameras) was being intentionally limited, and that CE was covert by design so as to catch as many offenders as possible and drive up revenue, not to encourage safer driving behavior

(Freedman et al., 1990; McCartt & Eichelberger, 2012).

These feelings cannot be separated from the matter of widespread mistrust of governing bodies. Trust in government is nearing historic lows in the US (Pew Research Center, 2022). Logically, this influences public opinion of camera enforcement as government agencies most typically serve as program administrators. Ralph et al. (2022b) examine this relationship. They find that those with higher levels of trust in local government were more supportive of camera enforcement than those with low levels. This work goes on to suggest that the directness of this relationship may actually be a blessing for government, as enforcement reform, camera or otherwise, could be a prime opportunity to rebuild trust; an effort that would have positive externalities well beyond the realm of enforcement. Agreeing with the potential power of this relationship but looking at the other side of the coin, McKenna (2007) warns that if mismanaged, CE could have the unintended consequence of further undermining trust. Finally, Fries et al. (2012) speak to the connection between trust and sustainability. They argue that without increased trust in government, the longevity of CE programming is in question; even for programs currently up and running and with track records of public approval.

The public opinion literature does not exclusively identify negative feelings toward CE. There is a considerable amount of alignment on findings related to the benefits that camera enforcement has over in-person enforcement. Much of the public agree that CE host the potential for increased capacity and consistency of enforcement (Fox, 2020; Ralph et al., 2022a), and is effective at decreasing roadway injuries and fatalities (Cicchino et al., 2014; Hu et al., 2011; Turner & Polk, 1998).

The interactions that gender (Blincoe et al., 2006; Corbett & Carmlau, 2006; Retting et al., 1999; Shaaban, 2017), age (Rodier & Shaheen, 2007; Shaaban, 2017; Soole et al., 2008), and location (IAM, 2014; Passetti, 1997; Soole et al., 2008) have with support for camera-based enforcement strategies have also been explored. Literature on these topics features general consensus on the following findings: those who identify as men are less in favor of CE than persons of all other genders, the young – most commonly defined as under 35 within the literature – are less in favor of CE than the old, and those in rural and suburban environments view CE far less favorably than those in urban environments.

One notable interaction between identity and opinion, however, has not been thoroughly examined. Existing research fails to reflect perspectives of communities who historically have had a uniquely negative relationship with law enforcement. It is extensively documented that police interaction with communities of color in the US – Black communities in particular – is disproportionately frequent, intrusive, traumatic, and deadly (Butler, 2017; Engel et al., 2012; Gelman et al., 2007; Hayes, 2017; Johnson et al., 2017; Rosenbaum, 2006; Taylor, 2006; Tyler et al., 2015; Weitzer, 2000). This would logically suggest that people of color may have strong or otherwise unique feelings toward camera technology as a law enforcement strategy.

Scholars of identity, policing, and power have explored the interplay between surveillance and racial oppression. Unsurprisingly, they express grave concerns about what implications for non-white, hyper-policed communities might be within an increasingly ‘Big Brothering’ society. In *Surveilling the City: Whiteness, the Black Man, and Democratic Totalitarianism*, John Fiske (1998) argues that “surveillance is a technology of whiteness that racially zones city space by drawing lines that Blacks cannot cross and Whites cannot see.” Here, surveillance as a segregationist tool applies not only to physical ‘city space’, but to non-physical space as well – social, economic, psychological, the list goes on. Similarly, literature documenting the history of how camera surveillance technologies have been used in the US to uphold the social norms of inequity, division, oppression, and exclusion is devastatingly bleak. Acutely, it highlights how violating these norms so often results in loss: of life, of freedoms, of power and agency, of community, of personal wellness, of humanity (Arnett, 2020; Browne, 2015; Roberts, 2010; Sewell et al., 2016). Though these works do not focus specifically

on traffic infractions, they bear a warning of what increased surveillance of any type may bring about.

Vice journalist Aaron Gordon (2020) relates race and roadway enforcement more acutely by calling to attention that, “Any effort to eliminate racism in American policing must figure out what to do about traffic enforcement, which is the leading cause of interactions between police and the public, according to the Department of Justice (2020).” While there is a wealth of literature exposing the existence of disproportionate targeting of motorists of color – particularly Black motorists – by law enforcement (Baumgartner et al., 2021; Grogger & Ridgeway, 2006; Pierson et al., 2020; Seo, 2019; Shoub et al., 2020), such cannot be said of literature centering Black opinions on the matter. Within the same passage Gordon goes on to emphasize that, “... by law, it is almost entirely up to the officer whether to let the person go with a warning, give them a ticket, to search their vehicle, or escalate the situation even further. It is an interaction intentionally designed to let the officer do virtually whatever he or she wants, reflecting the inherent biases of our legal system (2020).” As the role of transportation in American systems of racial oppression cannot be overstated and must not be overlooked, research attention should be paid to understanding feelings toward roadway-related CE specifically held by those who have been most marginalized by ‘biases of our legal system.’

While multiple studies have explored how traffic cameras *perform* with respect to racial profiling – consistently finding that cameras exhibit far less racial bias in administering tickets than police officers do (Eger et al., 2015; Quintanar, 2017) – only one study, to my knowledge and at time of writing, specifically weds the subjects of roadway CE, race, and public opinion. Via survey, the team of Ralph et al. (2022a) ask what effect can be expected from applying a racial justice framing to pro-camera enforcement campaigning. What is meant by ‘racial justice framing’ in this work is a shift in advocacy technique from a focus on race-blind safety to one that explores “the role cameras could play in reducing racial-profiling.” They find that applying such a framing technique does increase support for traffic camera use among individuals who believe that racial profiling exists and who disapprove of the practice. The work also assesses whether or not a racial justice framing would incur backlash, resulting in decreased support for CE. No evidence of backlash among respondents of any race was found. This type of research, that which focuses on the racialized politics of CE, is an essential component to any hope of achieving not only functional and safe roadways, but just ones as well.

Finally, despite there being many applications of roadway CE currently in practice (e.g. enforcement of stop signs, prohibited turns, toll payment, pedestrian-only zones, high-occupancy vehicle lanes, and parking regulations) the conversation surrounding CE has been hyper-focused on red-light and speed limit programs. Nuance can be added to our understanding of the topic by widening this lens. With interest and investment in bus-priority roadway design presently sweeping the globe (Duncan, 2021; GlobalBRTdata, 2022), exploration of camera enforcement’s applications for transit infrastructure warrants increased attention.

This research attempts to narrow some of the gaps in the literature by centering Black thought and expanding discussion of CE beyond its most conventional applications by answering the following question: How do Black community leaders in Boston understand the potential use of camera enforcement for traffic and transit roadway violations? Exactly who is meant by ‘community leaders’ as well as a discussion of why this group was selected as the focus of this research is offered in the next section.

### 3. Methodology

#### 3.1. Boston as case study

For several reasons, Boston serves as a well suited case study for policy makers to gain insight from. Firstly, this site hosts relevance for

the subject. Massachusetts state-level representatives have proposed legislation that would allow for CE of certain traffic violations several times within the last decade. The most recent proposal was put forth as a part of a 2021 Road Safety Bill. Despite a historical lack of support, many of the state's elected officials feel that appetite for CE of traffic violations is growing as it gains a new champion in newly elected Governor Maura Healey (DeCosta-Klipa, 2021; Mintz, 2023; Young, 2020).

Secondly, trends in Boston are representative of metropolitan areas across the country desperately struggling with safety conditions on their streets. The city has consistently averaged just over 3000 motorist incidents a year between 2015 and 2020 (City of Boston, 2020). After dropping by 1000 incidences in the first year of the COVID-19 pandemic, annual motorist incidences for 2021 spiked back up over 3300 incidences despite decreased peak period traffic and decreased total vehicular trips per capita as compared to pre-pandemic levels (City of Boston, 2022).

Thirdly, Bostonians are not green to camera technology in roadway spaces. In 2016, Massachusetts began the removal of all of its highway tollbooths in exchange for an “all-electronic tolling system using E-Z pass transponders (AP, 2017).” While this is the only form of roadway camera enforcement allowed in the state under the existing legal structure, this now five-year-old system has increased state-wide familiarity with how a camera-based enforcement program operates. A foundation of familiarity may facilitate greater depth of participant engagement.

Additionally, the Massachusetts State House is already being intentional about wedding racial justice and traffic-related administration. Two bill proposals – one regarding the establishment of a taskforce to assess the extent of racial profiling in traffic stops, another requiring police departments to report on racial data from both traffic and pedestrian stops to support the efforts of this taskforce – have recently been made to the Joint Committee on Transportation. Both of these proposals could have implications related to the design and applicability of CE programming (MilNeil, 2021).

Finally, the question of what role CE will come to play in the world of transit is particularly interesting for the Greater Boston Area. Capitalizing on the bus renaissance of the last decade (Duncan, 2021), in 2018 the Massachusetts Bay Transit Authority (MBTA) committed \$8 billion to a 5-year capital investment plan, a focal piece of which was bus service projects (MBTA Bus Transit Priority). Multiple evaluations suggest that the in-person enforcement currently applied to these projects is not the most effective way to maximize benefits to transit riders nor return on investment for the MBTA (Frost, 2019; Goffman, 2018). Because of this, the MBTA and related parties may be willing to be more creative than other agencies might in their approach to improvement strategies.

### 3.2. Data collection

#### 3.2.1. Focus groups

Many have expressed their dissatisfaction with surveys as the methodology most commonly used in efforts to gain nuanced insight into the debate over camera enforcement (Blincoe et al., 2006; Soole et al., 2008; Wissinger et al., 2000). Here, I conducted virtual focus groups to complement and enrich previous survey findings. In addition to having the benefits of being comparatively inexpensive, flexible, and quick to set up when conducted virtually (Robson & McCartan, 2016), focus groups have proven particularly useful in situations where the topic of interest was awkward, taboo, or highly politicized (Hopkins, 2007).

I convened six virtual focus groups each ranging from 90 to 115 min long, dependent on participant schedules. These groups were comprised of community leaders who all racially self-identified as Black. In this case, ‘community leaders’ refers specifically to individuals who serve in an elected, unpaid capacity on the boards of Boston neighborhood associations. These individuals are entrusted with acting on behalf of their

constituents and neighbors. They host community meetings, are tasked with information dissemination, and are entrusted to collect concerns held by their constituents. Knowing that these individuals are accustomed to thinking beyond themselves, sharing collectively held views, and prioritizing community wellbeing, I hoped that featuring them would allow amplification of many more Black voices, a sort of multiplier effect.

Allow me to state emphatically that the ‘Black Community’ is not monolithic in its experiences, feelings, and opinions. I would never claim that by including this particular cohort of participants that I have fully captured all, or even a comprehensive sample of the perceptions held by members of this diverse community. As such, it is important to keep in mind that comprehensiveness was not the goal; existing survey research may accomplish that better. Depth of understanding was this work's focus.

Recruitment was primarily conducted via email. 103 neighborhood associations received an email invitation to participate in this research pending their eligibility: having at least one elected board member who identifies as Black. As of November 1st, 2021, when invitations to participate were drafted, this list of 103 encompassed all active neighborhood associations in Boston with a public-facing web-presence of any kind: website, Facebook page, mention on City's neighborhood-specific information web pages.

Having been a transportation planner in Boston myself for a number of years, I have worked directly with several Black board members of neighborhood associations in the past. As a result, some of the participants were known to me. Additionally, as civic projects often cross the borders of different neighborhood associations, several participants and had worked together previously. Though focus groups of strangers are generally preferred (Smith, 1972), given that the Black community accounts for just 19 % of the city's total population and is highly geographically concentrated, it would have been a near impossible task to recruit an entire participant cohort of Black, elected, neighborhood association board members who were complete strangers.

That said, there are unique research benefits to having a focus group comprised of acquaintances. Focus groups can suffer from being a type of performance (Bhopal, 1995; Bocholtz, 2000; Fletcher, 1992; Grandclement & Gaglio, 2011) in which participants tend to “act as if speaking to a gallery governed by the norms of public discourse (Gamson, 1992).” Featuring participants known to one another may help minimize this behavior. Several research teams have found an increased accountability applied between focus group members in cases of pre-existing relationships. In these studies, group members challenged each other on contradictions between what they were ‘professing’ to believe inside of the group and how they actually behaved outside of the group (Kitzinger, 1994; Robson & McCartan, 2016). Similarly, some researchers contend that assembling groups of people known to one another and with whom members might ‘naturally’ have these types of discussions – i.e. discussions of race, transportation, enforcement – results in richer, freer-flowing sessions (Fern, 1982; Kitzinger, 1994). Discussion of how these dynamics played out as well as engagement with researcher reflexivity can be found in the Appendix.

The logistical design elements of these focus groups were shaped both by advised best practices and operational practicality. Scholars of qualitative methods most commonly cite between five and eight participants as preferable for a fruitful focus group (Fern, 1982; Krueger, 2002; Merton et al., 1956; Osborn, 1953). Schedule alignment among participants was such that I was able to run five groups of five community leaders each, and one group of two. This totaled 27 participants representing 22 different neighborhood associations. The geographies that these leaders represent is depicted in Fig. 1, while their summarized responses to a demography-focused pre-participation survey are shown in Chart 1. It is important to note that the exact areas that the associations cover have been slightly distorted within the figure to better protect the anonymity of participants.

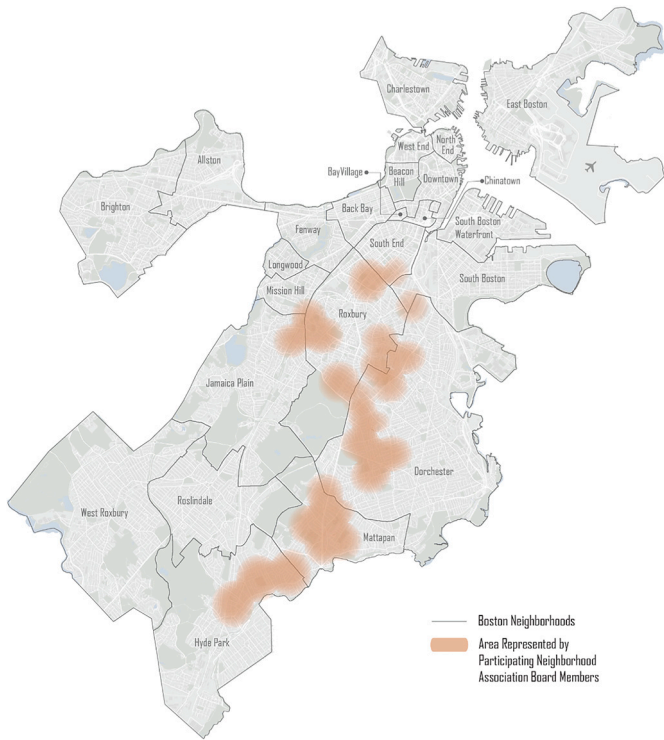


Fig. 1. City area represented by collection of neighborhood association participants.

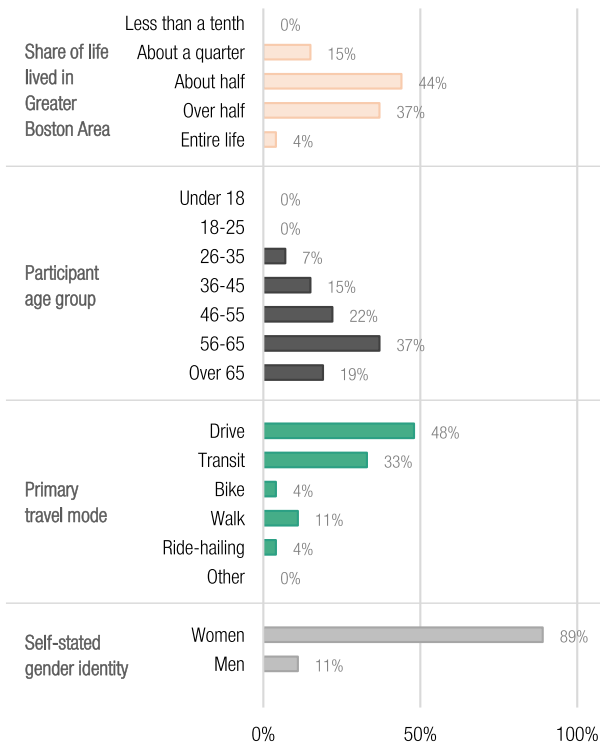


Chart 1. Pre-participation survey responses.

3.2.2. Informational one-pager

During the latter half of each focus group, I introduced a one-page information sheet (see Fig. 2). The sheet highlighted Boston’s current roadway enforcement system as well as an infographic depicting the process of how camera enforcement works conceptually. This

information was introduced via the screenshare feature on Zoom, and had two objectives. Firstly, I wanted to explore how, if at all, views toward CE change when distinction is made between which enforcing body – municipal police force, Boston Transportation Department officers, MBTA Transit Cops – might be involved. Secondly, reduction of the status imbalance between the researcher and the participants or among participants themselves is important. The literature suggests that this potential power imbalance can be mitigated by the introduction of a prompt (Mikecz, 2012). The prompt levels the pre-existing knowledge playing field by providing a transparent, shared, and confined set of information for participants to reflect on.

3.3. Data analysis

I chose to utilize a thematic analysis methodology. Thematic analysis is a highly iterative process that “seeks to unearth the themes salient in a text at different levels (Attride-Stirling, 2001)” through the creation of a set of thematic networks. These networks are links between ideas that build upon one another, traveling toward the identification of primary themes central to the description of the phenomenon of interest (Daly et al., 1997; Nowell et al., 2017). Within the thematic framework, an inductive analytical approach was taken. This entailed the application of a data-driven interpretation by which the raw transcripts were read many times over to allow themes to emerge (Boyatzis, 1998). Inductive analysis was selected because it takes on an exploratory orientation and is often applied when attempting to decipher meaning-making and understanding (Crabtree & Miller, 1999; Guest et al., 2014). Additionally, thematic analysis’ demonstrated rooting in excerpts from the raw data “ensures that interpretation remains directly linked to the words of participants (Patton, 1990)”; a principle central not only to the establishment of rigor and credibility, but also central to the respecting of research participants (Thomas & Harden, 2008; Patton, 1990).

4. Findings

4.1. Stage 1 - establishing a baseline

Before asking community leaders to explore the possibility of something that does not currently exist – a roadway camera enforcement program in the Boston Area – I first asked them to reflect on present conditions out on Boston streets. The following theme emerged from this initial line of questioning: Boston’s current enforcement system is not effective at inciting safe, healthful roadway behavior.

This theme had two primary contributing factors. The first being that behavior on Boston roadways is concerning. In building a foundation for this claim, participants emphasized the emotional distress that they feel as roadway users of all transportation modes. One focus group participant said, “I feel really frustrated when I see reckless driving behavior.” Other group members used the words “tense,” “scared,” “pissed-off,” and “anxious” to illuminate their feelings when out on Boston streets:

“I’m getting older. I don’t move as fast as I used to, and crossing the streets scares the hell out of me. People drive into the crosswalk while you are in it if they decide you are taking too long.”

“I’m even considering not letting my 16-year old get her license for a few more years. She is going to be furious, but it’s just too dangerous out there.”

Participants compared behaviors to what they had experienced elsewhere to highlight the magnitude of the problem. One proclaimed, “I have never seen as much red-light running and jaywalking anywhere as I have seen in Boston. And I’ve traveled a ton!” Similarly floored, a fellow group member expressed, “The amount of double-parking blows my mind. I have never seen that happen anywhere else as much as here. We even have triple parking. Not kidding.”

The second contributing factor to this theme is that the current

# Enforcement Elements

Many elements of the system/process are up for debate.  
What feels right to you and what does not. Why?

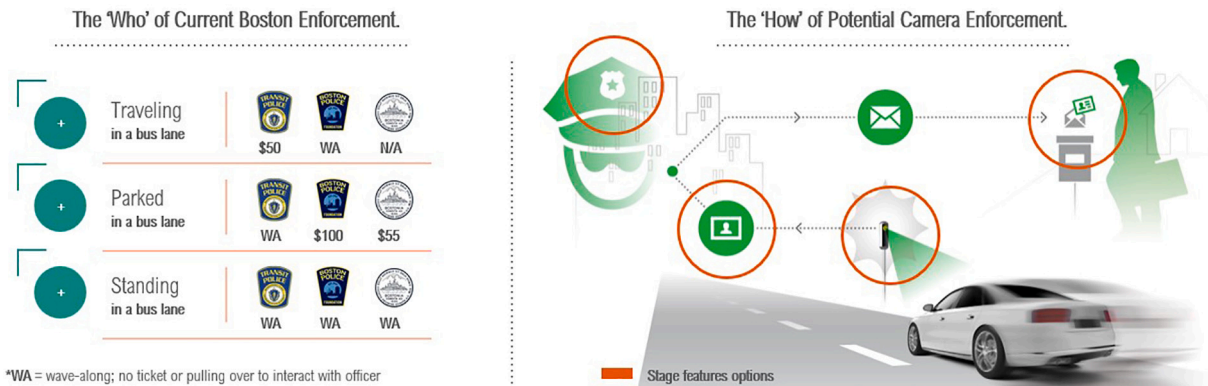


Fig. 2. Single slide informational prompt.  
Information Sourced from: City of Boston Parking Clerk's Office and the MBTA Safety and Violations Guidance.

system does not serve well to remedy this concerning behavior. There was much agreement that enforcement barely happens at all, and that when it does happen, ticketing, or verbal chastising in the absence of ticketing, are not resulting in noticeable change. Many expressed feeling that the reason behind this ineffectiveness was two-fold. On the one hand, police lack the capacity to enforce roadways comprehensively: "We have thousands of bus stops. Trying to get officers to prevent people from parking in all of them is extremely unrealistic." On the other hand, police are choosing not to enforce: "You can double-park right in front of a police officer, make eye contact, and not get a ticket. They really can't be bothered."

The degree of consensus around these two points – that current roadway use induces negative feelings, and that the current enforcement system is not mitigating those negative feelings through resultant behavior change – was striking. At no point did any participant from any focus group take an opposing stand or even a neutral position on the matter. Expressions of dissatisfaction were impassioned and uniform across persons of different neighborhoods, ages, and amount of time lived in Boston. Statements similar to the following were commonplace:

"Traffic enforcement has been an embarrassment in Boston for decades. Don't get me wrong, there are some things that Boston is great

at and should be proud of... but traffic, roadway management, safety, street things... nah."

"At this point, it's a joke. A horrific joke. People dying regularly in accidents is just something that I guess has been decided is fine in this city. No one in a position to do anything about it seems to give a damn. Nothing is done, and nothing changes. Actually that's not true. It does change. Every year it gets worse."

The thematic network for this first stage of analysis can be seen in Fig. 3, and serves as the foundation upon which the second stage of exploration was built.

### 4.2. Stage 2 - camera enforcement: not a panacea

#### 4.2.1. Camera vs. in-person enforcement

The second stage of analysis, whose thematic network can be seen in Fig. 4, similarly rendered two dominant themes. The first is that as a means of bringing about favorable roadway behavior, camera enforcement is not a silver bullet, but may be better than in-person enforcement. Greater consistency and wider coverage were two commonly cited superiorities over the current system:

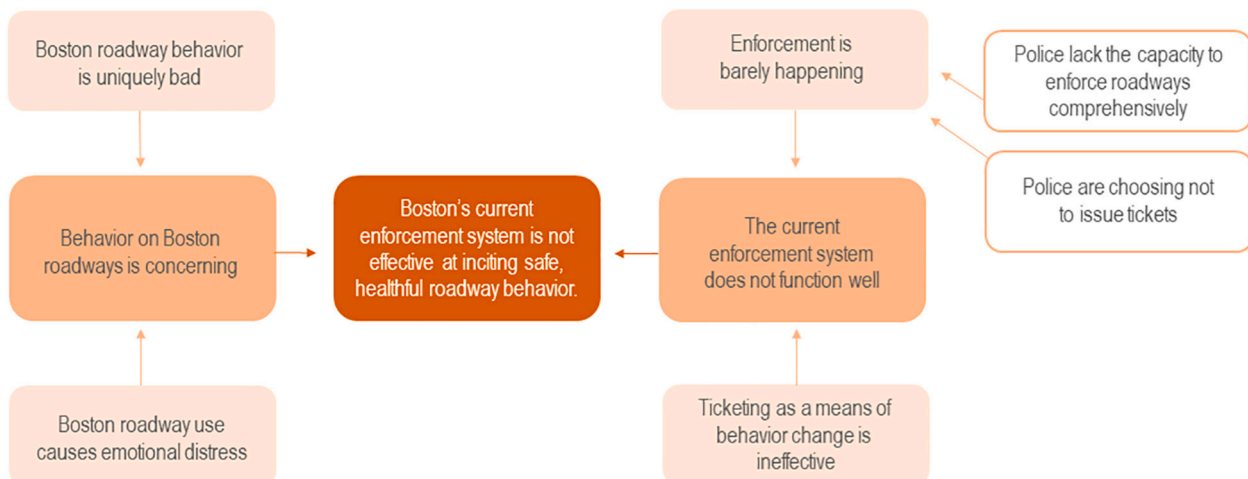


Fig. 3. Stage 1 thematic network.

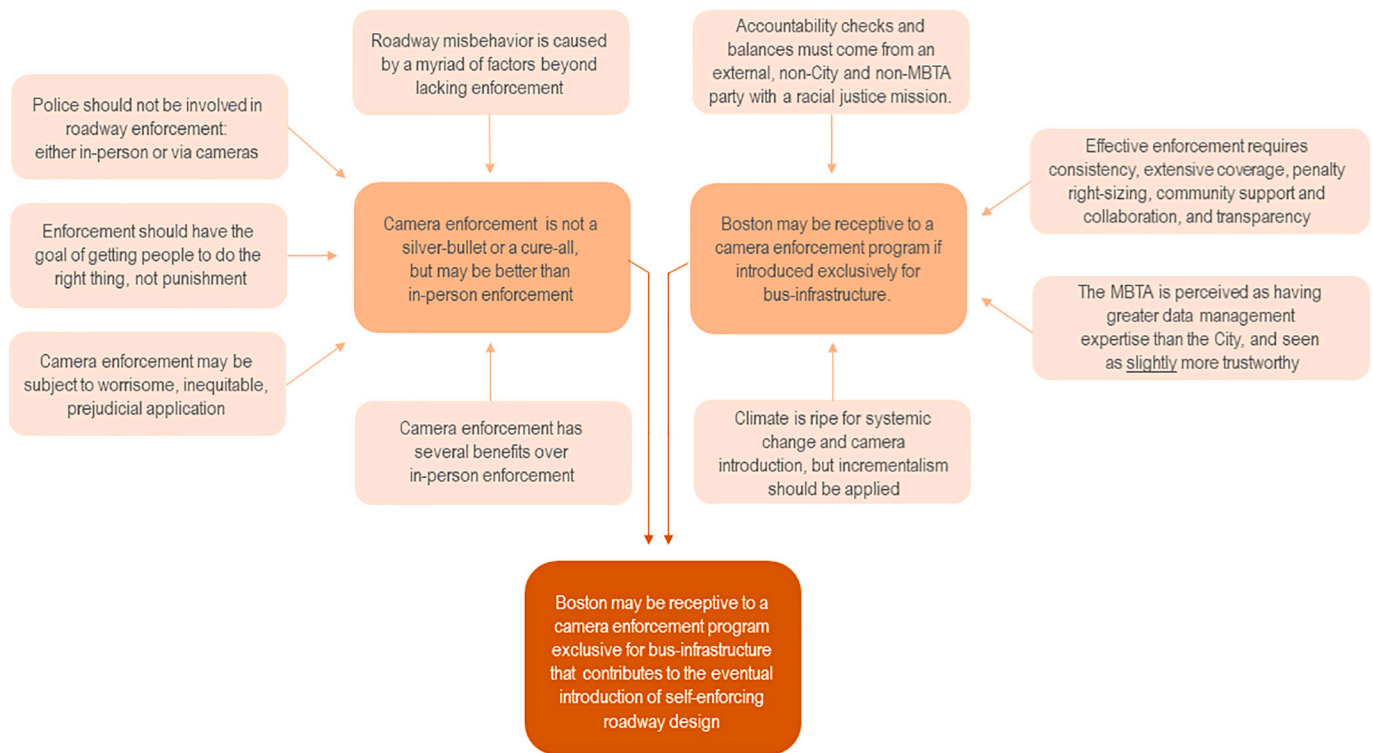


Fig. 4. Stage 2 thematic network.

"If you're going to do enforcement it should be automated so that everyone on the road has the same expectations. It should be consistent and everywhere. It's about expecting to get caught when you do something you shouldn't rather than what we have now which is that I expect to get away with it."

Participants also reflected that in their experience elsewhere, CE systems were successful at changing their own roadway behavior, though not without aggravation. Respondents mentioned how financially cumbersome the processes had been, stressing the size of the fines. Anecdotes often featured individual fines of between \$200 and \$300 dollars, and the experience was even referred to as financially "painful". Still, in all cases, participants noted that the result of these processes was their lasting behavior change:

"Years ago I was caught by speeding cameras in DC. I still remember which intersections I need to slow down on, and that was years ago. It wasn't even a crazy fine: \$50 or \$75 I believe. I think I just drive slower when I'm in DC in general. You never know if new cameras have been put up someplace."

Camera enforcement's potential to facilitate the removal of the police department from the roadway enforcement system was deemed particularly attractive. "I'm not saying cameras are perfect. It's not like they are race-neutral. There are still people involved behind the camera and they have their own prejudices that would impact that system as well. But nothing can be as bad as police officers. They have too much power to do whatever they want. The law allows them to not be accountable." Complaints of lacking impartiality and grossly imbalanced power dynamics in the in-person system were echoed in all sessions through statements like, "If you're going to do enforcement, might as well make it camera-issued rather than up to the whims of some ego-pumped person in uniform who can act without rules."

Views on what the role of police officers should then be within a CE system were by no means unanimous. Some participants felt police should be available for some situations, like tending to crashes, while others felt the force should be entirely disbanded. Still, most agreed that

largely due to their carrying of firearms, police should be removed from any tasks that required they patrol the streets; particularly for the safety of Black roadway users. The two statements below capture the widespread sentiment well.

"If we have to have this necessary evil of enforcement, then it shouldn't be done by the police. It shouldn't be done by anyone carrying a gun. It should be impossible to have a situation escalate from a double-parked car or a ran stop sign to a death at the hands of law enforcement."

"Think about Sandra Bland and Philando Castile and other people who ultimately got killed at what should have been a pretty routine traffic stop. Like... if that violation was enforced by a camera would they still be alive? Of course we can't know, but I think it's likely."

Many participants emphasized that CE was not void of significant shortcomings. In particular, some mentioned feeling that CE was "intentionally cryptic" in an effort to catch as many offenders as possible and raise revenue for the enforcing agency. Additional concern was expressed at the potential for CE programs to be privatized, and for any data collected via roadway cameras to be acquired for other, prejudicial uses. Many were adamant in stressing that they felt neither the City nor the MBTA had in place the responsible data management infrastructure and privacy agreement expertise necessary to avoid the potential for such data abuse. Additionally, fears that CE would likely be subject to inequitable application across racial lines were expressed regularly: "As a person of color, specifically as a Black man, I can't just believe that a new, powerful surveillance tool won't be used nefariously and systematically against me."

In determining whether the benefits offered by camera enforcement outweighed these potential shortcomings, there was a notable difference of opinion across age groups. Despite agreeing that current in-person enforcement was barely happening and was fairly useless at improving roadway behavior, there were a few who felt that the negatives of CE were too significant, and that in-person enforcement was preferable to a CE program. Those who held this stance were almost all over the age of

55. The under age 46 cohort accounted for those most open to CE programming. This same age group also felt most strongly in favor of a new enforcement system, camera or otherwise, completely void of police presence.

This disparity could be explained by several factors. Older participants more often offered anecdotes in which they experienced positive interactions with cops. They would cite instances of being pulled over and having the exchange end in a “smile,” “a shared joke,” “a pleasant bit of small talk about the neighborhood or something like that.” Though this group did not paint their experiences with Boston police as exclusively positive, their mixed set of experiences stood noticeably oppositional to the exclusively negative traffic-stop experiences that younger participants shared. A portion of this disparity could be the result of changed – directionally negative – police behavior over time.

Another potential temporal explanation comes by way of evolving school curriculum. Older participants in three focus groups directed the conversation toward changes that they have noticed in civics education in Boston between their time as school children and their children's time within the same school system.

“I swear Boston Public Schools do not teach Civics anymore. There is a complete lack of understanding of how basic local government works. Or should work. And because of that, the only understanding that young folk have is extremely negative. They only see social media. They haven't had the experience, many of them, of police officers coming to their schools and explaining who they are and what their responsibilities are. They don't have the experience of meetings police officers positively. Whereas, when I grew up, they came, they talked about safe street crossings, about signage and what it means, about ways to be a good driver, and stuff like that. I'm not saying we need to flood schools with cops. Hell no! I'm just saying it feels like my children and their children have absolutely no positive examples or understanding of governing agents, cops included.”

Irrespective of the age disparity in strength of opinion, overall, the majority of participants felt that camera enforcement would likely be more effective at making Boston streets safer for Black and non-Black roadway users alike than the current in-person method.

#### 4.2.2. Enforcement is not the be-all end-all

Participants stressed that even if CE was preferable to in-person enforcement, it should not be treated as the end of the enforcement-reform road. Lacking enforcement is not the sole cause of roadway misbehavior, making improved enforcement just one component of achieving high-functioning, safe, non-distressing roadways.

Community leaders were well attuned to the interconnectedness of roadway behavior, traffic volumes, housing scarcity, unaffordability, and displacement:

Participant A: “The amount of traffic is somewhat... amazing. Boston is not a huge city, yet it generates huge city congestion. It's traffic that is coming from outside the city into the city. The streets along the city limits headed inward are full to the brim as early as 6am. I know this because I see it.”

Participant B: “I think much of it could be from previous Boston residents who have been displaced and now live outside of the city. I can't even tell you how many friends I have that used to live in Roxbury and have been forced to Brockton or Randolph and how many of them are caretakers to their older parents who live in public housing here in Boston. So they are having to drive back and forth between things like multiple jobs, family, services, that used to be concentrated in one place for them.”

Participant A: “You talk to young people hanging out around Franklin Park, and they tell you they actually live in New Bedford or Lawrence, but they feel like their lives, their schools, the places they

like to eat and hangout, are all here in Boston. It's because of costs. These kids' parents have either been priced out, or want to buy, but can only do that way outside of Boston. It's a major problem on so many levels, and for sure one of those levels is traffic and congestion and street safety.”

This conversation segment suggests that taking a comprehensive approach to tackling roadway safety –explicitly addressing topics of mode-share, gentrification and displacement, property prices, and land-use – may offer the best chance for gaining public support, at least among communities negatively impacted by these factors.

Inconsistent roadway laws across jurisdictions, lack of care and compassion for one's fellow roadway user, faulty or failing infrastructure (i.e. potholes, missing crosswalk countdown clocks, poor street lighting), and excess demand for roadway space were cited as additional causes of roadway misbehavior that would likely not be solved by the introduction of a camera program.

The ultimate objective of enforcement programming was discussed. Many felt that any enforcement program should have the explicit goal of getting people to do the *right* – in this case most often meaning the *safe* – thing, rather than inflicting punishment or raising revenue. Community leaders therefore proposed that self-enforcing systems where punishment is not needed because misbehavior is virtually impossible should be the true aim. In four of the six focus groups, participants proposed an alternative to the models of in-person and camera enforcement. They argued that what is called for is a focus on street-design as an enforcing entity: “You design the street well and there is no need for additional enforcement; it self-enforces.” They offered that a CE program may be a good midway point between the current system and a self-enforcing, design-led system:

“I think I could stomach it if it were something temporary. If it were meticulously evaluated and monitored, and if the data collected, you know like the locations of the worst and most frequent offenses, was used to inform design changes that replace the cameras entirely. I still have major reservations; surveillance capitalism and all that. But at this point, something has to change. I've had too many friends and neighbors die or get seriously hurt in crashes on Boston streets.”

#### 4.2.3. Camera enforcement: transit first

The second dominant theme postured is that the members of Boston's Black communities may be receptive to a CE program if it were introduced exclusively to enforce bus lane and bus stop violations. Support for this theme fell into distinct categories: why such a program should be MBTA-led, and what elements were critical to ensure acceptability.

Several participants proposed that the initial introduction of any CE program to Boston streets should focus on bus-infrastructure. This was in part because of the clearly visible ineffectiveness of unenforced bus lanes and the ableist injustices associated with rampant parking and idling in bus stops. A community leader from a neighborhood hosting one of the City's new bus lane projects expressed, “I'm sold on the bus lane thing. In New York, the buses are flying. And it's all because they have bus lanes, and the bus lanes are empty of cars. We don't have that. We have a few bus lanes sure, but they are not respected by drivers at all. So we {the public} feel like they don't work at speeding up the bus.” Other related statements included:

“It makes me sick to see our elders having to dismount the bus in the middle of the street. They should be dismounting directly onto the sidewalk, but the buses can never get there because the stops are parked up. It's unsafe. And that huge step down off the bus and the step up the curb to get back to safety... it's a big deal for some. Especially our aging population. And you know that our Black neighborhoods account for a large portion of Boston's aging population.”

Acknowledgement of the issues associated with unenforced bus



infrastructure was coupled with the identification of several attributes of the MBTA that positioned it as preferable to the City to manage a CE program. One such attribute is the authority's very nature as a cross-jurisdictional entity. Having regulations apply to MBTA-affiliated roadway space region-wide might get around town-to-town legal inconsistency – an issue that participants identified as negatively impacting roadway behavior presently.

Another attribute revealed itself once the informational one-pager (see Fig. 2) was introduced during each session. The different camera placement options that exist in CE programs elsewhere were discussed. Participants were resistant to any scenario in which the camera could take an image of the faces of those inside the vehicle. This resistance made placement options in which facial imaging was impossible comparatively attractive. Because this would be the case with bus-specific CE – where a camera is positioned low on the front of the bus exclusively to capture license plate details – this model received greater support.

Additionally, there is a growing level of familiarity with the MBTA running proof-of-concept, temporary projects: “It would go over best if the T ran it. That way it can feel like ‘the T is implementing a new pilot’ which is language that we are getting used to these days.” Even some who expressed equal levels of mistrust with the City as with the MBTA showed interest in the idea of a pilot: “I feel very mixed about it. I'm worried it will be used against *us*. But, the current situation is just so bad... I think I need to see it. To experience it in some way.” With an existing internal team dedicated to the management and evaluation of pilot programs (Transit Pilot Policy, 2017), the MBTA may be best suited to execute such a program.

Furthermore, participants hypothesized that by hosting an in-house system, the MBTA may be well positioned to ensure that the proceeds from the punishment of the misbehavior be funneled directly to the primary victim of that misbehavior. This would be accomplished by having fines go directly toward bus service improvement. The idea that any revenue collected from a roadway infraction should be dedicated to making further infractions of that same kind less frequent was strongly supported. Statements like, “You park in a bus stop, you screw bus riders. So, your penalty payment should go to improving the experience of bus riders,” were met with broad approval.

#### 4.2.4. Trust is paramount

Finally, every focus group session revealed major, deep-seated trust issues between Boston's Black community and governing authorities. Leaders stressed that while community trust in the MBTA was not particularly strong, it was stronger than trust in the Police Department, in the Boston Transportation Department, and in the City in general.

“Let me be clear. I don't trust any of them. I don't like any of them. But at least I feel like the T {MBTA} has been making visible efforts at being more transparent. I feel like the City could release a ‘Transparency Plan’ tomorrow and it would make me trust them even less somehow. I would think, ‘Nope. What is this? Why now? They are up to something. This is a front for something sinister.’ There is zero trust there.”

Further illustrating this suspicion, groups consistently featured heavy *us-versus-them* sentiment. Interestingly, for older participants – roughly over 50 years of age – *us* was Black Boston and *them* seemed to specifically refer to Boston government while for younger participants, *us* was Black Boston and *them* was law enforcement in the specific form of police officers. Despite the variation in classification, the feelings of wariness were shared with similar strength. If at least some of this mistrust cannot be healed, then it is not hard to envision a scenario in which public support for not only an enforcement reform plan, but any roadway policy, design, or programming change is an impossibility; a condition warned about in the public opinion literature on CE (McKenna, 2007; Ralph et al., 2022b).

#### 4.2.5. Buy-in, participation, and review

On the topic of what is needed for a transit-focused camera enforcement program to be successful, a couple key elements revealed themselves as non-negotiables: community buy-in and on-going collaboration, and a transparent, publicly accessible data privacy policy and accountability framework. To ensure these elements, participants saw an opportunity for a beneficial partnership between the MBTA and racial-justice-driven community organizations, as well as the formation of an external program overseeing body.

In one focus group, the following was said of collaboration and buy-in:

“If a group like Black Lives Matter (BLM), or Urban League, or the NAACP, or a well-respected local group used the T's analytical capacity and outreach funds, and the T used their community legitimacy, and they both did an education campaign on exactly how cameras would be used and how they benefit rather than harm Black folk... that would probably go a long way toward getting both groups what they want. Unobstructed bus lanes for the T and a defunded police department for BLM. Or more of a voice, a true seat at the table for on-the-ground organizations already doing engagement work.”

It is worth noting that occasions of collaboration between transit agencies, the MBTA included, and organizations involved in race-centered justice work are not uncommon. Most often, these collaborations take the form of community advisory committees (National Academies of Sciences, Engineering, and Medicine, 2013). Unfortunately, these committees tend to be unidirectionally beneficial. Community organizations lend their expertise and clout, but are rarely offered any decision-making power (Cronley et al., 2021; Litman & Burwell, 2006; Lynn & Kartez, 1995; Matthews et al., 2018). It is hard to argue that this format supports true partnership: a relationship in which leadership and decision-making authority are shared. Through statements like the quote above, it is clear that what is called for to achieve community buy-in of a CE program is a mutually beneficial relationship that serves to distribute power across partnering stakeholders rather than further concentrate it within enforcement agencies.

On the topic of accountability, one community leader offered the following:

“I believe that Boston missed a key opportunity back when then-Councilor Andrea Campbell put forth the proposal for the city to have an Inspector General or something similar. Because you need to have a completely independent entity to gather and protect data. Unless that information is protected and that privacy agreement is vetted by the public, then I don't feel comfortable with any of these three {MBTA, Boston Transportation Department, Boston Police Department} running a camera enforcement program. If there is no accountability system, then any enforcement system is a failure. So who will check the MBTA? Who will check the City? Without an independent office, nobody.”

Community leaders demonstrate much wisdom in their emphasis of this need as the value of oversight by external parties is largely supported across scholarship of policing. Be it a civilian oversight model (Finn, 2001) or a professional auditing model (Attard, 2009), the benefits of consistent oversight have been found to be penetrating in cases where oversight committees have power of review which is then paired with disciplinary consequences (Clarke, 2009). These benefits include a decrease in incidences of police brutality and use of deadly force (Prenzler & Ronken, 2001), an increase in accessibility of the formal complaint process (Hope, 2021), a decreased use of disrespectful language toward civilians by law enforcement agents (ibid), and an increase in civic trust (Ferdik et al., 2013). While oversight committees have most commonly been applied specifically to police departments, there is no reason to think that the principles of such bodies could not be applied to other enforcement programs; for example, those hosted by transit agencies.

#### 4.2.6. Getting the 'penalty' right

Right-sizing infraction penalties was also described as fundamental to an appropriate camera enforcement program. Community leaders stressed that the size of a fine could be the difference between behavior change and behavior stasis, but could also be the difference between a pipeline to prison and an equity-rich program. No concrete plan for a fining scale was offered. Focus groups discussed whether a fine was even the correct format to bring about desired behavior: "A warning might honestly be just as useful as a ticket. I'm not sold on the idea that a financial payment is most effective way to change behavior. I think it just makes people angry at the government." The idea of having the mail-received penalty for a first-time offense be a warning rather than a fine was presented in all groups. Statements of support like, "That would be good so people could learn and get used to the system rather than feel immediately blindsided," were made. All groups concluded that this element of right-sizing the penalty needed much further discussion before any program got implemented, but that the ethos of an 'educate first' approach felt appropriate.

Beyond camera-specific enforcement, the sentiment that traffic penalty structures need close attention, if not complete overhaul, is shared on the national stage. Several major policy and research engines – the likes of the Fines and Fees Justice Center, the Vera Institute of Justice, Vision Zero Network, the Brookings Institute, and the Urban Institute – are actively working on alternatives to regressive fine systems that regularly subject communities of color and low income communities to the possibility of being trapped in a cycle of poverty and punishment. Some of their recommendations include removal of late fees, implementation of an income-adjusted fine structure, and the ability to pay fines in monthly installments (Hanak, 2021). Because of work by these organizations and others, several cities – e.g. San Francisco and Chicago – have implemented low-income ticket cost reductions ranging from 25 % to 80 %. While more and more municipalities adopting fine reduction schemes is surely progress, none are being so bold as to do away with fines as the primary penalty format of their traffic enforcement systems. The non-financial penalty structure suggested here by community leaders would make any municipality willing to adopt it a true pioneer in enforcement reformation.

## 5. Conclusion and discussion

By way of virtual focus groups, this work complements field-dominating survey research on public opinion toward roadway camera enforcement, and expands the literature by exploring transit applications and centering the voices of those most marginalized by existing enforcement practices. Two stages of thematic analysis combined to shed light on feelings held by Black community leaders in the US regarding the potential use of CE for traffic and transit roadway violations using Boston, Massachusetts as case study. Ultimately, the following was revealed: Though lukewarm on camera enforcement in general, Black community leaders feel that Boston may be receptive to a CE program if it were applied exclusively to bus-infrastructure (i.e. bus lanes and bus stops), were operated solely by the MBTA (i.e. transit providing agency), were overseen by an independent oversight committee with consequence administering capabilities, and were intended to serve as an interim measure en-route to the installation of self-enforcing roadway design. This conclusion was informed by discussions of concerns toward CE, benefits of cameras over in-person practices, deep-seated mistrust of governing agencies, and equity-supporting program design elements.

Many of the concerns contributing to the overall lukewarm feelings and mild trepidation toward CE found here are echoed in the public opinion literature as being felt by white and non-white persons alike. Namely, these include concerns of privacy and data abuse, lack of oversight and mistrust in governing and policing authorities, and perceived government money-grabbing. Beyond this list of non-rationally delineated worries, Black community leaders expressed concern that by

way of algorithmic racism (Crockford, 2020; Patty & Penn, 2023), CE programs have the potential to continue the enforcement practice of inequitably targeting communities of color.

Despite these concerns, Black community leaders identified several key benefits that CE has over in-person practices that ultimately make it an attractive enforcement alternative. Some of these elements align with findings from the wider literature, while others offer insight on which the literature is scant. Leaders agreed that, if not disproportionately deployed in neighborhoods of color, CE could offer increased enforcement capacity and consistency. They also emphasized believing camera enforcement to causally contribute to lasting behavior change and significant safety improvements overall. These feelings align with those found in much of the CE literature. Black community leaders warmed most intensely to CE's potential to be an entirely gun-free system, and to be operated without any police involvement. The degree to which leaders stated that these conditions would be crucial to the gaining of their support serves as a significant contribution to the public opinion knowledge base.

This Boston-specific context offers lessons that can be applied more broadly. Policy makers seeking to gain support for camera-based enforcement alternatives and wanting to advance racial equity in the process may benefit from being open to the following Black community leader-informed program design recommendations: 1) introduce camera enforcement through a pilot project with a finite duration and evaluation process; 2) divide CE programming into individual parts each specific to a single application, (e.g. red-light separate from speeding separate from bus application); 3) establish an external oversight committee with decision-making authority; 4) lead with the objective of education and behavior change rather than punishment; 5) have specialists in behavior, justice advocates, members of the public and leaders from the most enforcement-marginalized communities help determine the nature of the program's penalty structure; 6) explicitly disallow an increase in police funding or an increase in on-street officer presence as part of any CE programming; 7) channel funds collected via CE directly into street infrastructure projects that target safety through design as eventual replacement for cameras; 8) couple enforcement policy with attempts at targeting systemic contributors to unsafe roadway behavior beyond individual behavior (e.g. displacement and mode-share); 9) require inclusion of justice organizations as well as other enforcement-marginalized members of the public on the oversight committee; 10) house CE programming in whichever non-police, governing authority the public has the greatest trust; 11) put in place protections such that no police agencies may be granted access to camera collected data.

As Fig. 5 shows, recommendations one through five are well established in the CE literature and are featured in currently operational programs. Six through eight call for modifications to recommendations previously made on the subject. These modifications, as can be seen in the comments column of Fig. 5, relate to explicit restrictions on expansion of the police machine, eventual phasing out of cameras, and taking a multi-pronged, urban planning, preventative approach to enforcement policy.

Recommendations nine through eleven offer new ideas to the CE policy design landscape and directly address several concerns previously identified as major influencers over public opinion. Recommendation nine tackles fears of perpetuated targeting of particular communities. Recommendation ten speaks to issues of government mistrust. No municipality, at time of writing, hosts their CE program in anything other than a Transportation Department, Transit Authority, Police Department, or Traffic Authority. While these agencies are the default, they do not have to be the only options. The pervasive hinderance to successful enforcement policy posed by mistrust in particular authorities may best be tackled by considering other agencies as CE program hosts; or, at the very least, studying which of the default agencies the public is most open to engaging with. Recommendation 11 speaks to worries surrounding privacy and data protections by encouraging policy designers to be specific in their limitations of who is barred from tapping into this powerful tool of surveillance.

	Recommendation	US Example	Non-US Example	Literature with Similar Recommendation	Comments	
1	E	Introduce roadway camera enforcement as a pilot program with finite duration & evaluation process.	Scottsdale, AZ – 2006 Beaverton, OR – 2018 Charlotte, NC – 2004	Çerkezköy, Turkey - 2013 Nicosia, Cyprus - 2021 Cairo, Egypt - 2020	Allsop, 2010 Cebryk & Bell, 2004 Leduc, 2008	none
2	E	Divide CE into smaller, distinct pieces. Consider beginning with bus-related applications.	New York, NY – 2010 San Francisco, CA – 2008 Seattle, WA – 2021	Melbourne, Australia – 2013 Paris, France – 2017 Seoul, South Korea – 2005	McKenna, 2007 Carnis, 2007 Mulligan, 2008	Compartmentalization may increase perceived legitimacy. Not all applications incite the same response from the public.
3	E	Establish an external oversight committee, with consequence administering power, to monitor and evaluate the program.	Oakland, CA New Orleans, LA Knoxville, TN	Colombo, Sri Lanka Wadsworth Borough, UK Johannesburg, South Africa	Fries et al., 2012 Osse, 2016 Mokoena, 2019 Kiesling & Ridgway, 2006	none
4	E	Lead with the objective of education and behavior change rather than punishment.	New York, NY Seattle, WA Fairfax, VA	Dublin, Ireland Stockholm, Sweden South Wales, UK	McCartt & Eichelberger, 2012 Delaney et al., 2005 Fleiter & Watson, 2012	none
5	E	Have specialists in behavior, justice advocates, members of the public & leaders from the most enforcement-marginalized communities help determine the nature, magnitude, and form of the program's non-regressive penalty structure.	San Francisco, CA – penalty reformation; advocate informed  Albuquerque, NM - optional community service in place of fine; advocate informed	Germany - points toward loss of license; research informed  Mexico City - mandatory community service after a certain number of points; advocate informed	Hanak, 2021 Dixon & Alexander, 2005 Mohammed & Labuschagne, 2008	none
6	M	Disallow for any increase in police funding or any increase in on-street officer presence as part of any camera enforcement programming.	Portland, OR Colorado Springs, CO	Bristol, United Kingdom Lower Saxony, Germany	Ralph et al., 2022 Woods, 2021 Bliss, 2020	Examples here have a police divestment initiative, or no practice of using CE to increase police funding/presence. None explicitly disallow, nor does the literature.
7	M	Channel CE-collected funds directly into street infrastructure projects that target safety through design as eventual replacement for cameras.	Seattle, WA Washington DC Staten Island, NYC Baltimore, MD	Vancouver, Canada Rio de Janeiro, Brazil Milan, Italy Queensland, Australia	Ralph et al., 2022 Greenfield, 2022 Turner & Polk, 1998 Ralph et al., 2022	None of the programs nor literature specify the goal of camera replacement, but do focus on infrastructure investment.
8	M	Couple enforcement policy with attempts at targeting systemic contributors to unsafe roadway behavior beyond individual behavior.	Chicago, IL – funds from CE earmarked for after-school, job creation, and anti-violence programs.	London, United Kingdom - funds from CE used for free transit passes for elderly and young people (Hackney Council)	Ralph et al., 2022** Greenfield, 2022** Marshall, 2018 Vera Institute of Justice, 2021	No programs directly connect housing/settlement patterns and changes (e.g. displacement) with CE policies.
9	N	Require inclusion of justice organizations as well as other enforcement-marginalized members of the public on the oversight committee.	none	none	Rodier et al., 2007^ Woods, 2021^ Vera Institute of Justice, 2021	No CE program oversight bodies have explicit or mandated inclusion of justice organizations, institutions, advocates, etc.
10	N	House CE program in whichever governing authority the public has the greatest trust.	-	-	-	Identification of trust as an issue is present in the literature, but solutions are under-explored.
11	N	Establish protections such that police may not be granted access to camera collected data.	none	none	Fries et al., 2012 Woods, 2021 Ralph et al., 2022*	No programs outright disable police data access.

**E** = reiteration of as well established recommendation; **M** = modification of an established recommendation; **N** = presentation of a new recommendation to CE policy design landscape  
 \*Speaks to protections against data seizing and misuse, though not specific to police; \*\*Acknowledges these factors and their connection to race, but does not make explicit recommendations on the subject  
 ^Recommends giving groups and members of the general public with a 'special interest' a greater role in the oversight and review process, but does not specify those with heightened condition of vulnerability

Fig. 5. Black community leader-inform camera enforcement program design recommendations.

This work adds to the policy maker toolkit for shaping civilian-informed enforcement systems, and, hopefully, will contribute to the simultaneous improvement of roadway safety, decrease in racially unjust policing, and rebuilding of civic trust so desperately needed in so many places.

5.1. Limitations and topics for further study

No work is without its limitations. The pre-participation survey unearthed a demographic imbalance between the participant sample and the broader reality of the subject of enforcement with respect to gender. The gross majority of participants identified as women (89 %). Women are generally more in favor of camera enforcement as well as far less likely to violate roadway regulations than those who identify as men (Corbett & Caramlau, 2006; Retting et al., 1999). It is reasonable to assume that men, being statistically more likely to be engaged in the enforcement process, may have notably different perceptions of the appropriateness of camera-based enforcement alternatives. While this assumption does not degrade the value of the largely women-led findings here, it does suggest that extending this work might entail seeking viewpoints from a more gender-diverse collection of community leaders with an eye to comparison.

Because each participant was only engaged with in a single focus

group session, it was not possible to assess how their views toward camera enforcement may have changed over time or directly in response to having participated in this work. This information would be useful in that it could speak to the mixed findings on the subject of a possible familiarity effect found in the CE literature (Blincoe et al., 2006; Freedman et al., 1990). This work also does not explore the specifics of what it would take – structurally, financially, etc. – to implement a program that meets all of its resultant policy design recommendations. How might budgetary responsiveness change with decreased revenue brought about by increased compliance with roadway regulations? What might staffing needs look like to host a CE program entirely outside of an existing enforcement agency? What sources of revenue should be pursued to enable a program of this type? These ideas require further examination.

Additionally, this work does not explore how acting on any of the Black community leader-informed recommendations made here may result in backlash. Backlash can take many forms. For example: further worsened trust in government among certain groups; increased tensions across racial lines if non-Black members of the public feel that a CE program of this design affords the Black community undue preferential treatment; or even retaliatory action from police departments for being sidelined from the roadway enforcement process. Any such backlash would undermine the intentions of roadway enforcement reform.

Therefore, in effort to avoid such outcomes, these possibilities should be further studied.

Finally, while one could argue that Black America has the most to gain from camera-forward enforcement reform – not only because of racially disproportionate practices of police brutality, but because decades of inequitable investment in infrastructure has resulted in Black neighborhoods hosting disproportionately unsafe roadways (Barajas, 2021; Golub et al., 2013; Greenfield, 2022; Haddad et al., 2023; Rennert, 2016) – we must ask ourselves: ‘Who has the most to lose with CE?’ Persons with prior offenses as well as undocumented and non-citizen individuals may be positioned to be most taken advantage of, perhaps even targeted, via an enforcement system so dependent on automation and the on-file information of members of the public. Voices from these communities similarly need amplification regarding the acceptability of roadway CE programs, and enforcement alternatives more generally, if meaningful steps toward equity in both policing and roadway safety are to be made.

#### Author statement

I, Lindiwe Rennert, confirm that I have participated sufficiently in the conception, design, and production of this work, its analysis and data interpretation, as well as the writing of the manuscript, to take public responsibility for it.

#### CRediT authorship contribution statement

**Lindiwe Rennert:** Conceptualization, Methodology, Resources,

#### Appendix A

##### A.1. Participant protections, researcher reflexivity, and reflections on methodology

Researchers face ethical challenges in all stages of a study, from designing through to reporting. “These include anonymity, confidentiality, informed consent, researchers’ potential impact on the participants and vice versa (Sanjari et al., 2014).” These matters, as well as the ideas of power and protection, were considered at length. I reflected on ways in which participating in this research might cause harm to those involved, arriving at two categories of potential participant vulnerability. Firstly, serving in their elected roles, participants were all semi-public figures. What these people say on record has the potential to impact their board position or future election favorability. As a result, I decided to include neither the name of participants’ associations, nor any personal identifying information.

Secondly, it was not lost on me that this work called for Black individuals to discuss, among other things, the relationship between their communities and law enforcement entities. By asking participants to engage in this conversation, I introduced the potential to inadvertently surface distressing thoughts or past experiences that they or loved ones have had with the police. In an attempt to avoid inducing this type of stress, I was sure to frame my more delicate questions as requests for reflection upon *either* personal experiences *or* general perceptions.

No research can call itself robust without engaging with reflexivity, “the recognition that the product of research inevitably reflects some of the background, milieu and predilections of the researcher (Gibbs, 2007).” This ‘inevitability’ makes it futile to try to eliminate the effects of the researcher; rather, it is necessary to understand these effects and monitor and report them (Brewer, 2000). In this spirit, I now make an effort to shed light on aspects of myself that intersect with this work, and reveal instances in which I was able to identify how these aspects shaped the research process.

Professionally, I am tied to both transit and racial equity advocacy in Boston. In my past role as a Transit Planner with the Boston Transportation Department, my projects called for regular collaboration between myself, community associations, organizers, and the Massachusetts Bay Transportation Authority (MBTA). It was through my work in this capacity that some focus group members were familiar acquaintances of mine. By using this existing familiarity, placing at least one such acquaintance in each group, I hoped to create a comfortable, informal environment in which people felt safe to speak plainly on a sensitive topic.

Furthermore, it is vital to note that I am a Black woman, and that that fact was discernible to anyone participating in these Zoom meetings. Given that discussion of enforcement cannot, and should not, be parted from discussion of race relations, it is possible that respondents censored, played-up, or played-down their views in an attempt to appear a certain way to me – the researcher – rather than accurately represent their own beliefs. Past studies have cited issues of researcher appeasement as a sizable hurdle in attempting to discern meaning-making and internalized understanding (Blee & Taylor, 2002).

However, what I experienced in this work was a readiness to share personal anecdotes, frequent praise from one participant to the next for either past work within the City or a particularly poignant enforcement-related idea, and groups that regularly ended in participants expressing interest in working together further, both on matters concerning roadway enforcement and other civic issues impacting Boston neighborhoods. This is likely due in part to the virtual format. Walston and Lissitz (2000) suggest that the computer-based environment may lessen participants’ concern for what the moderator thinks of them, discouraging the withholding of seemingly unsavory information. Such was the case here. Participants playfully used profanity and divulged personal experiences that occasionally cast themselves in a somewhat negative light; often playing the traffic fugitive. It may

Investigation, Data curation, Formal analysis, Visualization, Writing, Project administration.

#### Declaration of competing interest

None.

#### Data availability

The authors do not have permission to share data.

#### Acknowledgements

The author greatly appreciates the editing contributions of Ana Olson. This work has undoubtedly benefitted from her support, as well as that of the Phelan US Centre at the London School of Economics and Political Science. Intense thanks from the author also goes to the 27 civic leaders who participated in this study, and whose commitment to serving their communities she hopes resonates through every page of this piece.

Additionally, the author confirms that all research design elements of this work were reviewed and approved by the London School of Economics and Political Science Research Ethics Committee on November 13th, 2020.

also largely in part be due to the fact that these groups were composed entirely of Black individuals. Robson and McCartan (2016) support this claim via their suggestion that demographically homogenous groups may create a 'safe-space effect' allowing for a freer flowing of ideas.

Further support is offered by Browne (2016): "Laughter and humor are emphasized within focus groups as a way of overcoming social awkwardness, particularly within marginalized groups." Laughter, an influencer of conversation tone, is more readily forthcoming when participants feel that they share perceivable commonality (Robinson, 2009; Wilkinson et al., 2007; Browne, 2016); which also explains why groups of all women and groups in which all participants appeared to be near to one another in age featured the most jovial atmosphere and comradery-laden language. I feel strongly that this research is richer for having featured spaces exclusive to Black voices and Black reactions. In this exclusivity, groups were well-primed to host moments of shared suffering, were open to disagreement, and were welcoming to playfulness and informality. Though I am not alone in the belief that minority-exclusively research is a uniquely valuable knowledge-shaping tool (Kitzinger, 1994; Morgan, 1996; Stanley, 2016), our current national social climate is such that emphasis of this value, and any influence that such emphasis may have over research design and funding decisions, cannot be overstated.

Finally, I find that the following statement rang true for my data collection process: "In-depth knowledge of the research topic and familiarity with the interviewees' culture and norms of behavior facilitated gaining their trust and establishing rapport, which proved invaluable in obtaining the interviewees' own perception of events (Mikecz, 2012)." My being Black, having called Boston home for ten years, and being a transportation professional all unquestionably contributed to the success of the data gathering process. Statements like "... well you've seen it" and "...as we know they will" were made frequently, suggesting shared positioning between myself and participants likely fostering openness.

## A.2. Black women leading the charge

With each focus group it became more and more apparent that Black women are, and for so very long have been, at the core of much civic activation, participation, movement, progress, and stability in Boston. Beyond the facts that nearly all of this work's participants – 24 out of 27 community leaders – were women, many of them shared stories of community-led enforcement, engagement, and education efforts that they have personally participated in:

"Back in the day I was a member of \_\_\_\_ (name omitted for participant anonymity). It was kind of a neighborhood watch. In the 80s and 90s, we did traffic work. Prompted by the death of an older lady – somebody hit her going 75mph – we did a heck of a safety campaign about it. Eventually we got speed bumps put in down there. Originally we were promised more comprehensive traffic calming, but we never got it. I guess they figured speed bumps were good enough. Typical. "Thanks for the crumbs, City Hall."

"The issue is that we don't have ongoing productive dialogue with our elected officials or with City Hall department staff. There is no ongoing educational discussion of outcomes of these {planning} elements saying, 'You know... look... lives have been saved!' Now, there is starting to be more dialogue in my neighborhood. Now that the City is paying community groups to do it. Ha. In other words paying sistas that were already doing it at neighborhood association meetings and in line at the grocery store, or whatever. That's progress. I think it is increasing the support for things like road diets and stuff like that."

Continuing to promote, learn from, and financially support the work and expertise demonstrated by Black women community leaders can only be beneficial to any government agency, both in and outside of Boston, both in and outside of enforcement.

## References

- Albanese, J. S. (2018). When corruption and organized crime overlap: An empirical hierarchy of corrupt conduct. In *Corruption in commercial enterprise* (pp. 28–44). Routledge.
- AP. (2017). *Removal of Mass Pike toll booths on schedule 1 year later*. Boston.com. Boston Global Media Partners, LLC.
- Arnett, C. (2020). In , 81. *Race, surveillance, resistance* (p. 1103). Ohio St. LJ.
- Aspinwall, C., & Weichselbaum, S. (2020). *Colorado tries new ways to punish rogue cops*. The Marshall Project. <https://www.themarshallproject.org/2020/12/18/colorado-tries-new-way-to-punish-rogue-cops>.
- Attard, B. (2009). In , 30. *Oversight of law enforcement is beneficial and needed-both inside and out* (p. 1548). Pace L. Rev.
- Attride-Stirling, J. (2001). Thematic networks: An analytic tool for qualitative research. *Qualitative Research*, 1(3), 385–405.
- Barajas, J. M. (2021). Biking where black: Connecting transportation planning and infrastructure to disproportionate policing. *Transportation Research Part D: Transport and Environment*, 99, Article 103027.
- Baumgartner, F. R., Bell, K., Beyer, L., Boldrin, T., Doyle, L., Govan, L., Thacker, K., ... (2021). Intersectional encounters, representative bureaucracy, and the routine traffic stop. *Policy Studies Journal*, 49(3), 860–886.
- Berkuti, C., & Osburn, W. (1998). Photo enforcement in the wild west: National city's experience with photo radar enforcement program. In *1998 compendium of technical papers*.
- Bhopal, K. (1995). Women and feminism as subjects of black study: The difficulties and dilemmas of carrying out re-search. *Journal of Gender Studies*, 4(2), 153–168.
- Blee, K. M., & Taylor, V. (2002). Semi-structured interviewing in social movement research. *Methods of Social Movement Research*, 16, 92–117.
- Blincoe, K. M., Jones, A. P., Sauerzapf, V., & Haynes, R. (2006). Speeding drivers' attitudes and perceptions of speed cameras in rural England. *Accident Analysis & Prevention*, 38(2), 371–378.
- Bocholtz, M. (2000). The politics of transcriptions. *Journal of Pragmatics*, 32, 1439–1465.
- Boyatzis, R. (1998). *Transforming qualitative information: Thematic analysis and code development*. Thousand Oaks, CA: Sage.
- Boyle, J. M., Dienstfrey, S. J., & Sothoron, A. (1998). *National Survey of Speeding and Other Unsafe Driving Actions. Volume 3, Countermeasures* (No. DOT-HS-808-750). United States. National Highway Traffic Safety Administration.
- Brewer, J. (2000). *Ethnography*. UK: McGraw-Hill Education.
- Browne, A. L. (2016). Can people talk together about their practices? Focus groups, humour and the sensitive dynamics of everyday life. *Area*, 48(2), 198–205.
- Browne, S. (2015). *Dark matters: On the surveillance of blackness*. Duke University Press.
- Butler, P. (2017). *Chokehold: Policing black men*. New York, NY: The New Press.
- Cesme, B., Roisman, R., Burns, R., List, K., Koudounas, A., Cuellar, J., & Miller, D. (2018). Strategies and barriers in effective bus lane implementation and management: Best practices for use in the greater Washington, DC Region. *Transportation Research Record*, 2672(8), 29–40.
- Cicchino, J. B., Wells, J. K., & McCart, A. T. (2014). Survey about pedestrian safety and attitudes toward automated traffic enforcement in Washington, DC. *Traffic Injury Prevention*, 15(4), 414–423.

- City of Boston. (2020). Vision zero crash map. <https://www.boston.gov/transportation/vision-zero>.
- City of Boston. (2022). Vision zero crash map. <https://www.boston.gov/transportation/vision-zero>.
- Clarke, S. (2009). Arrested oversight: A comparative analysis and case study of how civilian oversight of the police should function and how it fails. *Columbia Journal of Law and Social Problems*, 43, 1.
- Corbett, C., & Caramlau, I. (2006). Gender differences in responses to speed cameras: Typology findings and implications for road safety. *Criminology & Criminal Justice*, 6(4), 411–433.
- Crabtree, B. F., & Miller, W. L. (1999). *Doing qualitative research*. Sage.
- Crockford, K. (2020). *How is face recognition surveillance technology racist?* ACLU News & Commentary. <https://www.aclu.org/news/privacy-technology/how-is-face-recognition-surveillance-technology-racist>.
- Cronley, C., Miller, V. J., Fields, N., & Mattingly, S. P. (2021). Utilizing an inter-professional online advisory board: A case study to inform innovation in community-engaged, transportation equity research and planning. *Transportation Research Interdisciplinary Perspectives*, 10, Article 100365.
- Daly, J., Kellehear, A., & Gliksman, M. (1997). *The public health researcher: A methodological approach*. Melbourne, Australia: Oxford University Press.
- Davis, G. A. (2001). *NASCOP: An evaluation of the photo-radar speed enforcement program*. San Jose, CA: City of San Jose.
- DeCosta-Klipa, N. (2021). *From seat belts to traffic light cameras, here's what to know about Charlie Baker's new road safety bill*. BOSTON.com. <https://www.boston.com/news/politics/2021/04/26/massachusetts-road-safety-bill-seat-belts-red-light-cameras/>.
- Department of Justice. (2022). *Justice department announces \$40 million in funding to advance community policing and \$5 million in funding for the collaborative reform initiative*. Press Release. <https://www.justice.gov/opa/pr/justice-department-announces-40-million-funding-advance-community-policing-and-5-million>.
- Duncan, I. (2021). *Cities are turning to supercharged bus routes to more quickly and cheaply expand transit services*. The Washington Post. <https://www.washingtonpost.com/transportation/2021/07/23/bus-routes-public-transit-brt/>.
- Eder, S., Keller, M., & Migliozi, B. (2021). *As new police reform laws sweep across the U.S., some ask: Are they enough?* New York Times. <https://www.nytimes.com/2021/04/18/us/police-reform-bills.html>.
- Eger, R. J., III, Fortner, C. K., & Slade, C. P. (2015). The policy of enforcement: Red light cameras and racial profiling. *Police Quarterly*, 18(4), 397–413.
- Engel, R. S., Smith, M. R., & Cullen, F. T. (2012). Race, place, and drug enforcement. *Criminology & Public Policy*, 11, 603–635.
- European Road Safety Observatory. (2018). *Speed enforcement report*. European Commission.
- Ferdik, F. V., Rojek, J., & Alpert, G. P. (2013). Citizen oversight in the United States and Canada: An overview. *Police Practice and Research*, 14(2), 104–116.
- Fern, E. F. (1982). *Why do focus groups work: A review and integration of small group process theories*. ACR North American Advances.
- Finn, P. (2001). *Citizen review of police: Approaches and implementation*. Washington, DC: US Department of Justice, Office of Justice Programs, National Institute of Justice.
- Fiske, J. (1998). Surveilling the city: Whiteness, the black man and democratic totalitarianism. *Theory, Culture & Society*, 15(2), 67–88.
- Fletcher, C. (1992). Ethical issues in the selection interview. *Journal of Business Ethics*, 11(5–6), 361–367.
- Fox, J. (2020). *One tool to cut racism in policing: Traffic cameras*. Bloomberg opinion: Politics & policy.
- Freedman, M., Williams, A. F., & Lund, A. K. (1990). Public opinion regarding photo radar. *Transportation Research Record*, 1270, 59–65.
- Fries, R. N., Gahrooie, M. R., Chowdhury, M., & Conway, A. J. (2012). Meeting privacy challenges while advancing intelligent transportation systems. *Transportation Research Part C: Emerging Technologies*, 25, 34–45.
- Frost, A. (2019). *Vehicle-mounted cameras start issuing bus lane violations in New York City*. Traffic Technology Today.
- Gamson, W. A. (1992). *Talking politics*. Cambridge University Press.
- Gavanas, N., Tsakalidis, A., Aggelakakis, A., & Pitsiava-Latinopoulou, M. (2013). Assessment of bus lane violations in relation to road infrastructure, traffic and land-use features: The case of Thessaloniki, Greece. *European Transport/Trasporti Europei*, 55, 1–20.
- Gelman, A., Fagan, J., & Kiss, A. (2007). An analysis of the New York City police department's "stop-and-frisk" policy in the context of claims of racial bias. *Journal of the American Statistical Association*, 102, 813–823.
- Gibbs, G. R. (2007). In *Analytic quality and ethics. Analyzing qualitative data* (pp. 90–104). GlobalBRTdata. (2022). Key indicators by region. <https://brtdata.org/>.
- Goffman, E. (2018). *Automated bus lane enforcement is more effective than police, among other findings*. Mobility Lab.
- Golub, A., Marcantonio, R. A., & Sanchez, T. W. (2013). Race, space, and struggles for mobility: Transportation impacts on african americans in Oakland and the East Bay. *Urban Geography*, 34(5), 699–728.
- Gordon, A. (2020). *We don't need cops to enforce traffic laws*. Vice.
- Grandclement, C., & Gaglio, G. (2011). Convoaking the consumer in person: The focus group effect. In *Inside marketing: Practices, ideologies, devices* (pp. 87–114).
- Greenfield, J. (2022). *How should we respond to the UIC and ProPublica reports on Chicago traffic cameras?* StreetsblogChicago. <https://chi.streetsblog.org/2022/01/14/what-should-we-do-about-the-racial-disparities-in-chicagos-life-saving-traffic-camera-program/>.
- Grogger, J., & Ridgeway, G. (2006). Testing for racial profiling in traffic stops from behind a veil of darkness. *Journal of the American Statistical Association*, 101(475), 878–887.
- Guest, G., Namey, E. E., & Mitchell, M. L. (2014). *Collecting qualitative data: A field manual for applied research*. Sage.
- Haddad, A. J., Mondal, A., Bhat, C. R., Zhang, A., Liao, M. C., Macias, L. J. Watkins, S. C., ... (2023). Pedestrian crash frequency: Unpacking the effects of contributing factors and racial disparities. *Accident Analysis & Prevention*, 182, Article 106954.
- Hanak, N. (2021). *Addressing unjust financial penalties in traffic safety*. Vision Zero Network News. <https://visionzeronet.org/addressing-unjust-financial-penalties-in-traffic-safety-vision-zero/>.
- Hayes, C. (2017). *A colony in a nation*. New York, NY: W. W. Norton.
- Hope, K. R., Sr. (2021). Civilian oversight for democratic policing and its challenges: Overcoming obstacles for improved police accountability. *Journal of Applied Security Research*, 16(4), 423–455.
- Hopkins, P. E. (2007). Thinking critically and creatively about focus groups. *Area*, 39(4), 528–535.
- Hu, W., & McCart, A. T. (2016). Effects of automated speed enforcement in Montgomery County, Maryland, on vehicle speeds, public opinion, and crashes. *Traffic Injury Prevention*, 17(sup1), 53–58.
- Hu, W., McCart, A. T., & Teoh, E. R. (2011). Effects of red light camera enforcement on fatal crashes in large US cities. *Journal of Safety Research*, 42(4), 277–282.
- IAM. (2014). *Speed camera survey: Regional comparison: 2011-2014*. London: Institute of Advanced Motorists (IAM).
- Institute of Transportation Engineers. (1999). *Automated enforcement in transportation*. Washington, D.C.
- Insurance Institute for Highway Safety & Highway Loss Data Institute. (2022). *U.S. Communities using red light cameras*. <https://www.iihs.org/topics/red-light-running/red-light-camera-communitiesexternalicon>. (Accessed 27 January 2022).
- Johnson, D., Wilson, D. V., Maguire, E. R., & Lowrey-Kinberg, B. V. (2017). Race and perceptions of police: Experimental results on the impact of procedural (in)justice. *Justice Quarterly*, 34, 1184–1212.
- Kepaptsoglou, K., Pyrialakou, D., Milioti, C., Karlafatis, M. G., & Tsamboulas, D. (2011). Bus lane violations: An exploration of causes. *European Transport/Trasporti Europei*, 48, 87–98.
- Kidwell, D., & Richards, A. (2014). *Red light cameras tag thousands for undeserved tickets*. Chicago Tribune.
- Kitzinger, J. (1994). The methodology of focus groups: The importance of interaction between research participants. *Sociology of Health & Illness*, 16(1), 103–121.
- Krueger, R. A. (2002). *Designing and conducting focus group interviews* (Vol. 18).
- Laris, M. (2022). *Deaths on U.S. roads soared to 16-year high in 2021*. The Washington Post. <https://www.washingtonpost.com/transportation/2022/05/17/road-deaths-fatalities/>.
- Levin, S. (2023). *'It never stops': Killings by US police reach record high in 2022*. US: The Gaudian. <https://www.theguardian.com/us-news/2023/jan/06/us-police-killings-record-number-2022>.
- Linton, J. (2021). *Transportation committee approved motions to implement new CA laws: Speed limits, bus lane cameras, slow street*. StreetsBlogLA. <https://la.streetsblog.org/2021/11/02/transportation-committee-approved-motions-to-implement-new-ca-laws-speed-limits-bus-lane-cameras-slow-streets/>.
- Litman, T., & Burwell, D. (2006). Issues in sustainable transportation. *International Journal of Global Environmental Issues*, 6(4), 331–347.
- Lynn, F. M., & Kartzel, J. D. (1995). The redemption of citizen advisory committees: A perspective from critical theory. In *Fairness and competence in citizen participation* (pp. 87–101). Dordrecht: Springer.
- Maccubbin, R. P., Staples, B. L., & Salwin, A. E. (2001). *Automated enforcement of traffic signals: A literature review*.
- Matthews, A. K., Newman, S., Anderson, E. E., Castillo, A., Willis, M., & Choure, W. (2018). Development, implementation, and evaluation of a community engagement advisory board: Strategies for maximizing success. *Journal of Clinical and Translational Science*, 2(1), 8–13.
- Mapping Police Violence. (2023). <https://mappingpoliceviolence.us/>.
- MBTA Bus Transit Priority Projects. <https://www.mbta.com/projects/bus-transit-priority>.
- McCart, A. T., & Eichelberger, A. H. (2012). Attitudes toward red light camera enforcement in cities with camera programs. *Traffic Injury Prevention*, 13(1), 14–23.
- McKenna, F. P. (2007). The perceived legitimacy of intervention: A key feature for road safety. In D. C. Washington (Ed.), *Improving traffic safety culture in the United States: The journey forward* (pp. 165–175). AAA Foundation for Traffic Safety.
- Merton, R. K., Fiske, M., & Kendall, P. L. (1956). *"The group interview" in the focused interview: A manual of problems and procedures*. Free Press.
- Mikecz, R. (2012). Interviewing elites: Addressing methodological issues. *Qualitative Inquiry*, 18(6), 482–493.
- MilNeil, C. (2021). *State house update: New bills would tackle racial profiling, traffic enforcement cameras, E-Bikes*. StreetsBlogMass. <https://mass.streetsblog.org/2021/10/19/state-house-update-new-bills-would-tackle-racial-profiling-traffic-enforcement-cameras-e-bikes/>.
- Mintz, S. (2023). *Legislative agenda includes rail electrification, congestion pricing, and traffic cameras*. StreetsBlogMass. <https://mass.streetsblog.org/2023/02/06/this-years-legislative-agenda-includes-rail-electrification-congestion-pricing-and-traffic-enforcement-cameras/>.
- Morain, S. R., Gielen, A. C., & Bhalla, K. (2016). Automated speed enforcement systems to reduce traffic-related injuries: Closing the policy implementation gap. *Injury Prevention*, 22(1), 79–83.
- Morgan, D. L. (1996). *Focus groups as qualitative research* (Vol. 16). Sage publications.
- Murphy, D. (2020). *Philly officials support automated bus lane enforcement and say it could improve 'transit equity'*. WHYY PBS. <https://whyy.org/articles/could-automated-bus-lane-enforcement-come-to-philly/>.

- National Academies of Sciences, Engineering, and Medicine. (2013). *Developing partnerships between transportation agencies and the disability and underrepresented communities*.
- National Conference of State Legislatures. (2021). *Automated enforcement overview*. NCSL Transportation Research.
- Nowell, L. S., Norris, J. M., White, D. E., & Moules, N. J. (2017). Thematic analysis: Striving to meet the trustworthiness criteria. *International Journal of Qualitative Methods*, 16(1), 1609406917733847.
- Osborn, A. F. (1953). *Applied imagination*. New York: Scribner's. Charles Scribner.
- Passetti, K. A. (1997). *Use of automated enforcement for red light violations*.
- Patton, M. Q. (1990). *Qualitative evaluation and research methods*. SAGE Publications inc.
- Patty, J. W., & Penn, E. M. (2023). Algorithmic fairness and statistical discrimination. *Philosophy Compass*, 18(1), Article e12891.
- Pew Research Center. (2022). *Public trust in government: 1958–2022*. Pew Research Center. <https://www.pewresearch.org/politics/2022/06/06/public-trust-in-government-1958-2022/>.
- Pierson, E., Simoiu, C., Overgoor, J., Corbett-Davies, S., Jenson, D., Shoemaker, A., Goel, S., ... (2020). A large-scale analysis of racial disparities in police stops across the United States. *Nature Human Behaviour*, 4(7), 736–745.
- Price, D. (2019). *Opinion: The ugly truth about red-light cameras*. Palo Alto Daily Post. <https://paldailypost.com/2019/07/23/opinion-the-ugly-truth-about-red-light-cameras/>.
- Prenzler, T., & Ronken, C. (2001). Models of police oversight: A critique. *Policing and Society: An International Journal*, 11(2), 151–180.
- Quintanar, S. M. (2017). Man vs. machine: An investigation of speeding ticket disparities based on gender and race. *Journal of Applied Economics*, 20(1), 1–28.
- Ralph, K., Barajas, J. M., Johnson-Rodriguez, A., Delbosc, A., & Muir, C. (2022a). Can a racial justice frame help overcome opposition to automated traffic enforcement? *Transportation Research Interdisciplinary Perspectives*, 14, Article 100594.
- Ralph, K., Barajas, J. M., Johnson-Rodriguez, A., Delbosc, A., & Muir, C. (2022b). The end of speed traps and ticket quotas: Re-framing and reforming traffic cameras to increase support. *Journal of Planning Education and Research*. <https://doi.org/10.1177/0739456X221138073>
- Rennert, L. C. (2016). *When desperation planning meets reparations planning: Transit as an agent of equity in the shaping of Detroit's future*. Massachusetts Institute of Technology.
- Retting, R. A., Williams, A. F., Farmer, C. M., & Feldman, A. F. (1999). Evaluation of red light camera enforcement in Oxnard, California. *Accident Analysis & Prevention*, 31(3), 169–174.
- Retting, R. A., Farmer, C. M., & McCart, A. T. (2008). Evaluation of automated speed enforcement in Montgomery County, Maryland. *Traffic Injury Prevention*, 9(5), 440–445.
- Roberts, D. (2010). In , 54. *Collateral consequences, genetic surveillance and the new biopolitics of race* (p. 567). Howard LJ.
- Robinson, J. (2009). Laughter and forgetting: Using focus groups to discuss smoking and motherhood in low-income areas in the UK. *International Journal of Qualitative Studies in Education*, 22(3), 263–278.
- Robson, C., & McCartan, K. (2016). *Real world research*. John Wiley & Sons.
- Rodier, C. J., & Shaheen, S. A. (2007). Automated speed enforcement in the US: A review of the literature on benefits and barriers to implementation. In *Transportation research board 87th annual meeting. CD-ROM*. Washington, DC.
- Romaine, J. (2022). *States can now access billions for speed cameras under Biden's infrastructure bill*. *Changing America: Infrastructure*.
- Rosenbaum, D. P. (2006). The limits of hot spots policing. In D. Weisburd, & A. A. Braga (Eds.), *Police innovation: Contrasting perspectives* (pp. 245–263). New York, NY: Cambridge University Press.
- Safran, J. S., Beaton, E. B., & Thompson, R. (2014). Factors contributing to bus lane obstruction and usage in New York City: Does design matter? *Transportation Research Record*, 2418(1), 58–65.
- Sanjari, M., Bahramnezhad, F., Fomani, F. K., Shoghi, M., & Cheraghi, M. A. (2014). Ethical challenges of researchers in qualitative studies: The necessity to develop a specific guideline. *Journal of Medical Ethics and History of Medicine*, 7.
- Seo, S. A. (2019). *Policing the open road: How cars transformed american freedom*. Harvard University Press.
- Sewell, W., Horsford, C. E., Coleman, K., & Watkins, C. S. (2016). Vile vigilance: An integrated theoretical framework for understanding the state of black surveillance. *Journal of Human Behavior in the Social Environment*, 26(3–4), 287–302.
- Shaaban, K. (2017). Assessment of drivers' perceptions of various police enforcement strategies and associated penalties and rewards. *Journal of Advanced Transportation*, 2017, 1–14.
- Short, A. (2019). *Texas gov. makes life-saving red light cameras illegal*. StreetsBlogUSA. <https://usa.streetsblog.org/2019/06/03/texas-gov-makes-life-saving-red-light-cameras-illegal/>.
- Shoub, K., Epp, D. A., Baumgartner, F. R., Christiani, L., & Roach, K. (2020). Race, place, and context: The persistence of race effects in traffic stop outcomes in the face of situational, demographic, and political controls. *Journal of Race, Ethnicity, and Politics*, 5(3), 481–508.
- Smith, J. M. (1972). *Interviewing in market and social research*. Routledge/Thoemms Press.
- Snider, A. (2022). *New projection: U.S. pedestrian fatalities reach highest level in 40 years*. Governors Highway Safety Association: News Release.
- Soole, D. W., Lennon, A. J., & Watson, B. C. (2008). Driver perceptions of police speed enforcement: Differences between camera-based and non-camera based methods: Results from a qualitative study. In *Road safety 2008 conference*.
- Stanley, L. (2016). Using focus groups in political science and international relations. *Politics*, 36(3), 236–249.
- Tang, J., Wan, L., Schooling, J., Zhao, P., Chen, J., & Wei, S. (2022). Automatic number plate recognition (ANPR) in smart cities: A systematic review on technological advancements and application cases. *Cities*, 129, Article 103833.
- Taylor, R. B. (2006). Incivilities reduction policing, zero tolerance, and the retreat from coproduction: Weak foundations and strong pressures. In D. Weisburd, & A. A. Braga (Eds.), *Police innovation: Contrasting perspectives* (pp. 98–114). New York, NY: Cambridge University Press.
- Thomas, J., & Harden, A. (2008). Methods for the thematic synthesis of qualitative research in systematic reviews. *BMC Medical Research Methodology*, 8(1), 45.
- Transit Pilot Policy. (2017). *Policy on the evaluation and selection of MBTA service pilots*. MBTA Fiscal Management Control Board. <https://www.mbta.com/policies/service-pilot-process>.
- Trumm, D. (2020). *Camera enforcement bill returns with hopes of unlogging bus lanes and crosswalks*. The Urbanist. <https://www.theurbanist.org/2020/01/29/camera-enforcement-bill-returns/>.
- Turner, S., & Polk, A. E. (1998). *Overview of automated enforcement in transportation*.
- Tyler, T. R., Jackson, J., & Mentovich, A. (2015). The consequences of being an object of suspicion: Potential pitfalls of proactive police contact. *Journal of Empirical Legal Studies*, 12, 602–636.
- Walston, J. T., & Lissitz, R. W. (2000). Computer-mediated focus groups. *Evaluation Review*, 24(5), 457–483.
- Weitzer, R. (2000). Racialized policing: Residents' perceptions in three neighborhoods. *Law & Society Review*, 34, 129–155.
- Wiggins, A. E. (1998). *Birmingham bus lane enforcement system*. No. 2.
- Wilkinson, C. E., Rees, C. E., & Knight, L. V. (2007). "From the heart of my bottom": Negotiating humor in focus group discussions. *Qualitative Health Research*, 17(3), 411–422.
- Wilson, C., Willis, C., Hendrikz, J. K., Le Brocq, R., & Bellamy, N. (2010). Speed cameras for the prevention of road traffic injuries and deaths. *Cochrane Database of Systematic Reviews*, 11.
- Wissinger, L. M., Hummer, J. E., & Milazzo, J. S. (2000). Using focus groups to investigate issues of red light running. *Transportation Research Record*, 1734(1), 38–45.
- Yen, H. (2022). *U.S. road deaths rise at record pace as risky pandemic-era driving persists*. PBS News Hour. <https://www.pbs.org/newshour/nation/u-s-road-deaths-rise-at-record-pace-as-risky-driving-persists>.
- Young, C. (2020). *Massachusetts lawmaker to debate automated traffic cameras*. *Justice and public safety*. Government and Technology.
- Zipper, D. (2022). *US traffic safety is getting worse, while other countries improve*. Bloomberg CityLab. <https://www.bloomberg.com/news/features/2022-11-03/why-us-traffic-safety-fell-so-far-behind-other-countries>.

## References specific to Figure 5

- Allsop, R. (2010). *The effectiveness of speed cameras: A review of evidence*. RAC Foundation. [https://www.racfoundation.org/assets/rac\\_foundation/content/downloadables/efficacy\\_of\\_speed\\_cameras\\_allsop\\_181110.pdf](https://www.racfoundation.org/assets/rac_foundation/content/downloadables/efficacy_of_speed_cameras_allsop_181110.pdf).
- Bliss, L. (2020). *Public transit faces its own police reckoning*. BloombergUK: CityLab. <https://www.bloomberg.com/news/features/2020-06-26/how-public-transit-got-overpoliced-and-underfunded>.
- Carnis, L. (2007). The automated speed enforcement programme in France. In *Australasian road safety conference, Melbourne (Australia)* (p. 5).
- Cebryk, G., & Bell, T. (2004). Traffic safety at intersections: The Edmonton experience. In *Annual conference and exhibition of the transportation association of Canada-transportation innovation-accelerating the pace*.
- Delaney, A., Ward, H., Cameron, M., & Williams, A. F. (2005). Controversies and speed cameras: Lessons learnt internationally. *Journal of Public Health Policy*, 404–415.
- Dixon, C., & Alexander, K. (2005). *Literature review of HOV lane schemes*. Highway Agency-Unpublished Project Report.
- Fleiter, J. J., & Watson, B. (2012). Automated speed enforcement in Australia: Recent examples of the influence of public opinion on program sustainability. *Journal of the Australasian College of Road Safety*, 23(3), 59–66.
- Kiesling, M., & Ridgway, M. (2006). Effective bus-only lanes. *ITE Journal*, 76(7), 24.
- Leduc, G. (2008). Road traffic data: Collection methods and applications. *Working Papers on Energy, Transport and Climate Change*, 1(55), 1–55.
- Marshall, W. E. (2018). Understanding international road safety disparities: Why is Australia so much safer than the United States? *Accident Analysis & Prevention*, 111, 251–265.
- Mohammed, S. O., & Labuschagne, F. J. J. (2008). Can Draconian law enforcement solve the South African road safety crisis?. In *Southern African transport conference (SATC)*.
- Mokoena, A. S. (2019). *Improvement of traffic law compliance in South Africa: A knowledge management approach*. United Kingdom: The University of Liverpool.
- Mulligan, C. M. (2008). Perfect enforcement of law: When to limit and when to use technology. *Richmond Journal of Law & Technology*, 14(4), 13.
- Osse, A. (2016). *Handbook on police accountability, oversight and integrity*.
- Vera Institute of Justice. (2021). *Investing in evidence-based alternatives to policing: Non-police responses to traffic safety*. <https://www.vera.org/downloads/publications/alternatives-to-policing-traffic-enforcement-fact-sheet.pdf>.
- Woods, J. B. (2021). In , 73. *Traffic without the Police*. *Stan. L. Rev* (p. 1471).