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# Securing safe roads

## The politics of change

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Report

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Cover photo: Motorbikes and taxis speed through Mumbai's streets © Aashim Tyagi/WRI India, 2015

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This document contains preliminary research, analysis, findings and recommendations. It is being circulated to stimulate timely discussion and critical feedback, and to influence ongoing debate on the emerging issue of the political economy analysis of road safety.

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# Acronyms

<b>BRT</b>	bus rapid transit
<b>GDP</b>	gross domestic product
<b>GRSF</b>	Global Road Safety Facility
<b>JICA</b>	Japanese International Cooperation Agency
<b>KARA</b>	Kenya Alliance of Resident Associations
<b>MCGM</b>	Municipal Corporation of Greater Mumbai
<b>NAMATA</b>	Nairobi Metropolitan Area Transport Authority
<b>NMT</b>	non-motorised transport
<b>ODI</b>	Overseas Development Institute
<b>VKT</b>	vehicle kilometres travelled
<b>WHO</b>	World Health Organization
<b>WRI</b>	World Resources Institute

# Executive summary

Each year, traffic collisions kill an estimated 1.25 million people and injure up to 50 million. Of the fatalities, 90% occur in low- and middle-income countries, and most are among poorer working-age males – a group that tends to use vulnerable modes of transport such as walking, cycling and motorcycling. Traffic collisions are also the leading cause of death among children and young people globally (Wales, 2017: 10). Fatalities have increased in most low- and middle-income countries over the past 10 years, with such countries constituting the overwhelming majority (84%) of the 68 countries worldwide in which absolute numbers of traffic fatalities have grown since 2010 (WHO, 2015).

The social and financial impacts of both fatalities and injuries are substantial, and compounded for people living in poverty. For some households, the loss or injury of a family member in a road traffic collision can be the difference between financial stability and poverty (Wales, 2017). Children may suffer trauma and miss educational opportunities, resulting in lost potential. At the city level, already burdened health care and policing systems are struggling to cope. In total, the World Health Organization (WHO, 2015) estimates the annual economic cost of traffic fatalities and injuries to be around 3% of global gross domestic product (GDP). The effect in low- and middle-income countries is likely even more severe. Recent estimates in five such countries (China, India, the Philippines, Tanzania and Thailand) found that if a country could halve traffic fatalities, and sustain this for 24 years, they could generate increases in GDP per capita from 7% to 22% (WB GRSE, 2018).

Over the past 10 years, road safety has also been escalated to an issue of international concern. The 2030 Agenda for Sustainable Development has two targets related to road safety:

***Target 3.6** By 2020, halve the number of global deaths and injuries from road traffic accidents.*

***Target 11.2** By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons.*

Based on current projections, neither target is likely to be reached.

Some countries have proven considerably more effective than others in addressing road safety challenges. Where

significant progress has been made, a systemic approach to road safety has been integral (Welle et al., 2018). This approach sees road safety as a public health outcome, resulting from the interaction of all the elements of the transport system including transport options, land use, street design, regulation, vehicle standards, emergency response and other factors. Yet, for all the accumulated knowledge about what such a ‘Safe System’ looks like, developing and implementing it remains an enduring challenge for many countries – particularly those of low and middle income.

As fatalities continue to increase in much of the world (WHO, 2015) and road traffic collisions continue to exact an enormous social and financial toll, it is critical to examine and understand what is hampering progress and what can be done to reverse these trends.

## The research

The Overseas Development Institute (ODI) and the World Resources Institute (WRI) have undertaken a research project to identify the challenges to improving road safety in low- and middle-income countries, learn from stories of progress, and provide a series of strategies that can help decision-makers and practitioners working on road safety reform.

The project began with a literature review (Wales, 2017) that considered the overall scale of the problem, the main elements of the global response and the state of evidence on interventions to resolve the challenges. The review revealed a relative paucity of explicit attention to the challenges and opportunities associated with road safety issues, as well as an evidence gap around how reforms happen.

To address this gap, three middle-income cities were selected for more detailed case study analysis: Nairobi, Mumbai and Bogotá. The three cities represent a broad range of challenges and opportunities across three different countries and continents, and they represent uneven progress. Of the three, Nairobi has perhaps achieved least traction on securing safer roads to date, while Bogotá has come furthest. In collaboration with local partners, we studied diverse data to review the status of collisions, fatalities and injuries in the city, the key actors involved in addressing road safety, as well as the challenges and opportunities for improvement.

This report presents the findings of both the literature review and the case studies. It aims to inform road safety decision-makers and practitioners about the political barriers to change that they may be encountering, and to identify ways forward to improve road safety globally.

## Case study highlights

The findings from the Nairobi, Mumbai and Bogotá case studies reinforce trends identified in the broader road safety literature (Wales, 2017). In all three cities, pedestrians account for more than 50% of fatalities, with working-age males making up between 65–80%. Motorcycles display a startlingly high level of risk in Mumbai and Bogotá, making up only 5% of the mode share<sup>1</sup> but more than 30% of fatalities. The wider economic impacts of poor road safety in these cities (such as loss of income and opportunity for families) are likely substantial.

All three cities have made efforts to improve road safety, but progress has been uneven:

- **Nairobi.** Politicians focus on large-scale, car-oriented projects that generate short-term political rewards. Legal or regulatory changes to improve road safety are strongly resisted by powerful interest groups. Recently created institutions dedicated to road safety present an opportunity for better coordination and proactivity. A recent plan for non-motorised transport also shows a promising shift in the attention it pays to vulnerable road users.
- **Mumbai.** National calls for road safety reform have had little impact at the local level. Politicians focus on new major road projects, without integrating road safety considerations – an approach that is seen as more tangible and politically feasible. A Supreme Court ruling that requires states to create road safety plans may improve things but the need to advance other reform avenues remains.
- **Bogotá.** In just 10 years (1996–2006) the city halved traffic fatalities. This was due to a combination of institutional and public transport reform, the reframing of road fatalities as a public health issue and investment in safe infrastructure. Fatality numbers have since plateaued. The city is seeking to catalyse further improvements through the application of a system-based approach to road safety.

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1 Mode share refers to the proportion of people travelling by different forms of transport – for example, by foot, bicycle, motorcycle, car or public transportation.

## Key findings: challenges to road safety reform

To date, road safety research has largely focused on the technical aspects of the ‘Safe System’ approach, such as street design, urban planning and vehicle standards, and on calling for the associated interventions. Instead, we ask *why* sound, technical reforms are not being embraced, particularly in low- and middle-income countries.

1. **Road safety is not a political priority.** Currently, road safety lacks political salience. It is often subordinated to other priorities, and is perceived to be in direct conflict with efforts to reduce motor vehicle congestion. Therefore, while there is little opposition to improved outcomes, the reforms that are needed can be controversial. Instead, politicians deploy their influence and funding where they think they will be able to get greater visibility and recognition from other politicians, interest groups and the public.
2. **Road safety is seen as an issue of personal responsibility, rather than government (in)action.** Both decision-makers and the public tend to blame individual road users for collisions, rather than systemic issues such as infrastructure (or the lack thereof), weak regulation and planning or safe vehicles. Individuals often don’t think *they* will be affected by collisions, and often aren’t aware of the full array of options available to improve their safety. As a result, they tend to support short-term solutions and reactive measures, such as the simple expansion of a road network. These do not necessarily improve long-term road safety outcomes.

3. **There is little coordination between relevant government bodies.** Improving road safety outcomes relies upon the coordination of different government bodies at different levels, such as national ministries (particularly transport and health), local government structures, highways authorities and the police. Despite this, such bodies often have limited interaction, and those tasked with implementing road safety reforms often lack the knowledge, financial resources and power to do so – especially when faced with competing priorities or outright opposition. Bogotá, in particular, has shown the effectiveness of well-coordinated government bodies, working towards the same goal.
4. **Data is lacking.** In the three cities studied, and around the world, the true scale of the road safety problem is rarely understood and likely to be underestimated. This is due to the lack of basic information about victim demographics, transport modes and geographic distribution of collisions, as well as the impacts of fatalities and injuries. The ‘Safe System’ approach emphasises the importance of data to better understand collision risks and current road safety performance; the lack of it can serve as a disincentive or excuse for inaction.

These challenges show that underlying political factors can help explain why road safety reforms have proven more tractable in some places than in others: understanding and addressing them is critical to ongoing efforts to improve road safety.



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## The way forward: strategies to improve road safety

Our research demonstrates that progress on road safety is possible, despite uneven outcomes and setbacks. The key is to focus on what *good enough* reforms might look like in a particular setting, and how different reforms may gradually build on and reinforce one another (Grindle, 2004). Those trying to improve road safety, whether they are in government, the private sector or civil society, should focus as much on building the *political* case for road safety as on its *technical* solutions. Doing so means grappling with incomplete and imperfect data and information; stakeholders with diverse interests and motivations (licit or illicit); varied institutional settings that afford autonomy and discretion to different stakeholders at different levels; and a political tendency to favour car owners over people who rely on walking, cycling and public transport. We identify six key strategies that have the potential to enable improvements in road safety:

1. **Bundle road safety with more prominent or popular issues.** Identify stakeholders with an interest in road safety reform, even if for other motivations, and work together. This helps make the public case for reform and improve the political salience of the issue. For example, if making a street or public transport system safer will also reduce congestion issues, or help make businesses on the street more accessible, it matters little if road safety is not the primary objective of those business owners. This approach was inadvertently taken in Bogotá, where reform of the public transport system to improve travel options also significantly improved road safety. Where alignment of interests does not generate sufficient support for reform, advocates may find it useful to bundle road safety objectives with other (potentially unrelated) content via policy processes rather than treating it as a standalone issue.
2. **Reframe road safety in the public and political debate.** Road safety is a public health issue, but it is also an economic, social, education, equality, law and justice issue. This allows reformers to link road safety to issues with local resonance, thereby garnering political salience. It can also change the way road safety is viewed by the public: shifting the full onus away from road users themselves. For instance, reformers in Bogotá linked traffic fatalities to homicides, emphasising different benefits for different audiences. For example, in Bogotá, the Mockus administration successfully linked road safety challenges to the city's high homicide rate by focusing broadly on the issue of violent and avoidable deaths. The Kenya Alliance of Resident Associations (KARA) appealed to politicians' reputations in their successful lobbying for the 2015 Non-Motorised Transport (NMT) Policy.
3. **Seek opportunities and build alliances at all levels of government.** Both support for and opposition to road safety can exist at all levels: national, regional and local. Despite the fragmentation challenges identified, there

is not one form or extent of decentralisation required for progress. For example, Colombia has empowered directly elected mayors, but in Mumbai, the Municipal Corporation of Greater Mumbai (MCGM) holds the power and decision-making autonomy. Nairobi's Governor and county assembly have more power than the city council. Depending on the ideas they hold, the incentives they face, the autonomy they have and the ambitions they harbour, local actors may have the power to drive reform from within cities or block it. Those seeking to make progress on road safety must understand and respond to the political and institutional dynamics at play in their cities and countries.

4. **Take advantage of wider institutional and governance reform.** Many cities, including Mumbai and Nairobi, find it hard to improve road safety due to fragmented responsibility or a lack of ownership. As a result of national decentralisation and other reforms, Bogotá established an elected mayor and improved institutional coordination and accountability. This boosted public faith in local institutions and created a willingness to follow local regulations. Specific reforms to the police, public transport, city finances and the transport department all increased the city's ability to influence, control and monitor people's mobility and safety. That being said, it is not necessary to wait for governance improvements: in India, at both the national and city level, citizens have used the courts to mandate weakly coordinated institutions to take action on road safety.
5. **Sequence actions, prioritising an integrated approach.** More integrated efforts can generate faster and greater road safety impacts, but also additional allies or resistance. In Bogotá, reforming mobility systems, underpinned by innovative education and improved enforcement, contributed to road safety improvements. However, balancing the benefits of more comprehensive approaches with the political implications of choosing a given set of interventions can be a challenge. Prioritising 'quick wins' may be more politically feasible, but such reforms may end up being short-lived, as can be seen in Mumbai. A dedicated road safety plan that groups actions within strategies and divides them into the short, medium and long term, will greatly increase the potential for road safety interventions to have lasting impact.
6. **Don't wait for perfect data.** While comprehensive and robust data is always desirable, progress is possible even where reliable systems for the collection and use of detailed road safety data do not yet exist. Basic investments in basic data are sufficient to identify the most urgent road safety needs. For example, Bogotá's improvements occurred prior to its most recent investments in consistent and reliable data systems. Of course, investing in better data systems can help governments more efficiently target investments more effectively – prioritising proven high-fatality roads for example. But a word of caution: the political case for such investments will not be made by data alone; a strong, locally resonant narrative is also required.

# 1 Introduction

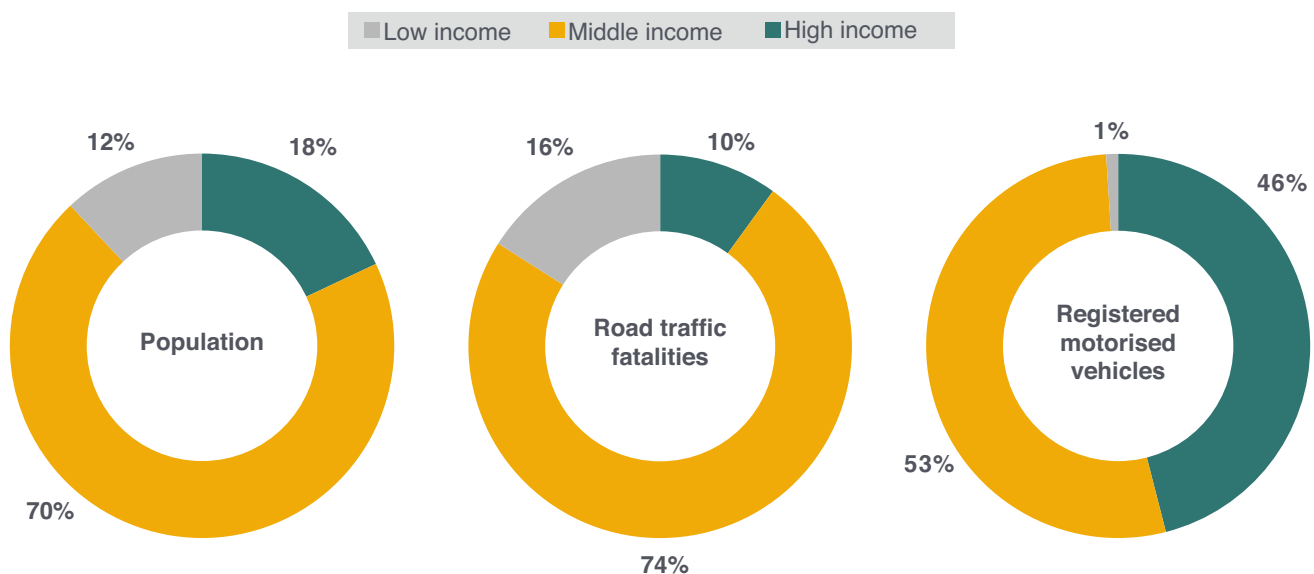
The provision of safe and effective transport is fundamental to human wellbeing. Even so, it remains a challenge in countries around the world, particularly in urban areas, where an increasing proportion of the world's population lives. It is a dynamic challenge, shifting as cities change over time, often very rapidly. It is also a complex challenge, made up of numerous interrelated factors, involving a wide range of stakeholders. It often requires responses that cross the sectoral boundaries that structure much of policy-making and programming. Many wealthy countries with advanced motorisation – such as Sweden, Norway and Spain – have already made rapid road safety gains through measures such as improved urban street design, reduced speed limits and safe vehicle technology. Yet low- and middle-income countries that are rapidly becoming urbanised and motorised face a significant challenge to adapt their streets and regulations to protect road users (Welle et al., 2018).

A disproportionately high number of fatalities, compared to both population and registered vehicles, occur in low- and middle-income countries (Figure 1). Among the estimated 1.25 million annual road fatalities, 90% occur in these countries. And among these, 50% are vulnerable road users – pedestrians, motorcyclists and cyclists. In urban

areas where there are high concentrations of vulnerable road users, the effects of poor road safety are acutely felt as exposure to dangerous vehicle speeds affects accessibility and quality of life. Road collisions also injure up to 50 million people each year. The economic costs of fatalities and injuries caused by traffic crashes are estimated to be in the region of 3% of global gross domestic product (GDP), a figure rising to an estimated 5% of GDP in low- and middle-income countries each year (WHO, 2015). Globally, fatalities and injuries tend to be concentrated among working-age males, a factor with significant economic impacts for families and communities. Furthermore, traffic collisions are the leading cause of death among children and young people (Wales, 2017: 10).

During the last 10 years, road safety has been escalated to an issue of international concern by multilateral organisations, which have quantified the scale of global traffic fatalities and have begun an international discourse. For example, the UN Decade of Action on Road Safety (2011–2020), the UN High-level Advisory Group on Sustainable Transport and Special Envoy for Road Safety (2015), the Brasilia Declaration on Road Safety (2015) and the Sustainable Development Goals have targets related to halving the number of traffic fatalities globally (Box 1).

**Figure 1 Population, road traffic fatalities and registered motor vehicles by country income status, 2013**



Source: WHO, 2015: 4.

## Box 1 Road safety in the 2030 Agenda for Sustainable Development

**Goal 3** Ensure healthy lives and promote well-being for all at all ages (*target 3.6: By 2020, halve the number of global deaths and injuries from road traffic accidents*).

**Goal 11** Make cities and human settlements inclusive, safe, resilient and sustainable (*target 11.2: By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons*).

In addition, major funds and initiatives have been established such as the Road Safety Fund, the Global Road Safety Facility (GRSF), the Bloomberg Initiative for Global Road Safety and the Global Initiative for Child Health and Mobility led by the FIA Foundation.

### 1.1 The ‘Safe System’ approach

These international declarations and partnerships are increasingly focused on taking a proactive, systemic approach to road safety. This is because analysis suggests that such an integrated, system-based approach has the greatest potential to save lives. For example, countries that have taken such an approach to road safety have reduced traffic fatalities at a faster rate and to a lower level than other countries (Welle et al., 2018). This approach, known as the ‘Safe System’ approach, emphasises complementary actions to address road safety in a coherent manner. This

requires a stronger focus on factors at all levels of the system – including land use planning, public transport, street design, regulation, enforcement, education, vehicle quality and emergency response – and coordination between different bodies.<sup>1</sup>

The ‘Safe System’ approach prioritises the safety of vulnerable road users, understands safety as a shared responsibility between government and citizens, and recognises that even people following the safety rules can make errors (Box 2). It takes the perspective that the immediate causes of road traffic crashes and injuries cannot be viewed in isolation from the broader context. Road user behaviour is influenced by the design of the road as well as the other components of the system mentioned above. Overall exposure to risk on the roads is also related to the local rate of private motor vehicle use because the level of risk for both car occupants and other road users is related to vehicle kilometres travelled (VKT) and time spent travelling. The outcome of collisions also depends on

## Box 2 The principles of a ‘Safe System’ approach to road safety

A study of 53 countries found that those that have taken a ‘Safe System’ approach to road safety have been able to reduce traffic fatalities faster and to a greater degree than other countries (Welle et al., 2018). The ‘Safe System’ approach is based on a set of key principles that establish a guiding perspective for technical experts and policy-makers. They represent a significant shift in perception, away from road safety as a personal responsibility to a public health issue for which governments have the responsibility and power to address.

The principles are summarised below (WHO, 2015; ITF, 2016; Welle et al., 2018):

1. People make mistakes that can lead to road crashes.
2. The human body has a limited ability to tolerate crash forces before harm occurs.
3. A shared responsibility exists among the people who design, build, manage and use roads and vehicles, and who provide post-crash care to prevent crashes that result in serious injury or death.
4. A proactive approach should be taken to making the mobility system safe, rather than waiting for events to occur and then reacting. All parts of the system must be strengthened to multiply their effects, so that if one part fails, road users are still protected.
5. No fatality or serious injury should be accepted in the mobility system. Lack of safety should not be a trade-off for faster mobility. Rather, the mobility system should be both safe and efficient.

<sup>1</sup> A contrast can be drawn between this ‘Safe System’ approach and the ‘traditional’ car occupant-oriented approach to road safety, which has an emphasis on individual road user responsibility. In the latter, road safety approaches tend to rely on mass media education campaigns. Some efforts may also be made towards enforcement and better infrastructure, although these still tend to be oriented towards car occupants, for example enforcing seatbelt laws or installing pedestrian bridges which create detours for people walking in urban areas, while prioritising high-speed vehicle movement (Welle et al., 2018).

the safety level of the vehicles involved, and the response time and quality of emergency medical care. The way that these interact should form a forgiving system – one that reduces the chance for errors to occur, but also minimises the impacts when they inevitably do (ITF, 2016).

The ‘Safe System’ approach is not new: it emerged 20 years ago in the Netherlands and Sweden. But it has only achieved widespread recognition among health and road safety practitioners in recent years. In 2017, Mexico City and Bogotá became the first middle-income cities to formalise this approach. States in India such as Haryana have also begun to include ‘Safe System’ concepts in new road safety plans mandated by the Supreme Court. This is a promising step, but it also demonstrates that much of the world is not yet taking this approach, and ‘that genuine political commitment may be lacking’ (WHO, 2015, in Wales, 2017) – a point that this work begins to unpack. The apparent consensus around road safety at the international level may be masking a lack of understanding at the national and local levels. Indeed, in many contexts, despite emerging evidence on the efficacy of a ‘Safe System’ approach, the adoption and implementation of its component parts is absent. In this sense, it is understandable that the literature review found that road safety ‘... is best understood as a governance challenge rather than a technical problem’ (Andrews, 2014, in Wales, 2017). Even as the content of reform becomes clearer, how to achieve a ‘Safe System’ remains a work-in-progress.

## 1.2 The research

This report aims to balance the utility of technical insights regarding traditional approaches to road safety and the more recent emphasis on a ‘Safe System’, with the position that the form and process of reform tend to unfold differently in different contexts. Its approach is in line with a growing literature in the broader development community that advocates for ‘best fit’ approaches that work towards identifying and pursuing technically sound, politically achievable reforms rather than ‘one-size-fits-all’ approaches that seek to impose ‘best practice’ (Fritz et al., 2014; Rocha Menocal, 2014). This literature describes reform processes as moving in ‘fits and starts’, acknowledging that reform often unfolds in steps over time, building on imperfect, *good enough* solutions.

This report considers the degree to which those components have contributed to improved road safety outcomes. The case studies used are not judged as successes or failures based on the degree to which they have completely and explicitly pursued a particular approach; rather, all three cases demonstrate a mix of progress and continuing challenges (that is, none should be seen as a complete ‘success’ or ‘failure’). The most interesting findings in fact relate to the *how* and *why* of the reform process rather than to the *what*. How do reformers position road

safety issues relative to other priorities? How do they build support? Why does opposition to reform exist when the objectives of improved road safety are largely uncontested?

The approach needed to explore the answers to these questions is one that identifies and understands the political factors that are affecting progress. Delving into the realities of ideas, incentives and power certainly adds a layer of complexity to technical analysis, but it can also help reformers to understand why implementation has lagged in many contexts and to develop strategies and identify opportunities for advancing important elements of a reform agenda that is capable of making a difference in improving road safety outcomes.

This paper synthesises findings from a collaborative project between the Overseas Development Institute (ODI) and the World Resources Institute (WRI) that seeks to improve understanding of whether and how political economy factors are contributing to this state of affairs. The project aims to inform road safety decision-makers and practitioners about the political dimensions of the barriers they may be encountering, and to highlight ways forward. It draws on a policy-oriented literature review (Wales, 2017) and three city case studies to identify common themes and key differences in relation to the political economy of road safety.

## 1.3 Methodology

This paper takes a political economy perspective to consider the underlying barriers and opportunities to improving road safety. While there is no single accepted definition for political economy analysis, the following definition has been widely used in international development circles:

*Political economy analysis is concerned with the interaction of political and economic processes in a society: the distribution of power and wealth between different groups and individuals, and the processes that create, sustain and transform these relationships over time.* (Collinson, 2003, in DFID, 2009)

Other sources provide some nuance and variations in emphasis, highlighting, for example, the role played by ideas or the disaggregation of different forms of power (e.g. Hudson and Marquette, 2015). However, there is a common analytical core among guidance documents on applied political economy analysis that is fundamentally concerned with the way in which stakeholders with different levels and forms of power contest and bargain over developmental outcomes in response to their interests and the incentives they face.

In the context of road safety, this means focusing on competing visions for a wide variety of areas, including roads and transport, the use of urban space and the resources necessary to deliver better road safety outcomes.



Indeed, while

*... literature directly examining the political economy of road safety is relatively sparse ... relevant literature can be found on the periphery of research on a range of tangentially related issues, such as urban planning, corruption (particularly amongst police forces), perceptions of risk and data systems. Drawing together these separate strands gives us the opportunity to generate a more complete picture of when, how and why it may be possible to generate reforms that will reduce the number of injuries and deaths on the road. (Wales, 2017)*

Decisions on these issues are contested and made in multiple venues, ranging from local city and municipal administrations, up to the national and international levels. In all cases, the outcomes generated are a function not only of the formal and informal institutional arrangements that govern these levels and the relationships between them, but also the ways (more or less strategic) in which different actors pursue their objectives in complex and dynamic political contexts.

It is necessary to add to this focus on politics an understanding of emerging thinking on technical approaches to improving road safety outcomes. As indicated in the introduction, this project seeks to recognise what has been learned about the ‘Safe System’ technical approach, without advocating for its implementation according to a specific blueprint. There are many reports and guidelines that outline the components and actions that make up a ‘Safe System’ approach (WHO, 2015; ITF, 2008; 2016; Welle et al., 2018). But understanding the underlying mechanisms of politics and power that affect the ability of a city, state or country to undertake such an approach is key in identifying and overcoming the barriers to improving road safety. Where road safety is being directly addressed, ‘there are also broader questions regarding how well implemented these programmes are and the factors that lie behind their effectiveness’ (Wales, 2017: 22).

To explore these ideas in a range of regions, city contexts and stages of addressing road safety, the research team selected three cities in rapidly evolving urban settings across the developing world – Nairobi, Mumbai and Bogotá – for additional case study analysis. This selection reflected a number of priorities: a focus on urban contexts, particularly in low- and middle-income countries, where issues of road safety are acute and fatalities remain concentrated; coverage of contexts seen to have achieved significant progress as well as those where significant challenges remain; and the opportunities for better analysis where the team had existing networks that could be drawn upon as a starting point for the research.

These cases are not necessarily representative of the experiences of all cities. Simplistic comparisons or translations of findings across contexts are not possible

due to important differences among the cases (see Table 1) and between these cities and other urban contexts, and there are limitations on the extent to which an inductive approach can determine the way forward. The approach does, however, allow for a set of propositions regarding the political challenges and strategies that shape road safety outcomes and the potential for reform. It aims to go beyond the ‘every country is different’ refrain to provide some reflections on features of an emerging theory of change, but does not necessarily claim to be universally applicable or ‘best practice’.

The methodology for the case studies was set out by Wales (2017). It broke down the approach into four phases:

1. Review of the existing data on road safety to identify key trends in terms of geographies, demographics and modes.
2. Identification of the key proximate causal factors behind road safety challenges, or the key ways in which policies and programmes to address this operated.
3. Identification of the underlying systemic drivers of the causal factors identified in phase two, including the interests and influence of different actors that relate to the problem identified, whether they have been able to take effective action through different institutional channels, and how these dynamics have facilitated or blocked progress.
4. Identification of potential strategies or lessons learned.

Taking into account the different progress that has been made with road safety in each case, and particularly the distinct progress already made in Bogotá, these phases were interpreted as five key research questions:

1. What is the current status of road safety internationally and in our case studies?
2. How is road safety in Nairobi, Mumbai and Bogotá, influenced by processes of political economy?
3. What are the underlying challenges to improving road safety in the case study cities?
4. What were the underlying contributors to a reduction of traffic fatalities in Bogotá?
5. How can other cities use the experiences of these cases to overcome barriers to improving road safety?

Information was gathered through analysis of local traffic fatality data collected via a variety of context-specific institutional arrangements, reviewing existing literature on the local transport and road safety context, and interviews. In each case, interviewees were identified through a process of stakeholder mapping provided for in the methodology. In total, more than 40 interviews were conducted with technical experts, government officials, current and former politicians, civil society representatives and transport operators. The full case studies are provided in the appendix, and the key findings are summarised within the body of this report.

## 2 Evidence from Nairobi, Mumbai and Bogotá

This section sets out the lived experience in each of the three case study cities as it relates to the global context. It first presents a summary of the road safety situation in each of the three cases. It then uses the literature review to provide the broader context in which the reader should

see the cases as well as identifying evidence from the case studies that confirms or conflicts with the broader findings. The cases demonstrate some important variations, with Bogotá in particular having already achieved significant reductions in traffic fatalities.

**Table 1 Case study summaries**

	Nairobi	Mumbai	Bogotá
<b>City context</b>	<ul style="list-style-type: none"> <li>Capital of lower middle-income country of Kenya and economic centre for the East Africa region.</li> <li>Population of 4 million.</li> <li>Reported fatality rate of 11 per 100,000 inhabitants.</li> </ul>	<ul style="list-style-type: none"> <li>Commercial and financial centre of lower middle-income country of India. Located in the State of Maharashtra.</li> <li>Population of 12 million.</li> <li>Reported fatality rate of 5 per 100,000 inhabitants.</li> </ul>	<ul style="list-style-type: none"> <li>Capital of upper middle-income country of Colombia.</li> <li>Population of 8 million.</li> <li>Reported fatality rate of 7 per 100,000 inhabitants.</li> </ul>
<b>Current road safety status</b>	<ul style="list-style-type: none"> <li>Reported fatalities are available since 2010. They grew slightly 2010–2013 and then dropped 2013–2016.</li> <li>Vulnerable users make up more than 90% of fatalities.</li> </ul>	<ul style="list-style-type: none"> <li>Over the last 15 years that data is available for, reported fatalities have varied but increased overall. They increased consistently 2013–2015, then dropped in 2016.</li> <li>Vulnerable users make up more than 90% of fatalities.</li> </ul>	<ul style="list-style-type: none"> <li>Rapid reduction of reported fatalities (&gt;50%) over 10 years (1996–2006), subsequent plateau (2007–2017).</li> <li>Vulnerable users make up more than 90% of fatalities.</li> </ul>
<b>Road safety progress</b>	<ul style="list-style-type: none"> <li>Recent formation of the Nairobi Metropolitan Area Transport Authority.</li> <li>Establishment of National Transport and Safety Authority.</li> <li>New policy on non-motorised transport for Nairobi.</li> <li>Planned construction of BRT system and associated redesign of major roads.</li> </ul>	<ul style="list-style-type: none"> <li>Supreme court ruling that all states must develop a road safety plan, instigated by citizens.</li> <li>Amendment to Motor Vehicles Act that increases focus on vulnerable user safety currently in progress.</li> <li>Road safety actions at city level mandated by city court.</li> <li>Increased attention at a national level due to international commitments, and the traffic death of a government minister.</li> <li>Road safety actions required based on Mumbai Court ruling instigated by concerned citizens.</li> </ul>	<ul style="list-style-type: none"> <li>Institutional reform of police, mobility and city taxation and financing.</li> <li>Spatial and transport system reform including implementing BRT, bicycling and pedestrian infrastructure.</li> <li>Linking road safety to general public health and safety, shifting perceptions about value of human life, and expectations of safe behaviour.</li> <li>Alignment of national and city level attention to road safety regulation and enforcement.</li> <li>Newly adopted integrated road safety plan.</li> <li>High quality of data collection and analysis supports planning and evaluation of road safety interventions.</li> </ul>
<b>Road safety challenges</b>	<ul style="list-style-type: none"> <li>Very poor data collection and availability.</li> <li>Limited enforcement of regulations, corruption.</li> <li>Rapid increase in motorcycles and motorcyclist fatalities.</li> <li>Fragmentation of government and lack of accountability between institutions hinders planning and action.</li> <li>Resistance to legislation to improve safety by states and business lobbies.</li> <li>Focus on car-oriented mobility projects without integrating safety considerations.</li> <li>Perception of road safety as a personal responsibility.</li> </ul>	<ul style="list-style-type: none"> <li>Very poor data collection and availability.</li> <li>Limited enforcement of regulations, corruption.</li> <li>Rapid increase in motorcycles and motorcyclist fatalities.</li> <li>Lack of ownership of road safety by decision-makers.</li> <li>States and business lobbies resistant to legislation to improve safety.</li> <li>Weak institutional structure for road safety, legislative focus on motor vehicles.</li> <li>Focus on car-oriented mobility projects without integrating safety considerations.</li> <li>Perception of road safety as a personal responsibility.</li> </ul>	<ul style="list-style-type: none"> <li>Rapid increase in motorcycles.</li> <li>'Low-hanging fruit' already addressed.</li> <li>Tensions between national coordination and local goals for both road safety and mobility.</li> <li>Saturation of current public transport system leading to unsafe operating practices and overcrowded vehicles.</li> <li>Reorganisation of national road safety fund creating uncertainty about future resources.</li> </ul>

*Note: In 2015, the average rate for high-income countries was 9.2 fatalities per 100,000 inhabitants (WHO, 2015).*

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## 2.1 Nairobi

Nairobi is the capital of Kenya and the economic centre of the East Africa region. It has a population of 4 million and a reported rate of 11 fatalities per 100,000 inhabitants. Vulnerable users make up more than 90% of fatalities. Data is lacking and likely to be under-representative for Nairobi, in particular recent information about mode share (the last study was conducted in 2005). However, the data that is available shows that the most common type of road traffic collisions are between vehicles (often motorcycles) and pedestrians. Pedestrians constitute the greatest mode share but there is little to protect them from the motorised vehicles that encroach on all available road space. The problem is exacerbated by heavy traffic flows, limited safe crossing areas and poor traffic regulation for speeding, drink-driving and unsafe vehicles. Car ownership continues to be a common aspiration among those who otherwise must rely on cramped and dangerous buses, motorbike taxis or walking. Consequently, citizens may see car ownership as a private solution rather than collectively demand investment in public transport. Road traffic collisions also only affect individuals occasionally, unlike congestion and poor quality public transport, which affect almost all Nairobi residents daily. Therefore, in the historical absence of political leadership on road safety and mobility, people's personal interests override the public need for a more efficient, equitable and safer urban mobility system.

Underlying these issues is the lack of strategic spatial development of Nairobi, which is driving many people to live on the city's outskirts and travel into the centre and back each day. This inevitably creates a challenge for accessibility, makes providing transport to all areas more costly, and results in the poorest being unable to travel to work in an affordable and safe manner. Public demand for road space for private cars and the appealing political and physical tangibility of road construction contracts skews government investment towards expanding roads rather than improving the safety of existing roads for pedestrians and cyclists. Likewise, politicians may find little to gain from improving the regulation of driver behaviour, particularly where some motorists and police officers find the current lack of regulation an opportunity for corruption that works to their advantage.

Those working on road development in Nairobi rarely spot the connections between urban land use, road development, mobility and traffic-related injuries. Nor do politicians, policy-makers or commuters view the problem of congestion in terms of the need for safer modes of mass urban transit. Road traffic collisions and resulting injury are seen as the fault of the individual. This perception of road safety is reflected in government regulation and interventions that focus on driver behaviour, including the construction of physical barriers to force behaviour change, whether railings or speed humps. Attempts to regulate or

improve the safety of privately operated public transport such as *matatu* minibuses have been strongly resisted by operators. Government fragmentation in the planning and implementation of road construction, land use, urban transport and road safety has reinforced these problems.

There are indications, however, that road safety is being given more consideration, if not priority, in public policy and planning. The Nairobi Metropolitan Area Transport Authority (NAMATA) and the National Transport and Safety Authority were both recently established, and a new non-motorised transport policy was created for Nairobi. Reported fatality numbers in the city have been dropping since 2013, and this may be related to these changes.

## 2.2 Mumbai

Mumbai is the commercial and financial centre of India, and has population of 12 million. In Mumbai, data on road safety is often poor, decentralised and difficult to access, suggesting a lack of prioritisation. Even so, trends can be identified. Mumbai is ranked seventh in India in terms of absolute number of fatalities. Although the rate of road traffic fatalities is relatively low at 4.9 per 100,000, this represents a considerable number of people. Crash data obtained from the police shows that more than 5,700 people died on the roads of Mumbai between 2006 and 2016, with 611 of these fatalities occurring during 2015 and 2016 alone – a rate of almost two people per day (ADGP, 2015; RTO, 2015). The limited data available shows that over the past 15 years, traffic fatalities have had peaks and troughs, but have increased overall. In recent years, fatalities increased consistently from 2013 to 2015, with a promising drop in 2016. The experts interviewed suggested that there may be a relationship between spikes in fatalities and the implementation of new flyovers and high-speed roads, although no data is available to confirm this. However, if this is the case, there is the risk that recent gains in road safety may be counteracted by the construction of more high-speed roads. Furthermore, vulnerable users – pedestrians, cyclists and motorcyclists – account for more than 90% of fatalities. In the case of motorcyclists, this is vastly out of proportion with their low mode share (reported at under 5%), even considering the rapid growth of motorcycle ownership in recent years.

Experts interviewed explained that any attempts to address road safety in the city must grapple with the perception among many policy-makers that individuals do not value their own lives. The prevailing view is that being safe on the roads is a personal responsibility independent of the local regulatory, transportation and infrastructural conditions. Given this, risky behaviour by road users and a lack of expressed demand for safety are seen as confirmation of this perception rather than as a failure of the system to facilitate safe behaviour.<sup>2</sup> Among other public entities, beyond the

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2 Globally, in many places with the highest fatality rates, traffic collisions, fatalities and injuries are seen as an inevitable twist of fate, or an unavoidable risk of daily life, and thus there is little public demand or political motivation to tackle it (ITF, 2008).

obligation of the police to enforce traffic regulations, there is no sense of ownership for road safety or perception of a public demand to address it. Experts interviewed noted that political will is strongly oriented towards large-scale, car-centric projects as the perceived solution to public concerns about congestion and poor transport connections. Road safety is seen as something separate to this. The opportunity is being missed to integrate safe design and planning principles into new road construction, or to improve road safety and reduce congestion through public transport improvements.

In recent years, India's national government has paid increasing attention to road safety due to international commitments, and also to domestic factors, particularly the death of a prominent government minister in a traffic crash. Studies have been undertaken and proposals made to improve existing laws or implement new ones. However, these have generally been resisted by states and private interest lobbies such as trucking companies. The laws and policies that do exist have a history of not being implemented. For example, although laws mandate the existence of road safety councils at the national, state and district levels, these do not have any decision-making authority, nor do they have the required statutory backing, or adequate financial resources. Since political representatives head up these councils, their effectiveness is dependent on the priorities of the government in power. Given that the Motor Vehicles Act of 1988 mandated their creation, the focus is on motor vehicles, not on other road users such as pedestrians and cyclists. A proposed amendment to this Act, to give status to pedestrians and cyclists, is currently under consideration.

Partially in response to this sense of inattention to road safety among executive and legislative actors, concerned citizens filed a public interest litigation. In 2015 the Supreme Court accordingly issued directives requiring all states to prepare road safety action plans. However, there is still no national framework for developing such plans, and the quality of the plans is unknown. In response to a 2010 national road safety policy that also required plans, states simply copied the sample plan with little effort to review or tailor it to local needs. A public interest litigation demanding action on road safety was also filed at the local level in Mumbai in 2010. Some impacts are now being seen as some of the resulting recommendations are being implemented. Fatalities dropped in 2016 for the first time in four years. However, it is notable that so far only the recommendations related to enforcement (traffic cameras) and regulation (licensing processes), and a few street design changes have been acted upon, while matters of institutional coordination and capacity remain unaddressed. This lack of cohesive vision and practical coordination on how road safety is interrelated with street design, connectivity and mobility remains the greatest challenge for Mumbai, but it is also a great opportunity. The national momentum and city-level rulings on road safety may offer useful entry points for

reformers to attract funding, coordinate institutions related to road safety and change perceptions among both public services and the wider public about improving road safety.

## 2.3 Bogotá

Bogotá is the capital and financial centre of Colombia with a population of 8 million people. Between 1996 and 2006, the city of Bogotá reduced its traffic fatality rate by more than 60%. Since then the fatality rate has plateaued, which is still an achievement in contrast to the national rate that has climbed over the same period. However, the rate of fatalities per 100,000 people remains high, and the city has not managed to achieve a consistent downward trend in fatalities since 2006. The reduction in fatalities most profoundly affected motor vehicle occupants, likely related to seatbelt and other laws introduced in the 2000s. There is still a great need for attention to the safety of people who walk or ride bicycles and motorcycles, as they are disproportionately affected by poor road safety. There are approximately 15 million trips a day in Bogotá with most people walking or travelling by bus, and an increasing amount travelling by motorcycle.

The case study found that the dramatic drop in traffic fatalities could be linked to many factors prompted by constitutional changes that gave greater autonomy to cities and empowered directly elected mayors. In Bogotá, as a result of these changes, there was a fortuitous convergence of ongoing investment in sustainable transport. This included reform of mass transit operations and infrastructure, implementation of cycling infrastructure, land use planning and public space improvement. The impact of infrastructure improvements were underpinned and likely magnified by the institutional reform of the police and mobility departments, and by an effort to address public violence (including road safety) by directly targeting citizen perceptions and behaviour (highlighting the importance of understanding and engaging with social norms). The impacts were further enhanced by the national reform of traffic regulations and traffic education funding. This collection of investments and reforms was not initially designed as a single cohesive package. The balance between the various components over time reflects the strength of different visions for the city and of how reform happens. Even the basic technical elements (e.g. decisions to prioritise bus rapid transit (BRT)<sup>3</sup> over rail systems, complete-street approaches) were – and in some cases still are – contested locally and nationally using a variety of political strategies. In this respect, the case study also found that road safety was made more politically salient in Bogotá when tied to a broader narrative about the value of human life and reducing violent fatalities. In addition, mobility reforms that also substantially improved road safety were tied to addressing problems with congestion and transportation options.

3 'Bus rapid transit (BRT) is a high-quality bus-based transit system that delivers fast, comfortable, and cost-effective services at metro-level capacities. It does this through the provision of dedicated lanes, with busways and iconic stations typically aligned to the center of the road, off-board fare collection, and fast and frequent operations' ([www.itdp.org/library/standards-and-guides/the-bus-rapid-transit-standard/what-is-brt](http://www.itdp.org/library/standards-and-guides/the-bus-rapid-transit-standard/what-is-brt)).



The reason for the plateau in fatalities over the past decade is more challenging to unpack. It could be related to the fact that many ‘low-hanging fruit’ had already been addressed, such as improved regulations and policing of drink-driving and seatbelt use, and an improved institutional framework. A reduction in the pace of new, safer infrastructure implementation such as BRT and cycle lanes has also been linked to the slowing of improvements in road safety. Furthermore, there has been a rapid increase in motorcycle use, a mode with a disproportionate amount of fatalities. Pedestrian fatalities have remained consistently high, demonstrating the need for better protection for vulnerable road users. An integrated, system-based plan for road safety in Bogotá is currently in development, and it is hoped that with such a framework to guide interventions, traffic fatalities will once again begin to drop.

Even so, there are many lessons to be learned from Bogotá’s progress that could inform the approach taken in other contexts. Road safety improvements were catalysed by the introduction of an elected mayor as the head of the city. Significant changes in institutions, public behaviour and infrastructure have been attributed to the leadership visions of particular mayors, and in many cases given continuity by their successors. Actions based on visions related to institutional and fiscal responsibilities, public values and mobility all generated positive, if sometimes unintended, political action that had a positive impact on road safety. Primarily, major impacts were achieved thanks to the political and technical integration of road safety into many different elements of public policy, institutions and infrastructure, consistently over time and across political administrations. Improvements in the approach to public safety, public institutions and public fiscal responsibilities

all contributed, as did the integration of infrastructure, enforcement and education consistently over time.

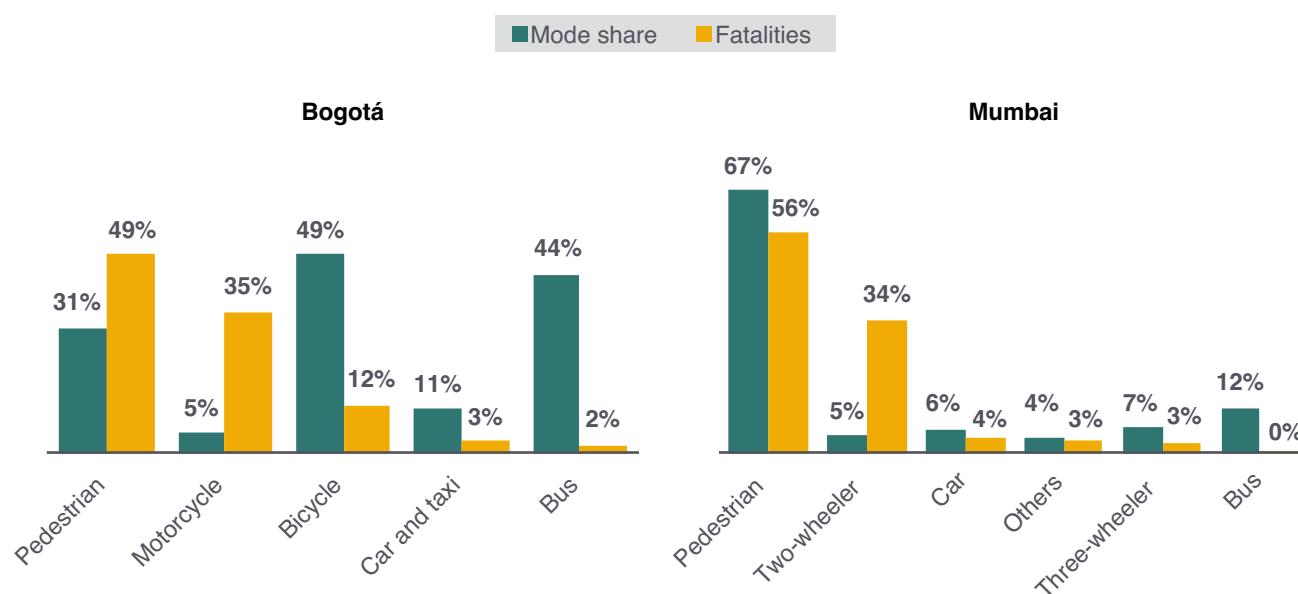
## 2.4 Linking the case studies to global trends

The literature review notes the significant challenge presented by a lack of reliable data on traffic collisions, ‘with limitations to reported data including under-reporting ... poor linkages between reporting agencies, inadequate sampling techniques, varying case definitions and exemptions from reporting requirements’ (Wales, 2017: 11). As anticipated, data at the case study level also presented limitations in terms of reliability. It is likely that collisions, fatalities and injuries are significantly under-reported, even in Bogotá, which has the most well established programme for collecting and analysing data of the three. Even so, it is informative to consider the case study data to give some context. While the absolute numbers may not be wholly reliable, they can still provide insights into changes over time and variations between different types of road user travel and fatality rates.

### 2.4.1 Fatalities by mode share

It is well established that more people are killed or seriously injured in low- and middle-income countries (accounting for almost 90% of the global total), that globally ‘vulnerable road users’ – pedestrians, cyclists, and motorcyclists – make up nearly half of those killed, and that people from lower socioeconomic levels are disproportionately affected by traffic fatalities and injuries in countries of all incomes (Wales, 2017).

**Figure 2 Mode share as a percentage of total trips and traffic fatalities in Bogotá, 2016, and Mumbai, 2015**



*Note: There is no non-motorised transport percentage in the CMP for Mumbai, so it was not included in this graph.*  
*Source: Secretaria de Movilidad, 2016 (data processed by Segundo López); ADGP, 2015.*

These findings were echoed in the three case study cities. While the share of people travelling by each mode varied (31% are pedestrian trips in Bogotá, 67% in Mumbai and 41% in Nairobi), and the fatality rates by city also varied (49%, 56% and 64% respectively), pedestrians made up the highest proportion of fatalities in all locations. Of particular concern in Bogotá is the extent to which the rate of pedestrian fatalities outstrips the mode share. Motorcyclist fatalities are even more alarming in this regard. In Bogotá, Mumbai and Nairobi motorcyclist fatalities are increasing faster than their rapid uptake as a daily travel option. The statistics are nearly identical for the two very different cities of Bogotá and Mumbai (Figure 2). In both, motorcycles make up only 5% of mode share but 35% of fatalities in Bogotá and 34% in Mumbai. Cycling mode share data was not available for Mumbai or Nairobi and cyclists made up only 1% and 2% of fatalities respectively. However, in Bogotá cyclists are overrepresented in terms of fatalities, comprising 4% of mode share yet 12% of fatalities.

The data from both Bogotá and Mumbai demonstrates that public buses are by far the safest mode of transport in these cities (more recent mode share data from Nairobi was not available for comparison). Despite this, the literature review notes that ‘... privately operated forms of public transport are often a major source of road casualties, particularly minibuses and other low-cost public transportation disproportionately used by poorer socio-economic groups’ (Wales, 2017: 21). This finding is contradicted by the case of Mumbai, where three-wheeler auto rickshaws account for a lower fatality rate than their mode share. The data is not disaggregated for the other cases to enable analysis of the safety impact of such

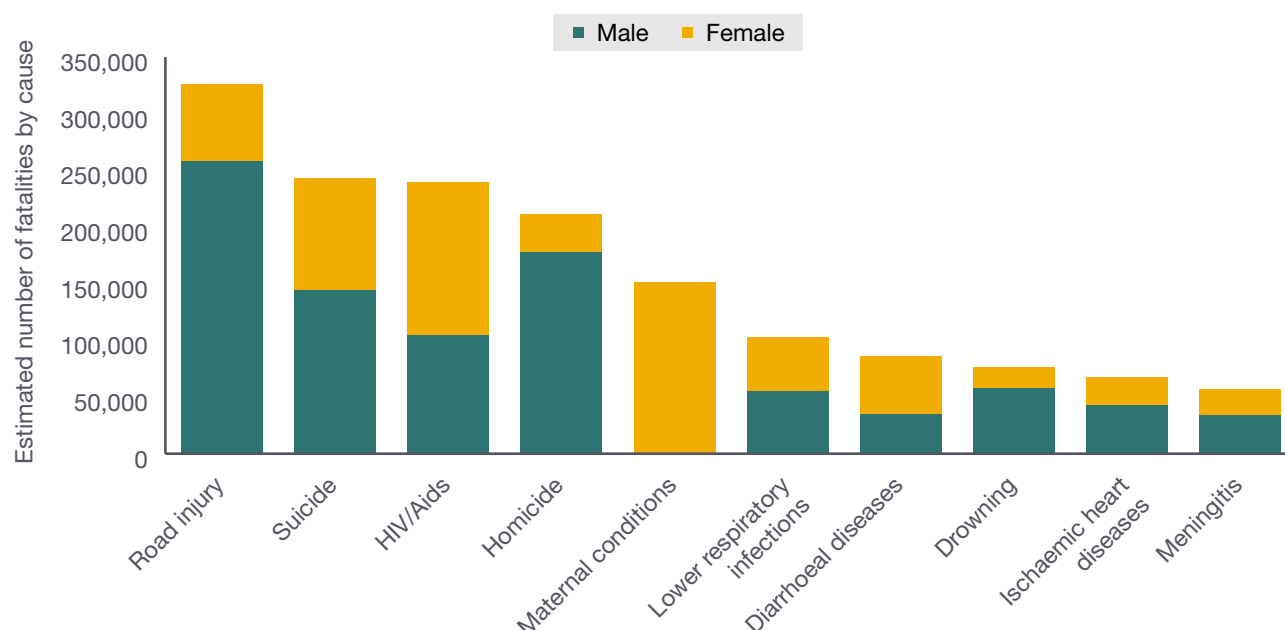
public or group transportation on passengers or vulnerable road users. It is worth noting, however, that in the case of Nairobi, where the public transport service is dominated by privately operated *matatu* minibuses, public transport passengers make up a much larger proportion of fatalities (14%). Even so, this still may be the safest way to travel given the number of trips taken via *matatu*. In the case of Bogotá, the literature and additional analysis undertaken for the case study finds that there have been significant safety impacts following reforms to the public transport system. These reforms enabled the transport system to transition from a privately operated model of individually run buses to a network of publicly coordinated BRT lines.

## 2.4.2 Fatalities by demographics

Globally, the available evidence suggests that people of working age (15 to 44 years), and particularly working-age males, are most likely to be killed or injured in road traffic collisions, with traffic collisions constituting the leading cause of death among young people aged 15 to 29 years (Figure 3) (Wales, 2017; WHO, 2015).

This was reflected in all three cases. In Bogotá, 80% of fatalities are male and 50% of people killed are aged between 20 and 50. When this is broken down by gender, the highest risk age group for traffic fatalities among both men and women is 20 to 30 years. The next largest group for men is the 30 to 40-year age group, while women aged 60 to 70 years are also a proportionately high-risk group. In Mumbai, a similar trend was identified. Men made up 80% of fatalities; the age group 25 to 64 years made up 58% of fatalities – a slightly larger percentage than their share of the population. Men aged 25 to 64 years and women

**Figure 3 Top ten causes of death among people aged 15–29 years, 2012**



Note: For more information, see [www.who.int/healthinfo/global\\_burden\\_disease/estimates\\_country\\_2000\\_2012/en/](http://www.who.int/healthinfo/global_burden_disease/estimates_country_2000_2012/en/)  
Source: WHO, 2015.

aged 65 years and above were the most disproportionately represented groups in terms of their total share of the population. In Nairobi, 65% of fatalities are male and 50% of people killed are aged between 20 and 44. A cross-analysis of mode and gender was not available.

The literature review points out that although children generally make up a smaller proportion of traffic fatalities, 'globally, traffic collisions are the leading cause of death amongst children aged 5-17 years' (Wales, 2017: 10). Although it is difficult to document, traffic fatalities and injuries, or even just the threat of these, can lead to children losing access to education and future potential, particularly in low-income countries (ibid.). In Mumbai, the statistics suggest a stark gender imbalance: girls under 14 make up 14% of total female road fatalities compared to boys in the same age group who make up only 4% of male fatalities. Further research is necessary to understand the causal factors behind this. The impact on children was difficult to compare between cases, due to variation in the age groups analysed. In Bogotá, children under 10 make up only 2% of fatalities, and those aged 10 to 20 years make up 8%, with no difference between genders. In Nairobi, children aged five to nine years make up 6% of fatalities.

### 2.4.3 The cost of traffic fatalities

The literature review found that although it is difficult to calculate the costs of traffic fatalities and injuries, they are likely to be very high, with estimated economic costs totalling up to 3% of global GDP (Wales, 2017).

*The lack of accurate and full data on the economic cost of road traffic collisions may be one factor that contributes to low political saliency and a failure to fully implement reforms in some contexts. Politicians, policy-makers and citizens may lack an understanding of the scale of the loss and how its*

*distribution affects the population. This reduces the understanding of the potential gains that could be made from resolving the challenges and so further minimises the urgency or pressure to do so. (ibid: 13)*

Other non-economic costs were also identified in the literature review. These include the burden on the health care system and on households, particularly women, to care for injured traffic victims. Impacts on children included missed educational opportunities, trauma, financial burden and lost potential. There are also policing, congestion and air quality costs related to poor street design and a lack of safe public transport options (ibid.).

This finding about the lack of data was borne out in the case studies, where little information was available aside from estimates of costs to overall national or city GDP. The wider impacts have been explored by a few road safety professionals and academics, but have not been quantified. For example, studies have found that road crashes cost India close to 3% of its GDP (\$8 billion) every year (Mohan, 2004; Balachandran, 2016). However, a study on the social costs of traffic crashes in India (Mohan, 2004) found that typical economic analyses fail to take in many of the costs incurred at an individual and family level, particularly for poor families and communities, effectively underplaying the impacts of a lack of road safety.

Carrying out analysis on the economic and social cost of road traffic collisions was beyond the scope of this research. Of interest, however, is that cost data does not appear to have been a central driver of the politics of reform in Bogotá; narratives of public health and safety proved more politically salient. Likewise, available cost data did not emerge as an influential driver of road safety reforms in Nairobi or Mumbai. It may well be relevant in other contexts, or in future reform efforts, but more work would be necessary to identify and document such processes.

# 3 Key findings: challenges to road safety reform

The wealth of guidelines and information on a ‘Safe System’ approach to road safety shows that there are many technical approaches to road safety, with well-established and evidenced impacts when appropriately adapted to local contexts. These can be loosely categorised in terms of street design and urban planning, regulation and enforcement, and education and capacity-building. However, the availability of technical guidelines and the evidence of their benefits are not sufficient to generate change without addressing underlying challenges. By analysing the findings of the case studies and comparing the outcomes with the trends identified in the literature, this report attempts to bridge the gap between the technical measures required, and the ‘messy reality’ of implementing them. Four underlying challenges that must be addressed are outlined below.

## 3.1 Lack of political prioritisation

Many challenges remain to making improvements to land use and the built environment that would also improve road safety. The cases of Mumbai and Nairobi made clear that addressing congestion by designing and building roads is still considered in isolation from road safety and other transportation needs. A significant opportunity to capitalise on existing infrastructure funding, and to integrate safer design into new construction is being missed in both Nairobi and Mumbai as politicians prioritise roads oriented to private vehicles, based on the perception that this will ease congestion. In the case of Mumbai, this was linked to a sense of economic urgency to complete the road as fast as possible, and to the perception that safety measures would increase congestion and negatively affect constituents wealthy enough to own cars. In fact, experts interviewed suggested that the construction of new flyovers and high-speed roads may have contributed to an increase in traffic fatalities. The literature review found that ‘... the most effective measures can be put in place more easily and cheaply if they are designed into new roads before construction’ (Wales, 2017: 18). In Nairobi, decision-makers lacked an understanding of the opportunity to address congestion by offering safe and reliable public transport and pedestrian and cyclist accessibility. This failure was also identified as a barrier to improving road safety through transportation planning.

This challenge of road safety being treated as a ‘rival good’ resonates with experiences documented in other contexts in which,

*... interventions designed to improve safety may be perceived as having negative externalities for some groups – for example automobile associations and users may oppose speed limits that are lower or more vigorously enforced as they view them as creating unnecessary inconvenience for drivers ... this comes with resulting actions, or lack of actions, being determined by groups’ relative ability to mobilise and exert influence on public authorities. (ibid: 25)*

This is also a barrier to improvements in legislation and enforcement. In Mumbai, specific interest groups, such as trucking companies and vehicle manufacturers, have resisted new regulations on vehicle safety and liability. In Nairobi, development and implementation of government regulation on road safety is often directly opposed by the *matatu* and bus sector. When road safety is perceived as rival to other concerns, it presents a barrier to improvements. Both the public and decision-makers often perceive design or regulatory efforts to improve safety and improve public transport as likely to negatively affect trip times, congestion and car travel, even though the evidence shows that safety investments are more likely to improve these factors (ibid.).

The available literature points to a link between lower overall private motor VKT and road safety. Higher levels of VKT cause higher levels of exposure to the risk of a crash, for both car occupants and other road users. VKT levels are shaped by a variety of factors, including land use patterns and the availability of other transportation options (Welle, 2018). This was evident in Bogotá, where the case study found that reforms to public transport coordination and infrastructure, and expansion of bicycle infrastructure have been linked to reduced vehicle travel and improvements to road safety across the entire city. However, VKT remains a significant challenge for the sprawling mega city, which has witnessed an increase both in motorbike VKT and road-traffic fatalities in recent years. The challenge of urban sprawl and the complex travel patterns that result were also identified in Nairobi, where personal car ownership is a strong aspiration, and in Mumbai, where public transport connections from north to south are very strong, but are lacking from east to west, generating increased demand for vehicle trips.



### 3.2 Focus on individual responsibility

In all three case study cities, decision-makers and experts interviewed generally attributed risky or illegal behaviour to individual road users not valuing life, rather than seeing it as an outcome of a dangerous or poorly regulated mobility system. Road safety was generally perceived as a personal responsibility rather than something that could be influenced by government action. In Bogotá, policy-makers sought to address this perceived lack of value placed on life, and a sense of fatalism, through the *Life is Sacred* campaign. This campaign is considered a contributing factor to the significant road safety gains achieved during the 1990s and 2000s. But the full story of progress in Bogotá is more nuanced, with complementary investments that depended on the government taking ownership of road safety as a public health issue and making system reforms, alongside efforts to shift road users' perceptions and expectations of others. In Nairobi and Mumbai, the narrative of personal responsibility continues to undermine public demand for explicit investments in road safety. It contributes to a lack of political incentives to tackle the issue and of public buy-in when efforts are occasionally made. Without a shift in these perceptions, the foundation for proactively addressing road safety is very weak and these norms undermine the potential for those forms of reformist collective action that depend on widespread public support.

This challenge persists despite international promotion of the 'Safe System' principles. At the international-national level, the UN Decade of Action on Road Safety and related declarations have led to national-level commitments to reduce traffic fatalities by a dramatic 50% by 2020 in all three case study countries – a goal unlikely to be reached at this point. While such commitments can support agenda setting, mobilisation and coordination for stakeholders working on these issues, they generally have no direct and binding impact on governments. It is worth noting that in the case of Bogotá, dramatic progress was made in the absence of such a commitment or road safety-specific international guidance; in the cases of Mumbai and Nairobi, it is evident that the actions necessary to achieve such an ambitious goal have not been undertaken. This is consistent with the literature, which found that '... despite this increasing focus internationally, the level of demonstrated commitment remains relatively low' (Wales, 2017: 15) and relates back to the previous point about the perception of road safety as a personal responsibility. This points to a concerning finding from the three studies – the apparent consensus at the international level on the approach necessary to combat traffic fatalities can mask a lack of knowledge, understanding or will at the local level.

### 3.3 Lack of coordination

Andrews (2014) states that:

*Effective governance requires having effective government organizations plus authority to bring a host of other agents (across government, nonprofit,*

*business and the international arenas) together as needed, when needed, in the appropriate way, to solve problems that undermine the achievement of key social objectives.*

The literature review highlighted the way that issues of governance could undermine the coordination necessary to improve road safety outcomes. It points out that 'sub-national and metropolitan governments may be well placed to coordinate within their jurisdictions, but may lack the capacity, knowledge and financial resources to do so in many cases' (Wales, 2017: 23). This was a noted challenge in Mumbai, where a lack of ownership over road safety and an absence of coordination between entities were observed. In Nairobi, fragmented planning and implementation of road construction, land use, urban transport and road safety efforts have contributed to unsafe transport systems. Poor governance and resulting weak institutions can also inhibit specific types of effort to address road safety. For example, issues such as police underfunding, corruption or lack of capacity can limit enforcement of traffic regulations. In both Mumbai and Nairobi, a lack of trust in the police was identified as undermining public willingness to obey traffic laws. This issue was also faced in Bogotá, and addressed through the replacement of city traffic agents with metropolitan police, and the establishment of a cooperation agreement between the Mobility Department and the Metropolitan Police Department.

### 3.4 Inadequate data

The lack of information and data about road safety in specific contexts represents a significant challenge, and is a constant theme throughout the literature and case studies. In addition to basic information about victim demographics, modes and geographic distribution of collisions, there is a lack of data on the impacts of traffic fatalities and injuries, for example, the financial and health costs to the economy and the burden placed on families of victims (Wales, 2017: 13). Where data does exist, there are issues concerning its reliability, completeness and timeliness of availability. Indeed, prior to these case studies, there had not been a published analysis of road safety demographics at the city level for Mumbai, although the police collect and hold this information.

This lack of information may contribute to a lack of political salience, as the true scale of the problem is rarely understood. It can also limit cities' abilities to plan interventions that target the most vulnerable demographics or locations, to justify investments in safety programmes or safer designs, as well as limiting the ability to target and monitor such interventions when they do occur. Yet, it is worth noting that in the case of Bogotá, the major fatality reduction there took place at a time when data was not readily available. While the 'Safe System' approach emphasises the importance of data to informing the road safety strategy, this emphasis may serve as a disincentive or an excuse for inaction in places where reliable data is scarce (the majority of places, including case study cities of Nairobi and Mumbai).

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# 4 The way forward: strategies to improve road safety

Following the inductive approach of the project, this section draws together our findings on what the case studies reveal about how to address these underlying challenges. It discusses the types of strategies that can generate the commitment necessary to deliver improved outcomes, through use of the various technical options. It also considers how advocates for reform can be strategic, keeping in mind competing interests and gaining the commitment of key stakeholders.<sup>4</sup>

This project did not set out to test a particular theory of change for how improved road safety outcomes are achieved, nor does our analysis suggest a single ‘theory’ or framework that could apply in all cases. The nascent state of the literature demands a degree of humility in this respect. However, it is possible to make observations about characteristics of the change (or lack thereof) regarding road safety in the three case studies. Most fundamentally, there is a lack of political prioritisation attached to road safety as a stand-alone issue in most domestic contexts. While there is little opposition to improved road safety outcomes, the components of reform are often controversial and therefore require negotiating local politics and power.

In each case, there are a variety of arenas in which reform efforts are contested, from shifting social norms to formal institutional processes (e.g. budgets and legislation). The institutional context, balance of power and constellation of interests are different in each arena and each context. The implication of these differences is that the room for manoeuvre is therefore different, and that the strategies for working within that room or for creating additional room will also vary. Thus, change is indeed local, and political tactics and rhetoric need to be locally resonant. This vision of how change happens shares some similarities with the power and systems approach (Green, 2016) and with other approaches that emphasise the need for politically informed understandings of change processes that are essentially

locally driven (Booth and Unsworth, 2014) and ‘best fit’ approaches to reform (Fritz et al., 2014). What follows is a set of six potential strategies that are consistent with this vision and may help to advance road safety reforms despite the apparent lack of political salience that the issue can hold.

## 4.1 Bundle with other issues

In the case study contexts, efforts to improve road safety face the challenge that road safety per se does not necessarily capture the attention of policy-makers or the public at large. This appears to be related, at least in part, to the absence of strong demand from road users. In contrast to public mobilisation around the delivery of services in health and education, there was a pervasive sense among the experts interviewed that road safety reforms are undermined by a generalised belief that ‘no one thinks it’s going to be them in the crash until it happens.’ As the Nairobi case illustrates, even within the transport sector, issues like road construction and optimising journey times for motorised transport users tend to be more politically important than addressing road safety, thus undermining efforts like a proposed reduction in the speed limit outside schools during entry and leaving times.

How then is a constituency for reform built? A simple framework outlined by Harrison and Kostka (2012) provides some useful insight into the strategies available to reformers to help them overcome this challenge.<sup>5</sup> The authors describe two *non-mutually exclusive* strategies – interest bundling and policy bundling – which capture important elements of the reform efforts in the case studies.

### 4.1.1 Interest bundling

The emphasis in this strategy is on understanding the interests and incentives that different stakeholders have

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<sup>4</sup> The case studies demonstrate significant variation in terms of progress on the spectrum of road safety, with particular recognition of the achievements made so far in Bogotá and the lessons they offer. Each case shows promising signs and offers important insights.

<sup>5</sup> Harrison and Kostka initially developed their insights on bundling through an analysis of the different political strategies used to address climate change in India and China, but this is applicable to any policy or reform issue for which political support must be generated.

specifically in relation to road safety, and on identifying alignment of interests that might bring different stakeholders together in support of reform. In their simplest form, such strategies suffer from the weak user demand noted above. However, the cases highlighted instances where stakeholders were given more scope to achieve reform. This has led to new options for achieving improved road safety outcomes. One prominent example from Bogotá is the effort to engage insurance companies with a financial incentive to reduce claims associated with newly required third-party insurance. The Colombian Federation of Insurers funded and managed the *Fondo de Prevención Vial*, which supported a range of road safety interventions. These included educational campaigns supporting the local transportation authority, thereby complementing investment and improved enforcement, and contributing to successful behaviour changes such as increased seatbelt use. Such approaches do not require all stakeholders to share the same principles (e.g. in the Bogotá case, the insurers' profit motive was different, though complementary, to campaigners' public safety motives), only that they align in terms of their support for the reform objective. Similar conclusions regarding the potential alignment of interests without the need for common motivations can be drawn from the Nairobi case. There, progress on the regulation and enforcement of seatbelt use reportedly depended on the personal financial interests of a particular Minister of Transport.

#### 4.1.2 Policy bundling

There appear to be fewer clear examples of Harrison and Kostka's alternative strategic approach of policy bundling, in which issues or policies that may not be sufficiently politically attractive in their own right are linked to other issues with more traction (or at least with support from a different constituency). Such approaches, when applied to legislative, budgeting and institutional reform processes, either create formal links by ensuring that new regulations or budget allocations consider the two issues together, or they rely on reciprocal agreements to increase the constituency in favour of reform. Rather than isolating road safety issues by focusing attention directly and exclusively on those issues, policy bundling approaches would aim to ensure that there is enough support for the whole package of reform to placate potential opposition to any given part of it.

The evidence presented in the case studies tends to highlight two scenarios. One concerns initiatives targeting specific road safety behaviours such as seatbelt or helmet laws. The other discusses efforts (or the potential) to establish national frameworks for road safety that seek to respond to the complex multi-sectoral nature of road safety challenges, by designing systems to address a variety of components of the problem. This makes intuitive sense given the focus of the cases and the many issue-based campaigns on road safety. However, it can imply choices to bundle several road safety reforms together, while isolating those from other issues that may have more political salience. It may well be worth considering whether a

broader approach to bundling might be useful, as appears to have been the case with efforts to include road safety as a part of broader efforts to address violent fatalities and promote Citizenship Culture in Bogotá.

## 4.2 Reframe the debate

The ability to adopt and present a framing of road safety as a part of a larger, socially resonant idea can form a complementary component of successful political strategies for reform or investment. For example, in Bogotá, the Mockus administration successfully linked road safety challenges to the city's high homicide rate by focusing broadly on the issue of violent and avoidable fatalities, thus giving road safety additional political weight that it might not otherwise have had. Successfully framing road safety as a public health issue enabled it to be integrated as a priority in the mayor's vision of 'Citizenship Culture', guided by the *Life is Sacred* principle, and by the policy framework that emerged from that vision. In this case, the framing narrative thus supported the policy bundling efforts noted above.

While the Bogotá case describes a framing that focused on the value of life, this is by no means necessarily the framing that would be most relevant universally. In other contexts, it may be more strategic to frame road safety as a part of other issues, which could include the productivity of the city, safe access to education or jobs, global competitiveness, nationalism and world leadership, freedom of movement, or religious values. The key is simply that the framing must be locally salient and effectively maintain a focus on road safety.

In contrast, the Nairobi case makes clear the way in which Kenyan officials as well as international donors tend to view road investment decisions through the lens of economic development. This, in itself, is not necessarily problematic. However, advocates have been unable to integrate road safety considerations into the economic development discussion that guides planning, feasibility studies and support for engineering design and road construction. This lens therefore currently presents a barrier to improving safety. It is nonetheless important to note that the diversity of economic, social and political interests involved in road safety means that even in such contexts it may be possible to identify and develop different ways of framing the issue when making the case to different stakeholders. What is important is that the framing resonates with the interests and ideology of the audience. In Nairobi, the Kenya Alliance of Resident Associations (KARA) appealed to politicians' reputations in their successful lobbying for the 2015 Non-Motorised Transport (NMT) Policy. Rather than simply emphasising the road safety outcomes, advocates also attempted to persuade assembly members to support the policy on the basis of NMT contributions to improved air quality, reduced car usage and even the political standing and legacy of the members.

This insight regarding the importance (and variability) of local salience should also guide the approach of supporters of international and global movements. These include the UN Decade of Action on Road Safety (2011–2020), the UN High-level Advisory Group on Sustainable Transport and Special Envoy for Road Safety (2015), the Brasilia Declaration on Road Safety (2015) and the two Sustainable Development Goals related to road safety. The cases make mention of the influence of international efforts, for example, the role of the Japanese International Cooperation Agency (JICA) in shaping urban mobility planning in Bogotá. However, if those efforts fail to resonate with local priorities and ideologies, such movements risk generating technical agreement without the necessary political backing or local capacity. Evidence from other sectors and contexts indicates the way in which efforts to increase pressure for reform driven by the ideological commitments of an outside actor to a particular way of doing things can generate form without function. This can produce questionable statistics or short-term reactive efforts with little long-term impact. Such a dynamic emphasises the need for links between whatever practical changes are being considered (e.g. budgeting, institutional reform, etc.) to try to make a difference in behaviour and, ultimately, improve outcomes and locally salient concepts (e.g. violent fatalities in Colombia).

### 4.3 Build alliances

Cities do not exist in isolation. Although each of our case studies was defined in terms of ‘a city’, it quickly became clear that all cities are embedded in wider contexts that shape the challenges they face and the opportunities they have to respond to those challenges. In some cases, defining the boundaries of the city itself was a matter of some debate, but in all cases, even the broadest definition pointed to a territory that was connected physically, administratively and politically, to the space around it. This connectivity and a city’s relationship with the region and country in which it is located have important consequences for the political economy of road safety.

#### 4.3.1 Connecting physical, administrative and political contexts

At a basic level, cities are connected to surrounding areas via extensive networks of transport infrastructure (road, rail, etc.). These physical connections to the wider world have produced complex administrative structures for management of road infrastructure that complicate efforts to mobilise political support for road safety. With the connection of cities to the broader national environment, administrative structures tend to divide roles and responsibilities between relevant national authorities and local authorities. For example, in the case of Nairobi, road safety and transport matters reside at the national level primarily with the National Transport and Safety Authority, an organisation under the Ministry of Transport,

Infrastructure, Housing and Urban Development. However, the Kenya National Highways Agency is responsible for highways and the Kenya Urban Roads Authority for urban roads. Responsibility for smaller roads rests with the relevant county government.

Similar divisions exist in the other cases, leading not only to technical coordination and planning challenges, but also to important political implications. In addition to tensions between levels of government, whether due to partisan differences or simply different priorities, the administrative complexity itself can lead to confusion among citizens over roles and responsibilities, undermining the potential for political mobilisation.

#### 4.3.2 Decentralisation and decision-making

The form and extent of decentralisation shape the space for reform. This occurs not only with managing different components of the road network and other sector-specific features, but also with wider institutions of governance autonomy and leadership. The three cities present different institutional configurations with respect to the timing, form and extent of decentralisation and democratisation. Colombia’s 1991 constitutional reform and decentralisation empowered directly elected city mayors (though prohibiting the re-election of mayors to consecutive terms). In Nairobi, reforms designating the city as a county in its own right led to its first county elections in 2013, granting far more power to the current governor and county assembly than was previously devolved to the former mayor and city council. Mumbai’s urban governance is led primarily by the Municipal Corporation of Greater Mumbai (MCGM), which has considerable decision-making autonomy. However, the elected head of MCGM, the mayor, does not have a significant role in the city’s development, which lies instead with the appointed executive head, the Municipal Commissioner.

The political economy of decentralisation reforms has been examined elsewhere, clarifying the contested nature of decentralisation itself (Eaton et al., 2010). As expected, based on the review of the wider literature, the level of autonomy that the case study cities have in decision-making and resource allocation is critical in determining whose agenda will be prioritised in practice. For example, the Bogotá case makes much of the leadership of the city’s mayors as drivers of the progress achieved; however, the potential for this relies on the ability of the mayors and their administrations to contest the vision of the national government and to direct funding. This finding is aligned with previous findings on Surakarta and Lagos, cited in the literature review. However, more detailed analysis suggests the relationship between different levels of administration is often dynamic and contested, as the Bogotá case makes clear. The decision to proceed with a BRT approach (and World Bank financial support) has often been contrasted with the heavy rail project preferred by the national government at the time. The national government subsequently used Bogotá’s BRT as the foundation of its National Urban Transport Policy, but even then contested



the city's vision for a complete-street approach in phases 2 and 3 of the Bogotá BRT, consenting to use of national government funds only after significant debate and bargaining over the way in which the investment would be defined.

While the Bogotá case places the local administration at the forefront of road safety improvements, it is important to note that the cases do not support the conclusion that lower (more local) levels of public administration are always more supportive of efforts to address road safety. Road safety challenges may be described at a city level, but it is not necessarily the case that reformers need to work exclusively at the city level. In some contexts, reformers may be better off considering opportunities to use higher-level mechanisms to leverage road safety improvements at a local level, such as occurred in Mumbai. Despite the formal presence of the mayor of Mumbai's democratic electoral accountability, the relative weakness of that channel to demand improvements to road safety prompted reformers in India to identify alternatives. While the failure of the Road Transport and Safety Bill of 2014 highlights the potential for local opposition to undermine national efforts (and the need to account for such opposition in reform strategies), entry points at the national level should not be overlooked. The recent use of public interest litigation brought before the Supreme Court in India is encouraging in this respect.

#### 4.3.3 Interests, incentives and ideology across levels of administration

Once cities are placed in a broader context, the cases also paint a more complex, nuanced picture of the relationship between electoral democracy and improvements in road safety – one that requires readers to consider the potential national political ambitions of city-level officials, their ideas and ideology and the political power they hold in that time and place. In Bogotá, Mayors Mockus and Peñalosa were able to push ahead with a vision for road safety and sustainable mobility that prioritised investments in mass transit over extension of the road network, even though the latter tends to be the local public demand in response to congestion (as in the Nairobi case). However, not only were the mayors in a relatively strong position at the time, both also aspired to run for the presidency of Colombia. Their desire to appeal beyond the narrower short-term interests of local motorists aligned with the vision they held and this created space for investments in the BRT. It freed them from a simplistic interpretation of democratic accountability in which voters tend not to prioritise road safety. This in turn emphasises the importance of understanding dominant narratives rather than assuming a simple responsiveness to immediate financial interests.

## 4.4 Take advantage of reform

The literature review clearly demonstrates the link between governance, a 'Safe System' and road safety, and the importance of road safety-specific regulation and credible enforcement. It found that:

*... there is strong empirical evidence that countries with well-functioning and capable state institutions experience lower levels of road traffic collisions, deaths and injuries compared to those that are weaker and less coherent. (Wales, 2017: 7)*

It also highlights the closely related issue of democracy and political credibility, which is often missing in places where '... politicians rely on patron-client relationships, and there are short time horizons and rent seeking is common' (ibid: 23). As a result, citizens have little expectation that politicians can address issues such as road safety, nor do they feel obliged to support the government in any efforts it may undertake. In all three case studies, a lack of faith in public institutions, particularly the police, undermined public willingness to respect traffic regulations, presenting the cities with this challenge.

In Nairobi and Mumbai, significant hurdles also remain in terms of fragmented responsibility, or a lack of ownership for road safety, although the recent creation of a new road safety entity in Nairobi, and court mandates for the preparation of state road safety plans in India may help to address these.

All of these issues arose in Bogotá in the 1990s – experiences that bear out the position that improved governance is related to improved road safety. The period of rapid reductions in traffic fatalities in Bogotá was also the period during which successive mayors reformed public institutions in the city, beginning with the property tax system, and extending to sectors directly relevant to road safety, namely the police and the public transportation system. This was partly in response to a new level of public accountability that was introduced to city government with the establishment of the position of elected mayor. Conversely, successive mayors also worked to strengthen informal social institutions and encourage informal social regulation of safer behavioural norms. At the same time, national-level reforms resulted in establishing a source of finance for road safety education, a national roundtable and legal reform to improve traffic regulations related to road safety. Finally, work by JICA to develop an urban mobility plan for the city coalesced transportation professionals in the city around a common project, overcoming institutional disconnections.

These changes have benefited road safety in Bogotá in many ways. Institutional reforms related to finance

established a secure source of funding for infrastructure and education investment, while reorganisation of institutions allowed for better coordination and agreements between entities. Apparent efforts to tackle corruption and reduce political patronage improved public willingness to obey tax requirements and traffic regulations.

Strengthening and coordinating road safety and mobility institutions takes time and resources. Even when they are achieved, in no case are there perfect institutions. The other strategies presented in this report do not necessarily depend on strong institutions to be feasible, however, stronger institutions may make it easier to apply the approaches. While this is taking place, specific contexts may present opportunities for other institutions to contribute to improving road safety. For example, in the case of Mumbai, citizens were able to use both the city and national courts as a tool to require tangible action on road safety at a state and city level.

## 4.5 Sequence and prioritise

Integrating different types of approaches has been proven to increase the impact of road safety interventions (Wales, 2017; Welle et al., 2018). This was borne out in the case study of Bogotá, although the strength in relationship between variables remains difficult to quantify. The significant gains in road safety in that city are associated with a period when education, enforcement and infrastructure improvements were all being pursued proactively and were supported by underlying institutional reforms, which further enhanced their impact. Although education and enforcement processes have continued, and been further strengthened through an institutional cooperation agreement between the police and transportation departments, the fatality rate has since plateaued. During the same period, sustainable mobility infrastructure construction rates have slowed. In the cases of Nairobi and Mumbai, the lack of an integrated approach can be linked to a failure to reduce fatalities. There has been no coordination between entities related to road safety and transport, infrastructure construction is vehicle speed-oriented, and there is limited enforcement of traffic regulations.

The case of Bogotá also shows the influence on safety of strong investment in a network of public transport and non-motorised transport (NMT) infrastructure. The contribution of rapid infrastructure expansion to improved road safety between 1996 and 2006 is attributed both to the direct impact of better street design (including a complete-street approach to phase 2 of the BRT) and safer operational practices, but also by avoiding potential vehicle trips. This phenomenon is also identified in the literature review: ‘Public transport ... may encourage the use of safer forms of transport and reduce the actual numbers of vehicles and pedestrians on the road’ (Wales, 2017: 20). Even though the interventions were an initial response to demand for better transport options rather than safety explicitly, the statistics demonstrate the impact on safety. Conversely, in Mumbai, investment in high-speed, high-volume, car-oriented infrastructure to confront the same

issue of congestion is speculated to have increased risk and fatalities. This shows that the opportunity exists to reorient infrastructure investments towards safer modes that also reduce congestion, such as public transport. It also shows that a lack of dedicated funding may not necessarily be a barrier to road safety. If the funding is already available for major transportation infrastructure, the opportunity exists to reorient the design of that infrastructure to be safer for all road users and to reduce VKT and overall exposure to risk.

It is important to note, however, that an emphasis on the value of taking an integrated approach does not mean that every road safety action must be tackled at the same time, which can be a barrier to achieving change. The rapid gains in Bogotá also demonstrate the value of targeting road safety interventions to first tackle the most urgent and addressable matters. Another likely contributing factor to the rapid reduction and subsequent plateau in Bogotá’s traffic fatalities, is that during the initial 10-year period, regulation and enforcement targeted ‘low-hanging fruit’ – highest risk behaviours that were contributing to a significant proportion of fatalities and were not politically challenging to address – drink-driving, seatbelt use and motorcycle helmet use. Now that these behaviours have been addressed to a significant degree, further gains must be made by tackling less politically popular issues, like speed, and working on more technical approaches, such as safer street and intersection design. While this is a challenge for Bogotá, it does highlight an opportunity for cities facing similar challenges to Mumbai and Nairobi, where strategic actions targeted towards addressing the highest risk behaviours could yield fast results.

Achieving an approach which manages to be both integrated and targeted, and to yield fast impacts as well as maintaining long-term change, can be facilitated by developing a dedicated road safety plan such as Bogotá has recently undertaken. Such a plan can group actions within different strategies, divide them into the short, medium and long term, and establish metrics to monitor impacts and progress.

## 4.6 Work around data limitations

Evidence from the case studies suggests that while good data can be helpful in efforts to address specific road safety challenges, it is not absolutely necessary to mobilise support for effective positive changes, nor sufficient to guarantee attention to road safety issues where other aspects of the necessary political narrative are missing.

This finding is, perhaps, counterintuitive given that evidence finds that road safety targets based on data make it easier to implement effective countermeasures and set priorities (Elvik, 1993). Yet, the bulk of Bogotá’s progress on road safety came at a time when the systems for the collection and use of road safety data (as well as media attention to and public knowledge of that data) were weaker than they have been in recent years, when progress appears to have plateaued. There is no doubt a variety of

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factors contribute to this set of outcomes. However, the findings across all three cases suggest the feasibility of working around data limitations is not an aberration:

- In the case of Nairobi, the authors conclude that public frustration over poor driving and inadequate vehicle maintenance, demand for faster journey times, opportunities for personal money-making and political credibility, and pressure from international organisations have been stronger drivers of recent improvements in road safety than data on collisions.
- The Mumbai case provides an example in which an anecdotal trigger event (the death of a minister) appears to have been more effective at catalysing (national-level) interest in road safety issues than more comprehensive planning/analytical efforts (GOI, 2007).
- The Bogotá case makes clear that those involved in the design and implementation of the first phase of the BRT only began to collect data in order to monitor the road safety impacts of the system *after* they started to receive reports about reduced collision numbers.

To be clear, the cases do not suggest that improved data is without value where transport authorities and city administrations are seeking to improve road safety by targeting actions and measuring impacts. They do, however, confirm the crucial strategic insight that cities need not wait for expensive and elaborate data systems to start making progress on road safety. The basics of a narrative that resonates with the public and with policy-makers are enough to trigger interest in important investments and reforms, even as efforts to improve the quality and specificity of information are under way. What matters is whether proposed changes connect with the lived experiences of people using the transport network and with the various incentives facing those with a stake in reform. In other words, while data may help make the technical case for reform, making the political case to turn those reforms into reality does not necessarily require agreement on data (e.g. the selection of indicators). Given the concerns expressed explicitly in Nairobi and Mumbai regarding the quality of available data, and at numerous times in the review of the broader literature, this finding provides encouraging guidance for potential reformers.

# 5 Conclusion

Advocates of road safety reforms must grapple with the fact that in many cases road safety outcomes are not in themselves politically salient. Approached on their own, initiatives to improve road safety can be side-lined in favour of more appealing investments in road construction or other more popular priorities, driven by the broad electoral appeal of highly visible investments, the need to reward a narrow subset of political supporters, or even outright corruption. Even where improvements might rely at least in part on non-financial commitments, as with improved enforcement of regulations, city leaders are faced with difficult decisions about how best to expend limited political capital. However, the evidence from the city case studies, as well as the wider literature, suggests that there are a number of approaches that help reformers of all types to manage this challenge.

Solving this complex, multifaceted problem requires approaches that are both technically sound and politically feasible. Reformers, whether they are in government, the private sector or civil society, should therefore focus as much on constructing the political case for reform as on its technical merits. This means grappling with incomplete and imperfect data and information; with stakeholders with

diverse interests and motivations; and varied institutional settings that afford autonomy and discretion to different stakeholders at different levels. Utilising the strategic approaches outlined in this report will help reformers to identify opportunities to work with potential allies both within and outside the mobility sector (even with those that care little about road safety outcomes), whether through formal coalitions or informal working relationships.

The precise combination of actors and required next steps varies in each of the cases explored and inevitably will do so in other contexts facing the high social and economic costs of road collisions. Additional research and experimentation with different strategic approaches to reform will be necessary in each of those contexts, particularly as institutional arrangements continue to shift. In the absence of an identifiable universally applicable roadmap, this report can only be a contribution to developing technically sound, politically feasible pathways to reforming road safety. Taken together with the sort of technical guidance provided in Welle et al. (2018) and the creativity and local knowledge of reformers working in and outside government in each context, progress is possible – even where the challenges remain complex and great.

## Box 3 Opportunities for further research

While these findings and the associated recommendations may be of interest to policy-makers, the research, synthesis and review process of this project also pointed to substantial room to broaden and deepen the findings of this project in ways that can facilitate more politically savvy efforts to improve road safety. In particular, the interviews with authors, reviewers and experts have identified the following areas for further exploration:

- Investigation of the applicability to other contexts of the types of political strategies identified in the report (e.g. interest bundling, policy bundling, issue framing). Are there other strategies that can help reformers to push forward road safety reforms that tend not to be politically salient?
- More detailed exploration of the particular sources of opposition encountered by reformers in different contexts. This could include examination of the way in which illicit interests and motivations work against reform, though this would require good data on such practices that can be hard to obtain.
- A clearer picture of what ‘good enough’ data looks like for different types of road safety challenges. Namely, what specific forms of data are technically necessary (vs ‘nice-to-have’) and/or politically influential?
- More data about the socioeconomic impacts of road safety at the individual, family, community and city level, and their impact on the potential for building reform coalitions.
- Investigation into the way that mobility and road safety contracts are designed, and awarded, and how road safety investments change over time in cities.
- Further information and examples of other opportunities to systemically improve road safety even when institutions are weak.

Data on the evolution of the perception of road safety and the ‘value of life’ in different contexts over time. How does or can perception of road safety shift from fatalistic, to personal responsibility, to shared responsibility for a public health issue over time?

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# References

- ADP – Office of Additional Director General of Police (Maharashtra) (2013–2015) Crash data for Mumbai (dataset)
- Andrews, M. (2014) *An ends-means approach to looking at governance*. Center for International Development (CID) Working Paper No. 281. Cambridge MA: Center for International Development at Harvard University
- Andrews, M., Pritchett, L. and Woolcock, M. (2015) *The challenge of building (real) state capability*. Center for International Development (CID) Working Paper No. 306. Cambridge MA: Center for International Development at Harvard University
- Balachandran, M. (2016) ‘Accidents on India’s deadly roads cost the economy over \$8 billion every year’. Quartz Media LLC, 23 May (<https://qz.com/689860/accidents-on-indias-deadly-roads-cost-the-economy-over-8-billion-every-year>)
- Batley, R. and McLoughlin, C. (2015) ‘The politics of public services: a service characteristics approach’, *World Development* 74: 275–285
- Booth, D. and Unsworth, S. (2014) *Politically smart, locally led development*. ODI Discussion Paper. London: Overseas Development Institute
- Collinson, S. (2003) *Power, livelihoods and conflict: case studies in political economy analysis for humanitarian action*. HPG Report 13. London: Overseas Development Institute ([www.odi.org.uk/resources/download/241.pdf](http://www.odi.org.uk/resources/download/241.pdf))
- DFID (2009) *Political economy analysis how-to note, a practice paper*. London: Department for International Development ([www.odi.org/sites/odi.org.uk/files/odi-assets/events-documents/3797.pdf](http://www.odi.org/sites/odi.org.uk/files/odi-assets/events-documents/3797.pdf))
- Eaton, K., Kaiser, K. and Smoke, P. (2010) *The political economy of decentralization reforms: implications for aid effectiveness*. Washington DC: IBRD/World Bank (<http://siteresources.worldbank.org/EXTDSRE/Resources/DecentralizationReforms.pdf>)
- Elvik, R. (1993) ‘Quantified road safety targets: a useful tool for policy making?’, *Accident Analysis and Prevention* 25(5): 569–583
- Fritz, V., Levy, B. and Ort, R. (2014) *Problem-driven political economy analysis: the World Bank’s Experience*. Washington DC: World Bank
- Green, D. (2016) *How change happens*. Oxford, UK: Oxford University Press
- GoI – Government of India (2007a) *Sundar Committee Report on Road Safety and Traffic Management*. Delhi: Parliament of India
- GoI (2007b) *Sundar Committee Report: Draft National Road Safety and Traffic Management Act*. Delhi: Parliament of India
- Grindle, M.S. (2004) ‘Good enough governance: poverty reduction and reform in developing countries’, *Governance* 17: 525–548
- Harrison, T. and Kostka, G. (2012) *Manoeuvres for a low carbon state: the local politics of climate change in China and India*. Developmental Leadership Program Research Paper 22. Birmingham: DLP (<http://publications.dlprog.org/Manoeuvres%20for%20a%20Low%20Carbon%20State.pdf>)
- Hudson, D. and Marquette, H. (2015) ‘Mind the gaps: what’s missing in political economy analysis and why it matters’ in *A governance practitioner’s notebook: alternative ideas and approaches*. Paris: OECD Publishing
- ITF – International Transport Forum (2016) *Zero road deaths and serious injuries: leading a paradigm shift to a safe system*. Paris: OECD Publishing ([www.oecd-ilibrary.org/transport/zero-road-deaths-and-serious-injuries\\_9789282108055-en](http://www.oecd-ilibrary.org/transport/zero-road-deaths-and-serious-injuries_9789282108055-en))
- ITF (2008) *Towards zero: ambitious road safety targets and the Safe System approach*. Paris: OECD Publishing ([https://fevr.org/wp-content/uploads/2014/08/OECD-safe-sytemA\\_pdf.pdf](https://fevr.org/wp-content/uploads/2014/08/OECD-safe-sytemA_pdf.pdf))
- Mohan, D. (2004) ‘Social cost of road traffic crashes in India’. Delhi
- Rocha Menocal, A. (2014) *Getting real about politics: from thinking politically to working differently*. ODI Working Paper. London: Overseas Development Institute
- RTO Maharashtra – Regional Transport Office Maharashtra (2015) Data set
- Wales, J. (2017) *The political economy of road safety: a policy-oriented literature review*. ODI Report. London: Overseas Development Institute ([www.odi.org/sites/odi.org.uk/files/resource-documents/11401.pdf](http://www.odi.org/sites/odi.org.uk/files/resource-documents/11401.pdf))
- Welle, B., Bray Sharpin, A., Adiazola-Steil, C., Job, S., Shotten, M., Bose, D., Bhatt, A., Aleveano, S., Obelheiro, M. and Imamoglu, T. (2018) *Sustainable and safe: a vision and guidance for zero road deaths*. Washington DC: World Resources Institute and Global Road Safety Facility
- World Bank (2017) *World Development Report 2017: governance and the law*. Washington DC: World Bank ([www.worldbank.org/en/publication/wdr2017](http://www.worldbank.org/en/publication/wdr2017))
- WB GRSF – World Bank Global Road Safety Facility (2018) *The high toll of traffic injuries: unacceptable and preventable*. Washington DC: World Bank ([www.worldbank.org/en/programs/global-road-safety-facility/publication/the-high-toll-of-traffic-injuries-unacceptable-and-preventable](http://www.worldbank.org/en/programs/global-road-safety-facility/publication/the-high-toll-of-traffic-injuries-unacceptable-and-preventable))
- WHO – World Health Organization (2015) *Global Status Report on Road Safety*. Geneva: WHO ([www.who.int/violence\\_injury\\_prevention/road\\_safety\\_status/2015/en](http://www.who.int/violence_injury_prevention/road_safety_status/2015/en))







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# At the crossroads

## The politics of road safety in Nairobi

Clare Cummings and Beatrice Obwocha



**Case study**

March 2018

This project was generously supported by:



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This document contains preliminary research, analysis, findings and recommendations. It is being circulated to stimulate timely discussion and critical feedback, and to influence ongoing debate on the emerging issue of the political economy analysis of road safety.

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Cover photo: Children from General Kago Primary School, Thika Municipality, central Kenya, try to cross the road © Georgina Goodwin/FIA, 2014.

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## About this case study

This case study explores road safety issues in Nairobi, Kenya, the challenges involved in confronting them and the potential opportunities. It is a political economy study that examines the interests and influence of the various actors who have a stake in road use, safety and transport in the city.

This case study is part of a broader project that analyses the political economy of urban road safety issues, undertaken by the Overseas Development Institute (ODI) and the World Resources Institute (WRI), and funded by the FIA Foundation. It accompanies: a theoretical background paper (Wales, 2017); two other case studies on Bogotá, Colombia, and Mumbai, India; and a synthesis report.

### **The political economy of road safety**

Political economy is a discipline with a long tradition in the social sciences. As an analytical approach, it seeks to understand the underlying reasons why things work the way they do and to identify the incentives and constraints impacting the behaviour of actors in a relevant system (Rocha Menocal, 2014). Characteristics of a political economy approach include:

- a concern with the role of formal and informal ‘rules of the game’.
- an analysis of power and the processes of contestation and bargaining between economic and political elites.
- a focus on the interests of different groups.
- an analysis of how these interests impact development outcomes, at times to the detriment of broader development objectives.

In general, there has been a tendency within policy-making circles to treat road safety as a technical issue. Exploring road safety from a political economy perspective constitutes an emerging field of study which seeks to understand when, how and why road safety emerges as an issue of public concern and how reform efforts can be most effectively supported taking those dynamics into account. The most recent *Global Report on Road Safety* includes some key aspects related to the political economy of road safety such as political saliency and resource allocation. The report also emphasises the importance of having traffic safety on the political agenda as a manner to mobilise resources and public awareness on road safety issues (WHO, 2015).



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# Acronyms

<b>AfDB</b>	African Development Bank
<b>BRT</b>	bus rapid transit
<b>CSO</b>	civil society organisation
<b>KARA</b>	Kenya Alliance of Residents Association
<b>KenHA</b>	Kenya National Highways Authority
<b>KSh</b>	Kenyan shilling
<b>KURA</b>	Kenya Urban Roads Authority
<b>MOA</b>	Matatu Owners' Association
<b>MWA</b>	Matatu Welfare Association
<b>NAMATA</b>	Nairobi Metropolitan Area Transport Authority
<b>NGO</b>	non-governmental organisation
<b>NTSA</b>	the National Transport and Safety Authority
<b>ODI</b>	Overseas Development Institute
<b>RSIP</b>	Road Sector Investment Programme and Strategy
<b>SACCO</b>	Savings and Credit Cooperative Organisation
<b>UNEP</b>	United Nations Environment Programme
<b>WHO</b>	World Health Organization
<b>WRI</b>	World Resources Institute

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# Methodology

The research took a political economy approach. The methodology was based on ‘problem-driven political economy analysis’ as described in the preceding literature review on the political economy of road safety (Wales, 2017). The methodology broke down the approach into four phases:

1. Review of the existing data on road safety to identify key trends in terms of geographies, demographics and modes.
2. Identification of the key causal factors behind road safety challenges, or the key ways in which programs to address this operated.
3. Identification of the underlying systemic drivers of the causal factors, including the interests and influence of different actors that relate to the problem identified, whether they have been able to take effective action through different institutional channels, and how these dynamics have facilitated or blocked progress.
4. Identification of potential strategies or lessons learned.

To implement this approach, we gathered existing local traffic fatality data and literature on the local transport and road safety context. We then conducted semi-structured interviews with 22 key informants from relevant government agencies (county and national level), civil society organisations (CSOs) and non-governmental organisations (NGOs), donor agencies, transport providers, and people who are immediately affected by road safety issues in the city. Specifically:

- Association for Safe International Road Travel
- Boda Boda Association
- *boda-boda* drivers
- Handicap International
- Japan International Cooperation Agency
- Kenya Alliance of Residents Association
- Kenya Institute of Public Research
- Matatu Owners’ Association
- *matatu* touts and drivers
- Nairobi Deputy Traffic Commandants
- Nairobi Metropolitan Area Transport Authority
- National Transport and Safety Authority
- World Bank Africa Transport Policy Programme
- UN-Habitat
- United Nations Environment Programme
- Usalama Watch

The data collected was analysed using a matrix to compare and triangulate different attitudes and perceptions of road safety. The draft report was reviewed by eight independent experts with knowledge of road safety, the Nairobi context and political economy dynamics.

While the study does not claim to be exhaustive, the approach does provide an alternative framing of the problem and offers propositions regarding the potential for reform. To stimulate further debate, and take the recommendations forward, a launch event and workshop are planned for March 2018 in Nairobi, bringing together CSOs, NGOs and international actors.

---

# Executive summary

Nairobi is one of Africa's fastest growing cities: in just 16 years, its population has doubled (World Bank, 2014). An increasing number of people and vehicles move around the city every day, creating competition for space and ease of travel (JICA, 2013). Congestion is acute and collisions are common: 668 people were killed in traffic collisions in Nairobi in 2015, accounting for 22% of all traffic fatalities in Kenya that year (NTSA, 2015). The available data, though not robust, suggests that pedestrians and motorcyclists are the most seriously and frequently affected by road traffic collisions (NTSA, 2016). And these people are also likely to be among the lowest income groups. More than half of all fatal traffic collisions in Nairobi occur on the new high-speed highways, and collisions peak over weekends and evenings (NTSA, 2016). Recent years have seen a decrease in the number of overall fatalities, but the number of motorcycle users killed in collisions continues to rise (*ibid.*).

## The effectiveness of road safety policies

In recent years, the Kenyan national government has enacted many policies and regulations to address vehicle standards and road use – perhaps in response to national concern about worsening congestion and increasing international focus on road safety. However, their effectiveness is limited for several reasons:

1. **Governance fragmentation.** The planning, design and maintenance of all roads in Nairobi are split across distinct national road agencies, urban development and transport departments and the county government. This fragmentation makes it difficult for road safety to be coordinated and mainstreamed across public road and transport plans.<sup>1</sup>
2. **Entrenched interests.** The powerful Matatu Owners' Association (MOA) fights for control over the public transport market and often contests new legislation that could reduce their profits. Regulating the use of *matatus* – privately owned minibuses – is therefore extremely difficult unless the *matatu* owners can also benefit by, for example, having a stake in the sale of speed governors.
3. **Enforcement.** Although the National Transport Safety Authority (NTSA) has a mandate to assess road designs for safety concerns, its recommendations can be ignored by other government bodies. Also, a culture of bribery undermines the effectiveness of the traffic police in

enforcing traffic regulations and limits public respect for law enforcement.

4. **Public perception of road safety.** Traffic collisions are widely considered to be the fault of the individual, and therefore government response often focuses on forcing behavioural change – building physical barriers such as railings or speed humps. Such interventions largely overlook the root causes of road safety problems, such as poor road design and limited mobility options.

Overcoming road safety issues remains a low political priority. For an individual to move around Nairobi, the fastest, safest and most comfortable option is to use a private vehicle. Those who can't afford this, travel in a minibus (*matatu*) or on a motorbike taxi (*boda-boda*). If this is too expensive, they must walk. There is, therefore, no strong collective demand for improved public transport: instead, individuals demand more space and better roads for cars.

Even if public demand was there, politicians are still more likely to prioritise road construction over road safety improvements, as shown by consistent government funding for road construction, the prioritisation of new roads in urban development plans, and the recent expansion of several highways in Nairobi. New roads are a tangible sign of government action, whereas road safety improvements are less visible, and so politicians can gain more public recognition for road improvements than for road safety improvements.

## The way forward

To overcome these challenges, strategic interventions are needed. The report makes several recommendations to local and international reformers:

1. **Increase the authority of road safety assessments.** This could be attempted by combining local and international technical expertise and lobbying power to ensure road safety assessments are carried out during the design phase and have legally binding recommendations.
2. **Work in partnership with the new bus rapid transit (BRT) system.** The expected construction of a BRT system in Nairobi will require the redesign of major roads in the city. This presents an opportunity for local and international organisations to work with the newly formed Nairobi Metropolitan Area Transport Authority (NAMATA) to introduce road safety principles.

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1 The recent formation of a new Nairobi Metropolitan Area Transport Authority (NAMATA) may improve coordination over road and transport design for the city.

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**3. Foster intercounty competition on road safety.**

International organisations could support the NTSA to rank each county government on its road safety record and publicise the results, praising or shaming the respective governors and councillors and encouraging improvements.

**4. Incentivise safer *boda-boda* driving.** International and local organisations could work with the Boda Boda Association to find ways to meet drivers' needs while incentivising safer roads – for example, by providing shelters at designated *boda-boda* drop-off points to encourage their use.



---

# 1 Introduction

Nairobi is a rapidly growing city (World Bank, 2014) in which an increasing number of people and vehicles attempt to move around the city every day (JICA, 2013). Like many other fast-growing cities, the competition for the space and means to travel quickly and easily is a huge challenge, and creates collisions and congestion. Nairobi County consistently has the highest number of road traffic fatalities of all counties in Kenya and one of the highest numbers of traffic fatalities per 100,000 residents (NTSA, 2015).

The available data, although not robust, shows that traffic collisions peak during weekends and evenings (NTSA, 2016). It also reveals that fatal traffic collisions are most likely to occur on the new high-speed highways passing through Nairobi. Pedestrians and motorcyclists are the most seriously and frequently affected by road traffic collisions, and while there has been a recent drop in traffic fatalities overall, the number of motorcycle users killed in collisions continues to rise (NTSA, 2016).

This case study explores the underlying challenges to addressing road safety in Nairobi, and the opportunities for overcoming them, from a political economy perspective. The question informing this research is: why is improving road safety in Nairobi so challenging? To answer this, the research situates road safety in the context of wider problems in urban development and governance, transport provision, and competing urban mobility priorities. The study goes beyond technical assessments of road safety to better understand the political economy dynamics at play, and from this is able to identify potential entry points for more effective action on road safety in Nairobi. We ask:

- What are the political economy factors contributing to persistently high levels of road traffic fatalities and injuries?
- What prevents more effective action to improve road safety from being taken?
- What opportunities are there to address underlying causes of road safety problems?

## 1.1 Understanding road safety

Attempts to address road safety around the world have often focused on the collision itself and have understood the problem as the fault of an individual driver and/or pedestrian. Focusing on human error and behaviour leads to road safety initiatives that try to change this behaviour – for example, through public information campaigns, regulations and sanctions, and physical changes such as speed bumps (Wales, 2017).

But there is growing recognition that many more and much wider factors underlie the immediate cause of a collision, and that road safety can be viewed as an outcome of multiple issues, rather than an isolated problem (Wales, 2017). The popular ‘safe systems’ approach considers how the causes of collisions can be addressed in a more integrated way (Welle et al., forthcoming). This could involve changes to various public-sector issues such as land use, vehicle standards, public transport and emergency medical response. Such factors shape people’s transit patterns and options, and the consequences of an injury, which together determine the likelihood of a fatal collision.

Recent thinking on road safety argues that the multiple issues affecting outcomes are grounded in how an area is governed (Wales, 2017). According to Andrews (2015): ‘Road safety is best understood as a governance challenge rather than a technical problem’; it is a public good, threatened by the interests of people to move quickly around densely populated areas, and by competing government priorities over services, investment and economic development (Wales, 2017).

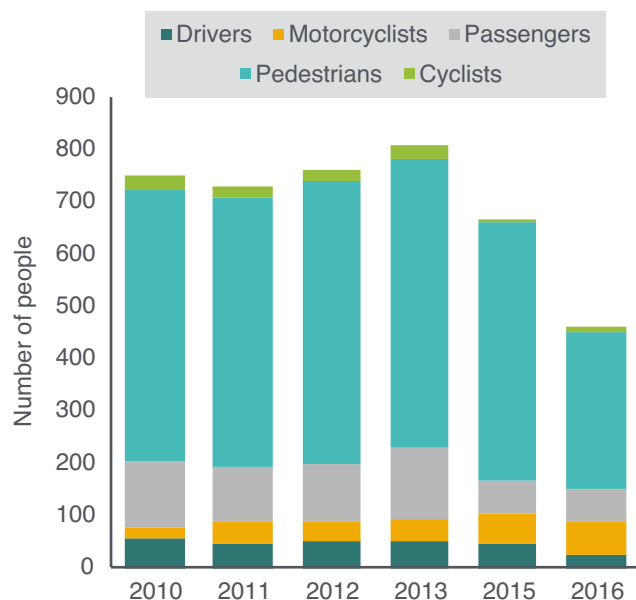
This research attempts to understand what governance issues shape the road and transport sector and so affect road safety outcomes. To do this, we use political economy analysis, which identifies who has the power to influence road safety and what shapes their behaviour. This means examining different stakeholders’ ideas and interests in how a city should develop, their priorities for how they move around the city, and what rules – formal and informal – govern how they use the road and how politicians respond to transport and safety concerns.

## 2 Nairobi's road safety problem

The available data, though not robust, shows that road traffic collisions primarily affect poorer populations living in Nairobi. This is because most fatalities in traffic collisions are pedestrians (Figure 1) and pedestrians are more likely to belong to low-income groups (Figure 2). Pedestrians accounted for 65% of traffic fatalities in Nairobi (NTSA, 2016) and while wealthier residents can afford to use safer transport, such as a private car, poorer people are less likely to have this option.<sup>2</sup> As Figure 2 shows, in 2005 most middle- and low-income people either walked or took a *matatu* to move around Nairobi, while high-income groups were much more likely to use a car (almost 30% of high-income residents' journeys were by car – see Figure 2).<sup>3</sup>

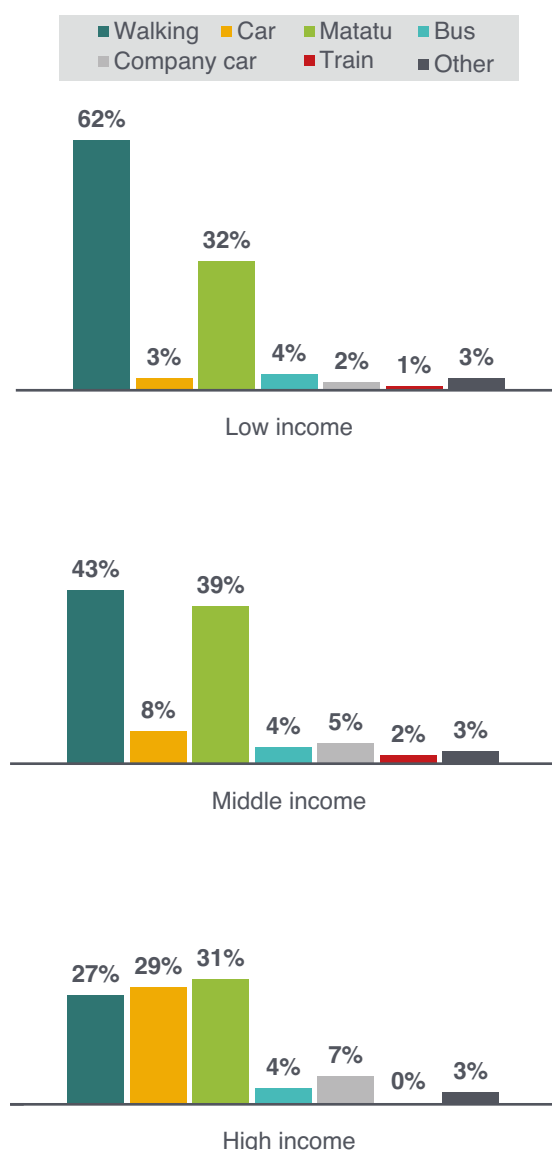
The number of people killed in crashes in Nairobi has declined in recent years (Figure 1). The number of motorcycle users dying in traffic crashes increased in 2015 and

**Figure 1 Traffic fatalities in Nairobi by road user, 2010–2016**



Source: data from NTSA, 2017.

**Figure 2 Mode share in Nairobi by socioeconomic group, 2005**

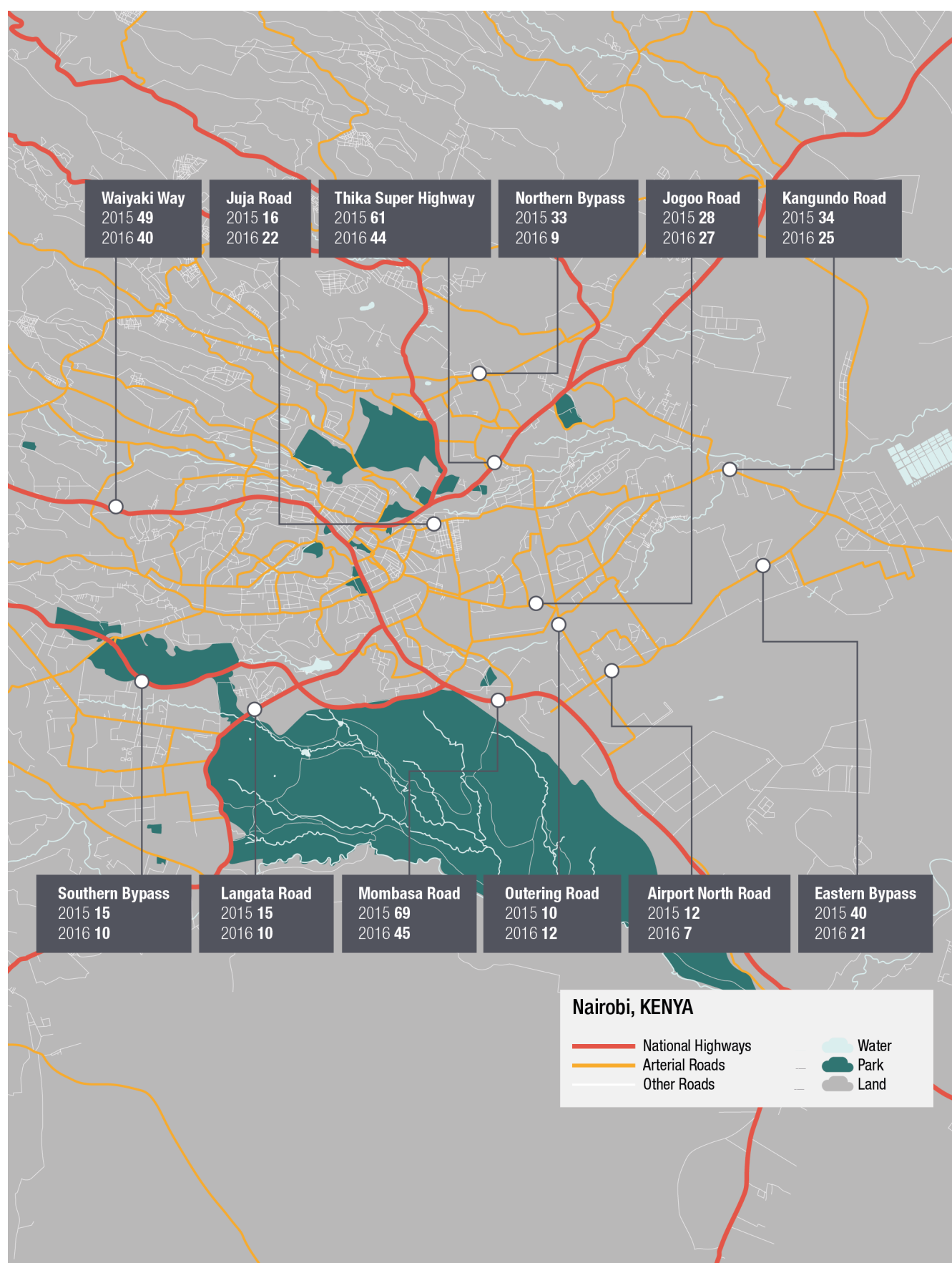


Source: Kayi, 2007, based on data from Aligula, 2005.

2 A survey of 2,105 households found that people living below the poverty line usually walk to work even though the journey might be 10–15 km (Koster, 1999, in Klopp, 2012).

3 More recent mode share data is not available.

**Figure 3 Number of fatalities on Nairobi's high-speed roads, 2015–2016**



Source: authors, based on data from NTSA, 2015 and 2016.

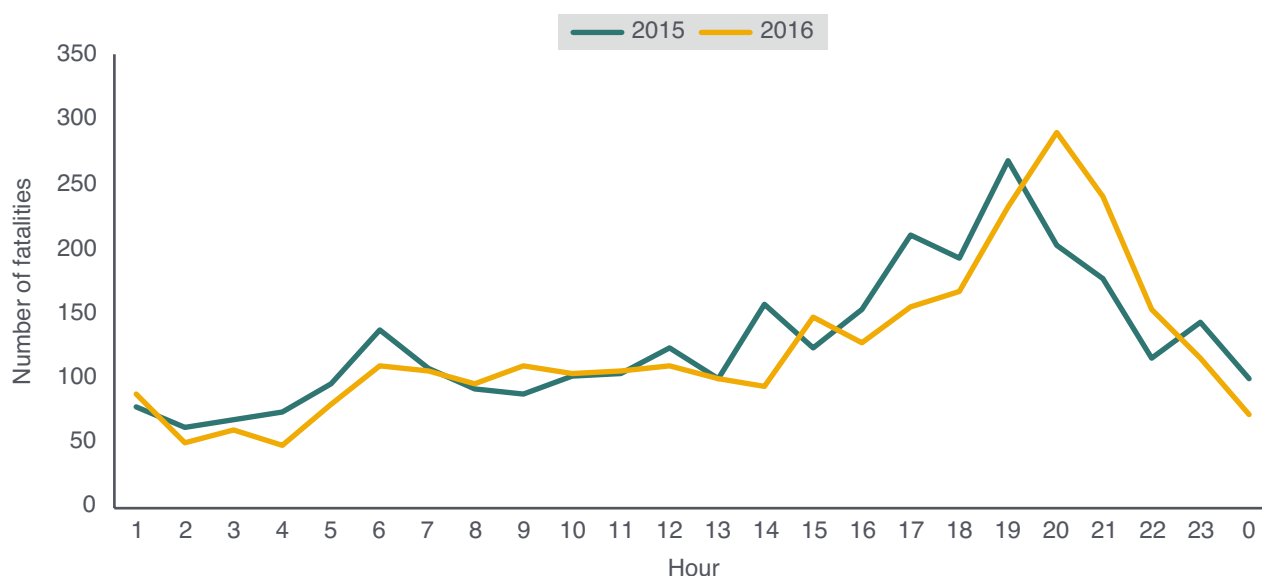
2016, tracking the very steep rise in motorcycle registration in the last decade (from 815 to 8,052) (NTSA, 2017).

Road safety data presents clear patterns regarding when and where traffic fatalities usually occur. Over half of fatalities in Nairobi in 2015 and 2016 happened on high-speed roads. The National Transport Safety Authority (NTSA) has identified 12 high-risk roads, which accounted for 57.2% of traffic fatalities in Nairobi in 2015 and 60.1% in 2016 (Figure 3). The NTSA 2015 Road Safety Status Report suggests that the renovation and expansion of the width of these roads have increased exposure of

people to vehicles and does not protect non-motorised vehicle users.

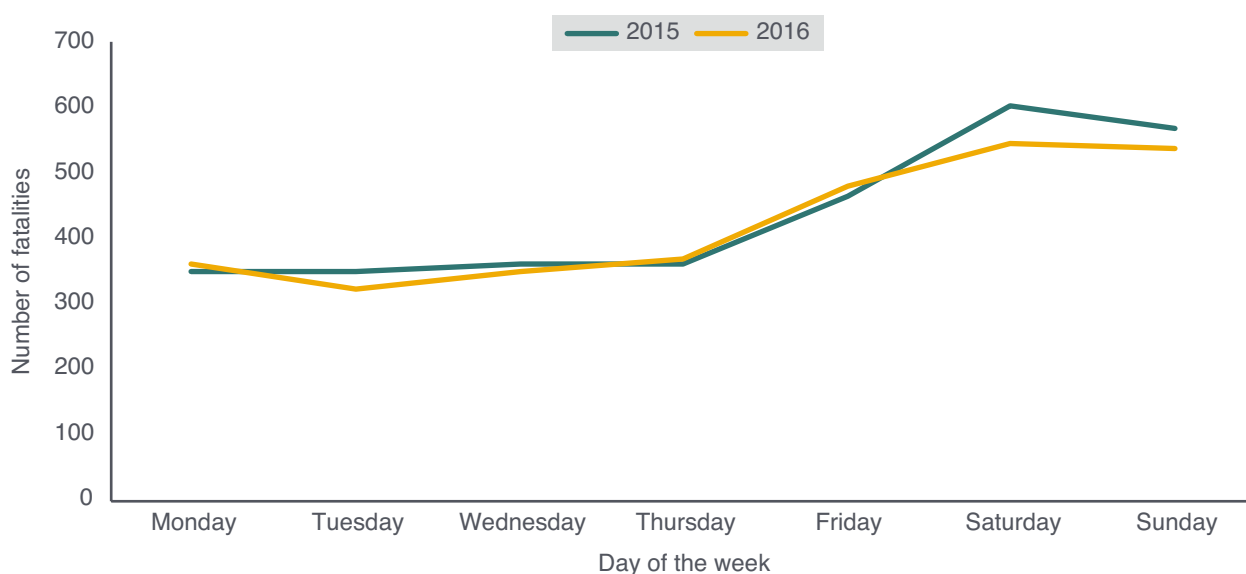
The data also suggests that collisions are linked to the time at which a person is travelling. In 2015 and 2016, most traffic collisions occurred between 17:30 and 22:00 (Figure 4). Fatalities also peaked at the weekend, with the highest frequency of fatalities in 2015 and 2016 occurring on Saturdays and Sundays (Figure 5). Interviews with road safety organisations in Nairobi suggested that fatalities are lower during weekday daytime hours because the congestion is worse and so vehicles are moving more slowly: at the

**Figure 4 Distribution of fatalities over a 24-hour period, 2015–2016**



Source: 2016 Road Safety Status report (NTSA, 2016).

**Figure 5 Distribution of fatalities across the days of the week, 2015–2016**



Source: 2016 Road Safety Status report (NTSA, 2016).

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weekend and later in the evening, drivers can move more quickly. There are also reports of drink-driving being a problem during evenings and weekends (e.g. *The Economist*, 2016). At night, motorcyclists and pedestrians are thought to be at higher risk because of visibility, especially if they do not wear reflective clothing (NTSA, 2016).

The data on road safety in Nairobi (and Kenya) is collected by the NTSA. The NTSA began systematically collecting data on road traffic collisions in 2015 and this data is taken from traffic police records. Unfortunately, there are several weaknesses in the way in which this data is recorded and reported. The timeline for follow-up on the outcome of a collision is not clear: it may be from two weeks to 30 days – and if a victim dies in hospital, their death is unlikely to be recorded by the traffic police. Standardised classification for the severity of an injury is also lacking; rather, individual traffic police officers record injuries according to their own

assessment, making data on injury severity of limited use. Data for crashes that do not result in injuries may not be recorded at all, as motorists tend to agree on compensation without involving the police or insurance companies.

The available data is therefore likely to be an underestimation of the actual number of casualties and collisions. The World Health Organization (WHO) estimates the number of road traffic fatalities in Kenya in 2013 at 12,891 – more than four times the number recorded by the Kenyan police (3,191) (WHO, 2015).<sup>4</sup> The low quality and lack of data are problematic for effective policy-making, and the lack of attention given to improving it suggests road safety is a low political priority. Unpacking the underlying politics of road use and mobility is critical to understanding why road safety continues to be an urgent problem in Nairobi and why it has not received the government attention it requires.

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<sup>4</sup> WHO uses a regression model including covariates such as road density, vehicles per capita, health system access and corruption index to calculate an estimation comparable with other countries (WHO, 2015). In its 2015 road safety status report, NTSA did compile data to meet WHO standards using risk exposure factors of motorisation and fatalities by population. However, this was not done in the 2016 status report. There are now discussions within the NTSA about how it can improve its data collection.



# 3 Why is road safety not a political priority?

The basic problem with improving road safety is that, to move efficiently around a densely populated space, many people in Nairobi choose to use a private vehicle. Private car use in Nairobi increased more than all other vehicle use between 2004 and 2013 (JICA, 2013).

Wealthier residents of the city can afford to own and use a private vehicle and cars are a symbol of social status. For an individual, buying their way out of the problem is the simplest option – especially when public transport options are considered less pleasant or convenient, and do not offer the added social status that car ownership does.

Those who are unable to afford a private vehicle must either pay to travel in a minibus (*matatu*) or on a motorcycle taxi (*boda-boda*). Where these options are also too expensive, individuals have no choice but to walk. This fragmentation in transport use means there is no strong collective demand for better public transport. Instead, individuals seek private solutions through car ownership, which leads to public demand for better roads rather than better transport.

Weak public demand for improved road safety in Nairobi is also because road safety is generally not considered the responsibility of the government but rather the individual – or even just an inevitability of life. Interviewees frequently described how people assume a traffic collision to be an act of God rather than taking personal responsibility for their actions. Consultations with those living and working on one high-risk road, the Thika Highway, found that some people wanted the government to introduce more crossing points and special lanes for motorcyclists. However, none of the interviewees questioned the construction of a high-speed, multi-lane road itself. Road conditions, competition for space between street hawkers and taxis, and human error continue to be blamed for collisions without a wider call for safer urban mobility options.

Roads are generally renowned for being popular investments for politicians, despite low political or public interest in road safety. Public demand for new or better roads is usually strong, and these constructions are visible, permanent and tangible signs of a government's action that may increase a politician's popularity (Wales, 2017). Public contracts for road construction also present opportunities for personal gain through kickbacks or rewards to political patrons (Wales, 2017). The political popularity of roads appears to be true for Nairobi where interviewees frequently commented that government funding is always

available for road construction but not for pedestrian facilities or road safety initiatives. Political support for new and faster roads is evident in the former government's construction of multi-lane, high-speed roads across the city, such as the Thika Road, Eastern Bypass, Northern Bypass, Southern Bypass and North Airport Road.

The political salience of roads was also made clear in Kenya's 2017 presidential elections, during which campaigning candidates promised to expand the country's road network. The Jubilee Party manifesto highlights the number of new roads built or under construction. There is, however, no mention of road safety. Unlike road construction, road safety initiatives do not generate visible outcomes, nor do they create opportunities for political credit and publicity. The resulting political and public popularity of roads, as opposed to road safety, are reflected in the Road Sector Investment Programme and Strategy 2010–2024 (RSIP) and the Metro 2030 plan for Nairobi, which prioritises investment in roads over public or non-motorised transport (Klopp, 2012). Box 1 provides a further example of how political importance given to high-speed roads can conflict with greater action on road safety.

Evidently, it is the most vulnerable road users – pedestrians, cyclists and motorcyclists – who are most frequently and severely affected by road safety problems. Yet, as the data shows, these people are often among the poorest and do not have the choice of a more secure mode of transport. The groups that would benefit most from public investment in and attention to road safety problems are also more likely to be less powerful and less well-connected to influential politicians and government technocrats. Not only is potential demand for greater road safety fragmented across social groups, but poor road safety (unlike congestion, for example) is experienced irregularly and by individuals rather than collectively. This further limits the likelihood of strong, collective demand from citizens for government to address the problem.

## 3.1 Finance for roads and road safety

The prioritisation of road construction is reflected in public funding allocations. National government budget allocations for spending on roads and transport are made by the Ministry of Finance and the Ministry of Transport with approval from the National Assembly. In June 2010,

### Box 1 A campaign to improve school children's safety in Kenya

A recent campaign that sought to improve the safety of school children through amendments to the National Traffic Act demonstrates how political norms in Kenya affect public demand for road safety. The campaign, which involved a group of civil society organisations (CSOs) and supported by Kenya Bus and the Kenyan Red Cross, lobbied for improvements to school buses and reductions in speed limits around schools (from 50 km/h to 30 km/h) during times that children are entering and leaving school.

Advocates had assumed that this campaign would be uncontroversial: they did not imagine a policy to improve child safety would meet with any opposition. But they experienced several setbacks. To draw the attention of national government, the campaigners worked closely with a member of parliament and initially persuaded them to sponsor the bill. The MP later abandoned the bill, reportedly disappointed that the organisations would not offer a bribe for their support (according to an interviewee), and it faced opposition from other politicians who argued it would cause greater congestion and so damage the economy. The bill has now been approved but with speed limits kept at 50 km/h (Owino, 2017).

Organisations describe the difficulty of capturing politicians' attention on a road safety issue and that this is only possible if they have been personally affected road traffic collision or if you offer them a bribe. This campaign found that protecting motorists' ability to drive around the city quickly had more sway over politicians than measures to increase the safety of children when crossing the road.

182 billion Kenyan shilling (KSh) (US\$1.8 billion, at 29 January 2018) was allocated for infrastructure spending to cover roads, rail, ports, broadband and energy, of which nearly half was allocated to roads. Spending on roads has since increased and the 2017/18 budget shows road funding levels of 134.6 billion KSh (IEA, 2017).

The budget allocations to the national road agencies do not show how funds are used within specific road maintenance projects. Some projects allocate funds for road safety campaigns in the areas where roads are built but it is unclear what proportion of the budget is spent on this. In the ongoing Nairobi Outer Ring Road construction project, the Environment and Social Impact Assessment Report states that road safety campaigns, and the construction of footbridges and designated crossing points will be undertaken as a complementary initiative (AfDB, 2012). However, these measures were only included after residents raised concerns in stakeholder consultations that the number of traffic fatalities would increase when new roads were constructed, as has happened in other areas of Nairobi.

At the county level, the 2015/16 Nairobi County budget reports spending 11% of the County Roads department's total expenditure (7.2 billion KSh) on road safety interventions (Nairobi City County, 2016). It is not clear, however, how this was spent. The budget report suggests the expenditure refers to road maintenance and maintaining non-motorised transport facilities and street lighting.

Specific funding for nationwide road safety initiatives is allocated to the NTSA from the Ministry of Transport's budget. Budget documents<sup>5</sup> show that the NTSA has been allocated 300 million KSh on an annual basis and this has increased slightly from 352 million KSh in the 2016/17 to 371 million KSh in 2017/18 (Nairobi City County, 2016). The NTSA has not received grants from development partners. The budget allocations at the national and county level indicate that the budget for the NTSA has not been

challenged, but that there is also sustained support at these levels for road construction and maintenance. The budgetary data does not, however, show whether the funds are being spent effectively or how more or less financing would affect road safety outcomes.

## 3.2 Justification for road investment

Government and donors often justify investment in road construction on economic grounds. For example, the RSIP estimates that every shilling invested in roads will generate 2 shillings and 60 cents in benefits (Ministry of Roads, 2010). The strategy is based partly on expected future vehicle numbers but does not include projections for non-motorised vehicles. A very small amount of funding is allocated to non-motorised vehicle facilities, road safety audits, and raising public awareness of road safety. The strategy notes that 'improvement in the roads under the RSIP will indeed create higher speeds and the potential threat of higher collision rates' and concludes that to mitigate this 'both drivers and pedestrians need to be more fully aware of traffic safety and traffic safety seminars in the road areas affected by the RSIP may be useful' (ibid: 68). There appears to be strong political will behind the strategy: the national government exceeded its road building targets for 2008/12 and 2012/15 (Bhatkal et al., 2016).

Support for public investment in road construction also comes from international donors and investors. In the early 2000s, around half of all funding for road construction and rehabilitation in Kenya was sourced from international donors, such as the World Bank, the African Development Bank (AfDB), the European Union and the Chinese government via grants and loans (Kaunda, 2014; Klopp and Makajuma, 2014). These donors work with the Ministries of Finance and Transport to inform decisions

5 2017/18 Annex of State Corporations Revenue and Expenditure and 2016/17 Annex of Approved Budget State Corporations.

on planning, conduct feasibility studies and support engineering design and road construction. Funding for transport infrastructure in Kenya has historically favoured motorised transport (Klopp, 2012) and donors appear to view investment in roads primarily from an economic development perspective, overlooking public health concerns and focusing on engineering technicalities instead. For example, the African Development Bank (2007) claimed that to address problems of congestion, slow journey times and high collision rates on Thika Road:

*A limited access dual carriageway highway with four lanes on each side, traffic interchanges at existing roundabouts, and intermittent frontage service roads for local traffic - was found to be technically and economically the most adequate solution.*

The appraisal briefly and vaguely mentions ‘social and environmental mitigation measures’ (ibid.). The

Thika Highway Improvement Project example (Box 2) demonstrates how donor and government investment has given importance to motorised traffic without due attention to the vulnerability of non-motorised transport users.

This report does not argue that all road construction and improvement is a bad use of public money, but rather that the continued prioritisation of road construction without consideration of the consequences for urban mobility and safety is a serious challenge for road safety. First, the recently constructed and expanded high-speed roads are where over half of all road traffic fatalities in Nairobi occurred in 2015 and 2016. Secondly, the large public budgets for these projects could mean that less money available for investment in mass public transport and non-motorised transport, which would reduce the need for private cars and motorcycles that are associated with road traffic collision. Thirdly, constructing more roads does not necessarily reduce congestion as is intended and does not challenge the popular preference for private vehicle use.

## **Box 2 The Thika Highway Improvement Project**

This project was one of the first major highway construction projects in Nairobi and was officially completed in 2012. It was funded primarily by loans from the AfDB and a smaller contribution from the EximBank of China. The AfDB claims that the road benefits: commuters, in terms of reduced journey time; those working or studying at the Kenyatta University and Jomo Kenyatta University of Agricultural Technology, which are located near the road; and the informal traders who work close to the road (AfDB, 2012). The initial plan is reported to have come from the Nairobi Metropolitan Area Urban Transport Master Plan, which highlights the inadequacy of urban transport infrastructure in Nairobi and poor mobility on Thika Road (AfDB, 2007).

The road has proven controversial. It leads to the presidential home (and has been considered a ‘presidential ego project’) and has also benefited property developers in the area by raising house prices. The groups that have suffered from the highway construction are primarily low-income traders who were working in the Githurai market area. The highway construction reduced the space available in the Githurai market and, despite the importance of the marketplace for these traders, no alternative space has yet been created (Gichaga, 2016). Instead, traders now set up at the roadside, but some have been killed in traffic collisions (ibid.).

The AfDB appraisal report (2007), which recommended funding for the road’s construction, includes perfunctory comments on the displacement of small roadside businesses and the inclusion of a road safety campaign. But it nonetheless argues that ‘non-motorised road users will also be among the beneficiaries of the project’ and that ‘a large proportion of beneficiaries of the road project will be women most of whom sell horticultural products in the Nairobi Metropolitan Area transported from Thika area and beyond.’ The project appraisal explicitly references the high collision rate on Thika Road and articulates the expectation that the improvements will decrease the collision rate ‘by minimizing vehicle conflicts through interchanges and by providing separate service roads for local and non-motorized traffic.’

The AfDB appraisal describes a consultation process that included NGOs and CSOs but few organisations represent low-income groups in land development or transport planning issues, and media attention to such problems is also low (Gichaga, 2016). Since the project’s completion, the NGO Kenya Alliance of Resident Associations (KARA) and a small civil society organisation, Usalama Watch, have engaged with students living near the road and campaigned for better provision for vulnerable road users. In response, additional physical barriers such as barbed wire have been put in place to ‘encourage’ pedestrians to cross only at footbridges, which demonstrates how road safety measures still prioritise motorised vehicles. Other road users described how the road is dangerous and does not provide enough protection for motorcyclists or pedal cycles.

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# 4 Why is government policy not more effective?

In recent years, road safety has gained more prominence in government policy and regulation in Kenya, perhaps due to growing international debate about this issue and concern over worsening congestion. In the last decade, various policies have been passed (Box 3) and in 2012, the government established the National Transport and Safety Authority (NTSA) to regulate the transport sector. Although greater regulation of vehicle and road use is important, government policy is limited in its effectiveness because it is poorly enforced and it overlooks underlying causes of road safety related to road design, land use and public transport.

## 4.1 Focus on individual responsibility

Firstly, the effectiveness of government policy on road safety outcomes is limited because it mirrors the common understanding that individuals must behave more safely if collisions are to be avoided. The focus of most of the new traffic and road use policies and laws has been on changing behaviour. The 2003 Legal Notice No. 161, for example, aims to regulate the public service vehicle subsector to reduce collisions caused by speeding and enhance the safety of commuters.<sup>6</sup> It also seeks to ensure driver accountability and competence, and restrict vehicle operation to authorised routes (MOTC, 2004). Other recent laws and policies include a legal notice requiring all public service and commercial transport vehicles to be fitted with speed governors, and another requires *matatu* associations (known as Savings and Credit Cooperative Organisations – SACCOs) to submit quarterly reports on collisions involving their vehicles.

Government analysis of road traffic collisions also overlooks the underlying causes of the incidents. For example, the NTSA attributes the high number of pedestrian fatalities to a lack of adequate pedestrian facilities, drink-driving, drink-walking and poor enforcement of traffic laws (NTSA, 2017). Critically, this means that, while the NTSA has a wide remit of responsibilities, most of its activities concern regulation and public information. The NTSA does not have a strong role in road design or urban development or mobility planning, which continue to be conducted by other

government agencies and with little consideration for road safety. For example, an international survey of road quality found that nearly all roads surveyed in Nairobi had high numbers of pedestrians but only 20% had sidewalks (Silverman, 2016). Likewise, high-speed road construction projects in Nairobi often neglect to include infrastructure provisions for non-motorised transport because they are designed for high-speed vehicle transport only (Becker, 2011). This is despite the fact that such roads pass through developed areas where pedestrians, informal street traders and vehicles compete for space along the roadside (Gonzales et al., 2009).

The NTSA has a mandate to review road construction plans from a road safety perspective. But there are currently no standard processes for safety audits of road design and plans are not automatically passed to the NTSA for its approval. The NTSA can give policy advice to other government departments and make recommendations on road design. But the NTSA has little authority within government, and its recommendations on the policy and plans of other government bodies, such as the national road agencies, can be ignored.

## 4.2 Corruption and poor enforcement

The second problem that limits the effectiveness of government regulations is its poor enforcement. The traffic police have primary responsibility for implementing traffic regulations but significant corruption undermines the usefulness of regulation (Chitere and Kibua, 2012; Imboga, 2015). It is widely understood that if a motorist is stopped by the police, they may avoid prosecution by paying a bribe to the officer in the street. These bribes may come from individual motorists but also from public service vehicle drivers, who have a ready supply of cash from their passengers' fares. One particular problem is that some *matatu* owners are active or retired police officers, which affects both the interest and ability of other officers to police these vehicles (Imboga, 2015; Klopp, 2012).

The traffic police department does not deny that corruption exists, but blames both the individual traffic officer and the bribe giver. There are anecdotes of creative subversion of traffic regulation by motorists. For example,

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<sup>6</sup> 'Public service vehicle' is the term commonly used to refer to privately owned minibuses and other buses which offer transport to paying customers.

### Box 3 Key initiatives in policy and governance, 2002–2017

2002	Integrated National Transport Policy: Moving a Working Nation
2003	Legal Notice No. 161, on public service vehicle regulation
2008	Nairobi Metro 2030: A World Class African Metropolis
2010	Road Sector Investment Programme & Strategy 2010–2024
2012	Act No. 33 establishes National Transport and Safety Authority
2012	Urban Development Master Plan for Nairobi City
2013	Legal Notice No. 219, on NTSA Regulations (operation of public service vehicles)
2013	Legal Notice No. 217, on speedometer use in vehicles
2014	National Transport and Safety Authority Regulations (operation of motorcycles)
2015	Non-Motorised Transport Policy for Nairobi
2016	Legal Notice No. 161, on fines for minor traffic offences
2017	Nairobi Metropolitan Area Transport Authority created

since the 2012 Road Safety Act, traffic police have been using roadblocks with breathalysers to check drivers' alcohol consumption to reduce drink-driving. One interviewee considered this to be a successful, though costly, intervention. But there are also reports of people circumventing these roadblocks. Allegedly, there is a Facebook page on which users warn drivers where the roadblocks are so they can avoid them when driving home drunk, and of a network of entrepreneurial drivers who will drive drunken drivers through the roadblock in their own car and then leave them to drive themselves the rest of the way home (Economist, 2016). This culture of corruption not only undermines the effectiveness of traffic regulation, but may also reduce public respect for road use legislation and may engender resentment among those drivers that do obey traffic rules.

### 4.3 Opposition from the *matatu* and *boda-boda* sectors

Direct opposition from the *matatu* sector also limits the effectiveness of traffic legislation (Nderitu, 2017). The *matatu* sector is represented by the Matatu Welfare Association (MWA) and the Matatu Owners Association (MOA), formed in 2001 and 2003, respectively. The MOA represents the interests of investors in the *matatu* industry and is the larger, more powerful organisation. The MOA has used legal opposition and strikes to challenge the introduction of new legislation, including the 2004 requirement for public service vehicles to have seatbelts due to the associated upgrade costs (Chitere and Kibua, 2012).

But in 2004 the then Minister of Transport, John Michuki, who had a reputation for taking forceful action against law-breaking, succeeded in suspending drivers caught breaking safety regulations (Chitere and Kibua,

2012). Michuki reportedly benefited personally from enforcing the legislation since he was a prime supplier of seatbelts to the *matatu* owners. Nevertheless, seatbelt use and the use of speed governors are said to have improved during his tenure although compliance has since waned (Business Daily, 2016). This example suggests that while traffic regulations may be politically unpopular, political leaders may choose to enforce them if there are direct personal gains to be made.

The interests of the MOA regarding road safety are mixed. The Association represents the owners of the *matatus*, not the drivers and touts, and road safety legislation is important for owners who do not want their vehicles to be damaged in collisions. However, owners also want their vehicles to make as many journeys, carrying as many passengers as possible to generate the greatest profit. This puts pressure on drivers and touts to work long shifts, use stimulants to keep working, find shortcuts, drive at high speeds and carry too many passengers.

More recently, the MOA chair reportedly backed new traffic legislation because it provided an opportunity for profit instead of added cost. The chair (in the style of former Minister Michuki) backed the introduction of speedometers in *matatus* and sold the speedometers to other *matatu* owners. A similar alignment of personal business interests is now occurring in relation to the proposed introduction of a bus rapid transit (BRT) system. The MOA chair is heavily engaged in political negotiations over who will own and run the new buses. The expected introduction of the BRT could threaten the *matatu* industry's profits but it also presents *matatu* owners with a business opportunity if they can also own the new buses used for the BRT system. By capturing the commercial interests of *matatu* owners, changes to vehicle legislation and public transport that might otherwise be met with contestation can be facilitated.



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The *boda-boda* drivers, like the *matatu* drivers, are often accused of flouting traffic regulations and causing collisions. *Boda-boda* drivers also aim to make as many journeys as possible in one shift to collect as many fares as possible, which incentivises risk-taking behaviour. However, *boda-boda* drivers also personally carry the cost if they are in a collision or are apprehended for misconduct. As such they have greater interest in engaging with the NTSA to avoid fines and collisions. The Boda Boda Association, registered in 2015, is now working with the Ministry of Transport, the NTSA and NGOs to discuss road safety issues. Here, there is potential for constructive dialogue about the need to improve driver behaviour, but also about how to meet the needs of motorcycle drivers regarding safe road space, shelters at designated pick-up points and training.

In summary, the challenges of enforcing government legislation mean that drivers are often not penalised for dangerous road use. This means there is little incentive for other drivers to obey the rules. Widespread corruption in the traffic police makes a mockery of traffic regulation and supports a culture of disrespect for rules. Furthermore, the difficulties of regulating the *matatu* and *boda-boda* sector mean that passenger experience of public transport is poor, and public transport has a bad reputation. This is likely to fuel aspirations for personal transport and makes a demand for public transport less likely. Yet, if private vehicle use continues to increase, the struggle for road space will also continue, exacerbating demand for more high-speed roads, rather than more efficient and safer mass-transit.

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# 5 How planning and design affects road safety in Nairobi

While road and transport design are widely recognised as important factors shaping road safety (Wales, 2017), there are multiple barriers to ensuring that safety is considered in Nairobi's road and transport design. These barriers include institutional mandates and government coordination as well as political and personal interests that may be at odds with government intervention.

In Nairobi, the major roads classified as highways and managed by the Kenya National Highway Authority (KenHA) include Mombasa Road, Southern Bypass and Thika Superhighway (see Methodology). Nairobi's designated urban roads, managed by the Kenya Urban Roads Authority (KURA), include the Ngong road, Northern Bypass, Eastern Bypass, Waiyaki Way and Outer Ring Road (see Methodology). KURA is also mandated to construct 17.2 km of non-motorised transport lanes in Nairobi, and to work with the police to manage traffic and road safety in urban areas. All remaining roads are managed by the Nairobi County Government which has a Public Works, Road and Transport department to oversee all matters related to roads, street lighting, traffic, parking and public road transport. The county council committee with the political leadership of this department directs policy and interventions on road safety at the county level.

This governance structure means that road design and maintenance decisions are split across three government bodies, and divided between county and national governments and political leaders. If the NTSA is to ensure that safety is considered in the planning, design and maintenance of all roads in Nairobi, it must work closely with KURA, but also with KenHA and the county government. The challenge here is that, as discussed, the NTSA has little authority within the Ministry of Transport or over the other agencies or county government, which are more heavily influenced by the political salience of road construction.

Road safety in Nairobi is also relevant to the work of the newly formed Nairobi Metropolitan Area Transport Authority (NAMATA). The Authority's primary focus is on advancing the plans for a bus rapid transit (BRT) system (Box 4). One NAMATA engineer emphasised the importance of improving public transport but also of making more space for non-motorised transport to increase mobility and safety in Nairobi. They stated strongly the need to turn road space into safe walkways for pedestrians, given that walking accounts for at least 50% of the mode share in Nairobi, and there are reportedly plans to widen walkways in the central business district to improve walking safety and comfort in this area.

NAMATA is in a strong position to enforce decisions and implement transport plans, potentially with consideration for vulnerable road users. An NTSA representative works in NAMATA, which raises the possibility of coordination and collaboration between national action on road safety and Nairobi metropolitan area transport planning. NAMATA can access funds from national government, the five council budgets, and from donors or private sector actors, and its board includes the governors of each county council as well as the Cabinet Secretary for Transport, which boosts its political power.

NAMATA is, however, a very new organisation and is yet to demonstrate its capability or priorities with respect to road safety. Its formation – from agreement in the 2014 memorandum of understanding to its creation in 2017 – involved long negotiations between the five counties' respective governors over the scope of NAMATA's mandate and how it would be funded. The slow political process behind its creation suggests that NAMATA's efficiency in delivering its mandate could be limited by political wrangling over each county's financial contributions, and their respective benefits and responsibilities.

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**Box 4    Negotiating the introduction of a bus rapid transit system**

Plans to develop a bus rapid transit (BRT) system in Nairobi have been under discussion for several years but now appear to be progressing. Government officials have visited other cities with a BRT system, including Bogotá, and there appears to be political support for such a system in Nairobi.

But delays to planning and construction are reportedly due to unresolved questions of who will pay for, operate and manage the new system. One interviewee commented that, as construction may take longer than a single four-year election term, political leaders risk investing public money without being able to take the credit for its completion. There are conflicting reports on whether national or county governments will finance the construction and subsidise fares or whether the system is expected to recover its costs.

It is also not yet clear how the BRT may affect the *matatu* industry. One possible model is for the system to be run by the Matatu Owners Association (MOA), or to allow the MOA to buy shares in the system. MOA has already started investing in buses for the project with the clear intention of controlling bus operation, and they have been approached by a bus manufacturer and an international bank offering finance. Interviewees said the MOA is not opposed to the BRT system if it can run it and therefore not lose market share in urban transport.

Individual *matatu* drivers and touts (who encourage passengers onto buses) may not be absorbed by the new system, however – though *matatus* are expected to provide feeder services to the BRT pick-up points and continue to service the routes not served by the BRT. The challenge with allowing *matatu* owners to run the new transport system is that, according to interviewees, they lack management skills. Some interviewees commented that if the MOA is allowed to run the BRT, poor bus maintenance or unreliable schedules could cause the project to fail.

Despite the negotiations over financing and operation, one government interviewee was confident that construction would begin soon. NAMATA is now responsible for driving the project forward and, with five county governors and the Minister of Transport on the its board, there should be little government opposition to its decision-making. Those benefiting from the project are expected to be commuters who are currently dependent upon *matatus*, politicians associated with its development and financing (in particular, the new Nairobi County Governor), the MOA chair and other road users, as congestion is reduced.

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# 6 Addressing the broader urban development challenge

Decisions on road design and transport are symptomatic of wider challenges associated with rapid urban growth and land use. Urban development in Nairobi is not strategic. Despite the existence of an independent Land Commission and the formulation of urban masterplans – including those supported by international actors – disagreement over land ownership is common and private commercial interests can distort formal development plans (Becker, 2011). This allows the city to sprawl as peripheral land is developed informally and at low-densities to meet the growing population's demand for housing (World Bank, 2014). The sprawl contributes to long-distance commuting and while the *matatu* industry emerged to service these transport needs, it is relatively unregulated and inefficient (Klopp, 2012). The resulting mobility challenge affects all Nairobi residents who experience the problem of congestion on a regular, if not daily, basis. The collective need for improved mobility is therefore strong. But rather than calling for more efficient public transport and strategic land-use planning, demand focuses on faster roads and individuals aspire to car ownership. This contributes to the political salience of road construction at the expense of investment in road safety and public transport.

The transport sector is also beset by private commercial interests that influence formal decision-making processes. The gradual increase in regulation of the *matatu* sector was only possible when new legislation led to personal financial gain – for example, through the sale of seatbelts and speed governors. Likewise, negotiations between the government and the MOA over who will own and run the proposed new BRT system are pivotal in allowing or preventing the introduction of a new formal transport system and of greater regulation. The *matatu* sector could oppose the BRT, on the grounds that it will prevent *matatus* from servicing the city centre and reduce their market share, but the system also offers the potential for *matatu* owners to profit, provided they can agree a role in ownership and operation (Box 4).

Finally, civic action on road safety takes place in a political culture where accountability between Kenyan politicians and citizens is weak and shaped heavily by personal ties rather than electoral promises or citizens'

rights (Burgess et al., 2010). Client-patron relations affect all areas of public office, and personal connections and private interest often trump formal policy and law (Wanyama and McCord, 2017). With respect to road safety, this political culture is seen to undermine regulation over land and road-use, and changes to the transport system, as well as creating difficulties for civil society groups to lobby for government intervention.

Public action on road safety in Nairobi is relatively minimal but there is a community of CSOs engaged in demanding improvements to road safety, with some support from international organisations. However, civil society calls for increased government attention to road safety encounter difficulties in gaining political support. The major highways and large urban roads are controlled by national government while county governors and members of county assemblies now have more power over how local resources are allocated to road construction and maintenance (Bhatkal et al., 2016). This means that, to shape road safety and road design in Nairobi, the priorities and political networks of elected representatives at both the county level and at the national level are important. Accessing and influencing these individuals and their decisions can be a challenge for CSOs, which may not personally be connected to those in power.

The political difficulty of achieving government action on road safety can be seen in the efforts of the 'Share the Road' programme to introduce a new non-motorised transport policy for Nairobi. Share the Road was led by the United Nations Environment Programme (UNEP) in collaboration with the Kenya Alliance of Resident Associations (KARA), a large NGO formed in 2000, and with funding from the FIA Foundation. KARA began campaigning on non-motorised transport issues as part of its work on congestion, poor transport planning and road safety for its members. KARA and UNEP worked with members of the Nairobi County Assembly to develop a non-motorised transport policy for Nairobi.

As a KARA member explained, the organisation knew that, for the policy to be approved by the Nairobi County Assembly, they would first need to convince individual assembly members of the importance of non-motorised

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transport. To do this, Share the Road organised a two-day workshop for members of the County Transport Committee to explain the policy and its importance. They argued that 50% of journeys made in Nairobi are made on foot and yet there is very little investment in non-motorised transport. KARA tried to persuade the assembly members to support the policy on the basis that it would improve air quality, reduce car use and the number of people killed in traffic crashes, and boost the members' political standing. They also tried to persuade members of the county assembly that getting the policy approved would be their legacy in the Council's transport sector, which would give them political popularity and visibility. According to KARA, some County Transport Committee

members initially resisted and asked to be paid to support the policy. Share the Road refused to pay bribes, continued to lobby and won the support of the Committee chair. The policy was finally passed in 2015 and KARA, UNEP and other stakeholders are now working to make sure it is put into practice.

This example demonstrates how, despite competing interests, the creation of new governance structures, competing interests and persistent lobbying by an alliance of stakeholders can drive improvements in Nairobi's policy for transport and road design. While these changes may not directly target the most vulnerable road users, they are at least opportunities for improvements in road safety at the city level.



# 7 Recommendations

Who needs to employ strategic interventions to overcome resistance to improved regulation and road and transport design? Recent improvements in road-safety legislation and investments in public or non-motorised transport have not been driven by data on road traffic collisions.

Rather, the driving forces that emerged frequently in discussion with Nairobi stakeholders were:

- public frustration with congestion
- public awareness of a collision hot-spot
- opportunities for personal financial gain and political credibility
- pressure from international organisations.

It is difficult to trace these processes of change accurately without further research, but using these as a basis, we suggest four potential entry points to change for local and/or international organisations addressing road safety.

The situation in Nairobi is constantly evolving. Since this research was conducted, a new governor of Nairobi has been appointed, advances have been made with the BRT and new urban management boards have been announced – all of which are likely to have an influence on road safety outcomes. Alongside the recommendations, it will be important for those working on road safety to be able to consider how such changes, within and beyond formal government, can create new opportunities and challenges for improvement in road safety in the city.

## 7.1 Road safety assessments

Within Nairobi, many fatal road traffic collisions occur on high-speed roads. To address safety issues on these major roads, the NTSA is trying to increase its influence across national road and transport bodies. The NTSA aims to amend the 2012 Road Traffic Act to give greater strength to its road safety assessing role. This is also a key demand of the 2015 NMT policy for Nairobi. The International Road Assessment Programme has begun work with the NTSA on assessing road designs but the NTSA require greater authority to make the recommendations from their assessments obligatory.

To increase the legal power of road auditing and assessing, **international actors such as International Road Assessment Programme and the World Bank could partner with politically engaged local organisations to encourage the national government to make road safety**

**assessments obligatory and their recommendations enforceable.** An initial activity could be, as one NTSA interviewee suggested, a roundtable or forum in which road safety concerns could be discussed with others working on road construction and design to share perspectives and understand each other's priorities. The current collaboration between international donors and the Kenyan government on road construction and design and the apparent willingness of NAMATA to engage on road design issues suggests that there may be potential for road safety assessments to gain greater importance, at least in Nairobi, as a starting point.

## 7.2 Road redesign for BRT construction

The redesign of city-centre roads to accommodate the construction of Nairobi's bus rapid transit system is an opportunity to improve cross-agency coordination and increase the authority of the NTSA. Five major roads must be redesigned and reconstructed for the BRT, and the process involves various stakeholders including the MOA and donors. NAMATA – the agency responsible for the design and implementation of the BRT – is also charged with implementing the 2015 NMT policy, which should be integrated with the BRT plans.

**CSOs and NGOs should review the proposed BRT designs and assess their attention to road safety issues.** NTSA has a representative in NAMATA who could use the BRT as a high-profile opportunity to conduct a road safety audit or assessment. Technical support from International Road Assessment Programme and the Japan International Cooperation Agency could be useful, especially because the latter has already produced detailed road designs for safer urban mobility in Nairobi. As the plans are operationalised, **there could be ongoing opportunities for the NTSA and other advocates to monitor progress and hold NAMATA to account on the non-mobilised transport policy provisions.**

Reflecting on previous NGO-led campaigns, politicians concerned that traffic speeds would be reduced may oppose demands for safer road design and road safety assessments. Politicians are also likely to demand payment for supporting changes to the 2012 Road Traffic Act. But Share the Road's experience suggests that persistent lobbying without the use of bribes can be successful. The high-profile nature of the BRT may also encourage greater attention to road design as it offers an opportunity for national politicians to promote Nairobi's progress.

### 7.3 Inter-county competition on road safety

Since the 2010 Constitution, county councils have had responsibility for road safety and maintenance over smaller roads in their jurisdiction. Some CSOs hope that this devolution will increase their influence locally, enabling them to work with the county roads and transport committees and the county assemblies, as the Share the Road programme did to pass the non-mobilised transport policy for Nairobi County. In Nairobi, working with the county government and assembly on road design and safety issues may be particularly important as it is now part of NAMATA.

Working within NAMATA will give the county government influence over transport planning and road design for the whole metropolitan area, and connect county-level actors to national road agencies and the NTSA. This new governance structure may in turn enable CSOs and NGOs to use contacts at the county level to influence decision-making in less accessible government bodies. It is currently difficult to persuade Nairobi county councillors to address road safety. But, as this study found, politicians are more likely to support interventions on road safety, if there are opportunities for personal or political gain.

One approach to create a sense of political gain could be through fostering competition. **Organisations such as the World Bank or the WHO could work with the NTSA to develop indicators for measuring the quality of county-level road safety policies and outcomes.** These scores could then be used to rank counties on their performance. Media outlets such as the *Daily Nation*, which is already supportive of action on road safety, could **publicise the performance of different counties and praise or shame them accordingly.** Increased public awareness of a county's relative road safety record may increase or lessen county politicians' political credit. There are similar international initiatives to reward countries performing better on road safety and urban sustainable transit which appear to motivate political action (Scruggs, 2017).

### 7.4 Self-regulation by *boda-boda* drivers

Motorcycle use is increasing, and motorcycle users are second only to pedestrians in their risk of involvement in traffic collisions and fatalities. Regulation of motorcycles has gradually increased but its enforcement is undermined by the need of drivers to move around the city as quickly

as possible, and by the limited effectiveness of the traffic police. As this study has found, aligning the personal incentives of *matatu* sector with new traffic regulation can be successful in improving compliance. **The recent formation of the Boda Boda Association of Kenya presents new opportunities for government regulation to similarly align with the needs of motorcycle taxi drivers.**

The Association is keen to improve the safety of its members and improve their reputation so this interest may be leveraged to **explore ways of encouraging *boda-boda* drivers to use designated pick-up points and adhere to road use regulations.** For example, *boda-boda* drivers complained of the cold conditions of their work so if the county government provided shelters at designated pick-up points, drivers may be more willing to use them and less likely to obstruct pedestrians by parking on sidewalks. Donors and NGOs could play a role by facilitating dialogue between the Boda Boda Association and the NTSA, NAMATA, Nairobi County Government and other relevant government bodies.

### 7.5 Unanswered questions

This study reveals the breadth of issues affecting road safety outcomes in Nairobi and could not address all of them sufficiently. Many questions remain unanswered which would be useful for better understanding what is driving progress in road design, urban mobility, and safer road use. The following questions require further research to better understand what enables and limits improvements to road safety in Nairobi:

- How are plans and designs related to road construction, expansion and maintenance; urban transport; and land use developed by the different government agencies. What is prioritised and whose ideas guide these separate decision-making processes?
- What motivated and enabled the government to enhance formal policy and legislation on road safety?
- How is NAMATA positioned to influence road as well as transport design, and what would enable road safety to have greater influence in these decisions?
- What is the attitude of different population groups in Nairobi towards improved public transport?
- How can data be simply and cheaply improved so that policy-makers and planners have a better understanding of how, why and where collisions occur?

# References

- AfDB – African Development Bank (2007) *Appraisal report: Nairobi – Thika Highway Improvement Project*. Tunis: AfDB Infrastructure Department
- AfDB (2012) 'AfDB-funded Thika Superhighway: a masterpiece for East Africa "A national pride" – President Mwai Kibaki'. AfDB news, 9 September 2012 ([www.afdb.org/en/news-and-events/afdb-funded-thika-superhighway-a-masterpiece-for-east-africa-a-national-pride-president-mwai-kibaki-9986](http://www.afdb.org/en/news-and-events/afdb-funded-thika-superhighway-a-masterpiece-for-east-africa-a-national-pride-president-mwai-kibaki-9986))
- Aligula, E.M., Abiero-Gariy, Z., Mutua, J., Owegi, F., Osengo, C. and Olela, R. (2005) *Urban public transport patterns in Kenya: a case study of Nairobi City*. Special Report No. 7. Nairobi: Kenya Institute for Public Policy Research and Analysis
- Andrews, M., Pritchett, L. and Woolcock, M. (2015) *The challenge of building (real) state capability*. CID Working Paper No. 306. Cambridge, Massachusetts: Harvard Kennedy School
- Becker, T. (2011) 'Obstacles for non-motorized transport in developing countries – a case study of Nairobi, Kenya'. Conference paper for the European Transport Conference 2011, Association for European Transport
- Bhatkal, T., Blampied, C., Chattopadhyaya, S., Jalles D'Orey, M.A., Greenhill, R., Hart, H., Kelsall, K., Long, C., Mustapha, S., Samman, E., Binat Sarwar, M., Simonet, C., Stuart, E., Tulloch, O. and Wales, J. (2016) *Leaving no one behind in the roads sector: an SDG stocktake in Kenya*. ODI Report. London: Overseas Development Institute
- Burgess, R., Jedwab, R., Miguel, E. and Morjaria, A. (2010) 'Our turn to eat: the political economy of roads in Kenya'. Draft. Wageningen: Roads for Water (<http://roadsforwater.org/our-turn-to-eat-the-political-economy-of-roads-in-kenya>)
- Business Daily (2016) 'NTSA names public transporters tampering with speed governors', Business Daily, 11 August ([www.businessdailyafrica.com/news/NTSA-names-public-transporters-tampering-with-speed-governors/539546-3341514-a9hqavz/index.html](http://www.businessdailyafrica.com/news/NTSA-names-public-transporters-tampering-with-speed-governors/539546-3341514-a9hqavz/index.html))
- Chitere, P.O. and Kibua, T.N. (2012) Efforts to improve road safety in Kenya: achievements and limitations of reforms in the *matatu* industry. Nairobi: Kenya Institute for Policy Analysis and Research
- Economist (2016) 'How to drive drunk in Kenya', *Economist* (Middle East and Africa print edition), 21 May ([www.economist.com/news/middle-east-and-africa/21699172-clever-tricks-beating-breathalyser-not-death-how-drive-drunk](http://www.economist.com/news/middle-east-and-africa/21699172-clever-tricks-beating-breathalyser-not-death-how-drive-drunk))
- Gichaga, F.J. (2016) 'The impact of road improvements on road safety and related characteristics', *IATSS Research* 40: 72–75
- Gonzales, E.J., Chavis, C., Li, Y. and Daganzo, C.F. (2009) *Multimodal transport modelling for Nairobi, Kenya: insights and recommendations with an evidence-based model*, Berkley: University of California
- IEA – Institute for Economic Affairs (2017) *Budget analysis 2016–2017*. Nairobi: Institute for Economic Affairs
- Imboga, J.O. (2015) 'Passenger's perception of risk factors in relation to road traffic accidents in Kenya: case study of regular users of public transport in Nairobi county' (MA paper, University of Nairobi)
- JICA – Japan International Cooperation Agency (2013) *JICA personal travel survey*. Tokyo
- Jubilee Party (2017) 'Jubilee manifesto 2017' (<http://deputyresident.go.ke/images/jpmanifesto2017.pdf>)
- Kaunda, D. (2014) 'Enhancing connectivity and regional integration through roads development', *Uchukuzi* Issue No. 1. Nairobi: Ministry of Transport and Infrastructure
- Kayi, C. (2007) 'Exploring Policy options and strategies in enhancing the safety of non-motorized transport modes in african cities: the case of Nairobi City'. A paper presented at the 11th World Conference on Transportation Research, University of California, Berkeley, 24–28 June 2007
- Klopp, J.M. (2012) 'Towards a political economy of transportation policy and practice in Nairobi' *Urban Forum* 23: 1–21
- Klopp, J.M. and Makajuma, G. (2014) 'Transportation infrastructure integration in East Africa in a historical context' in M. Schiefelbusch and H.L. Dienel (eds.) *Linking networks: the formation of common standards and designs for infrastructure*. Berlin: Berlin Technical University
- Ministry of Roads (2010) *Road sector investment programme and strategy 2010–2024*. Nairobi: Ministry of Roads, Government of Kenya
- MOTC – Ministry of Transport and Communications (2004) *Transformation of road transport report*. Nairobi: MOTC
- Nairobi City County (2016) Estimates for recurrent and development expenditure programme based budget 2015/2016 and projections for 2016/2017 and 2017/2018. Nairobi: Nairobi City County (<http://nrbccountyassembly.go.ke/transport-and-public-works-2>)
- Nderitu, J. (2017) 'Bus rapid transit in Nairobi: a *matatu* driver's perspective', Nairobi Planning Innovations: Innovations in Urban Planning for the Nairobi Metropolitan Area, 4 January (<https://nairobiplanninginnovations.com/2017/01/04/bus-rapid-transit-in-nairobi-a-matatu-drivers-perspective>)
- NTSA – National Transport and Safety Authority (2015) *Road safety status report 2015*. Nairobi: NTSA
- NTSA (2016) *Road safety status report 2016*. Nairobi: NTSA
- NTSA (2017) *Improving road safety on Nairobi's high-risk roads*. Nairobi: NTSA

- 
- Owino, S. (2017) 'MPs approve new traffic regulations for school buses', Daily Nation, 8 June ([www.nation.co.ke/news/education/MPs-approve-new-traffic-regulations-for-school-buses/2643604-3960266-srnf1/index.html](http://www.nation.co.ke/news/education/MPs-approve-new-traffic-regulations-for-school-buses/2643604-3960266-srnf1/index.html))
- Rocha Menocal, A. (2014) *Getting real about politics: from thinking politically to working differently*. ODI Working Paper. London: Overseas Development Institute
- Salon, D. and Gulyani, S. (2010) 'Mobility, poverty and gender: travel "choices" of slum residents transport reviews' *Transport Reviews* 30(5): 1464–5327
- Scruggs, G. (2017) 'New bus rapid transit system earns Dar es Salaam 2018 Sustainable Transit Award', Citiscope, 30 June (<http://citiscope.org/story/2017/new-bus-rapid-transit-system-earns-dar-es-salaam-2018-sustainable-transit-award>)
- Silverman, A. (2016) *Rights of way: child poverty and road traffic injury in the SDGs*. Washington, D.C.: F1A Foundation and UNICEF
- Wales, J. (2017) *The political economy of road safety: a policy-oriented literature review*. ODI Report. London: Overseas Development Institute ([www.odi.org/publications/10739-political-economy-road-safety-policy-oriented-literature-review](http://www.odi.org/publications/10739-political-economy-road-safety-policy-oriented-literature-review))
- Wanyama, F.O. and McCord, A. (2017) *The politics of scaling up social protection in Kenya*. ESID Working Paper No. 87. Manchester, UK: Effective States and Inclusive Development Research Centre, University of Manchester
- Welle, B., Bray Sharpin, A., Adiazola-Steil, C., Job, S., Shotten, M., and Bose, D. (forthcoming) 'Sustainable and safe: a vision and framework for zero road deaths through safe systems'. Washington DC: World Resources Institute and Global Road Safety Facility
- WHO – World Health Organization (2015) *Global status report on road safety 2015*. Geneva: WHO
- World Bank (2014) *Kenya Urbanisation Review*. Washington DC: World Bank









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# Making in-roads

## The politics of road safety in Mumbai

Tanushri Gupte



**Case study**

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This document contains preliminary research, analysis, findings and recommendations. It is being circulated to stimulate timely discussion and critical feedback, and to influence ongoing debate on the emerging issue of the political economy analysis of road safety.

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Cover photo: Pedestrians try to cross the Bharatmata Intersection in busy traffic in the Island City of Mumbai © Prasad Shekhar/WRI India, 2018.

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## About this case study

This study examines the political economy of road safety in India, with a focus on Mumbai. The idea is to identify the underlying factors embedded in the political, economic and social framework of the city which influence road safety.

This case study is part of a broader project that analyses the political economy of urban road safety issues, undertaken by the Overseas Development Institute (ODI) and the World Resources Institute (WRI), and funded by the FIA Foundation. It accompanies a theoretical background paper (Wales, 2017); two other case studies on Bogotá, Colombia, and Nairobi, Kenya; and a synthesis report.

### **The political economy of road safety**

Political economy is a discipline with a long tradition in the social sciences. As an analytical approach, it seeks to understand the underlying reasons why things work the way they do and to identify the incentives and constraints impacting the behaviour of actors in a relevant system (Rocha Menocal, 2014). Characteristics of a political economy approach include:

- a concern with the role of formal and informal ‘rules of the game’.
- an analysis of power and the processes of contestation and bargaining between economic and political elites.
- a focus on the interests of different groups.
- an analysis of how these interests impact development outcomes, at times to the detriment of broader development objectives.

In general, there has been a tendency within policy-making circles to treat road safety as a technical issue. Exploring road safety from a political economy perspective constitutes an emerging field of study which seeks to understand when, how and why road safety emerges as an issue of public concern and how reform efforts can be most effectively supported taking those dynamics into account. The most recent *Global Report on Road Safety* includes some key aspects related to the political economy of road safety such as political saliency and resource allocation. The report also emphasises the importance of having traffic safety on the political agenda as a manner to mobilise resources and public awareness on road safety issues (WHO, 2015).



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# Acronyms

<b>ADGP</b>	Additional Director General of Police
<b>BIGRS</b>	Bloomberg Initiative for Global Road Safety
<b>BNVSAP</b>	Bharat New Vehicle Safety Assessment Program
<b>CSO</b>	civil society organisation
<b>CSR</b>	corporate social responsibility
<b>GDP</b>	gross domestic product
<b>Gol</b>	Government of India
<b>GoM</b>	Government of Maharashtra
<b>MCGM</b>	Municipal Corporation of Greater Mumbai
<b>MMR</b>	Mumbai Metropolitan Region
<b>MMRDA</b>	Mumbai Metropolitan Regional Development Authority
<b>MMVR</b>	Maharashtra Motor Vehicles Rules of 1989
<b>MoHA</b>	Ministry of Home Affairs
<b>MoHFW</b>	Ministry of Health and Family Welfare
<b>MoI</b>	Ministry of Heavy Industries and Public Enterprises
<b>MoRTH</b>	Ministry of Road Transport and Highways
<b>MoT</b>	Ministry of Transport
<b>MoUD</b>	Ministry of Urban Development
<b>MPWD</b>	Maharashtra Public Works Department
<b>MSRDC</b>	Maharashtra State Road Development Corporation
<b>MTP</b>	Mumbai Traffic Police
<b>MVA</b>	Motor Vehicle Act
<b>NCAP</b>	New Car Assessment Program
<b>NRSC</b>	National Road Safety Council
<b>NGO</b>	non-governmental organisation
<b>NHAI</b>	National Highway Authority of India
<b>ODI</b>	Overseas Development Institute
<b>PIL</b>	public interest litigation
<b>RTO</b>	Regional Transport Office
<b>SRSC</b>	State Road Safety Council
<b>UDD</b>	Urban Development Department
<b>UN</b>	United Nations
<b>VRU</b>	vulnerable road users
<b>WHO</b>	World Health Organization
<b>WRI</b>	World Resources Institute

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# Methodology

The study begins by exploring the city's historical background with a focus on transportation. An analysis of road crash data has been conducted to recognise the most vulnerable road user groups. Interviews of local road safety experts and public officials and a chronological study of the policy level interventions at national, state and local levels has been conducted to frame a picture of the state of road safety in Mumbai and India. The final stage of the study involves summarising challenges and identifying opportunities to improve road safety with a special focus on influencing political will.



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# Executive summary

The world has seen some major developments in road safety over the past two decades, such as the UN Decade of Action for Road Safety and the adoption of the 2030 Agenda for Sustainable Development. However, road safety is largely ignored in India, despite the scale of the challenge in the country. In 2015, India accounted for more road fatalities than any other country in the world, with close to 150,000 traffic fatalities officially reported. This translates into 12.3 road traffic fatalities for every 100,000 people – one of the highest rates in the region. Apart from the loss of life and severe financial and emotional stress caused to the victims' families, road crashes also result in significant productivity losses for the country. It is estimated that road crashes cost India close to 3% of its gross domestic product (GDP) (\$8 billion) every year (Mohan, 2004; Balachandran, 2016).

While road safety is considered a serious public health issue and has been exhaustively researched internationally, research on road safety in India (apart from the representation of crash statistics) is sparse. Aiming to throw light on the subject in the Indian context, this paper examines the political economy of road safety in India, with a focus on Mumbai in order to understand the underlying factors embedded in the political, economic and social framework of the city that influence road safety. Such research is in its nascent stages, and India is currently undergoing significant economic reforms that are already having a significant impact on the urban transport sector. A study of these reforms, specifically in relation to road safety, would be a valuable addition to this study.

## Road safety in Mumbai

Mumbai is the capital city of the state of Maharashtra and the most populous city in the country. The city's status as the commercial centre of the country has driven both its physical and financial growth over the past few centuries, and continues to do so. Mumbai's population has grown from approximately 3 million people in the 1960s to more than 12 million. Every day, millions of commuters use the city's transport infrastructure – both new (mostly roads) and old (public transportation). And while there have been efforts to augment this infrastructure, it still falls drastically short of meeting the city's needs: new developments are focused on motor vehicle infrastructure despite half of all daily trips being made on foot and only 5% made by private car.

Mumbai presents a good case for studying the political economy of road safety in the Indian context. The city

enjoys considerable political attention as the state capital and is a key contributor to the Indian economy. But despite its strategic importance and significant investments in infrastructure in the city, Mumbai's road safety performance is mediocre. The rate of road traffic fatalities in the city is low (at 4.9 per 100,000), it ranks seventh in the country overall in terms of absolute numbers – and this is a huge number of lives.

Crash data obtained from the Mumbai police shows that more than 5,700 people died on the roads of Mumbai between 2006 and 2016, with 611 of these fatalities during 2015–2016 alone – a rate of almost 2 people per day (ADGP, 2015; RTO, 2015). Pedestrians, cyclists and two-wheelers users are found to be most vulnerable and constitute more than 90% of all road traffic fatalities. Young working populations – mostly men – are particularly affected. Research also shows that low-income people are disproportionately affected by traffic fatalities. Yet most investments in infrastructure target car users, which contribute less than 7% towards mode share and account for only 4% of all road traffic fatalities.

## Policy interventions in road safety in India

Precipitated by international and national developments, the Indian government has made multiple attempts, mostly at the national level, to institutionalise road safety (the National Road Safety and Traffic Management Bill (2010), National Road Safety Policy (2010) and National Road Safety Bill (2014) being the most prominent among them). But these have faced resistance from various interest groups. More recent national efforts include the Government-led Motor Vehicles Amendment Bill. This bill promotes public transport; recognises for the first time in a statutory document that pedestrians are road users with specific safety needs; increases fines for traffic offences; promotes safer vehicle design; and requires centralised licensing and crash databases at the national level. There has also been a series of public interest litigations brought by citizens, which led to the establishment of the Supreme Court Committee for Road Safety and the Bombay High-power Committee. These may prove to be more successful, but the sustainability of such ad hoc efforts is questionable in the face of continued state-level resistance and loopholes, and limited power to mandate or coordinate change.

The government needs to make changes from within its executive arm, and develop a coordinated strategy, that is actionable at national, state and local levels.

## Challenges

**Road safety in Mumbai is perceived as a personal responsibility** by both the public and decision-makers, and victim blaming is common. It is true that citizens rarely follow traffic rules or even help crash victims on the road. But this is often considered a moral failing on the part of the individual, rather than the outcome of poor regulatory and judicial systems that have created a situation in which regulatory awareness and confidence in the judicial system is low. This emphasis on personal responsibility is also reflected in public policy, which neglects to consider the systemic issues that affect how people use the roads.

**Road safety does not feature on any political party's agenda.** Attention given to the subject by individual politicians at the national level has not filtered down to state and local levels. Competition between leaders of different political parties in Maharashtra's coalition government and public opinion (leading to re-election) influence the level of interest among elected representatives. Public decision-makers and private stakeholders perceive road safety as isolated from and in conflict with transportation policies and projects to address congestion and facilitate travel. Politically lucrative subjects such as building new roads often take priority over road safety improvements such as infrastructure provision for vulnerable road users and investments in public transport. This is a particular issue at the state and city level, and has also led to resistance against national initiatives for reform. At the state level, too, public institutions may deprioritise road safety if it interferes with more important considerations such as revenue collection.

**The absence of a single actor or agency with the power and mandate to coordinate road safety issues** at any level of government undermines attempts to shift towards a systemic approach to road safety. Instead power is spread over a range of agencies, which do not have it as their main function and lack coordination. The absence of a powerful agency with statutory backing, committed solely to the task of ensuring road safety, is a serious impediment to progress. Overseeing road safety is the secondary function performed by a multitude of public agencies, most of which do not communicate with each other. At the local level, Mumbai Traffic Police (MTP) is the most prominent public agency grappling with the task of traffic management and enforcement.

## Opportunities

The UN Decade of Action for Road Safety is nearing its end in 2020 and India has not come close to fulfilling its commitment under the Brasilia Declaration, or contributing towards the achievement of Sustainable Development Goals target of reducing road fatalities by 50%. Action is urgently needed.

### Policy and legislative reforms

To foster a systemic approach to improving road safety policy and legislative reforms are urgently needed at all levels of government. These include the amendment to the Motor

Vehicle Act, a state road safety plan for Maharashtra, and the creation or attribution of state and city level institutions to take leadership on Road Safety action. To achieve this, the national Minister of Transport would need to secure political buy-in from opposing stakeholders through strategic engagement and re-iteration of road safety as a priority. At the city level, the Chief Minister and Maharashtra's Minister of Transport – two key state-level politicians – need to demonstrate committed leadership to ensure that crucial hurdles such as funding, support from other stakeholders such as transport unions and the private sector, and political support at the local level are crossed effectively.

### Improving inter-agency coordination and building capacity

The MTP and the Municipal Corporation of Greater Mumbai (MCGM) are the two key agencies influencing road safety in Mumbai. The agencies currently operate in the absence of an action plan. Both MTP and MCGM enjoy the significant financial freedom and could invest in strategies to improve road safety if a framework was provided to encourage or require this. However, both agencies currently lack the institutional and technical capacity to deal with the complex problems of road safety. They often operate in isolation, ignoring and even undoing the work done by each other. Improved communication, combined with effective monitoring mechanisms and guidance under a state-level strategy for road safety would make improved inter-agency coordination more feasible.

### Fostering political action

- Civil society organisations can, through legal channels, elicit government action on road safety. There are examples (Supreme Court Committee on Road Safety and Bombay High Powered Committee) where India's judiciary, acting on public interest litigations filed by such groups, has issued road safety related directives to the national and state governments with which they must comply.
- The Ministry for Road Transport and Highways (MoRTH) has the power to direct state governments to bring about reforms. The current minister has already had a positive influence on road safety in India and could further this by making the Chief Minister of Maharashtra and State Minister of Transport road safety 'champions'.
- Corporators are the only directly elected representatives of the city government. They can be influenced by increased attention and policy reform for road safety at higher levels of government, as well as upwardly from citizens and civil society group, who should hold them to account.
- Conferring additional powers on the Mayor of Mumbai could curb the state government's dominance over the city and enable the city administration to address pressing issues without its interference (WEF/PwC, 2016). This could lead to an increase in democratic accountability of the urban local body and more control over how the budget is allocated. The mayor should also ensure better coordination between different departments and political support for road safety initiatives.

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# 1 Introduction

Mumbai is India's most populous city, and in the past decade, more than 5,700 people have died on its roads. During 2015–2016 alone 611 people died (almost 2 people every day) (ADGP, 2015; RTO, 2015). Compared with other Indian cities, Mumbai ranks seventh in terms of absolute number fatalities (behind Delhi, Jaipur, Bengaluru, Kanpur, Chennai and Lucknow). Its considerable population means the number of fatalities per 100,000 population is 4.9 – much lower than most major Indian cities, and comparable to rates in Beijing and Bangkok, for example (WRI, 2015). Mumbaikars spend, on average, close to an hour commuting every day, which is the longest commuting time in the country (NUMBEO, n.d.). They also have a poor negative view of road safety: according to a public perception survey, 82% of Mumbaikar respondents consider Indian roads to be unsafe, 92% feel unsafe walking and 58% feel that the issue of road safety is very important (SaveLIFE Foundation, 2017).

The world has seen some major developments in road safety over the past two decades, such as the UN Decade of Action for Road Safety and the adoption of the 2030 Agenda for Sustainable Development. But road safety is largely ignored in India, despite its rising global road safety and the scale of the challenge in the country. The UN Decade of Action for Road Safety is nearing its end in 2020 and India has not come close to fulfilling its Brasilia Declaration commitment or contributing towards the achievement of SDG target of reducing road fatalities by 50%.

Road traffic fatalities in many countries are significantly under- or misreported due to deficiencies in data reporting systems, according to the *Global Status Report on Road Safety* states that. But an algorithm developed by the World Health Organization (WHO) suggests that there were 207,551 road traffic fatalities in India in 2013 – almost 1.5 times the official reported figure of 137,572 (MoRTH, 2013). The WHO put India's road traffic fatality rate at 16.6 per 100,000 population, which is lower than that of China (18.8), Nepal (17.0) and Sri Lanka (17.4) but higher than Pakistan (14.2), Bangladesh (13.6) and Bhutan (15.1) (WHO, 2015a). The Government of India's official records show road traffic fatalities in the country have been increasing since 2013, with almost 150,000 reported in 2015. According to these statistics, there were 12.3 road traffic fatalities for every 100,000 people in the country.

Apart from the loss of life and severe financial and emotional stress caused to the victims' families, road

crashes also result in significant productivity losses for the country. Crashes result in significant productivity losses for the country: every year, they cost India close to 3% (\$8 billion) of its GDP (Mohan, 2004; Balachandran, 2016). Yet decision-makers at the highest levels of government have done little to address road safety, and it is beset by challenges of political inaction, opposition and vested interests of various stakeholders.

A largely overlooked subject in India, only a few analytical studies on road safety are available (Mittal, 2008; Mohan et al., 2015). Some papers present broad statistics on traffic crashes in the country but they do not examine the underlying factors responsible for the poor state of road safety. Literature that considers crash statistics or road safety strategies specific to Mumbai, or the state of Maharashtra, is not available at all. This lack of research on the subject is a further indication of its perceived importance (or lack thereof).

## 1.1 Understanding road safety

While road safety is considered a serious public health issue and has been exhaustively researched internationally, research on road safety in India, apart from the representation of crash statistics, is sparse. Aiming to throw light on the subject in the Indian context, this paper examines the political economy of road safety in India, with a focus on Mumbai. The idea is to understand the underlying factors embedded in the political, economic and social framework of the city which influence road safety. It is a part of a wider study conducted by the Overseas Development Institute (ODI) and the World Resources Institute (WRI) with funding from the FIA Foundation.

The study begins by exploring the city's historical background with a focus on transportation. An analysis of road crash data has been conducted to recognise the most vulnerable road user groups. Interviews of local road safety experts and public officials and a chronological study of the policy level interventions at national, state and local levels has been conducted to frame a picture of the state of road safety in Mumbai and India. The final stage of the study involves summarising challenges and identifying opportunities to improve road safety with a special focus on influencing political will.

# 2 Mumbai's transport infrastructure

## 2.1 Mumbai's population explosion

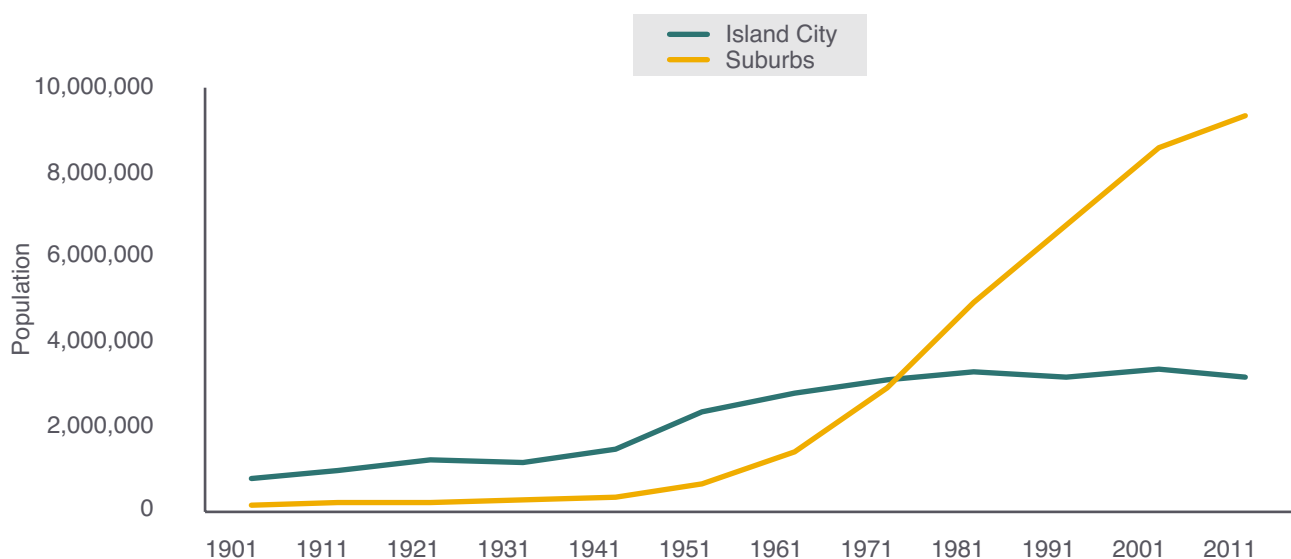
Mumbai was originally seven marshy islands that were joined, through an ambitious land reclamation and silting process, to create a 4.8 km-wide peninsula. Today, this area is known as Island City. As more land was reclaimed to join the Island City with Salsette Island, the extension came to be known as suburban Mumbai (Figure 2) (Risbud, 2003).

The economic and industrial growth of Mumbai after India gained independence in 1947 led to a population explosion in the city, which increased the strain on infrastructure. Island City and suburban Mumbai were put under one administration in 1950, known collectively as Greater Mumbai (Table 1 shows the current population of Greater Mumbai). The population of the suburbs overtook that of Island City in the 1970s and has been growing rapidly ever since. Mumbai today has one of the highest population densities in the world: of Maharashtra state's total population, 11% resides in Greater Mumbai, which accounts for only 0.2% of its area.

This tremendous growth, together with the confined geography of the city, has severely strained its infrastructure. On the one hand, the city functions as a financial hub with the highest per capita income in the country. On the other, Greater Mumbai has a strong socioeconomic divide, with a significant percentage of its population living in slums. This section of the population has little access to planned infrastructure, despite contributing significantly to the city's economy. In response, the Government of Maharashtra created the Mumbai Metropolitan Region (MMR) in 1975 to redirect growth to the metropolitan region. The MMR is significantly larger than Greater Mumbai and has a much lower population density (Census Organization of India, 2011). It contributes to a significant flow of commuters into the city and, as such, to the problem of road safety in Mumbai. However, due to the unavailability of data, this study does not include the MMR in its analysis.

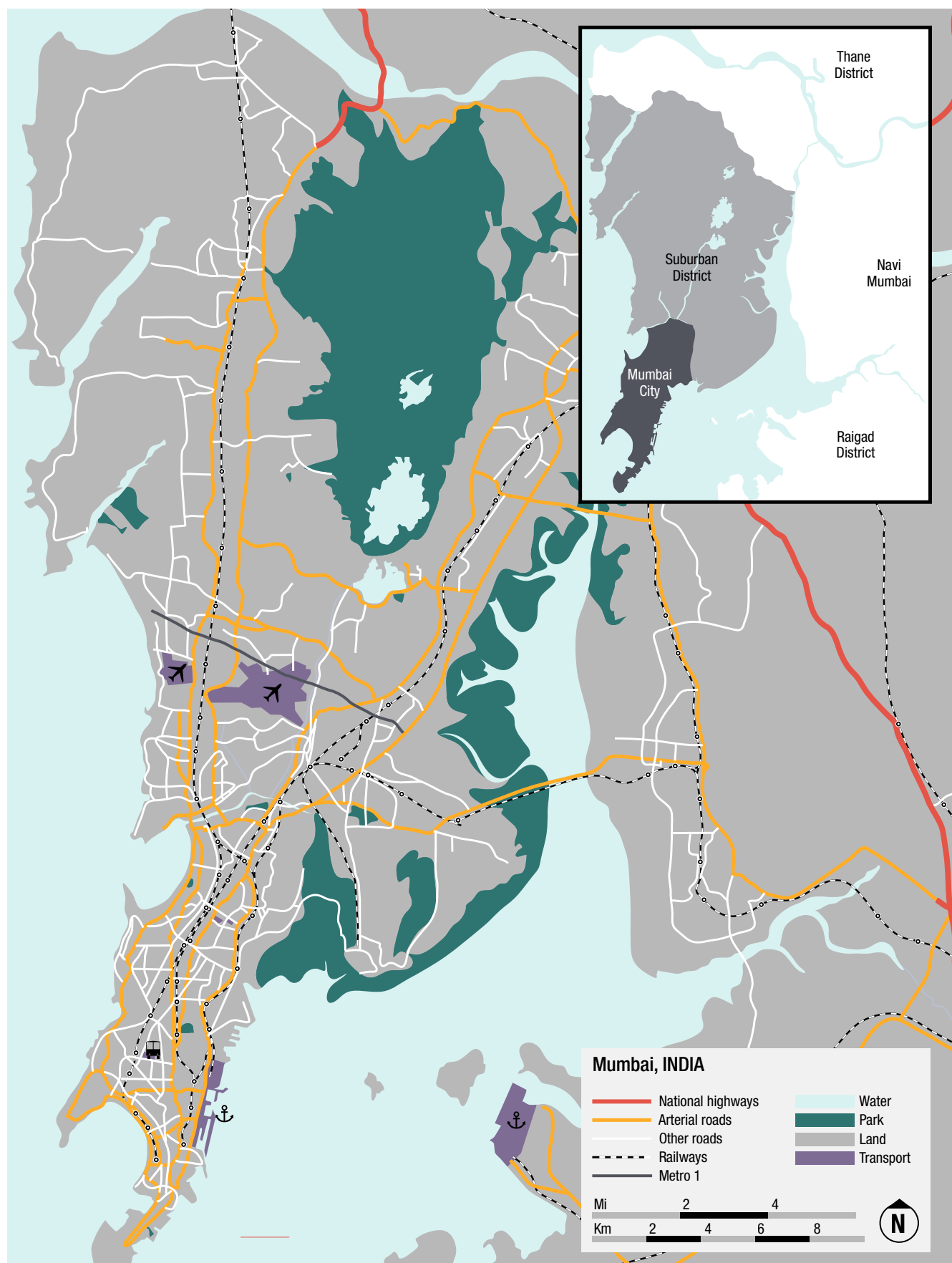
Greater Mumbai is a classic example of a mixed land-use city. It is also a good example of organically occurring, transit-oriented development. Due to heavy commercial

**Figure 1** Population growth by decade in Island City and suburban Mumbai



Source: MMRDA, 2003; Census Organization of India, 2011.

**Figure 2 Study area delineation**



Source: Pai, 2014.



**Table 1 Population, area and density of Island City, suburban Mumbai and Maharashtra, 2011**

	Island City	Suburban Mumbai	Total (Greater Mumbai)	Maharashtra State
Total population	3.1 million	9.3 million	12.4 million	112.4 million
Area (km <sup>2</sup> )	69	389	458	307,713
Density (persons per km <sup>2</sup> )	45,594	23,973	27,228	365

Source: Census Organization of India, 2011; CMP, 2016; Risbud, 2003.

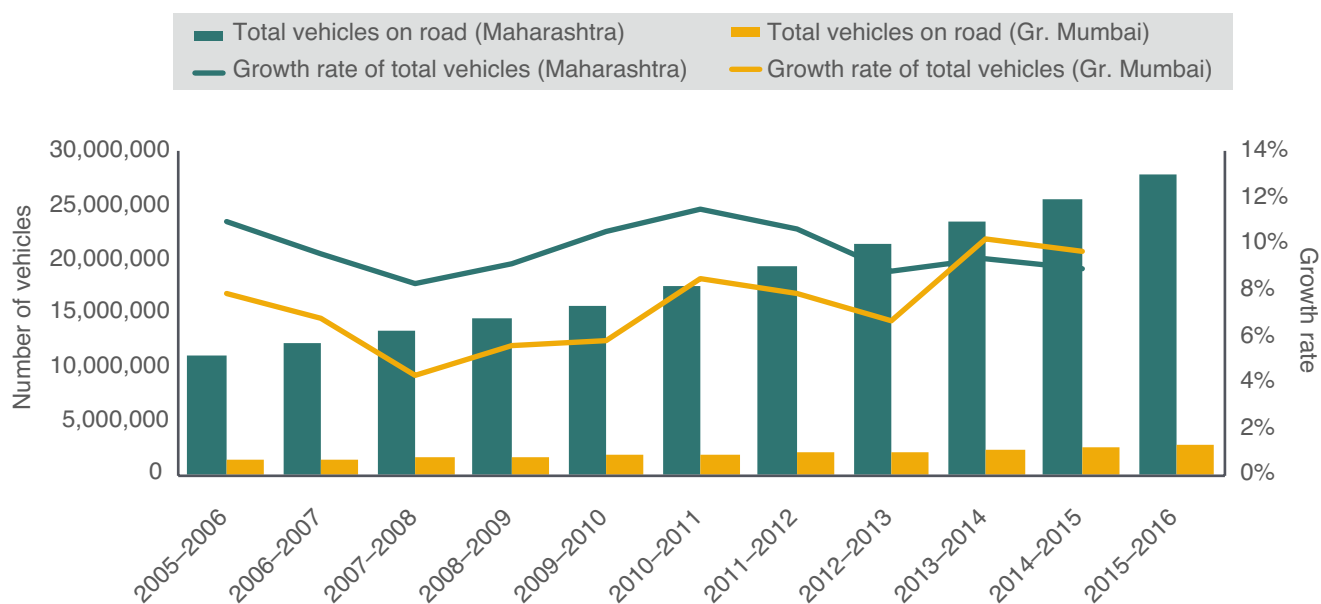
activity and high land values around the suburban rail stations, high density residential developments have been constructed near them. About 25% of Greater Mumbai's developed area is residential (MCGM, 2012). Because of limited room for expansion, the city has one of the most expensive real estate markets in the world. Most of the residential areas are situated in the suburbs. Greater Mumbai has one of the highest annual per capita incomes in India (\$4,500) (Praja Foundation, 2017). At the same time, the cost of living in Mumbai is also very high. People living in formal housing settlements are dependent on the rail network, buses, and private vehicles. Mumbaikars' average expenditure on transportation is the highest in the country at close to 11% of their total income (Cropper and Bhattacharya, 2012; CMP 2016). More than half of Greater Mumbai's population live in slums or hutments (Census Organization of India, 2001), and these individuals have very different mobility patterns to those of people living in planned housing. Cycling and walking account for over 60 percent of all trips, and low-income families living in informal settlements spend 16% of their total income on transportation.

Greater Mumbai and its adjoining MMR cities have a complex interrelationship, with each being interdependent for employment and housing. Approximately 700,000 people enter Greater Mumbai from surrounding areas during the morning rush-hour. They commute between cities using public transport. The problem of congestion is also significant.

Discussions between public officials around the improvement of public transport and augmentation of road networks started as early as 1962. The Regional Plan for Mumbai (then 'Bombay') Metropolitan Region, prepared by the Bombay Metropolitan Regional Development Authority in 1973, proposed several inter-regional, intra-regional and intra-city connections (Nallathiga, 2010), none of which have come to fruition. The delineation of the Mumbai Metropolitan Region (MMR) in 1975 and several other investments in road and public transport have not helped ease congestion either.

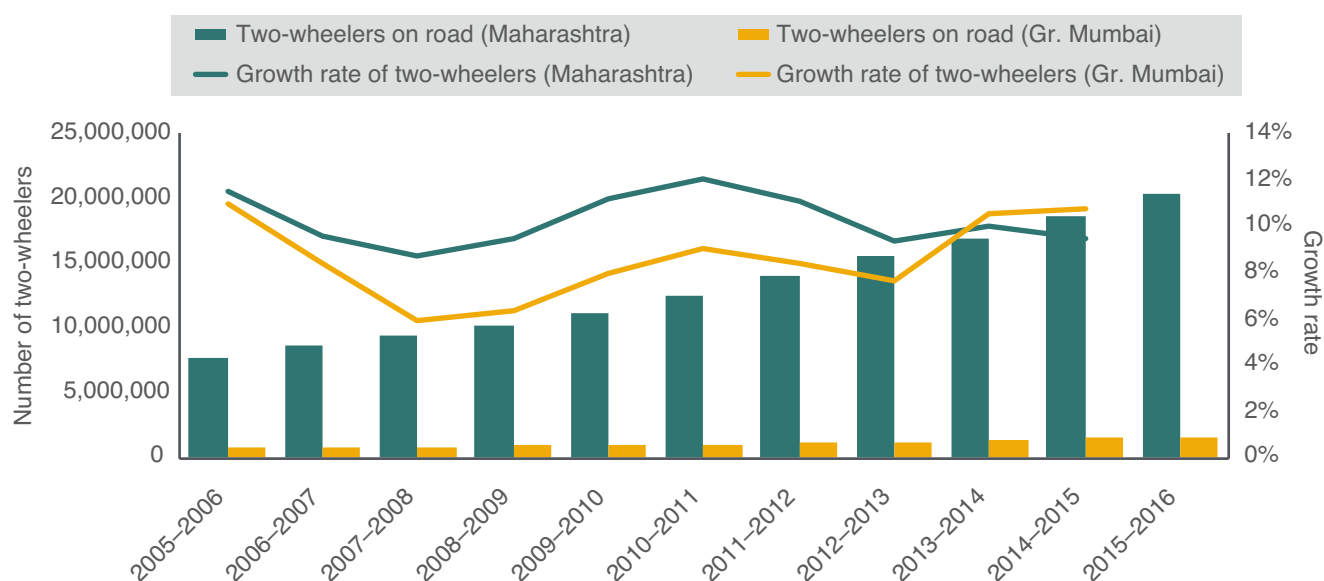
## 2.2 Roads in Greater Mumbai

Mumbai, as a peninsula, has a linear transportation network. North-south road and rail connections are very good, but east-west connections in the city are not well established. Apart from a few connectors such as Jogeshwari-Vikhroli Link Road, east and west remain largely unconnected. People must traverse the length of the city to access the other side, which increases travel time significantly. Over the past few years, there has been a rapid increase in the total number of vehicles on Greater Mumbai's roads (Figures 3 and 4). As of March 2015, there were more than 2.5 million vehicles registered in the city, and Mumbai's growth rate for both total vehicles and two-wheelers is now ahead of that of Maharashtra State (Figure 3).

**Figure 3 Annual growth rates of all vehicles and two-wheelers in Maharashtra and Greater Mumbai**

Source: RTO, Motor Vehicles Department 2006–2015.

**Figure 4 Annual growth rates of two-wheelers in Maharashtra and Greater Mumbai**



Source: RTO, Motor Vehicles Department 2006–2015.

There have been several significant additions to the city's road network over the last two decades. Multiple flyovers were built along the main arterial roads (Eastern Express Highway, Western Express Highway, Lal Bahadur Shastri Marg and the Island City) during the late 1990s and early 2000s. These were built at a cost of more than \$100 million (MSRDC, 2014). Two other developments were the Eastern Freeway and the The Santacruz Chembur Link Road. The Eastern Freeway is a 17-km road (a mix of elevated, tunnelled and at-grade roads) that was built at a cost of \$116 million and opened in 2013. It is a high-speed corridor linearly connecting the eastern parts of the city. The Santacruz Chembur Link Road is a 6.5 km-long road that offers east-west connectivity and cost \$67 million to build.

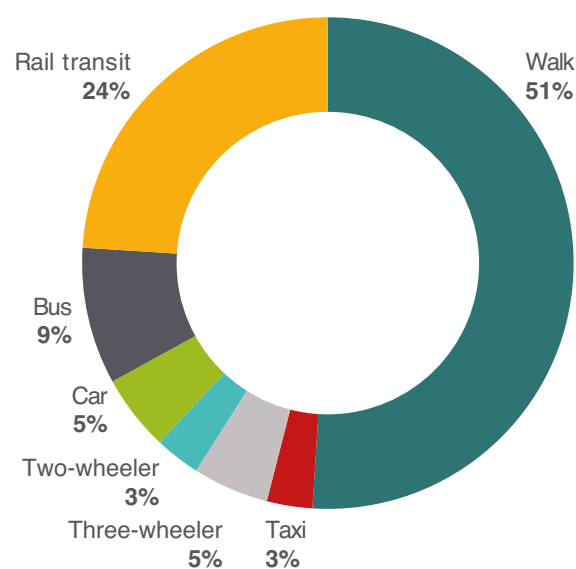
A 34 km-long Coastal Road, to be built in two phases with an estimated cost of \$2.2 billion, has also been proposed. This proposed development, which involves a significant land reclamation component, has met with opposition from various sections of society. Professionals had questioned the project's stated benefits and environmental feasibility (Wagh and Indorewala, 2015), but it has now received final clearance and will soon be built (Gupta, 2017).

## 2.3 Public transport in Greater Mumbai

Greater Mumbai has an extensive suburban rail network that connects areas both within and outside the city, and has a daily ridership of 7 million passengers. The railway connections extend to several neighbouring cities such as Vasai-Virar, Thane and Kalyan. A significant percentage of the city workforce commutes daily from these areas. While the socioeconomic profile of suburban rail users is generally very diverse, 57% earn \$800 or more per month (Abhyankar, et

al., 2012). Mumbai is also developing a metro rail network – phase 1 of Mumbai Metro, which started operations in 2014. It now has a daily ridership of 250,000 passengers along the 11.4 km route. It is the only mode of public transport providing east-west connectivity, and is scarcely able to meet the high level of demand. When completed, Mumbai Metro will span 200 km and will serve a significant proportion of

**Figure 5 Mode share in Greater Mumbai, 2016, by number of trips**



Note: there is no non-motorised transport percentage in the CMP, so it was not included in this graph.

Source: derived from data in CMP, 2016.

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the city's population. Mumbai Monorail, planned as a feeder service to the suburban rail system, is 8.93 km long (in its first phase) and has a daily ridership of less than 20,000. This low ridership, combined with high operating costs, has resulted in daily losses of \$13,800 for the operating and maintenance agency, Mumbai Metropolitan Regional Development Authority (MMRDA) (Rawal, 2017).

The road-based public transport network in the city is also substantial: Brihanmumbai Electric Supply & Transport Undertaking runs more than 3,500 buses within the city limits. The buses tend to be slow, due to high levels of congestion in the city, and as such commuters prefer

suburban rail (which is much faster). Nevertheless, the bus network has a daily ridership of 5.5 million trips.

Other important modes of intermediate public transport in Mumbai are taxis and three-wheelers or auto-rickshaws. The taxis are widely used in South Mumbai for short-distance trips. Three-wheelers (or rickshaws) are permitted to operate only in the northern suburbs, where they provide last-mile connectivity for rail and bus users. They also operate as shared rickshaws within the suburbs. Taxis and rickshaws also operate over longer distances, transporting people to different areas of the city. Figure 5 shows the mode split in Greater Mumbai.

# 3 Road safety in Mumbai

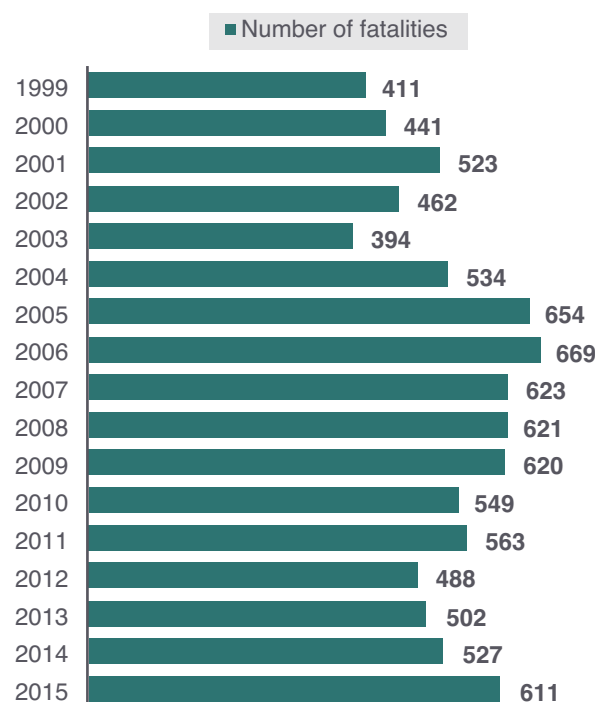
## 3.1 Traffic collisions

Maharashtra, India's second most populous state, accounted for 9% of all road traffic fatalities in India in 2015. In absolute numbers, it state ranked third in India and first in the region, with 13,212 fatalities. The rate of fatalities was 12.2 per 100,000 population, close to the national average and much below that of states such as Tamil Nadu (21.2), Telangana (20.2) and Karnataka (17.8), among others.

But of all fatalities due to unnatural causes, traffic collisions accounted for 37% – the greatest cause of such fatalities in the state. In 2015, an average of 38 people died every day on Maharashtra's roads, with one road traffic fatality happening every 18 km of road. In 2015, the number of injuries sustained in traffic collisions fell from the previous year. But the total number of collisions and fatalities both rose, suggesting that the severity of crashes had increased. The share of fatalities increased from 23% in 2013 to 26% in 2015, while the share of minor injuries reduced from 34% to 31%.

With 611 fatalities in 2015 alone, Greater Mumbai contributed to 4.6% of all road traffic fatalities in Maharashtra, higher than any other city in the state (Table 2).<sup>1</sup> In absolute numbers, Mumbai has more than double the number of fatalities than every other city, except Pune. However, its fatality rate is among the lowest.

Figure 6 Number of fatalities, 1999–2015



Source: RTO, 1999–2015.

Table 2 Road crash statistics for major cities in Maharashtra

City	Road traffic fatalities, 2015	Fatalities per 100,000 population
Nashik City	234	15.7
Aurangabad City	170	14.5
Thane City	266	14.4
Pune City	438	14.0
Nagpur City	260	10.8
Mumbai City	611	4.9

Source: ADGP, 2015.

<sup>1</sup> In India, the collection of crash data is the sole responsibility of the traffic police and is an overlooked aspect of road safety. As stated in the Global Status Report on Road Safety 2015, there are severe shortcomings in crash data collection and reporting. For this study, researchers obtained crash data from the office of Maharashtra Additional Director General of Police (ADGP), Traffic. While crash data for Mumbai was considered accurate and reliable at the broad level (total number of fatalities and injuries), the collection process raised many concerns regarding its quality. The author was, as a result, unable to consider many subsets of the data collected. The absence of socio-economic data pertaining to crash victims makes a more detailed analysis difficult. This analysis can be considered as a subject for future research. More details about the reporting and collection procedure are given in Annex A.

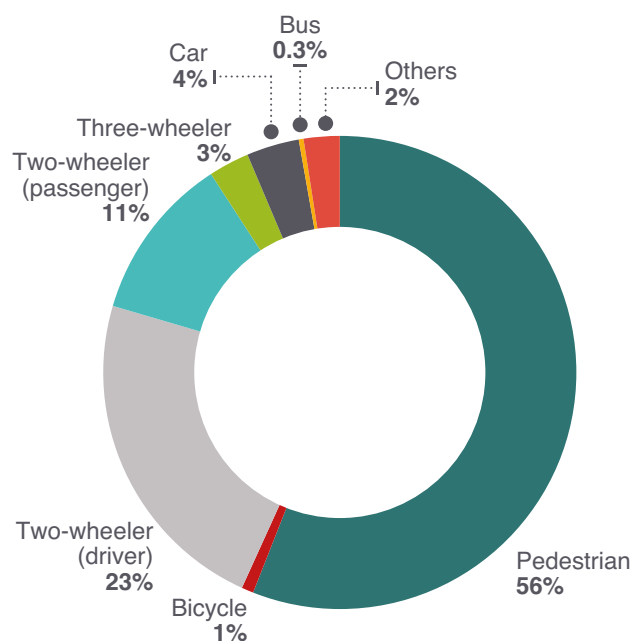
Mumbai has managed to contain the number of fatalities resulting from road crashes (Figure 6) (there were 657 road collision fatalities in the city in 1985 – 8 fatalities per 100,000 people (Chengappa, 1985)). But rather than being the result of any serious efforts on the part of the authorities, this trend can be attributed to reduced speeds due to increased congestion in the city (CMP, 2016). In particular, infrastructure for vulnerable road users (VRUs) – for instance, pedestrians, cyclists and motorized two-wheeler users – is less than adequate, and their share in road crash fatalities has been increasing (section 3.2).

The number of road fatalities in Mumbai has oscillated between 400 and 600 for the past decade, with several significant spikes (Figure 6). Discussions with local road safety experts pointed towards the construction of flyovers during the early 2000s as the cause of increased road fatalities during 2006, and 2012–2015. More recently, fluctuations in fatalities coincide with the construction of high-speed corridors (Santacruz Chembur Link Road and Eastern Freeway) in 2012 and 2013. Poor design of these roads and flyovers is a possible cause of high fatalities (Datar, 2017; Mathew, 2017).

### 3.2 Traffic fatalities by mode and gender

VRUs accounted for an estimated 91% of all fatalities in Mumbai in 2015, with almost half of all road traffic fatalities being pedestrians. Car users, meanwhile, accounted for only 4% of all fatalities. While this number is much lower than cities such as Nagpur (18%) and Navi Mumbai (9%), it is higher than Thane (1%) and Pune (2%). This number is also much lower than Delhi (24%). From 2013 to 2015, fatalities occurring in the two-wheeler category (both drivers and passengers) have been consistently increasing (31% in 2013 and 34% in 2014 versus 34.1% in 2015), and fatalities for two-wheeler passengers alone are also on the rise (9.5% in 2013, 10.1% in 2014 and 11.3% in 2015).

**Figure 7 Distribution of fatalities by mode, 2015**

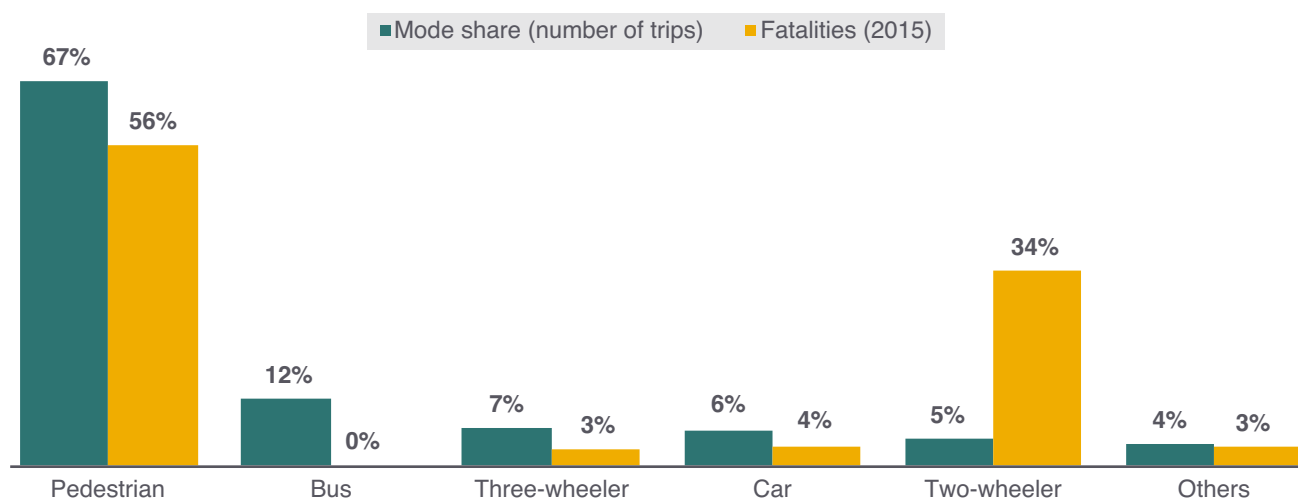


Source: ADGP, 2015.

Public transportation, such as, buses, account for less than 1% of all road fatalities in the city.

The high proportion of VRU fatalities is explained partly by the relatively low use of cars in the city and, in greater part, by dangerous road conditions. Space is limited, allowing little room for defensive behaviour; infrastructure is unsafe; traffic rules difficult to enforce; and little deference is shown to the rules of the road (Mathew, 2017). Poor and inadequate pedestrian infrastructure has also contributed to the high number of pedestrian fatalities: several areas in the city lack sidewalks. Where present, sidewalks are too narrow, too high or broken, and they tend to rarely be used. On-street parking and the unplanned presence of informal

**Figure 8 Mode share and related fatalities, 2015**



Note: There is no non-motorised transport percentage in the CMP, so it was not included in this graph.

Source: ADGP, 2015.

vendors on sidewalks also force pedestrians to walk on non-pedestrianised roads, exposing them to vehicular traffic (Datar, 2017).

When road traffic fatalities are compared with mode shares in the city (Figure 8), the plight of vulnerable user groups is further highlighted. Two-wheelers – which constitute around 4.6% of all trips – account for 34% of all road fatalities. The risk is much higher for this user group compared to others, even as the exposure (in terms of the number of trips) is low. In the case of pedestrians and cyclists, risk and exposure are both high. Public transport (buses) on the other hand, offers the least risk.

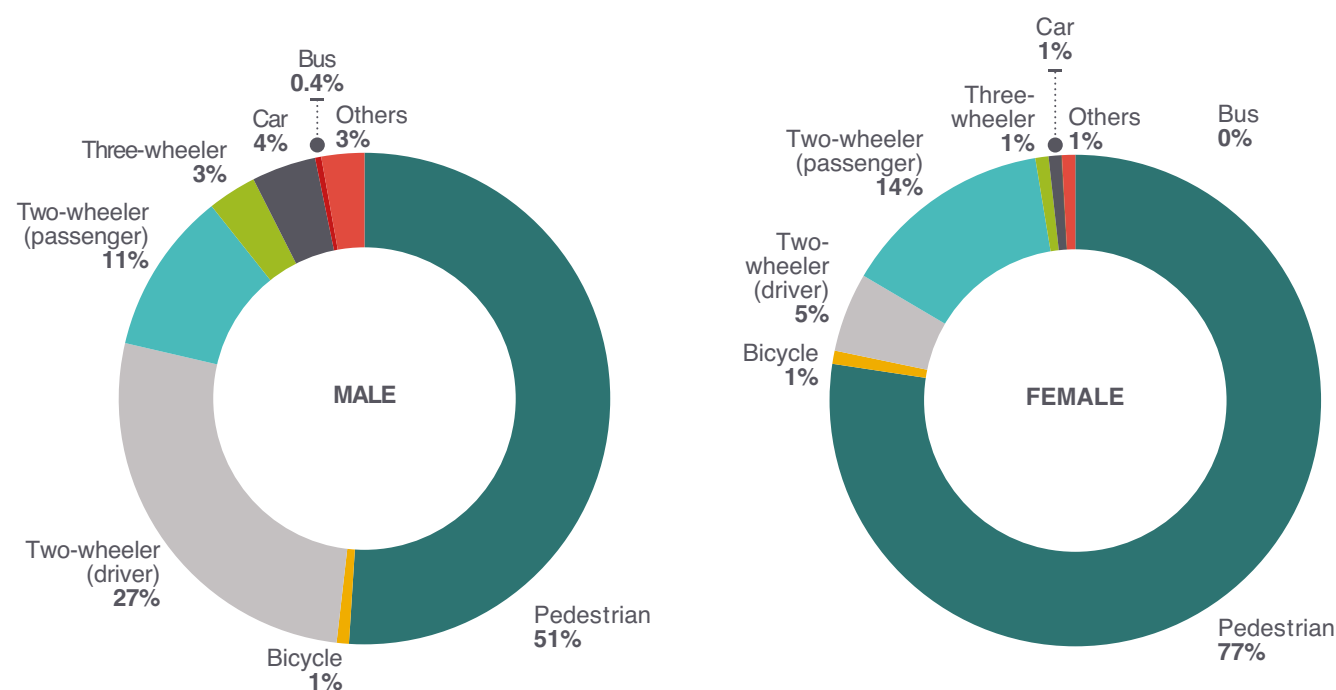
There are also significant differences across male and female road user groups (Table 3). This highlights the need for gender-specific considerations in road safety strategies such as customised awareness campaigns, gender inclusive road

infrastructure and gender-sensitive enforcement strategies. Males account for more than 80% of all road fatalities, a distribution that has remained almost constant between 2013 and 2015. Figure 9 shows the distribution of fatalities by mode and gender in 2015. For several modes – for example, two-wheelers (driver) – almost all fatalities are men (96%). For other modes, there is a comparatively higher share of female fatalities for modes such as walking (26%), two-wheelers (passenger) (23%) and bicycles (20%). This is also demonstrated in the fatality distribution by mode for each gender. Of all female road fatalities, 77% were pedestrians. And while 27% of all male fatalities are of two-wheeler drivers, this number is only 5% for females. While there is a low percentage of female two-wheeler drivers in the city, passenger fatalities for this road user group are high (14%). Of all female fatalities, 97% are vulnerable road users.

**Table 3 Distribution of fatalities by gender, 2015**

Road user type	Total fatalities	Total fatalities (%)	Male fatalities	Male fatalities (%)	Female fatalities	Female fatalities (%)
Pedestrian	342	56%	253	51%	89	77%
Bicycle	5	1%	4	1%	1	1%
Two-wheeler (driver)	139	23%	133	27%	6	5%
Two-wheeler (passenger)	69	11%	53	11%	16	14%
Three-wheeler	17	3%	16	3%	1	1%
Cars	22	4%	21	4%	1	1%
Buses	2	0%	2	0%	0	0%
Others	15	2%	14	3%	1	1%
<b>Total</b>	<b>611</b>	<b>100%</b>	<b>496</b>	<b>100%</b>	<b>115</b>	<b>100%</b>

**Figure 9 Fatalities by mode, 2015**



Source: ADGP, 2015.



Discussions with road safety experts highlighted cultural factors that contribute to VRU fatalities. Most women wear saris (which has led to a protective feature, named the ‘sari guard’, being made part of the standard two-wheeler design in India). Indian women prefer to ride side saddle for cultural reasons. This sitting position makes them very vulnerable to falling off the vehicle. Interviewees also spoke about poor enforcement of helmet laws for two-wheeler passengers in the city. While *driver* compliance with the helmet rule is estimated to be around 90% in Mumbai, *passenger* compliance is almost nil. Women and children, who account for most two-wheeler passengers, often do not wear helmets. Women perhaps choose not to, but children have little choice: the helmet market in Mumbai (and other parts of the country) caters to adults only, which means finding helmets to fit children is almost impossible (Kumar, G., 2017).

### 3.3 Traffic fatalities by age and gender

The 14–24 and 25–64 years age groups accounted for most road traffic fatalities in Mumbai in 2015 (Figure 10). The 65+ years age group seems to be most affected by road collisions. The rate of fatalities in this age group (9.3 fatalities per 100,000 population) was almost twice the rate

**Table 4 Rates of fatalities by age group and gender, 2015**

Age group	Total fatalities per 100,000 population	Male fatalities per 100,000 male population	Female fatalities per 100,000 female population
<15 years	1.6	1.5	1.8
15–24 years	6.1	9.3	1.9
25–64 years	5.4	8.5	1.8
65+ years	9.3	14.0	4.9

of fatalities in younger age groups (around 6.0 fatalities per 100,000 population or less). Children (under 15 years) are the only under-represented age group. Nevertheless, 45 children died in road crashes in 2015 – a number that has almost doubled since 2014 (when 29 children died). This emphasises the need for safe zones around schools (Silverman, n.d.). Data on the numbers or percentage of children aged under 10 using two-wheelers are not available, but a recent study observes that such children comprised about 5.5% of all two-wheeler fatalities in regions with high two-wheeler usage (Bhalla and Mohan, 2015). And, as mentioned in the previous section, helmets for children are very difficult to find in the Indian market and use of them among children rarely enforced.

**Figure 10 Fatalities by mode, 2015**



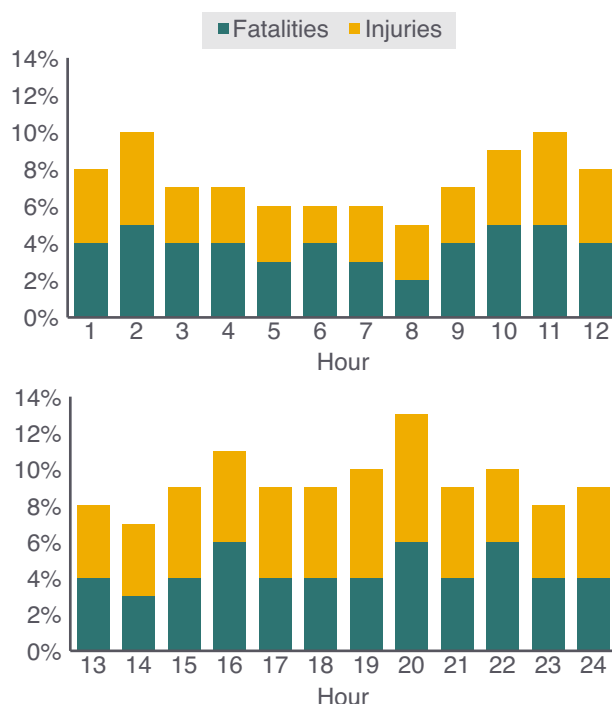
Source: ADGP, 2015.

Fatality trends differ among male and female age groups. For example, the incidence of road traffic fatalities is higher among men in the 15–24 and 25–64 years age groups, while younger and older women (<15 years, and 65+ years) demonstrate higher shares of fatalities. Rates for men are, however, substantially higher than those for women (Table 3). These trends might be due to a higher percentage of young two-wheeler users among men. Crash data correlating mode with age, which would be crucial to further identifying vulnerable groups, is not reported by the police department.

### 3.4 Temporal distribution of fatalities and injuries

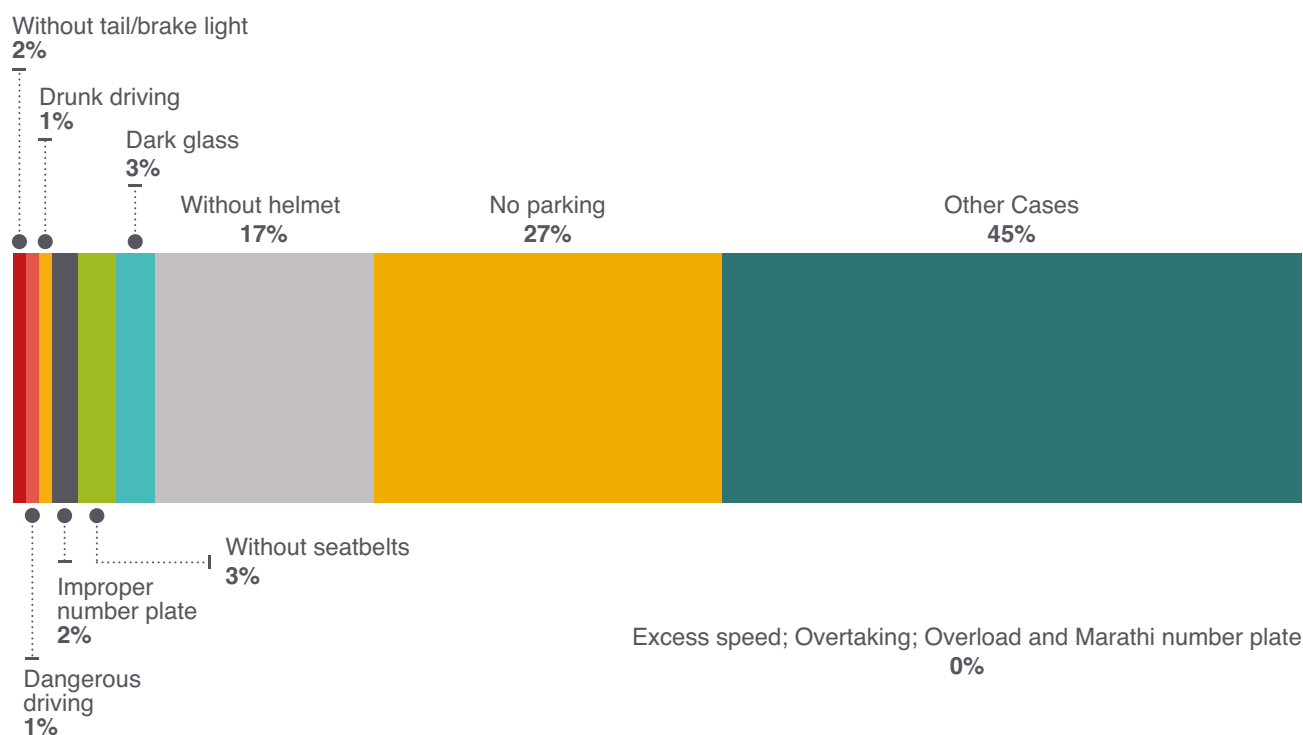
The total numbers of fatalities and injuries are highest during the peak hours (morning and evening) (Figure 11). This could be due to more collisions arising during peak hours due to the mixed traffic of varying speeds and more vehicles and people on the road. Around 60% of the road network in Mumbai has an average journey speed of less than 20 km per hour (CMP, 2016). During off-peak hours, fatalities mostly occur during early evening and late night. This could be due to higher speeds, lower visibility and lower levels of enforcement during these hours. The share of fatalities is higher during the early morning and late-night hours, suggesting increased injury severity at higher speeds.

**Figure 11 Distribution of fatalities and injuries by time of day and their share in each time period**



Source: ADGP, 2015.

**Figure 12 Distribution of traffic offences by type, 2015**



Note: The 'other cases' category, which makes up nearly half the offences (44.84%), is not defined by the police. A 0% share implies that while the category exists, no offences were recorded in that particular year. This statistic, once again highlights shortcomings in the way data is recorded.

Source: ADGP, 2015.

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### 3.5 Traffic offences

Traffic offences data pertains to fines levied as part of everyday enforcement or special enforcement drives undertaken by the Mumbai traffic police (Figure 12). Over the past few years, offences involving not wearing seatbelts or helmets have increased from 12% in 2010 to 20% in 2015. There is also a mismatch between traffic offences and cause of fatalities (as mentioned in police records). Only 0.11% of all traffic offenders were booked for speeding in 2015. Contrary to this statistic, speeding was mentioned in 81.5% of all fatalities as the cause of the fatality. It is unclear whether this discrepancy is due to poor enforcement or incorrect data reporting. This further highlights the need for reliable crash data.

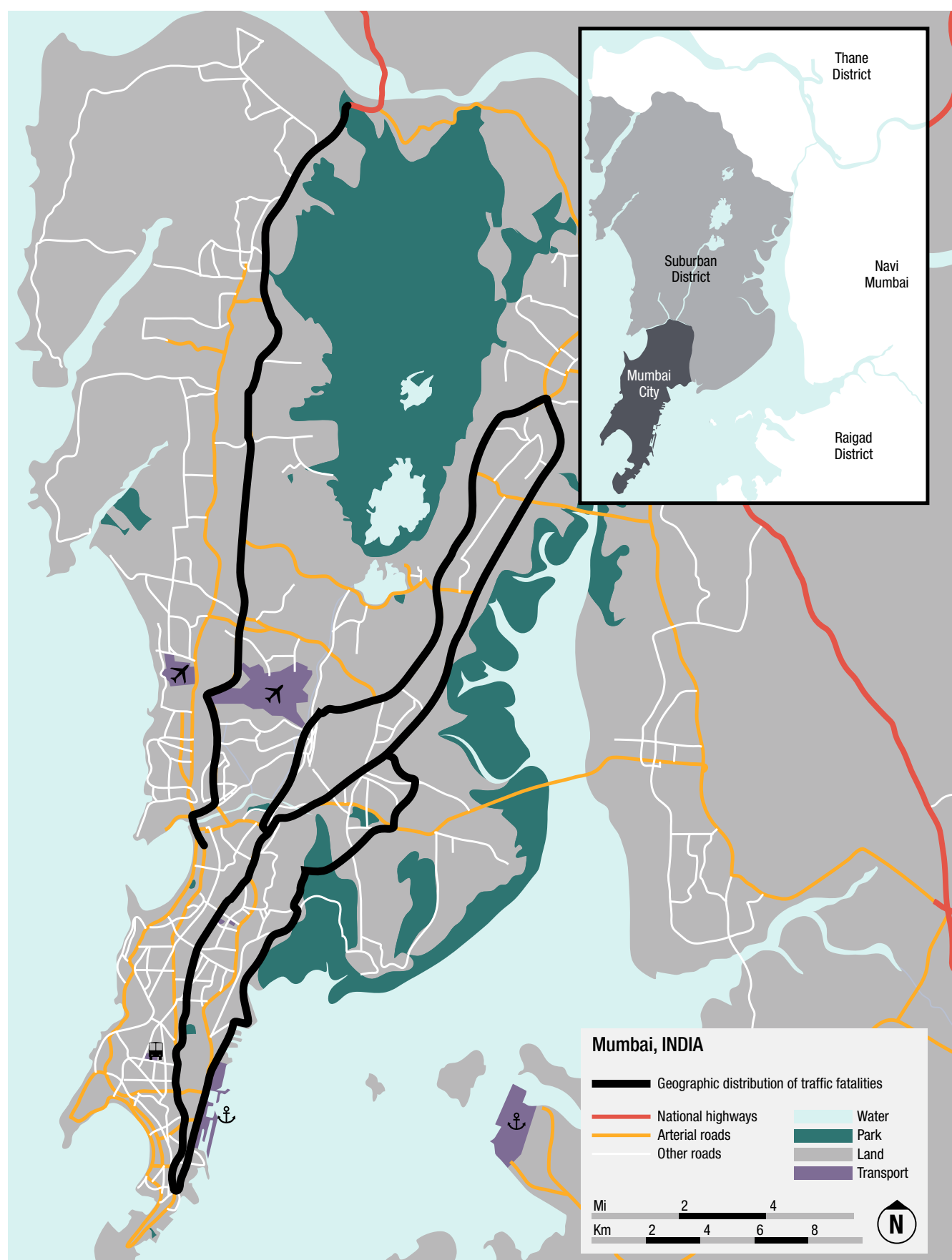
### 3.6 Geographic distribution of traffic fatalities in Mumbai

Traffic fatalities in Mumbai are heavily concentrated along the city's arterial roads (Vital Strategies, 2017). The three main arterials, running the length of the city, are Western Express Highway, Eastern Express Highway and Lal

Bahadur Shastri Marg (Figure 13). The Western and Eastern Express Highways are very wide (six lanes) in suburban Mumbai, with 17 flyovers on the Western Express Highway and 11 on the Eastern Express Highway. Fatalities are especially high in the middle portion of Greater Mumbai, along with the suburbs closer to the Island City. They are also slightly more concentrated in the western suburbs. Clustering can be seen, too, at certain intersections on these arterials (e.g. Airoli–Mulund intersection).

In Island City, fatalities are more dispersed and do not follow a specific pattern. Some clustering can be seen on certain flyovers, and fatalities also occur in the denser areas of the older part of the city. These areas are old settlements that are now predominantly commercial. They are highly congested and experience heavy traffic. There is also a higher density of fatalities along newly constructed roads in the city (Santacruz–Chembur Link Road and Eastern Freeway). These roads – which started operating as recently as 2014 – are built for higher-speed traffic, of 60 km/h and above, and several fatalities are also seen on the low-speed roads connecting the city road network to these new high-speed corridors. This suggests either a difference between the two in infrastructure quality or poorly designed infrastructure connecting old and new roads.

**Figure 13 Geographic distribution of traffic fatalities in Mumbai, 2015**



Source: MTP, 2015.

# 4 Policy and governance related to road safety in Mumbai

India's commitment to international goals – such as those identified in the Brasilia Declaration (WHO, 2015) – have driven forward the country's efforts to improve road safety over the past few years. The Road Transport and Safety Bill (2014) and, more recently, the Supreme Court Committee on Road Safety (2015) and Motor Vehicles Amendment Bill (2017) are particularly notable initiatives.

While decision-makers recognise the importance of such frameworks, there is currently no coordinated strategy for road safety in India. This is detrimental to the progress of road safety efforts (Figure 14), and means that successes to date have been marginal. By studying these efforts – even the less successful ones – we can, however, shed light on the politics of road safety reform.

## 4.1 Road safety policy and legislation

### 4.1.1 Overview

The Indian government has made multiple attempts – mostly at the national level – to institutionalise road safety, the most prominent of which are the National Road Safety and Traffic Management Bill (2010) and the Road Transport and Safety Bill (2014). These attempts have been resisted by various interest groups for political or financial reasons. The opposition objected to increases in fines for committing traffic offences, and state governments felt their administrative and financial powers were being encroached upon by the central government. Transport unions in the country have also opposed the laws, which once passed, would mean stricter rules and financial penalties for breaking them, thereby affecting their livelihoods.

The Motor Vehicles Act of 1988, with its amendments, is currently the only major piece of legislation that directly impacts road safety. The current iteration is focused mostly on vehicle safety, but the latest amendment, if passed by the Parliament, should bring much-needed attention to vulnerable road users.

Global commitments such as the United Nations Decade of Action for Road Safety (2011–2020), adoption of Sustainable Development Goals and signing of Brasilia Declaration have put pressure on political representatives

at the national level to convert words into action. With cooperation from international organisations such as Global NCAP, programs such as BNVSAP will be instrumental in improving vehicle safety and educating the consumer about roadworthiness of vehicles. At the state level, initiatives such as the Bloomberg Initiative for Global Road Safety (BIGRS) have been successful in engaging elected representatives at the state level securing commitments to invest in road safety.

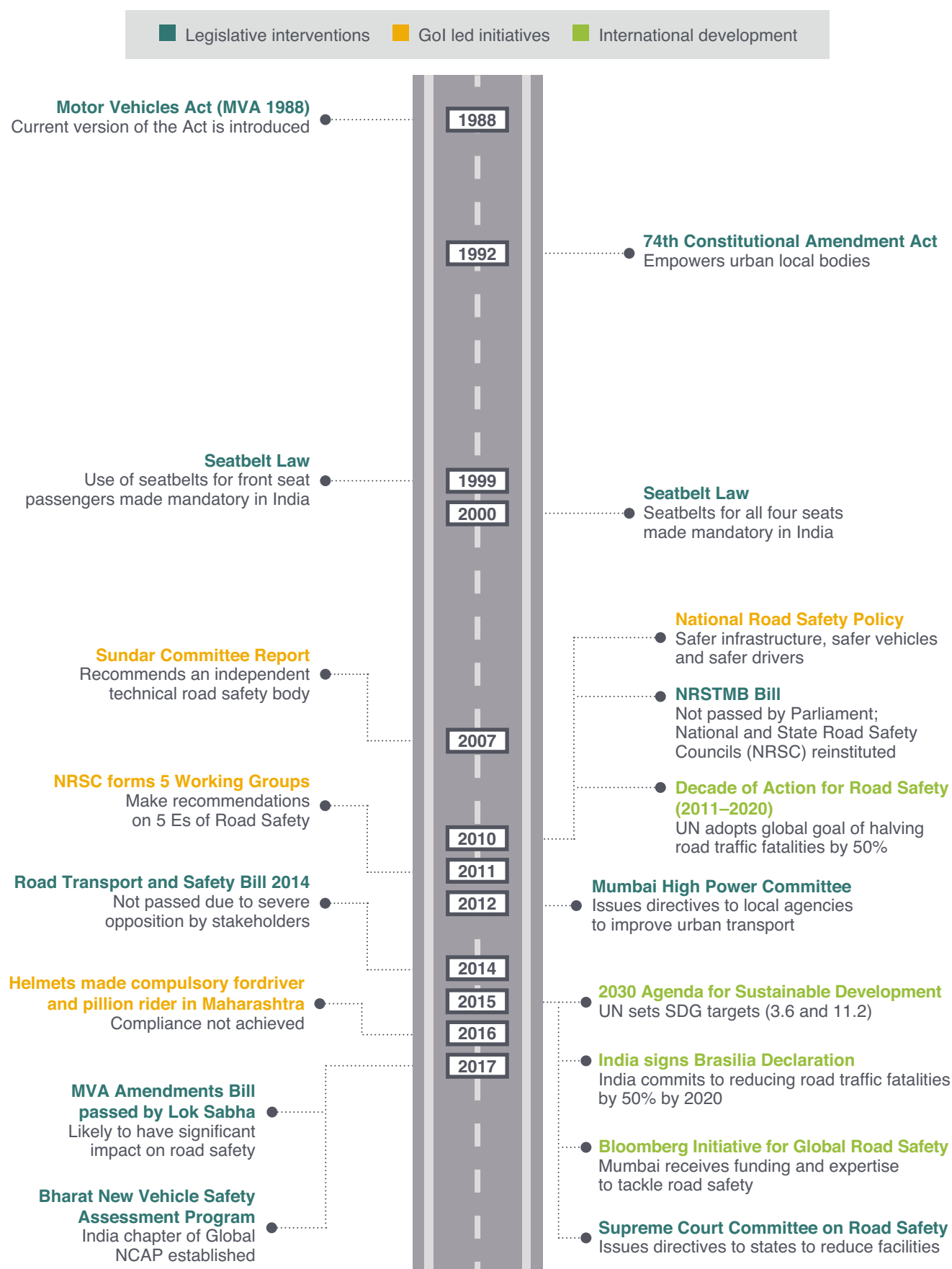
Citizen and civil society efforts have been more successful than government-led initiatives in bringing about attention to and reforms in the road safety sector. Public interest litigation filed by citizen groups leading to the formation of the Mumbai High-Power Committee (2014) and the Supreme Court Committee on Road Safety (2014) demonstrate that, with the right push, it is possible to spur action. But the sustainability of such ad hoc efforts is questionable: the government needs to make changes from within the executive and develop a coordinated strategy that is actionable at all national, state and local levels.

### 4.1.2 Road safety in pre-independence India and the Motor Vehicles Act (1855–2018)

India's Fatal Accidents Act of 1855 gives crash victims the right to compensation. This Act was replaced by the Motor Vehicles Act (MVA) of 1939. The MVA broached topics such as licensing, the responsibility of the road user to follow traffic rules, use of helmets by two-wheeler drivers, vehicle insurance, compensation for crash victims, and punishments and fines for traffic offenders. The Act was amended once in 1956 before the current version was adopted in 1988.

The Motor Vehicles Act (MVA) of 1988 relates to all road transport vehicles in India. It specifies a regulatory framework for vehicle design standards, safety inspections, permits, and road safety. The Act provides for the creation of a National Road Safety Council (NRSC). It also requires that each state set up a State Road Safety Council (SRSC) and District Road Safety Committees. By 2010, however, these councils (at state and district levels) had still not been set up by the state governments. The Councils' limitation to act only as an advisory body rather than a regulatory one diminished its importance to a great degree (The Hindu, 2001).

**Figure 14 Major road safety related laws and policies in India**



Source: MoRTH, 2015; GoI, 2015; Parihar, 2014.



Until 2008, the NRSC had convened only 7 times in 15 years (Mittal, 2008). The almost-dormant council was reconstituted in 2010, after the National Road Safety and Traffic Management Bill was introduced (and rejected) in the Parliament (section 4.1.7). The Minister for Road Transport and Highways serves as the Chair of this Council and the Minister of State for Road Transport and Highways serves as the vice-chair. Ministers in charge of road transport for all states and union territories) serve as members of the Council. It has representation from various other public departments such as Home Affairs, Heavy Industry and Urban Development, and various academic institutions (MoRTH, 2015). Most states, including Maharashtra, have set up state-level councils and district level committees.

The main function of these councils at various levels of government is advisory; they do not have any decision-making authority or statutory backing. Nor do they have the power to allocate funding for road safety or decide how the road safety fund should be spent. Chaired by political representatives, their effectiveness is dependent on the priorities of the government in power. As their creation is mandated by the Motor Vehicles Act of 1988, the focus is usually on vehicle safety and not pedestrians and cyclists. Even after being reconstituted in 2010, most of the state road safety councils remained dormant. They have been revived once again following orders of the Supreme Court Committee on Road Safety, constituted in 2015.

The MVA was amended in 1994, 2000, and 2001, with the latest Motor Vehicles Amendments Bill proposed in 2016 and tabled in 2017. This Bill makes substantial changes to the Act and is likely to have a significant impact on road safety regulation and enforcement. It promotes public transport and is the first statutory document to recognise pedestrians as road users, as well as the need for regulatory interventions to improve their safety. It seeks stricter enforcement of traffic rules by significantly increasing the fines for traffic offences. The Bill also promotes safer vehicle design technology and mandates the creation of centralised licensing and crash databases at the national level (Bhatt, 2016). There was widespread opposition to some elements of the bill from both houses of Parliament, state governments and other stakeholders such as unions. For example, the Opposition has argued that the proposed increase in fines may lead to an increase in corruption and will not necessarily improve levels of enforcement. However, there was an agreement across political parties that road safety was an issue which needed to be addressed urgently. The Union Minister of Transport appealed all political parties to support the Bill lest more lives are lost in road crashes (The Indian Express, 2016a). It was passed in the Lower House of the Indian Parliament in March 2017 and is currently awaiting approval from the Upper House.

#### **4.1.3 74th Constitution Amendment Act of 1992**

This legislation gave constitutional status to the municipalities and brought them under the purview of judicial review. The Act aims to revitalise and strengthen

the urban local bodies so that they may function as effective units of local government. It defines functions which must be performed by city-level agencies. While road safety itself has not been explicitly stated as a responsibility of the urban local body, functions such as urban and town planning, planning for economic and social development, planning of roads and bridges, ensuring public health, and safeguarding the interests of weaker sections of the society have an impact on how road safety is perceived by the municipal agencies (GoI, 1992).

#### **4.1.4 Seatbelt and helmet laws, 1988–2000**

The Ministry of Road Transport and Highways (MoRTH) mandated installation of front seatbelts in all motor vehicles in 1994. Use of seatbelts, however, was not made mandatory until 1999. Seatbelts, and their use, on all seats (front and rear) in four-wheelers, were mandated by the MVA in 2002. In major cities, enforcement of this law has been stringent, and has yielded good results (though enforcement across the rest of the country remains weak). A survey of ten major Indian cities showed that 63% people do not wear seatbelts while driving a car (SaveLIFE Foundation, 2017).

Enforcement of helmet-use in India is very different. Driving, or riding as a passenger, without wearing a helmet is a punishable offence under the MVA. Enforcement of this rule has met with opposition from various religious and ethnic groups. For example, the Sikh community opposes this rule because it interferes with their religious practice of wearing turbans. This community is currently exempt from the rule. There have been several efforts by various states (apart from MoRTH's awareness campaigns) to enforce helmet use among two-wheelers users. For example, in February 2016, the Bombay High Court issued circulars to the Maharashtra Motor Vehicles Department to ensure helmet use by both the driver and pillion rider. It also directed two-wheeler dealer to sell two helmets (for the driver and passenger) with every two-wheeler (Mohammed, 2016). Enforcement of this directive has been inadequate. While Delhi has achieved a near 100% compliance rate for both driver and two-wheeler passengers, Mumbai is close to 90% in the case of drivers but achieves very low compliance for two-wheeler passengers (Koregaonkar, 2017).

In another instance, in July 2016, the Government of Maharashtra asked Maharashtra Petrol Dealers Association to refuse the sale of fuel to any two-wheeler driver not wearing a helmet (India Today, 2016). Due to objections from the Petrol Dealers Association as well as the opposing party in Maharashtra, the government went back on its decision. Instead, it asked all fuel stations to report vehicle registration numbers of offenders (Indian Express, 2016b), which did not prove as an effective adherent.

#### **4.1.5 Sundar Committee Report, 2007**

Recognising the need to contain burgeoning road collisions and fatalities in the country, the Cabinet Committee on Infrastructure headed by the Prime Minister directed MoRTH to present a note to the Empowered Committee of Secretaries for the creation of a Directorate of Road Safety

and Traffic Management and the amendment of traffic laws as required. An expert committee under the chairmanship of S. Sundar, Distinguished Fellow, The Energy and Resources Institute (TERI) was formed in 2005 to analyse the state of road safety in India and recommend reforms. Several area experts contributed to the committee's findings. It concluded that existing institutions are weak and not focused on road safety. The committee also recognized the need for a single agency to deal with the wide spectrum of problems associated with road safety (GoI, 2007a). For the first time in India, road safety was identified as a public health issue and the committee proposed strategies focused on preventing injuries rather than crashes.

The Committee proposed a National Road Safety and Traffic Management Act (NRSTM Act). It proposed national and state-level Road Safety and Traffic Management Boards with decision-making authority on the regulation and advancement of road safety and traffic management. Along with the statutory authority to set standards, these boards would comprise of experts (in addition to government representatives) providing technical inputs. Most of the Committee's recommendations were tweaked by the government and the resulting National Road Safety and Traffic Management Bill was not passed in the Parliament. These have been explained in detail later in the report.

#### **4.1.6 National Road Safety Policy, 2010**

Based on the recommendations of the Sundar Committee, MoRTH framed the National Road Safety Policy, which was approved by the Union Cabinet in 2010. The policy outlines the initiatives to be taken by the government at all levels to improve road safety in the country. It emphasises safer infrastructure, safer vehicles, and safer drivers as key to reducing road traffic fatalities. The formulation of the policy led to the framing of the National Road Safety and Traffic Management Board Bill of 2010.

While the National Road Safety Policy has been guiding investment priorities in road safety for the national government, it has done little for the states. As per directions from MoRTH, most of the states in India, including Maharashtra, have formulated their own road safety policies. Most of them, except for a few, read the same as the national policy. This points towards the lack of attention given to the problem by the state governments.

#### **4.1.7 National Road Safety and Traffic Management Board Bill, 2010**

Following up on the Sundar Committee's recommendations, MoRTH proposed the National Road Safety and Traffic Management Board Bill in 2010. The Bill made a few significant changes to the earlier bill drafted by the Sundar Committee. It diminished the role of states to almost nil and limited the scope of the bill to national highways. Since the board could make recommendations on road safety only in relation to national highways (which form just 2% of the total road length of India), its mandate was severely limited. The Standing Committee on Transport,

Tourism and Culture, which reviewed the bill, did not recommend passing it for this reason. Instead, it proposed a reconsideration of the institutions mandated by MVA 1988. Because of this recommendation, NRSC and SRSCs were re-constituted. It also proposed the formulation of a National Road Safety Policy (GoI, 2010a).

#### **4.1.8 Working groups on the five E's of road safety, 2012**

On the recommendation of NRSC in 2011, MoRTH formed five working groups on the five Es of road safety: education; engineering of roads; engineering of vehicles; enforcement; and emergency care. These groups submitted their recommendations to the government in 2012. For example, the Working Group on Road Engineering pointed out that the mediocre quality of crash data made it hard to demonstrate the efficacy of various road safety strategies. Budgetary constraints also pose a problem, particularly for lower hierarchy roads. The group recommended that 'highway and urban road design standards and guidelines be made consistent with ... international best practices' (GoI, 2012). The working group also recommended formulation of a National Road Safety Policy, National Road Safety Fund, and State and District Road Safety Councils. It proposed conducting road safety audits for all national and state highways, improving vehicle design, and mandatory crash tests (Kumar, S., n.d.). Several recommendations of these working groups have been adopted by MoRTH, but only recently.

#### **4.1.9 Mumbai High Power Committee of 2012**

A public interest litigation was filed in the High Court of Bombay by the Bombay Bar Association (after one of its lawyers was involved in a scuffle with a traffic policeman over a traffic offence) in 2010. This public interest litigation questioned the inaction of the city government regarding road traffic in the city of Mumbai, specifically on issues such as improper regulation and operation of traffic, technology, enforcement and manpower. The Bombay High Court conducted several hearings in which these issues were discussed. After holding a joint hearing of all agencies on the matter, the Court established a High-Power Committee in 2012. The High-Power Committee was chaired by a senior official from the Home Department and comprised officials and three urban transport professionals. After several discussions, the Committee proposed an action plan to address urban transport issues facing the city. The plan identified several priority actions:

- expand the Mumbai traffic police force
- improve design and signals at junctions
- develop intelligent transportation systems
- reform the Motor Vehicles Department
- restrict registration of vehicles
- share data and information
- improve detection of traffic-related offences
- improve enforcement of penalties
- enhance the use of enforcement technologies

The action plan prepared by the High-Power Committee was comprehensive and most of the activities specified in the action plan impact road safety. The committee identified lead and assisting agencies to implement the activities and specified a timeframe of implementation for each action item.

The public interest litigation of 2010 is a good example of how concerned citizens (a group of lawyers in this case) can demand action from the government through the judiciary. It compelled city officials to analyse the urban transport scenario in Mumbai and come up with an action plan to address vital issues. Five years on, some recommendations have been partially addressed by the city government. For example, the Mumbai Traffic Police installed closed-circuit television cameras at several locations in Mumbai in 2016. A centralised state-level licensing database was introduced in 2016. These actions were also a result of initiatives being taken at the national level (national road safety policy, setting up of the Supreme Courts Committee on Road Safety (section 14.1.1). Design improvements to intersections were (and are being) undertaken, although not much progress has been made. Overall, compliance with the Court's directives has been poor (Bombay Bar Association & Another v/s State of Maharashtra & Others, 2016). While road traffic fatalities fell from 611 in 2015 to 562 in 2016, four years after the Committee was formed, the long-term success from these partial measures remains to be seen.

#### **4.1.10 Road Transport and Safety Bill, 2014**

The Road Transport and Safety Bill of 2014 was proposed by the Bharatiya Janata Party-led national government, which is currently in power in India. A week after the government was sworn in, in May 2014, Gopinath Munde, the Rural Development Minister, was killed in a car crash. This incident renewed the debate over road safety. The government took up the issue of priority and presented the Road Transport and Safety Bill to the Parliament for approval in 2014.

Recognising the need for a change in outlook towards road safety, and building on the findings of the Sunder Committee, this bill is notable for its shift in focus – from motor vehicles to the safety of road users. Major highlights of the Bill were the proposed independent national level authority for road safety, unified licensing and vehicle registry systems, heavier penalties for traffic offenders and a two-tier permit system for public transport vehicles (Singh, 2017a). Several stakeholder groups, including state governments, opposed the Bill. For example, transport owners' associations objected to truck owners being held accountable for criminal negligence (due to freight vehicles being overloaded and truck drivers usually fleeing the crash-site). The Bill also met with opposition from auto-manufacturers regarding the setting of minimum standards for safety in vehicles, which do not currently exist. Governments of states with prominent auto-manufacturing industries also opposed the Bill. Other state governments also objected to the proposal to centralise driver licensing

and vehicle registration procedures, citing revenue losses (Tiwari, P., 2014). To appease various stakeholders, diluted versions of the bill were brought out twice. However, no version has yet been passed by Parliament.

#### **4.1.11 Public interest litigation and Supreme Court Committee on Road Safety, 2014**

Following another public interest litigation case (filed by S. Rajasekaran, an orthopaedic surgeon from Coimbatore, Tamil Nadu) in 2012, India's Supreme Court appointed a Committee on Road Safety in 2014 to supervise the central and state governments with regards to actions undertaken by them to improve road safety. The Committee has been issuing directives to all states in 2015 with a view to improving road safety. For example, the Committee on Road Safety has directed all states to formulate road safety policies, prepare state-level road safety action plans, activate state road safety councils, establish a road safety fund and conduct road safety audits at the design, construction and operation stages and rectify black spots among other instructions (Rathod, 2017). States have been slow to respond (Supreme Court Committee on Road Safety, 2017). They are, however, compelled to implement the directives, lest they are held in contempt of the Supreme Court (and are subject to a punishment or fine levied by the Court).

While the judicial arm of the Government of India is willing to ensure that existing laws are implemented by the concerned parties, it is reluctant to intrude upon the functions of the legislature and executive branches, which formulate law and policy. For this reason, the Supreme Court of India has rarely been involved in the subject of road safety. It has, however, expressed concern over the inaction of the Union and state governments in tackling the problem. The public interest litigation case of 2012 elicited a strong response from the Court because of the global attention given to road safety (UN Decade of Action for Road Safety and the Brasilia Declaration) as well as the national developments (non-passage of the Road Transport and Safety Bill). Its impact on road safety remains to be seen.

The Supreme Court has, in other rare instances, attempted to compel national and state governments to address the problem of road safety. In December 2016, the Supreme Court issued directives to remove liquor stores located within 500 meters of all national and state highways (which came into effect on April 1 2017). This was one following a public interest litigation filed by Harman Sindhu, a road collision victim turned road safety activist in the Haryana and Punjab High Court in 2012. The Supreme Court also cited NRSC's policy decision (taken in 2004) to ban the sale of alcohol along highways (Dutt, 2017).

While the presence of liquor stores along highways may promote instances of drunk-driving, they are also a significant source of revenue for the government. Several state governments, including Maharashtra, denotified stretches of highways to lower hierarchy roads. The Supreme Court diluted its directive in July 2017, when it stated that the ban does not apply to roads passing through cities. This allowed liquor stores to continue functioning

within city limits (Rajagopal, 2017). This incident shows that states are not yet ready to prioritise road safety at the cost of revenue losses.

#### **4.1.12 Bharat New Vehicle Safety Assessment Program, 2017**

Bharat New Vehicle Safety Assessment Program (BNVSAP), India chapter of the Global New Car Assessment Program (Global NCAP) was launched in 2017. New cars entering the Indian market will now be subjected to crash tests and assigned star ratings based on the results. Initially slated to be launched in 2014 with an aim of standardising safety features in cars, BNVSAP hopes to apply more stringent safety norms on four wheelers (Mahajan, 2017). It will also help potential vehicle buyers make informed decisions with regards to safety.

#### **4.1.13 Global developments, 2010–2017**

The United Nations (UN) General Assembly adopted Resolution 64/255 (9) in 2010, which designated 2011–2020 as the Decade of Action for Road Safety. The Assembly adopted a global goal of reducing road traffic fatalities by half during the Decade of Action (UN, 2011). The UN Road Safety Collaboration, consisting of governments, UN agencies, multilateral institutions and non-governmental organisations (NGOs) developed a Global Plan for the Decade of Action for Road Safety to provide an overall framework for action. The plan is meant to act both as a guide for countries, and as a facilitator for coordinated and concerted action towards achieving the goal of 50% reduction in road traffic fatalities.

In addition to the UN General Assembly's efforts, the UN adopted the 2030 Agenda for Sustainable Development in 2015. The Sustainable Development Goals (SDGs), identified in the Agenda, build upon the Millennium Development Goals (MDGs), which were adopted in United Nations Millennium Declaration, the outcome document of the Millennium Summit. While no mention of road safety was made in the MDGs, it is mentioned in two SDGs:

1. Goal 3 pertains to ensuring 'healthy lives and promoting well-being for all at all ages'. Target 3.6 aims to halve the number of global fatalities and injuries from road traffic collisions by 2020 (WHO, 2017).
2. Goal 11 talks about making cities and human settlements inclusive, safe, resilient and sustainable. Target 11.2 aims to 'provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons' (by 2030) (WHO, 2017).

Following the announcement of the SDGs, world leaders attended the 2nd Global High-Level Conference on Road Safety in 2015. The aim of this conference was to chart progress at the mid-point of the Decade of Action for Road

Safety 2011–2020. Around 2,200 delegates – including the Indian Minister of Transport, Shri Nitin Gadkari – adopted the Brasilia Declaration on Road Safety, through which they agreed on ways to halve road traffic fatalities in their respective countries by the end of this decade. Following this commitment, the Indian government has undertaken several road safety initiatives. A few of these are identification and remediation of collision black-spots, incorporating engineering solutions at the design stage, formulating and implementing safety standards for automobiles, coordinating trauma care and generating public awareness. Barring black-spot identification and rectification, these initiatives are still in the planning stages. Most of them are being implemented first on the national highways, which form a very small percentage of roads in the country. Coordination with various departments at the state level has been poor and not much has been done on lower-hierarchy roads.

In 2015, Bloomberg Philanthropies announced the second phase of the Bloomberg Initiative for Global Road Safety (BIGRS, initially launched in 2010). Committing \$125 million, it chose 10 cities around the world on which to focus road safety efforts (Bloomberg Philanthropies, 2015). Mumbai is the only city in India to be selected under this programme. BIGRS works at the national level as well as the local level to influence legislation and implement road safety interventions respectively.

These developments, in addition to committing political leadership in India towards road safety, have brought about a change in the way road safety is perceived by decision makers. Concepts of safe systems approach and Vision Zero have been introduced (GoI, 2015). Differing greatly from traditional road safety philosophy, the safe system approach is a holistic approach towards improving road safety with an aim of creating a transport system which is more 'human proof'. Vision Zero is a strategy to eliminate all traffic fatalities and severe injuries while increasing safe, healthy, equitable mobility for all. While the focal point is the road user, the solutions concentrate on other elements of the transportation system such as road infrastructure and vehicles. This approach is particularly relevant for a middle-income country such as India where most of the road users are pedestrians, two-wheeler users or cyclists. The concepts have been instrumental in shifting focus, at least at the national level, to safe and inclusive infrastructure.

## **4.2 Governance structure and funding for road safety**

The Indian government has a federal structure, with legislative, executive and judicial arms at the national, state and local levels. Decision-making tends to be top-down, and national and state levels share decision-making powers while functioning independently. For example, while policy issues such as defence and industry are on the Union List (governed centrally), road transport is on the



State List. Motorised vehicles, on the other hand, are on the Concurrent List – that is, jointly governed by national and state governments. All decisions pertaining to road transport at the state level (state highways and lower-hierarchy roads) are taken by the state government, which also has autonomy to pass laws in this policy area.

There are many different actors involved in road safety in Mumbai. The Ministry of Road Transport and Highways (MoRTH) (at the national level) and the Department of Transport (at the state level) are key players in road safety in Maharashtra, and in Mumbai itself, traffic police and the municipal corporation design, build and manage most road infrastructure. There are also several other agencies working towards road safety at all levels of government, but the lack of coordination between them is a significant deterrent to the improvement of road safety despite increases in funding to the issue in recent years. Private players, such as automobile manufacturers, have come to play an important role in the road safety ecosystem, providing both expertise and funding. Lastly, civil society, with a focus on bigger sustainability and social equality issues, has been instrumental in provoking action from the government. Tools such as public litigations and public-private-civil society partnerships have been useful in emphasising the need to focus on road safety.

#### 4.2.1 Government institutions

##### National-level institutions

As with most democratic governments, the legislative branch in India is responsible for formulating policy and national laws, while the executive arm of the government is responsible for implementing laws and programs, including those pertaining to road safety in the country. It also oversees the planning and development of national highways.

The key implementing agency for all road safety policy, legislation and works is the MoRTH, headed by the Union Minister for Road Transport and Highways. The MoRTH is the focal ministry responsible for implementing the Motor Vehicles Act 1988 (through the Motor Vehicles Department) and collaborates with several ministries to do so. It is also responsible for: ensuring the adoption of standards in vehicle and road design; initiating education and awareness programmes (for instance, establishing Institutes of Driver Training and Research); and emergency care schemes, such as the Good Samaritan Guidelines (Singh, 2017b). The MoRTH, which is advised by the National Road Safety Council, guides all state-government-led transport planning.

The Minister, the elected leader of MoRTH, plays a key role in setting the agenda and identifying the MoRTH's priorities. But while the current Union Minister for Road Transport and Highways has made road safety a government priority (National Road Safety Policy, NRSTM Bill), he has been unable to pass relevant legislation. Implementation is constrained by other institutional actors including the Official Opposition (the opposing political party in the Lower House of the Parliament), the legislative branch

of government (Parliamentary Committees) and other independent bodies seeking to protect their own interests (such as the automobile and transport industry lobbies).

##### State- and local-level institutions in Maharashtra

The Department of Transport for Maharashtra is advised by the Maharashtra Road Safety Council. The Council is chaired by the State Minister for Transport and the state ministers of the Public Works Department and Home Affairs are elected representatives. Administrative heads of relevant departments (roads, police, health etc) are members of the Council. As at the national level, the state council's role is to advise the government on road safety matters. It meets once every six months to review plans for road safety measures, implementation strategies and monitoring mechanisms. The Maharashtra Road Safety Council is slightly more powerful than the National Road Safety Council as all of the key decision-makers – such as the State Minister for Transport, Municipal Commissioner of MCGM and Joint Commissioner of Police, Traffic – are direct members.

The organisational structure at the local level is slightly different. Because Mumbai doesn't fall under a district, it is directly overseen by state-, regional- and local-level agencies. The primary agency responsible for the urban governance of Mumbai Suburban is MCGM –one of the largest urban local bodies in Asia. MCGM has considerable decision-making autonomy. It has two heads: the Mayor of Mumbai is the elected head of the agency (a 2.5-year tenure) while the Municipal Commissioner is the appointed head (appointed by the Government of Maharashtra). MCGM is responsible for all infrastructure development in the city, including roads. The Brihanmumbai Electric Supply & Transport Undertaking bus service is also housed under MCGM.

Mumbai Traffic Police (MTP) is responsible for the enforcement of traffic rules. Mumbai, as the state capital, has a separate department overseeing traffic that is headed up by the Joint Commissioner of Police, Traffic. As well as overseeing traffic rules, MTP works with MCGM to manage traffic movement and enforce speeds. While MTP is responsible for deciding speed limits in the city, MCGM is responsible for installing signage. MTP is also responsible for collecting and reporting crash data for the city. The agency frequently works with the Motor Vehicles Department (also referred to as Regional Transport Office – RTO) to implement enforcement techniques. Recently, MTP has introduced 'e-Challans', which is an electronic payment system for traffic fines.

But discussions with local experts suggested that local agencies are not playing the roles that they should when it comes to road safety. The absence of a well-coordinated approach was also evident. In Mumbai (and most Indian cities) the traffic police determine how traffic moves and at what speeds. Given that design and posted speeds should be the same, this task should be undertaken by the agency that designs roads (in the case of Mumbai, this is MCGM) (Mathew, 2017). The police should instead act as representatives of the legal system, coming in only when

a traffic offence is committed or a collision takes place. In short, they should act as enforcers and not regulators. Through safe road design, it is MCGM that should ensure prevention of crashes.

The RTO's primary role is to ensure safety on the roads of Mumbai. It enforces traffic rules using flying squads that provide support to MTP and identify overloaded passenger and freight vehicles; ensures the competence of drivers on the road through stringent and transparent licensing procedures; and ensures the roadworthiness of vehicles by performing safety checks. Poor communication means coordination between various local public agencies is lacking. While MTP works closely with both MCGM and RTO, coordination between MCGM and RTO has been non-existent due to their functions being entirely separate (Shinde, 2017).

Public agencies display a lack of ownership when it comes to discussing the problem of road safety, stating that ensuring road safety is the responsibility of the traffic police (Ingle, 2017). They also tend to hold road users responsible for crashes, rather than unsafe road design; during interviews, public officials often cited reckless driver behaviour as the main cause of collisions, while poor infrastructure was never mentioned.

MCGM is the richest municipal corporation in the country (Praja Foundation, 2016a). As such, MTP suggested road-safety-related design improvements, most of which MCGM has been able to implement on the ground (Koregaonkar, 2017). The RTO is the only public agency lacking financial resources to deploy more resources on Mumbai's roads. However, its role has undergone a gradual change in recent years, with an increased focus on meeting revenue collection targets rather than ensuring safety. For example, the flying squads are under pressure to target offences that bring in higher fines.

#### **4.2.2 Role of the private sector and civil society in road safety in India and Mumbai**

Over the last two decades, the private sector has participated heavily in roads in India, bringing with it financial resources and improved operational efficiency in transport projects. The private sector has been able to plug gaps in technical capacity and match the increasing demand for improved

mobility in India (Puri, 2003). Automobile manufacturers in India actively work with the Indian government to set vehicle design and safety standards (Society of Indian Automobile Manufacturers, SIAM gives inputs to the technical committee responsible) (SIAM, n.d.). Automobile manufacturers work with local and state governments to conduct vehicle testing and capacity-building (NATRIP, n.d.). Maruti Suzuki, a popular car manufacturer in India with an annual output of 1.5 million cars, operates six Institutes of Driving and Traffic Research in collaboration with various state governments (IDTR, n.d.).

India's poor road safety record also affects the industrial sector: road crashes result in the delayed transportation of raw materials and finished products, causing financial losses for manufacturing industries. Moreover, loss in personnel hinders the employer growth and affects their reputation as a safe employment provider (FICCI, 2016). Private businesses work with local and state governments to conduct driver training and awareness programmes as part of in-house road safety initiatives and corporate social responsibility. Maruti Suzuki has opened 421 Maruti Driving Schools all over the country (Maruti Suzuki, n.d.). The private sector is deeply entrenched in the road safety sector and can exercise considerable influence in its working.

Civil society is the third key player in road safety, after the government and the private sector. Civil society organisations working on sustainability address wider, multi-sectoral issues such as social equity which the other two players don't. Public interest litigations initiated by NGOs have incited government action. Civil society has the distinct advantage of being able to forge partnerships with the government, the private sector and citizens. A good example of such a partnership between civil society and the government is the Bloomberg Initiative for Road Safety and working in Mumbai. Another successful partnership between the three key players is the Zero Fatality Corridor Project on the Mumbai Pune Expressway (Box 1).

#### **4.2.3 Funding for road safety in India**

One of the MoRTH's main responsibilities is the design and construction of national highways in India. In 2016/17, out of its budget of \$11.2 billion, \$30.0 million

#### **Box 1 Road safety partnership between the public sector, private sector and civil society**

The Mumbai–Pune Expressway is a notoriously unsafe high-speed corridor connecting the cities of Mumbai and Pune. More than 1,300 people died on this stretch of road between 2010 and 2015.

In 2016, the 'Zero Fatality Corridor Project on the Mumbai–Pune Expressway' project was launched as a partnership between Maharashtra State Road Development Corporation (the public agency responsible for maintaining the expressway), in partnership with Mahindra & Mahindra (prominent Indian automakers), JP Research India (a road and automotive safety research organisation) and Savelife Foundation (a road safety NGO).

The project team conducted detailed analysis of crashes occurring on the Mumbai–Pune Expressway and safety audits, and implemented all-inclusive interventions based on engineering, enforcement, education and emergency care. It found that seemingly minor road design elements, such as landscaping, were leading to fatal crashes. Over 1,000 unsafe spots were addressed through changes in road design. As a result, road crash fatalities fell by 45% in the first three quarters of 2017 (Singh, 2017c).



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(roughly 0.27%) was allocated for ‘Research Training and Studies and Other Road Safety Schemes’. This may cover activities such as road safety programmes, the creation of national highways facilities for extending relief to collision victims, the establishment of a National Road Safety Board, strengthening of public transport, research and development, and training. However, only \$21.5 million was actually spent during the fiscal year. In the 2017/18 budget, this allocation has been increased marginally to \$37.5 million (0.3%) of the total budget (\$12.5 billion) (MoRTH, 2017). During 2016 Road Safety Week, the MoRTH also earmarked \$1.6 billion for implementing safe road design through rectification of black spots along national highways over the next five years, until 2020 (GoI, 2016).

At the state level, capital expenditure in road safety is undertaken by Maharashtra Public Works Departments and other road building agencies such as Maharashtra State Road Development Corporation (MSRDC) and Mumbai Metropolitan Region Development Authority (MMRDA). Budgets of both the Maharashtra Public Works Departments and MMRDA do not have specific road safety heads. They do, however, allocate resources for roadworks (around \$716 million).

The MSRDC organisation itself is not allocated a budget by the state government, but instead funds its projects by market borrowings (MSRDC, n.d.). To provide for non-capital expenditure for road safety, the Government of Maharashtra established the Maharashtra Road Safety

Fund in 2016. Revenue collections from traffic fines and a road safety levy contribute to this fund. While any public agency can apply to use this fund, the expenditure must be approved by a committee comprised of senior government officials. The Supreme Court Committee on road safety has specified guidelines for the expenditure of this fund. The road safety fund has not been spent by the Government of Maharashtra so far, and details pertaining to the total amount collected are unavailable.

At the local level, MCGM had a 2017/18 budget of over \$3.7 billion (down from \$5.5 billion in 2016/17). While road safety is not a separate budget head, approximately 7.5% (\$283 million) of the total budget for 2017/18 has been allocated to ‘roads and traffic’, which includes road repair work (CARE Ratings, 2017). Road safety work in India and Maharashtra seems to be sufficiently – if not comfortably – funded. At the national level, road safety financing has been increasing year on year. At the state and local levels, too, a considerable percentage of the budget has been set aside for roadworks, and sometimes specifically for road safety. With the introduction of the Maharashtra Road Safety Fund, various initiatives can be undertaken by the government. However, since the expenditure is often dictated by the government’s outlook towards the problem, it remains to be seen if more urgent needs such as safe infrastructure and enforcement are given priority over strategies such as driver education. Further research in the area, which considers this aspect in detail, will provide useful insights.

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# 5 Challenges to improving road safety in Mumbai

## 5.1 No strong legislative framework

Different national governments in India have tried to address road safety and revamp the institutional setup at the highest level. But opposition from non-ruling parties and pressure from other interest groups have made progress difficult. The absence of a strong legislative framework is a major contributing factor. The Motor Vehicles Act of 1988 is the only statutory document that addresses road safety, and it has shortcomings.

## 5.2 Political differences and competing priorities

At the state level, the Chief Minister and State Minister for Transport are key players who can champion road safety. As Maharashtra has a coalition government, the Chief Minister and the Minister of Transport belong to different political parties. The former belongs to the political party with a national-level majority, and the latter, to the party that won the municipal elections. And despite being part of the same coalition, they differ in their opinion from time to time. For example: after a Supreme Court order banned the sale of alcohol within 500 metres of highways, the Government of Maharashtra denotified certain stretches of road to circumvent the ban, an action that the Minister of Transport called detrimental to the cause of road safety in a letter to the Chief Minister (Times of India, 2017).

## 5.3 Competing priorities and external pressures

Issues of competing priorities (as was demonstrated by the alcohol ban) and public opinion (leading to re-election) also influence elected representatives' levels of interest in road safety. Elected local-level ward councillors or corporators can play a liaison role, coordinating between the municipal corporation and the citizens, and with the government to ensure effective implementation of projects. Ward committees, mandated by the 74th Constitution Amendment Act of 1992 and chaired by the ward councillor, can also be an effective tool by which

to understand and address citizens' concerns, who are committee members. Having the same political priorities as their higher counterparts, roads are usually high on the list of priorities of ward councillors. However, their concerns are limited only to repairs or building new roads: in the past few years, councillors have ignored important issues and instead focused on other concerns such as 'renaming of roads' to recognise political figures – one of the most debated matters (Praja Foundation, 2016a).

## 5.4 The focus on safer driving, not safer road building

Road crashes tend to be considered the fault of the driver(s) involved (Indian Express, 2015). As such, the government views road safety as a personal responsibility and not a public health issue that merits political action. All tiers of government lack a systems-based approach to tackling road safety issues: current approaches to the problem are driver- and vehicle-oriented. Building forgiving infrastructure – which is the cornerstone of the safe systems approach – is rarely spoken of by key influencers, especially at the state and local levels. Instead, most road safety efforts focus on driver education and public awareness campaigns. No unified regulatory framework and no strong road safety authority exist to encourage a broader approach.

## 5.5 A lack of coordination and communication

Transport in India is overseen by a plethora of agencies that do not communicate or coordinate with each other. This has led to multiple piecemeal efforts being made at various levels without significant results. At the city level, lack of strong leadership (in the form of a strong mayor) also proves detrimental to the cause of road safety.

The remits of local and state agencies have undergone significant changes over the past few decades. For example, the primary role of the Motor Vehicles Department has changed from licensing, registration and enforcement to revenue generation. Traffic-related tasks performed by

MCGM and MTP are also highly interlinked. For example, while the speed limit along a stretch of road is decided by MTP, the signage is installed by MCGM. This leads to problems such as incorrectly installed signage at locations with poor visibility. Moreover, when a problem arises, agencies refuse to take ownership and instead blame each other. It is difficult, too, to identify problems or causes of road traffic collisions, which is a first step in making improvements: methods of crash data collection are highly flawed and there is no scientific investigation of the reason for crashes. Inaccurate and incomplete data does not provide a good basis for informed decision-making.

## 5.6 Disinterest and mistrust among the public

Reluctance among citizens to help crash victims on the road was mentioned by most interviewees as a particular systemic issue impeding road safety in Mumbai and India more broadly. Bystanders, who play a critical role

in getting medical help to the victim, have been legally protected by the Good Samaritan Law since 2016. This protection, present earlier in the form of guidelines by the MoRTH, was written into a law after a public interest litigation was filed by the road safety NGO SaveLIFE Foundation (Supreme Court of India, 2012). But awareness of the law and confidence in the judicial system remains low (Singh, 2017b).

Harassment at the hands of the police and a slow judicial process might also be to blame. Interactions with authorities and dealing with the judiciary to obtain meagre compensation may take up to several years, and families of crash victims are often unwilling to go through it. Interviewees also stated that traffic management and enforcement is made very difficult because citizens are not willing to follow the rules (Patil, 2017; Ingle, 2017). This behaviour may stem from a feeling of disillusionment with the political and economic system. Corruption and the ability to get away with committing a traffic offence are two factors that may lead to irresponsible driver behaviour (CMS India, 2017).

**Figure 15 Factors inhibiting improvement of road safety in Mumbai**

POLITICAL/ POLICY RELATED	INSTITUTIONAL	INFRASTRUCTURE	ENFORCEMENT	SOCIAL/CULTURAL
Absence of a strong road safety policy or legislation at the national or state level	Public agencies display a lack of ownership and are not held accountable for poor road safety	Poorly designed and inadequate infrastructure	Difficult conditions for enforcement of traffic rules	Citizens not willing to follow rules or help crash victims
Opposition from influential groups prevent reforms from being introduced	Mismatched roles of local agencies; focus on revenue generation rather than road safety	Mixed traffic; low per capita availability of road space in Mumbai	Police officials responsible for managing traffic in addition to enforcing rules	Cultural factors (i.e. female attire and riding side-saddle) contribute to female injuries
Conflicting political priorities of elected representatives at the state level detrimental to road safety	Lack of institutional capacity to tackle road safety at all levels of government	Low-quality public transport	Non-compliance of helmet rule among two-wheeler passengers, females and children	Reluctance to interact with the system, which is slow and often harasses citizens

Source: author's own.

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# 6 Opportunities to improve road safety in Mumbai

## 6.1 Policy and legislative reforms

Policy and legislative reforms are urgently required at all levels of government. At the national level, the Motor Vehicles Amendment Bill of 2017 will greatly improve road safety in India once passed by the upper house of Parliament. Through strategic engagement techniques and reiteration of road safety as a priority, the national Minister of Transport can obtain political buy-in from opposing stakeholders, albeit at the cost of a temporary slump in public opinion (due to some of the consequences of the Act such as higher fines for traffic offences) according to experts interviewed. Political support can also ensure increased funding for road safety at both national and state levels.

In the absence of a road safety law, Maharashtra should formulate a State Road Safety Action Plan (currently under preparation) which can act as a unifying guidance document for road safety. The plan will set a common goal for the state, identify priority areas, set time-bound targets and outline detailed activities required to decrease the road traffic fatality rate. The State Road Safety Action Plan will also establish a monitoring mechanism, which will enable a periodic evaluation of the work being done in the state and identify strategies for course correction.

The Government of India's federal structure – with independent tiers of government at national and state levels – offers an opportunity for states to formulate their own legislation. State-level legislation can ensure that departments overseeing development and maintenance of all state-owned roads focus on improving road safety. The goal for the Government of Maharashtra should be to enact legislation that establishes a road safety authority. While such an authority may have an organisational structure similar to that of Maharashtra Road Safety Council (with the State Transport Minister as its head), it must be a statutory body with strong legal backing and decision-making powers. In addition to elected and appointed members, a road safety authority should also comprise road safety experts who can view the problem in a data-led manner and help the authority implement evidence-backed strategies.

The successful implementation of the Action Plan and establishment of a road safety authority will require support from the two, key state-level politicians: the Chief Minister and Maharashtra's Minister of Transport. To ensure that crucial hurdles such as funding, support from other stakeholders such as transport unions and the private sector, and political support at the local level can be overcome, these decision-makers will need to show committed leadership.

## 6.2 Improving inter-agency coordination and building capacity

The Mumbai Traffic Police (MTP) and the Municipal Corporation of Greater Mumbai (MCGM) are the two key agencies influencing road safety in Mumbai. Working at the lowest level in the hierarchy gives them a certain autonomy to implement rules according to their own interpretation (in the absence of any guiding legislation or action plan). Both MTP and MCGM enjoy significant financial freedom and can also invest in strategies to improve road safety. Of the two, MTP is directly involved in critical aspects of road safety such as the movement of people and vehicles and enforcement of rules: its representatives are present on the ground to manage traffic. However, both agencies currently lack the institutional and technical capacity to deal with the complex problems of road safety. They often operate in isolation, ignoring and even undoing the work done by the other. Improving interagency coordination is therefore essential. This is possible in the presence of a state-level strategy for road safety and focused leadership.

There is also an urgent need for technical training of personnel in other local agencies. In 2015, the Government of India launched the Atal Mission for Rejuvenation and Urban Transformation. One of the components of this programme is building capacity at the individual and institutional levels in urban local bodies. This programme could be an effective instrument through which to educate and train officials in road safety issues.

### 6.3 Fostering political action

India's judiciary can exert significant influence and urge action from the elected arm of the government. It has the power to issue directives to the national and state governments with these institutions must comply. It is also the only legal channel through which citizens may demand action on issues that the government is neglecting. The work done by the Supreme Court Committee on Road Safety and Mumbai High-Power Committee are good examples of this influence. The judiciary is in a powerful position to bring about a more permanent institutional arrangement for road safety through its directives.

The jurisdiction of the MoRTH, headed by the Minister for Road Transport and Highways, is limited to national highways, but the ministry does have the power to direct state governments to bring about reforms. The politically elected head, the Union Minister of Transport is a key actor in the road safety ecosystem: he makes most policy and financial decisions regarding road transport and therefore road safety. The current minister has had a particularly positive influence on road safety in India. His commitment to reducing fatalities by 50% by 2020 through the Brasilia Declaration has been instrumental in initiating a discussion on road safety at the national level. He also made sure that road safety receives central government funding. This elected representative can be an important influencer, and has the potential to make the Chief Minister of Maharashtra and State Minister of Transport road safety 'champions'.

The role of the local councillors, or corporators – like that of state heads – has significant scope for improvement. Corporators are the only directly elected representatives of government. Whether independent or affiliated with a political party, they contest and win or lose elections by putting forward locally relevant agendas. They also work closely with the local urban body to deliver on campaign promises. But while road *repairs* regularly feature on these actors' agendas, road *safety* does not. Establishing road safety as a political priority at national and state levels should have a cascading effect, increasing its salience at local level too. Citizens can also demand road safety action from these political figures (see also section 6.4).

Another way in which to address problems facing cities is to empower elected local urban bodies – such as mayors. Conferring additional powers city mayors can curb the state government's dominance over the city and enable the city administration to address pressing issues without interference (WEF/PwC, 2016). Given the nature of competing for political priorities, this reform does not guarantee road safety improvements but it will increase democratic accountability of the local urban body and improve control over how budgets are allocated. The mayor can also facilitate coordination between different departments and garner political support for road safety initiatives.

Outside India, there are several examples of elected city mayors who have tackled urban development and successfully transformed cities (for example, in Bogotá,

Mexico City and New York). In India, some limited attempts have been made to similarly empower these political figures. For example, in 2016, a member of the Lower House introduced a private bill that proposed amendments to the Constitution of India to strengthen local governments. One recommendation was to elect a city mayor directly and make them the executive head of the municipality. This bill is still under consideration in Parliament, but as a private bill that sets out significant reform, it is unlikely to be passed.

The media in also play an important role in encouraging political action: by increasing public awareness and debunking common misconceptions about why road crashes happen, the media can bring the issue of road safety to the public and political fore. Pressure from the citizens and well-intentioned media can go a long way in establishing road safety as a political priority (key informant interviews).

### 6.4 Citizen engagement efforts

Civil society groups can help further citizen engagement in road safety, and championing by citizens can inspire political action. Equally, political road safety champions have inspired increased citizen involvement: the Swachh Bharat Abhiyan (Clean India Campaign) citizenship engagement campaign, launched by the Government of India in 2014, was marketed as a social movement rather than a programme. Its success depended heavily on citizens' involvement in the cause of cleanliness, and residents in a neighbourhood organised clean-up drives and engaged with locally elected representatives on the subject. In 2017, the citizens were also then asked to rate the success of the programme in their respective neighbourhoods, thus holding local bodies accountable (FE, 2017).

### 6.5 Role of global road safety community, civil society and private partners

Committing to global road safety goals set by the international community is crucial for India to maintain its global reputation. But India has signed up to such commitments, nationally it has been difficult to overcome internal opposition and introduce productive measures. Three sets of non-government actors play a critical role in keeping road safety on the policy-makers' agenda and curbing opposition. First, international agencies such as the UN, WHO and the World Bank can influence political will in favour of road safety by educating decision-makers, which they have been doing through initiatives such as BIGRS. Secondly, civil society, through advocacy, can draw attention to road safety thereby advancing policy and legislative reforms. NGOs in India have often worked with the government in the areas of advisory, capacity building and public outreach programmes. Thirdly, the private sector can also play an important role by contributing technical know-how and financial resources for improving road safety.

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## Opportunities for further research

1. **Socioeconomic analysis of crash data.** Absence of socioeconomic data prevented a detailed analysis of crash statistics as part of the study. Further research focusing on aspects such as occupation, education, income, geographic location (i.e. ward or neighbourhood) of crash victims could help determine if there are specific groups of population who are disproportionately affected by road safety issues in the city and why. Such studies could delve deeper into the role of the local councillors, i.e., corporators in improving the state of road safety in the city.
2. **Funding for road safety.** While this study has attempted to determine the extent of funding available for road safety at various levels of government in India, it has not been able to go into detail due to lack of information, especially at the state and local levels. A more detailed analysis of each public agency's budget, along with flow of funds into the road safety sector from non-government sources such as the private sector and development agencies will help in completing the financial picture. The share of road safety activities in the total budget for road development reflects the political focus on the sector and such research will add significant value.
3. **Role of citizens in improving road safety.** Road user behaviour is influenced by many factors, often not in direct control of decision makers. While the study briefly touches upon some of these factors which drive citizens to follow (or flout) traffic laws or assist victims of crashes, further research into social, cultural and political factors will be useful in pinpointing potential areas of governance reform.
4. **Impact of Motor Vehicles Amendment (2017) on Improving Road Safety.** The Amendment, if approved by law makers, could prove to be a landmark legislation and significantly affect road safety. Several objections pertaining to sharing of administrative and fiscal powers and the Amendment's ability to change road user behaviour effectively have been raised by interest groups. The researcher proposes a study of the political and economic implications of the Amendment on road safety to be conducted in the future. This research will be useful in assessing whether India requires a legislation specifically formulated to address road safety challenges.
5. **Further analysis of lobbies in Mumbai itself, as well as the scope and limitations of civil society action.** The scope of this case study focused on experts and decision makers involved explicitly in road safety. An even broader understanding of the civil society and party-political landscape and its salience for road safety issues could be gained from interviewing a wider range of participants in future research efforts.



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# References

- Abhyankar, A., Narayanmorthy, A., Ramachandran, V. and Mhapankar, M. (2012) 'A survey on Mumbai suburban local train travelers' *Review of Integrative Business and Economics Research*: 291–302
- ADP – Office of Additional Director General of Police (Maharashtra) (2013–2015) Crash data for Mumbai (dataset)
- ADP (2015) Mumbai (dataset)
- ADP (2016) Maharashtra crash data (dataset)
- Alesina, A. (2007) *Program report: political economy*, vol. 3. Cambridge MA: National Bureau of Economic Research
- Balachandran, M. (2016) *Accidents on India's deadly roads cost the economy over \$8 billion every year*. Quartz Media LLC, 23 May (<https://qz.com/689860/accidents-on-indias-deadly-roads-cost-the-economy-over-8-billion-every-year>)
- Bhalla, K. and Mohan, D. (2015) 'Safety of young children on motorized two-wheelers around the world: a review of the global epidemiological evidence' *IATSS Research*: 83–91
- Bhatt, A. (2016) 'Is The Motor Vehicle (Amendment) Bill 2016, a step closer to Vision Zero India?' WRI Ross Center for Sustainable Cities (via SlideShare), 19 August
- Bloomberg Philanthropies (2015) 'Road safety: helping to save lives through proven interventions that reduce road traffic fatalities', Bloomberg Philanthropies ([www.bloomberg.org/program/public-health/road-safety](http://www.bloomberg.org/program/public-health/road-safety))
- Bombay Bar Association & Another v/s State of Maharashtra & Others* (2016) PIL No. 18 of 2010 (High Court of Judicature at Bombay, 2 September)
- CARE Ratings (2017) *MCGM budget: FY18*. Mumbai: MCGM
- Census of India (2001) 'Mumbai (Greater Mumbai) City Census 2001'. Mumbai: Census of India
- Census of India (2011) 'Mumbai (Greater Mumbai) City Census 2011'. Mumbai: Census of India
- Chengappa, R. (1985) 'Traffic: death on the roads'. *India Today*, 15 May (<http://indiatoday.intoday.in/story/sudden-and-gruesome-death-becomes-a-chilling-phenomenon-on-overcrowded-indian-roads/1/337064.html>)
- City Mayors Statistics (2007) 'The largest cities in the world by land area, population and density' ([www.citymayors.com/statistics/largest-cities-density-125.html](http://www.citymayors.com/statistics/largest-cities-density-125.html))
- Clark, G. and Moonen, T. (2014) *Mumbai: India's Global City*. JP Morgan Chase
- CMS India (2017) *CMS-India corruption study 2017: perception and experience with public services & snapshot view for 2005-17*. New Delhi: CMS Research House
- Cropper, M. and Bhattacharya, S. (2012) *Public transport subsidies and affordability In Mumbai, India*. Research Support Team, World Bank
- Datar, A. (2017) (Chair, Mumbai Social Environmental Network) Interview with Tanushri Gupte, 17 April
- Dutt, R. (2017) 'Alcohol banned on national and state highways. All you need to know', Huffington Post, 3 April ([www.huffingtonpost.in/2017/04/03/alcohol-banned-on-national-and-state-highways-all-you-need-to-know\\_a\\_22023477](http://www.huffingtonpost.in/2017/04/03/alcohol-banned-on-national-and-state-highways-all-you-need-to-know_a_22023477))
- ECMT Transport Research Centre (2006) *Speed Management Report*. Paris: Organisation for Economic Co-operation and Development
- FE – Financial Express (2017) 'Full list of Swachh Survekshan 2017 rankings: know where your city ranks in Swachh Bharat survey. Financial Express, 5 May ([www.financialexpress.com/india-news/full-list-of-swachh-survekshan-2017-rankings-know-where-your-city-ranks-in-swachh-bharat-survey/653949](http://www.financialexpress.com/india-news/full-list-of-swachh-survekshan-2017-rankings-know-where-your-city-ranks-in-swachh-bharat-survey/653949))
- FICCI – Federation of Indian Chambers of Commerce and Industry (2016) *Role of corporates in road safety*. Report. Ernst & Young LLP
- Frieth (2005) 'Road safety impacts of excessive and inappropriate vehicle speed' *Austroroads road safety handbook*, vol 2.
- GoI – Government of India (2007a) *S. Sundar Committee recommends creation of national road safety and management board*. Press release. 20 February ([www.pib.nic.in/newsite/erecontent.aspx?relid=24901](http://www.pib.nic.in/newsite/erecontent.aspx?relid=24901))
- GoI (2007b) *Sundar Committee report on road safety and traffic management*. Delhi: Government of India
- GoI (2007c) *Sundar Committee report: draft National Road Safety and Traffic Management Act*. Delhi: Government of India
- GoI (2010a) *Standing Committee report summary: the National Road Safety and Traffic Management Board Bill*. Delhi: Parliament of India
- GoI (2010b) *One hundred sixtieth report on the National Road Safety and Traffic Management Board Bill*. Delhi: Government of India
- GoI (2012) *Road safety: final report of the Working Group on Engineering (Roads)*. Delhi: Government of India
- GoI (2014) *Draft Road Transport and Safety Bill*. New Delhi: Government of India.
- GoI (2015) 'India is committed to improving safety, efficiency and sustainability in the transport sector, says Shri Nitin Gadkari at the Global Conference on Traffic Safety in Brazil.' Press release. 19 November (<http://pib.nic.in/newsite/PrintRelease.aspx?relid=131677>)

- GoI (2016) 'Road Safety Week Launched, Rs. 11,000 Crore Earmarked to Fix Black Spots across the Country in Next Five Years'. PIB, 11 January (<http://pib.nic.in/newsite/erelease.aspx>)
- Government of Maharashtra (2017) *Economic Survey of Maharashtra (2016–2017)*. Mumbai: Directorate of Economics and Statistics
- Gupta, S. (2017) 'Mumbai's 12,000 Crore Coastal Road project gets final clearance from centre'. NDTV, 11 April ([www.ndtv.com/mumbai-news/mumbais-12-000-crore-coastal-road-project-gets-final-clearance-from-centre-1692446](http://www.ndtv.com/mumbai-news/mumbais-12-000-crore-coastal-road-project-gets-final-clearance-from-centre-1692446))
- High Court of Bombay (2015) *Bombay Bar Association vs The State of Maharashtra*. High Power Committee Meeting Minutes, Mumbai
- IDTR – Institute of Driving and Traffic Research (n.d.) 'Institute of Driving and Traffic Research' ([www.idtrmaruti.com/Our\\_addresses.aspx](http://www.idtrmaruti.com/Our_addresses.aspx))
- India Today (2016) 'No helmet no fuel drive to hit Mumbai from August 1', India Today, 17 July (<http://indiatoday.intoday.in/story/no-helmet-no-fuel-drive-to-hit-mumbai-from-august-1/1/716895.html>)
- Indian Express (2015) 'Fadnavis: to avoid road accidents, licensing system in city should be made stricter'. Indian Express, 14 January (<http://indianexpress.com/article/cities/mumbai/fadnavis-to-avoid-road-accidents-licensing-system-in-city-should-be-made-stricter>)
- Indian Express (2016a) 'Nitin Gadkari seeks support from all parties for passing Motor Vehical Amendment bill'. Indian Express, 9 August (<http://indianexpress.com/article/india/india-news-india/nitin-gadkari-seeks-support-from-all-parties-for-passing-motor-vehical-amendment-bill>)
- Indian Express (2016b) 'Maharashtra goes back on "no helmet, no fuel" policy'. Indian Express, 6 August (<http://indianexpress.com/article/india/india-news-india/maharashtra-goes-back-on-no-helmet-no-fuel-policy-2956650>)
- Ingle, R. (2017) (Executive Engineer, Municipal Corporation of Greater Mumbai) Interview with Tanushri Gupte and Amegh Gopinath, 26 April
- Internews (n.d.) *Traffic crashes: reporting on road safety as a global health crises*. Washington DC: Internews ([www.internews.org/sites/default/files/resources/IN1301\\_TRAFFIC\\_SAFETY\\_FOR\\_WEB.pdf](http://www.internews.org/sites/default/files/resources/IN1301_TRAFFIC_SAFETY_FOR_WEB.pdf))
- Kannaiah, M. (2009) 'Municipal administration in Andhra Pradesh and problems of municipal finance in Guntakal municipality: a study' (PhD thesis, Sri Krishnadevaraya University)
- Karnik, M. (2016) 'The reasons behind Mumbai's ever increasing, unaffordable home prices', QZ, 22 May (<https://qz.com/540983/the-reasons-behind-mumbais-ever-increasing-unaffordable-home-prices>)
- Koregaonkar, S. (2017) (Police Inspector, Mumbai Traffic Police) Interview with Tanushri Gupte and Dhawal Ashar, 22 April
- Kumar, G. (2017) (Advance Engineering Vehicle Safety and Assistance System, Bosch Corporate Research) Interview with Tanushri Gupte, 12 April
- Kumar, S. (n.d.) *National Road Safety Council* ([www.arthapedia.in/index.php?title=National\\_Road\\_Safety\\_Council\\_\(NRSC\)](http://www.arthapedia.in/index.php?title=National_Road_Safety_Council_(NRSC)))
- Mahajan, M. (2017) 'Bharat New Vehicle Safety Assessment Programme', govinfo.me, 1 February (<https://govinfo.me/bharat-new-vehicle-safety-assessment-programme>)
- Maharashtra State Road Development Corporation (2017) 'Accounts/Finance' ([www.msrdc.org/1247/Accounts/Finance](http://www.msrdc.org/1247/Accounts/Finance))
- Maruti Suzuki (n.d.) 'Maruti Suzuki & road safety' ([www.marutisuzuki.com/maruti-suzuki-and-road-safety.aspx](http://www.marutisuzuki.com/maruti-suzuki-and-road-safety.aspx))
- Mathew, T. (2017) (Professor, Indian Institute of Technology Bombay) Interview with Tanushri Gupte, 25 April
- MCGM – Municipal Corporation of Greater Mumbai (2012) *Development plan for Greater Mumbai 2014-2034: preparatory studies*. Mumbai: MCGM
- MCGM (2014) *Citi development plan: housing*. Mumbai: Government of Maharashtra
- MCGM (2015) *Disaster risk management master plan for Mumbai*. Mumbai: MCGM
- MCGM (2016a) *Comprehensive Mobility Plan for Greater Mumbai*. Mumbai: MCGM
- MCGM (2016b) *Development Plan of Mumbai*. Mumbai: MCGM
- Ministry of Highways (2010) *Road Safety Resolution*. New Delhi: Government of India
- Mittal, N. (2008) 'Policies and programs for road safety in developing India' *Journal of Emergencies, Trauma and Shock*: 42–49
- MMRDA – Mumbai Metropolitan Regional Development (2003) *Population and employment profile of MMR*. MMRDA: Mumbai ([www.mumbaidp24seven.in/reference/MMRDA\\_Population\\_and\\_Employment\\_Profile\\_of\\_MMR.pdf](http://www.mumbaidp24seven.in/reference/MMRDA_Population_and_Employment_Profile_of_MMR.pdf))
- MMRDA – Mumbai Metropolitan Regional Development Authority (2011) *Mumbai Metropolitan Regional Development Authority. MMR*
- Mohammed, A. (2016) 'Maharashtra makes buying 2 helmets mandatory with two-wheelers'. Times of India, 7 February (<https://timesofindia.indiatimes.com/city/aurangabad/Maharashtra-makes-buying-2-helmets-mandatory-with-two-wheelers/articleshow/50885591.cms>)
- Mohan, D. (2004) 'Social cost of road traffic crashes in India'. Delhi
- Mohan, D., Tiwari, G. and Bhalla, K. (2015) *Road safety in India: status report*. IIT Delhi: Delhi
- MoRTH – Ministry of Road Transport and (2010) *Road Safety Resolution*. New Delhi
- MoRTH (2013a) 'Resolution: reconstitution of National Road Safety Council'. New Delhi: The Gazette of India
- MoRTH (2013b) *Road accidents in India*. New Delhi: Government of India (<http://revista.dgt.es/images/informe-accidentes-India-2013.pdf>)

- MoRTH (2015) Resolution: reconstitution of National Road Safety Council. New Delhi
- MoRTH (2017) *Notes on demands for grants, 2017-2018*. Delhi: Government of India
- MoUD – Ministry of Urban Development (2017) ‘Level of urbanization’ (<http://moud.gov.in/cms/level-of-urbanisation.php>)
- MSRDC – Maharashtra State Road Development Corporation (2014) Mumbai
- MSRDC (n.d.) ‘MSRDC: accounts/finance’ ([www.msrdc.org/1247/Accounts/Finance](http://www.msrdc.org/1247/Accounts/Finance))
- MTP – Mumbai Traffic Police (2015) ‘Map showing road traffic fatalities in Mumbai’. Mumbai: MTP
- Nallathiga, R. (2010) Formulating urban transport strategy: learning from the experience of Mumbai. Paper presented at the International Conference on Infrastructure Finance (ICIF), Indian Institute of Technology Kharagpur, Kharagpur
- NATRIP – National Automotive Testing and R&D Infrastructure Project (n.d.) National Automotive Testing and R&D Infrastructure Project’ ([www.natrip.in](http://www.natrip.in))
- New York City Department of City Planning (2015) ‘Population facts’ ([www1.nyc.gov/site/planning/data-maps/nyc-population/population-facts.page](http://www1.nyc.gov/site/planning/data-maps/nyc-population/population-facts.page))
- Nilsson, G. (2004) *Traffic safety dimensions and the power model to describe the effect of speed on safety*. Sweden: Lund Institute of Technology, Lund University
- NUMBEO (n.d.) ‘Traffic in Mumbai, India’ ([www.numbeo.com/traffic/in/Mumbai](http://www.numbeo.com/traffic/in/Mumbai))
- Oxley, J. and Corben, B. (2002) *Effective speed management*. Melbourne: Monash University Accident Centre, VICROADS
- Pai, M. (2014) *Motorized two-wheelers in India: a case study of Pune*. Mumbai: EMBARQ India
- Parihar, M. 2014. ‘Road safety’. Nashik: Yashwantrao Chavan Maharashtra Open University
- Patil, A. (2017) (Deputy Chief, Municipal Corporation of Greater Mumbai) Interview with Tanushri Gupte and Amegh Gopinath, 26 April
- Praja Foundation (2016) *Report on working of ward committees in the City of Mumbai and Civic problems registered by citizens*. White Paper. Mumbai: Praja Foundation
- Praja Foundation (2016a) ‘Praja dialogue’. Newsletter. Mumbai: Praja Foundation
- Praja Foundation (2017) *Report on the state of health of Mumbai*. Mumbai: Praja Foundation
- Proptiger (2014) ‘Thane: city of lakes and high rises’ ([www.slideshare.net/ankurdhawan/prop-tiger-thane-city-of-lakes-and-high-rises](http://www.slideshare.net/ankurdhawan/prop-tiger-thane-city-of-lakes-and-high-rises)) (via Slideshare)
- Puri, B.N. (2003) ‘Private sector participation in the transport sector in India’ *Transport and Communications Bulletin for Asia and the Pacific* No. 73
- Rajagopal, K. (2017) ‘Liquor ban: denotifying highways within cities does not violate order, says SC’. The Hindu, 4 July ([www.thehindu.com/news/national/liquor-ban-de-notifying-highways-within-cities-does-not-violate-our-order-says-sc/article19210297.ece](http://www.thehindu.com/news/national/liquor-ban-de-notifying-highways-within-cities-does-not-violate-our-order-says-sc/article19210297.ece))
- Rathod, V.S. (2017) ‘Ministry’s perspectives on road safety and discussion on CoRS directions and compliance.’ *Road Safety Workshop – Maharashtra*. Mumbai: MMVD
- Rawal, S. (2017) ‘Mumbai monorail turns three today but shortage of rakes may delay phase-II’, Hindustan Times, 1 February ([www.hindustantimes.com/mumbai-news/mumbai-monorail-turns-three-today-but-shortage-of-rakes-may-delay-phase-ii/story-5hb5iz18FrmMQRWx1Ugg1N.html](http://www.hindustantimes.com/mumbai-news/mumbai-monorail-turns-three-today-but-shortage-of-rakes-may-delay-phase-ii/story-5hb5iz18FrmMQRWx1Ugg1N.html))
- Rawal, S. (2017) ‘Mumbai monorail turns three today but shortage of rakes may delay phase-II’. Hindustan Times, 1 February ([www.hindustantimes.com/mumbai-news/mumbai-monorail-turns-three-today-but-shortage-of-rakes-may-delay-phase-ii/story-5hb5iz18FrmMQRWx1Ugg1N.html](http://www.hindustantimes.com/mumbai-news/mumbai-monorail-turns-three-today-but-shortage-of-rakes-may-delay-phase-ii/story-5hb5iz18FrmMQRWx1Ugg1N.html))
- Risbud, N. (2003) ‘The case of Mumbai’, *Understanding Slums: Global Report 2003*. Delhi: UN-Habitat
- Rocha Menocal, A. (2014) *Getting real about politics: from thinking politically to working differently*. ODI Working Paper. London: Overseas Development Institute
- RTO Maharashtra – Regional Transport Office Maharashtra (2015) Data set
- RTO Maharashtra (n.d.a) 2006–2015 data set
- RTO Maharashtra (n.d.b) 1999–2015 data set
- SaveLIFE Foundation (2017) *Road safety in India – public perception survey*. Delhi: SaveLIFE Foundation
- Shinde, P. (2017) (Deputy Regional Transport Officer (Mumbai Central), Regional Transport Office) Interview with Tanushri Gupte, 26 April
- SIAM (n.d.) Vehicular safety standards & regulations. SIAM ([www.siamindia.com/technical-regulation.aspx?mpgid=31&pgidtrail=34](http://www.siamindia.com/technical-regulation.aspx?mpgid=31&pgidtrail=34))
- Silverman, A. (n.d.) *Rights of way: child poverty and road traffic injury in the SDGs*. FIA Foundation/UNICEF
- Singh, S. (2017a) ‘Why India needed the Road Transport and Safety Bill’, NDTV, 10 April (<http://sites.ndtv.com/roadsafety/why-india-needed-the-road-transport-and-safety-bill-2619>)
- Singh, S. (2017b) *Why India needs the Good Samaritan Law*. NDTV, 31 January (<http://sites.ndtv.com/roadsafety/why-india-needs-the-good-samaritan-law-1515>)
- Singh, S. (2017c) *Reducing road deaths: how the Mumbai-Pune Expressway got a lot safer*. NDTV, 27 February (<http://sites.ndtv.com/roadsafety/reducing-road-deaths-mumbai-pune-expressway-got-lot-safer-3087>)

- 
- Supreme Court of India (2012) *SaveLIFE Foundation & Another v/s Union of India & Another* (2012) Writ Petition (C) No. 235 of 2012 (Supreme Court of India)
- Supreme Court of India (2017) *Dr. S. Rajaseekaran vs Union of India & Ors.*, Writ Petition (Civil) No. 295 Of 2012 (Supreme Court of India, 30 November 2017)
- Sy, K. (2017) Human error: leading cause of road mishaps in Metro Manila ([www.rappler.com/move-ph/issues/road-safety/165556-road-crashes-causes-metro-manila-human-error](http://www.rappler.com/move-ph/issues/road-safety/165556-road-crashes-causes-metro-manila-human-error))
- The Hindu (2001) *Road Safety Council, still a non-starter*. The Hindu, 8 January ([www.thehindu.com/thehindu/2001/01/08/stories/04082236.htm](http://www.thehindu.com/thehindu/2001/01/08/stories/04082236.htm))
- Times of India (2017) 'Denotifying highways wrong, says Shiv Sena's Diwakar Raote'. Times of India, 17 April (<http://timesofindia.indiatimes.com/city/mumbai/denotifying-highways-wrong-says-shiv-senas-diwakar-raote/articleshow/58228872.cms>)
- Tiwari, G. (2007) *Urban transport in Indian cities*. LSE Cities, November (<https://lsecities.net/media/objects/articles/urban-transport-in-indian-cities/en-gb>)
- Tiwari, P. (2014) 'Crushed under the wheels: why stakeholders oppose the Road Transport & Safety Bill'. Daily News and Analysis India, 23 December ([www.dnaindia.com/analysis/column-crushed-under-the-wheels-why-stakeholders-oppose-the-road-transport-safety-bill-2046220](http://www.dnaindia.com/analysis/column-crushed-under-the-wheels-why-stakeholders-oppose-the-road-transport-safety-bill-2046220))
- UN – United Nations (2011) *Global plan for the Decade of Action for Road Safety 2011-2020*. UN General Assembly
- UN Economic and Social Commission for Asia and the Pacific (2003) *Review of Developments in the ESCAP Region: Asia and the Pacific*
- Vital Strategies (2017) Mumbai
- Wagh, S. and Indorewala, H. (2015) *Mumbai's coastal road: social & environmental impacts*. Mumbai: KRIVA Collective for Spatial Alternatives
- WEF/PwC – World Economic Forum/PricewaterhouseCoopers (2016) *Reforms to accelerate the development of India's Smart Cities: Shaping the Future of Urban Development & Services Initiative*. Geneva: WEF
- Wegman, F. and Elsenaar, P. (1997) *Sustainable solutions to improve road safety in the Netherlands*. Netherlands: SWOV Institute for Road Safety Research
- WHO – World Health Organization (2012) *Advocating for road safety and road traffic injury victims: a guide for nongovernmental organizations*. Geneva: WHO.
- WHO (2015a) *Global status report on road safety*. Geneva: WHO
- WHO (2015b) Brasilia Declaration on Road Safety, agreed at the 2nd Global High-Level Conference on Road Safety: Time for Results, Brasilia
- WHO (2017) *Save LIVES: a road safety technical package*. Geneva: WHO
- WRI – World Resources Institute (2015) *Cities safer by design*. Washington, DC: WRI

## Legislation

- Motor Vehicles Act, 1988 (India)
- Motor Vehicles Act, 1939 (India)
- Draft Road Transport and Safety Bill 2014 (India)
- The Constitution (Seventy-Fourth Amendment) Act, 1992 (India)

# Annexes

## Annex A

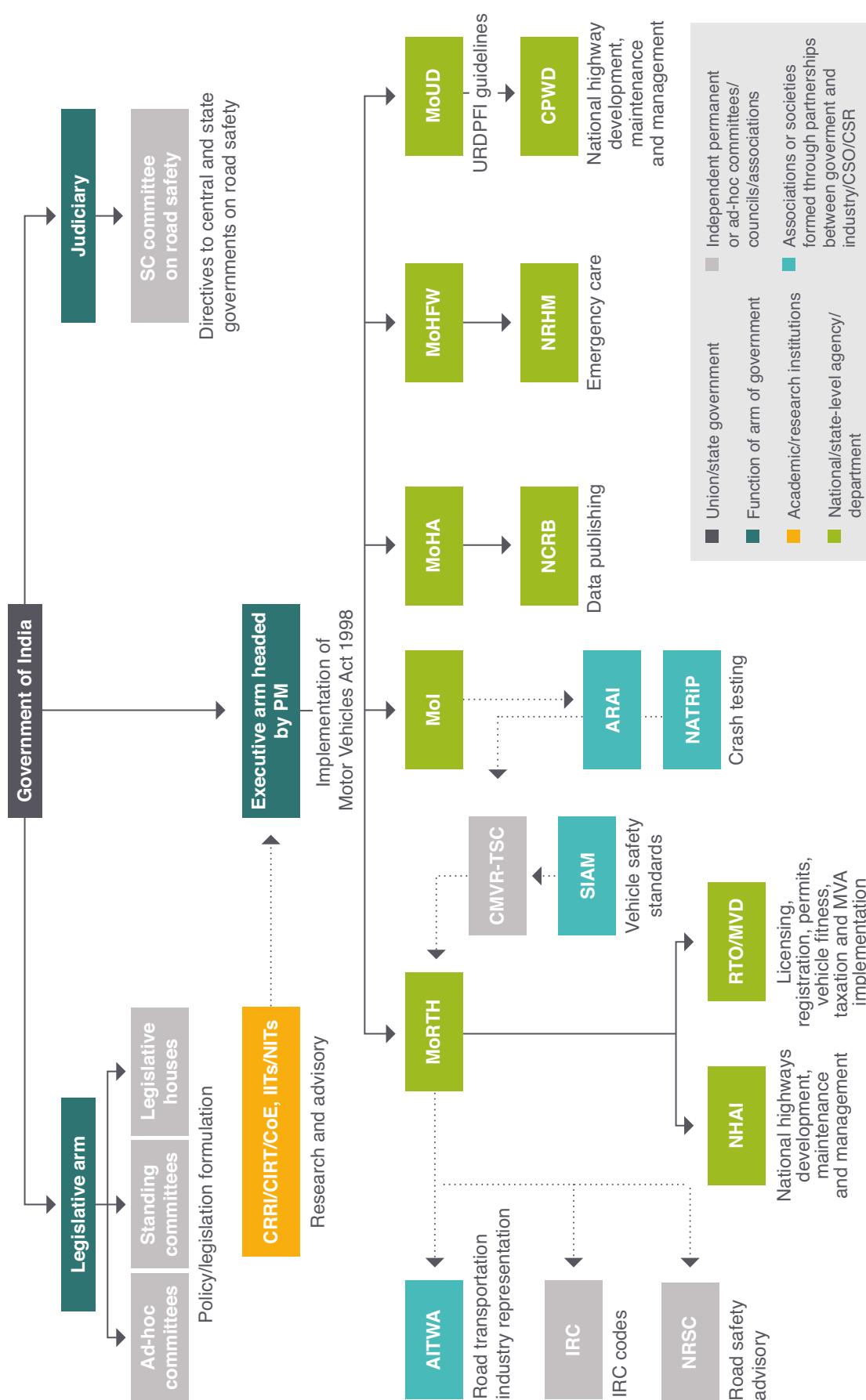
**Table A1 Susceptibility to crashes and fatalities**

	Highly susceptible	Susceptible	Least susceptible
Road user	Pedestrians	Cyclists	Road-based public transport users
	Two-wheeler (drivers and passengers)	Car users	Three-wheeler users
Age group	25–44 years (males)	45–64 years (males)	<15 years (males)
		25–44 years (females)	>55 years (males)
	45–64 years (females)	<15 years (females)	15–24 years (females)
		15–24 years (males)	
Gender	Female pedestrians	Male two-wheeler passengers	Male public transport and car users
	Male pedestrians		
	Male two-wheeler drivers		Female public transport and car users
	Female passengers in two-wheelers		
Time of day	Late night and very early morning (between 00:00 and 06:00)	Morning peak (between 09:00 and 12:00)	Early morning (between 06:00 and 09:00)
	Start and end of evening peak (between 16:00 and 17:00, and 20:00 and 21:00)	Evening peak (between 17:00 and 20:00)c	Afternoon (between 14:00 and 15:00)



## Annex B

Figure B1 Institutional setup for road safety in India at the national level

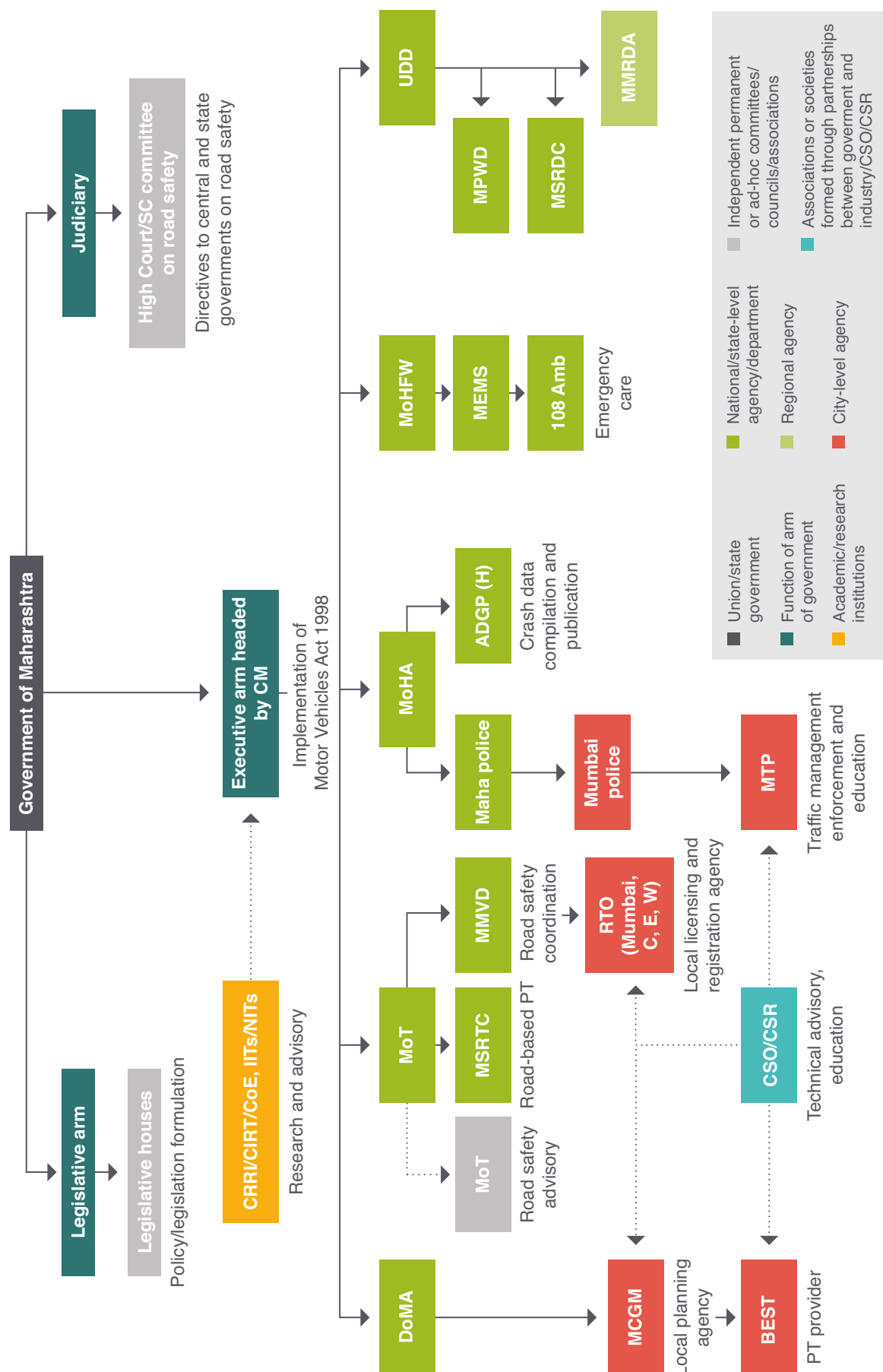


AITWA – All India Transporters Welfare Association; ARAI – Automotive Research Association of India; CIRT – Central Institute of Road Transport; CMVR-TSC – Central Motor Vehicles Rules -Technical Standing Committee; CoE – Centre of Excellence; CPWD – Central Public Works Department; CRR – Central Road Research Institute; IITs – Indian Institutes of Technology; IRC – Indian Road Congress; MVD – Motor Vehicles Department; NATRIIP – National Automotive Testing and R&D Infrastructure Project; NCRB – National Crime Records Bureau; NITs – National Institutes of Technology; NRHM – National Rural Health Mission; NRSC – National Remote Sensing Centre; SIAM – Society of Indian Automobile Manufacturers; URDPFI – Urban and Regional Development Plans Formulation and Implementation.

Source: various.



Figure C1 Institutional setup for road safety in India (at the state and local level)



Note: CIRT – Central Institute of Road Transport; CoE – Centre of Excellence; CRRR – Central Road Research Institute; IITs – Indian Institutes of Technology; MMVD – Maharashtra Motor Vehicle Department; MSRTC – Maharashtra State Road Transport Corporation; NITs – National Institutes of Technology.

Source: various.

## Annex D

Collection of crash data is solely the responsibility of traffic police in India. For this study, crash data was obtained from the office of Maharashtra Additional Director General of Police, Highways (ADGP). The data was found to be of poor quality and the researchers were unable to analyse many questions. For example, ADGP's office reports statistics pertaining to 'Cause of Accident'. In 2015, 68% of all fatalities were attributed to 'fault of the driver'. The remain 22% were attributed to 'fault of the driver of another vehicle'. Under 'Fault of Driver,' 80% of fatalities occurred due to 'over-speeding' and only 4% due to 'vehicle not giving right of way to the pedestrian.' The actual causes of crashes and fatalities probably involved these and other factors but they cannot be discerned from the data. Improper road design is rarely mentioned as a possible cause.

The process of data collection in the state of Maharashtra is as follows. Crash details are recorded at the site of the crash. At the end of each month, the police station compiles information from all crash data collection forms and sends it to the Office of Superintendent of Police. This office (one for each district) receives information from all Police Stations located within the district. The same information, compiled at the district level, is sent to the Office of Additional Director General of Police at the state level, which then reports it at the state and national levels. Unfortunately, a lot of the information collected at the site of the collision is lost in the process of being transmitted up the hierarchy of authorities. The data collected are often unreliable. For the purposes of this study, data was collected from two sources: The Office of the Additional Director General of Police (Maharashtra) and the Motor Vehicles Department/ RTO (Maharashtra). Table D1 shows the heads under which the data was received.

**Table D1 Data collected from various sources**

Name of organisation	Administrative level	Data heads	Year
Office of Additional Director General of Police, Maharashtra	Mumbai Commissionerate/ Greater Mumbai	Number of crashes, fatalities and Injuries by age and gender of victim, mode of vehicle, age of vehicle, nature of crash, cause of crash, fault of driver, type of manoeuvre, carriageway width, type of junction, nature of injury (serious or minor), location (nearby landmark), type of license of driver, type of road (national highway, state highway or other road), weather condition, road condition, month and time of day	2013, 2014 and 2015
Office of Additional Director General of Police, Maharashtra	Mumbai Commissionerate/ Greater Mumbai	Number of traffic offences and number of fines collected	2010 to 2016 (until November)
Regional Transport Office	Mumbai Commissionerate/ Greater Mumbai	Number of vehicles on road	2005–2006 to 2015–2016
Census of India	Mumbai Commissionerate/ Greater Mumbai	Population	2011









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# Paving the pathways to change

## The politics of road safety in Bogotá

C. Erik Vergel-Tovar, Dario Hidalgo and Anna Bray Sharpin



**Case study**

March 2018



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The views expressed in this report and the accuracy of its findings do not necessarily represent the views of or confer liability on the FIA Foundation.

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This document contains preliminary research, analysis, findings and recommendations. It is being circulated to stimulate timely discussion and critical feedback, and to influence ongoing debate on the emerging issue of the political economy analysis of road safety.

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Cover photo: TransMilenio buses, part of Bogotá's bus rapid transit system, travel down lanes separated from regular motorised traffic © Claudio Olivares Medina, 2012.



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## About this case study

This study explores the factors behind the significant road safety advances that were made in Bogotá between 1995 and 2006, and underlying challenges to addressing road safety that has since resulted in a plateau in traffic fatalities. It also explores opportunities that exist to overcome these challenges, all from the perspective of political economy.

This case study is part of a broader project that analyses the political economy of urban road safety issues, undertaken by the Overseas Development Institute (ODI) and the World Resources Institute (WRI), and funded by the FIA Foundation. It accompanies: a theoretical background paper (Wales, 2017); two other case studies on Nairobi, Kenya, and Mumbai, India; and a synthesis report.

### **The political economy of road safety**

Political economy is a discipline with a long tradition in the social sciences. As an analytical approach, it seeks to understand the underlying reasons why things work the way they do and to identify the incentives and constraints impacting the behaviour of actors in a relevant system (Rocha Menocal, 2014). Characteristics of a political economy approach include:

- a concern with the role of formal and informal ‘rules of the game’.
- an analysis of power and the processes of contestation and bargaining between economic and political elites.
- a focus on the interests of different groups.
- an analysis of how these interests impact development outcomes, at times to the detriment of broader development objectives.

In general, there has been a tendency within policy-making circles to treat road safety as a technical issue. Exploring road safety from a political economy perspective constitutes an emerging field of study which seeks to understand when, how and why road safety emerges as an issue of public concern and how reform efforts can be most effectively supported taking those dynamics into account. The most recent *Global Report on Road Safety* includes some key aspects related to the political economy of road safety such as political saliency and resource allocation. The report also emphasises the importance of having traffic safety on the political agenda as a manner to mobilise resources and public awareness on road safety issues (WHO, 2015).

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# Acronyms

<b>Av.</b>	Avenida
<b>BRT</b>	bus rapid transit
<b>FPV</b>	Fondo de Prevención Vial
<b>JICA</b>	Japanese International Development Agency
<b>NQS</b>	Norte-Quito-Sur
<b>ODI</b>	Overseas Development Institute
<b>SITP</b>	Sistema Integrado de Transporte Público
<b>SOAT</b>	Seguro Obligatorio de Accidentes de Tránsito
<b>UTMP</b>	Urban Transport Master Plan
<b>WRI</b>	World Resources Institute

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# Methodology

The research methodology included a combination of literature review, analysis of road safety data for the city, and a qualitative data analysis of interviews with 14 key actors from the public and private sectors with a decision-making level experience in the national, regional and local government levels, and the insurance sector, during the last 20 years. The qualitative data analysis examined seven factors related to road safety across all participants. It identified three emerging themes: (1) education, safety and behavior; (2) infrastructure and sustainable mobility; and (3) enforcement.

To complement the literature showing safety impacts from phase 1 and 2 of the BRT system, the authors conducted an analysis of the collisions and fatalities from phase 3, by comparing data for BRT trunk corridors and a selection of non-BRT arterial roads. The data was processed by identifying the collisions that took place within a buffer of 35 meters from the axis of BRT corridors (treatment) and main arterial roads (controls) and controlled for the length of each corridor. The data offers the opportunity to observe the influence of infrastructure investments such as BRT on road safety outcomes.



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# Executive summary

Bogotá is the capital and financial centre of Colombia. It has a population of 8 million people. Between 1996 and 2006, the city of Bogotá reduced its traffic fatality rate by more than 60%. Since then it has remained constant – an achievement given the climbing fatality rate nationally.

The 1996–2006 drop in fatalities most profoundly affected motor vehicle occupants, likely related to a combination of education, infrastructure and enforcement policies and programmes with road safety indicators as part of their implementation.

There is still a great need for attention to the safety of vulnerable road users, who are affected by difficult conditions in terms of road safety: there are approximately 15 million trips a day in Bogotá, with most people walking or travelling by bus, and an increasing number travelling by motorcycle.

## Approaches to road safety in Bogotá

Bogotá's transformation, including improved road safety, has been closely linked to the prevailing mayoral leadership and vision. In 1991, Colombia adopted a National Constitution that decentralised many policy responsibilities to local governments, including land use planning – a move that further empowered the recently created position of elected city mayor.

This case study finds that changes in road safety over time can be linked to five key phases in the administration of Bogotá. Although individual mayors cannot hold consecutive terms, the continuity of public policies, alliances between mayors and the repeat election of previous mayors have contributed to a consistency of approach between administrations, which has allowed road safety gains to extend beyond individual administrations.

Road safety initially became a key public policy issue as a result of the local government response to the elevated levels of homicides in the city. In addressing the high violent death rate, they realised that a high proportion of fatalities in the city were caused by road traffic collisions, and so began '... a protection of life campaign ... completely focused on road safety' (personal communication, March 2017, Bogotá).

This precipitated a number of policies, programmes and approaches that have contributed to improved road safety. They include: the development of Citizenship Culture that emphasised the value of human life, a shift from understanding traffic fatalities as a personal responsibility to

a public health issue, changes in local government structure, fiscal reorganisation schemes, institutional reforms, educational campaigns, urban planning and design for sustainable mobility, and significant changes on enforcement procedures including national and local regulations.

This study's qualitative data analysis revealed three emerging themes under which the approaches towards road safety can be grouped:

1. civic education, safety and behavioural programmes
2. infrastructure and sustainable mobility
3. enforcement.

No single approach has improved Bogotá's road safety in isolation: interviewees and our qualitative analysis strongly pointed to the *combination* and interlinking of approaches as the reason for the city's drastic reduction in fatality rates, and critically the maintenance of these lowered rates over time.

## The impacts of Bogotá's TransMilenio bus rapid transit (BRT) system on road safety

The implementation of the BRT system in Bogotá has been closely linked to overall improvements in road safety in the city both in the literature and by experts interviewed for this case study. Before the development of the BRT system, bus transport in Bogotá was characterised by high 'interaction effects' (incidents due to the mixing of buses with other traffic), aggressive driving by competitive drivers, and dangerous pedestrian crossing areas. Buses were stuck in congestion and service levels were poor. Creating a BRT system with a dedicated operations agency and exclusive bus lanes was a response to public demand for better transport and was one of the recommendations of the city's 1996 mobility plan, which had recently been created under the guidance of the Japanese International Development Agency (JICA).

The literature finds that the changes in operations and infrastructure introduced by phase 1 and 2 of the BRT had positive impacts on road safety outcomes after over 80 km of BRT lanes were implemented between 2001 and 2006. An analysis of the impacts of phase 3 of the BRT system (launched 2012) for this study found a reduction in collisions and fatalities in the corridors of this phase, although high variations meant the data was not conclusive (this may relate to the fact that phase 3 has only 19 km of bus lane in total).

## Strategies for road safety

The case of Bogotá demonstrates that road safety can be improved in a relatively brief period given the integration of institutional reform, educational campaigns, provision of infrastructure, promotion of sustainable mobility, regulation at different scales, enforcement and continuity across administrations. This case study identifies several key factors that underlie the improvement in road safety experienced in Bogotá since 1995.

Changes in the legal and institutional framework at both the city and national level laid the foundation for changes in other areas. Nationally, a road safety fund – which, as a public–private cross collaboration remains stable over time – has been in existence since the 1990s. More recently, a national agency was established, and new safety regulations approved. These regulations were subsequently better enforced at the city level due to a reform of the traffic police in Bogotá as well as the institutional reform of the local government. Financial reform at the city level provided greater security for funding infrastructure projects, while new departments for managing mobility and the BRT system provided for better planning of transport and safety.

An increased emphasis from the city government on education and civic responsibility empowered people to demand safer behaviour from one another when using the roads, and improved awareness of traffic regulations and key risks. Bus and bicycling infrastructure reforms improved safety for users of these modes and reduced car use, which in turn increased safety for all road users.

## Challenges and unintended impacts of Bogotá's road safety strategies

Although the road safety gains in Bogotá are impressive, challenges remain to further reduce fatalities and serious injuries, and to avoid unintended negative impacts, some of which have already occurred and are identified in this case study:

- Recently the national Fondo de Prevención Vial (FPV), formerly funded and partially managed by private sector insurance companies, has been integrated into the national government. This transfer process suggests that public and private sectors are still defining their roles in terms of managing, funding and implementing educational campaigns designed and promoted by this fund.
- In terms of infrastructure, initial efforts to create bicycle infrastructure took space from pedestrians along sidewalks, who are also vulnerable road users, creating conflict and reducing comfort and safety. Pedestrian bridges over some BRT corridors also segregated non-motorised transport. This had unexpected consequences for pedestrian behaviour, with people choosing to cross at street level without suitable infrastructure (due to increasing travel times for pedestrians, and personal

safety risks due to people being isolated from street level and therefore more vulnerable to mugging or other violent crimes).

- The success of BRT investments and slow rate of expansion after 2006 has resulted in highly congested buses and overworked drivers, both of which increase risk and reduce the appeal of this transport option. Finally, a new approach to the BRT system's operation in the form of partial integration with mixed traffic at key connection points between trunk corridors may reduce the need for passengers to switch buses, but could also increase the risk of BRT buses being involved in traffic collisions at intersections of mixed traffic lanes.

## Lessons learned from Bogotá

Although progress in Bogotá shows a significant reduction in road fatalities between 1996 and 2006, and a generally stable fatality rate since then, there are many improvements still to be made. Important lessons are already emerging from efforts over the past 20 years:

1. **National reforms can support city level change.** The capacity for Bogotá to rapidly improve road safety was facilitated by changes in the regulatory framework at the national level, especially the decentralisation process that transferred responsibilities to local governments, the approval of road safety regulations and the collaboration between agencies at different government levels on enforcement procedures.
2. **A combination of technocratic and democratic approaches to public policies can generate desired outcomes such as the successful reduction of fatalities.** Reforms at the city level helped generate an institutional and financial framework that was conducive to improving road safety. The implementation of educational campaigns in combination with infrastructure investments helped to influence people's behaviour and facilitated the enforcement of national and local regulations on road safety.
3. **International agencies have also had a significant impact on road safety in Bogotá.** JICA helped the city to develop an Urban Transport Master Plan. World Bank funding contributed to the BRT project after successful implementation by the local government, and more recently Bloomberg Philanthropies is supporting road safety management and planning.
4. **Linking the problem to broader issues to which the public can relate may support public policy responses to road safety.** In Bogotá, the concept of road safety as a public policy issue emerged in the 1990s as a response to public demand to address the high death rates in the city. The mayor and local government officials began to consider violence, including traffic fatalities, as a public health issue.
5. **Improved public transportation from a sustainable mobility approach can have a significant impact on road safety for all modes.** The organisation of public transport

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services by introducing the BRT system has had a positive impact on road safety indicators due to improvements on infrastructure and operational services.

**6. The provision of non-motorised transport infrastructure.**

In Bogotá, where cycle lanes were built on top of sidewalks, dangerous and unintended conflicts between pedestrians and cyclists were generated. More recently, ‘road diet’ measures – whereby space for non-motorised transport is co-opted from motorised transport – has made the segregation of cyclists and pedestrians

possible, with room for motor vehicle lanes taken and used to create cycle lanes. Cyclists and pedestrians have different movement and safety needs that must be addressed through dedicated design and infrastructure.

- 7. While fatalities have dropped among car occupants, they are rising among cyclists and motorcyclists, and require special attention.** This demonstrates the necessity for an approach that is targeted to particularly high-risk groups, and that is also adaptive to changing travel and mode patterns over time.

# 1 Introduction

Bogotá is the capital and largest city in Colombia with a population of nearly 8 million. It represents 25% of the national economy and provides 18.9% of national employment. The city has 1,421 kilometres (km) per road lane of main arterial roads and 2,063 km per road lane of secondary roads. Since the approval of the Urban Master Plan in 2000, the city has built 187 km of bike paths and nine BRT trunk corridors totalling 103 km (SDP, 2017a). Approximately 15 million trips are made every day in Bogotá, with most people walking or travelling by bus (Figure 2). Around 190,000 vehicles commute into Bogotá from surrounding municipalities daily (Secretaria Distrital de Movilidad, 2015; BogotaComoVamos, 2016).

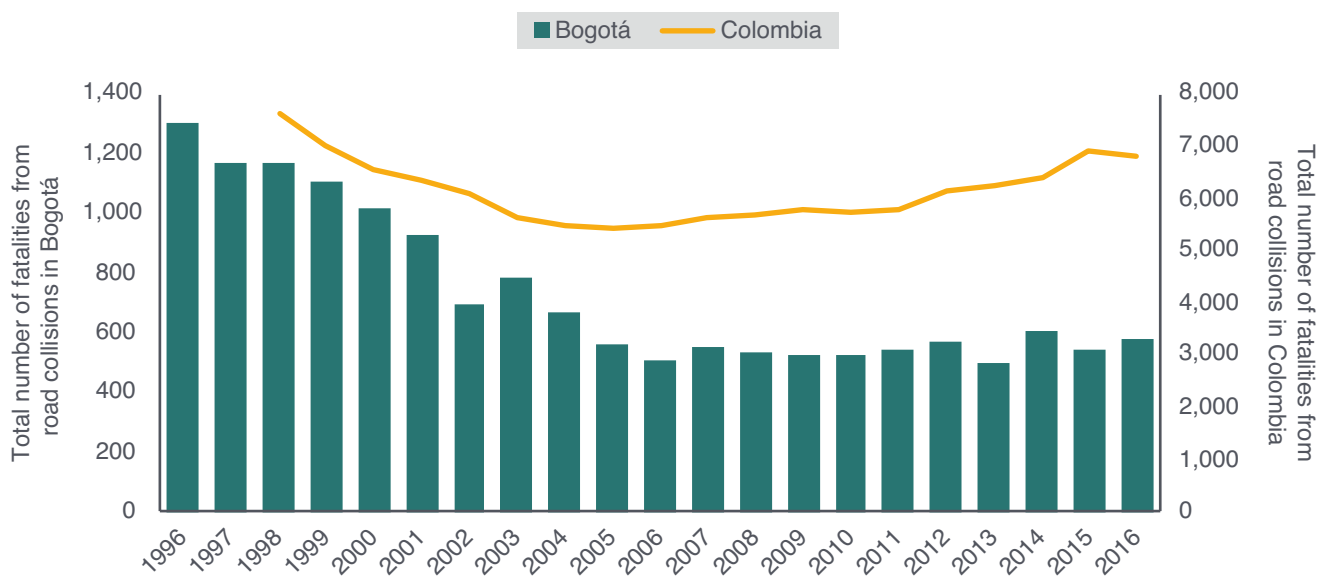
Between 1996 and 2006, numbers of traffic fatalities in Bogotá steadily declined. Since then, the annual rate has remained relatively stable (between 511 fatalities in 2006, and 577 in 2016) while the national rate (after almost a decade of decline) has been rising since 2005. Traffic fatalities in Bogotá are also well below those of other Latin American cities: Bogotá's fatality rate was 7.2 in 2016 (having dropped from 22.3 in 1996) while 2015 saw traffic fatality rates of 26.3 in Guadalajara and 16.0 in Monterrey (Mexico); 22.5 in Belo Horizonte, 20.9 in Brasilia and 20 in Curitiba (Brazil); and 10.4 in Montevideo (Uruguay) (WRI, 2016). This study identified and describes the policies and processes that contributed to this achievement,

from a political economy perspective (see 'The political economy of road safety' on page 111).

Bogotá experienced a decrease of 27.6% in the total number of road collisions between 2007 and 2009, followed by relative stability between 2010 and 2015 (Figure 3). The decrease in fatalities (Figure 1) is consistent with the decrease in total number of road collisions in Bogotá (which dropped by 27.6% between 2007 and 2009 and remaining relatively stable – Figure 3) and may relate to enforcement of drink-driving laws, among other factors. Between 2007 and 2008, the number and rate of injuries caused by road traffic collisions also dropped, by 28.4%, which may be attributed to the enforcement of vehicle occupant safety laws, such as seatbelt use, among other factors.

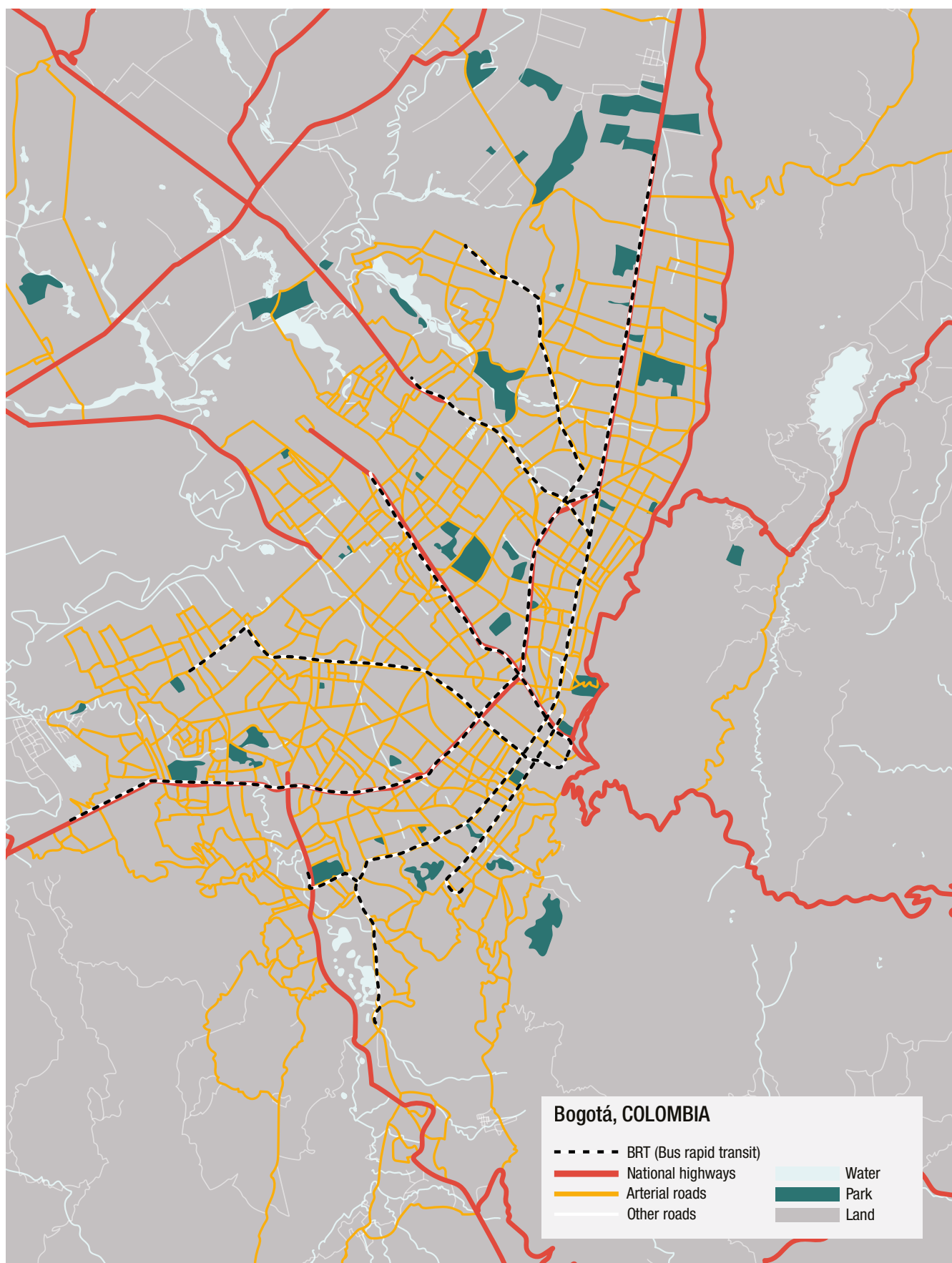
These reductions in fatalities in Bogotá coincide with the mayoral terms of Antanas Mockus (two terms), Enrique Peñalosa and Luis Eduardo Garzón. These terms were characterised by institutional and legal reforms, the design and implementation of 'Citizenship Culture' policies, and the promotion and development of sustainable transport policies such as the bus rapid transport (BRT) system and provision of non-motorised transport infrastructure. Pedestrians consistently account for the greatest proportion of victims in Bogotá over time (Figures 4 and 5). Drivers are the only road users who experienced fewer fatalities over

**Figure 1** Number of fatalities from road collisions in Bogotá and Colombia, 1996–2016



Source: Medicina-Legal, 1999–2015; El Tiempo, 2017; WRI, 2017.

**Figure 2 Major roads and BRT lines in Bogotá**

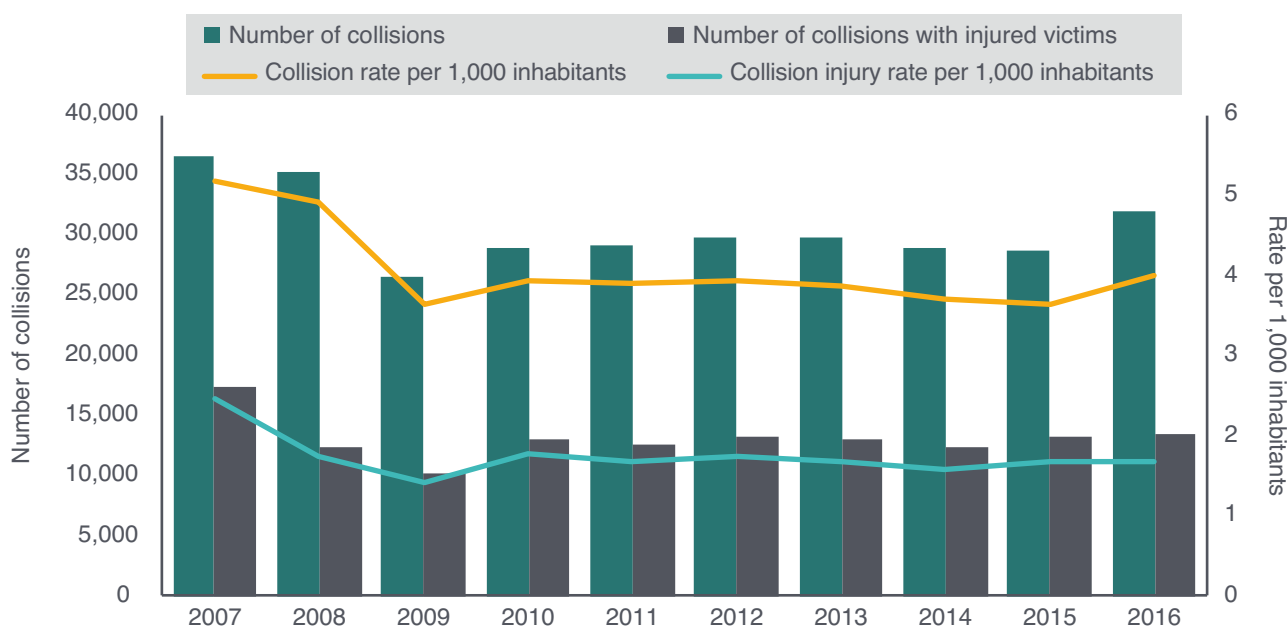


Source: ODI, 2018, adapted from Google Maps.

time. The share of motor vehicle occupant fatalities dropped dramatically between 2007 and 2008, which could explain much of the overall reduction in fatalities. Vulnerable users – pedestrians, cyclists and, to the greatest extreme, motorcyclists – are killed at disproportionately high rates compared to their overall mode share, while people using public transport are at minimal risk of fatality (Figure 6). One explanation is the rapid growth of motorcyclists in the

city and the emerging conflicts between cyclists and other road users, especially due to conflicts for the use of road space. The current administration is addressing the provision of segregated infrastructure for cyclists through road diet and construction of bike paths measures. The data regarding the most vulnerable road users shows increasing fatalities among motorcyclists and cyclists between 2007 and 2016 and roughly constant fatalities among pedestrians.

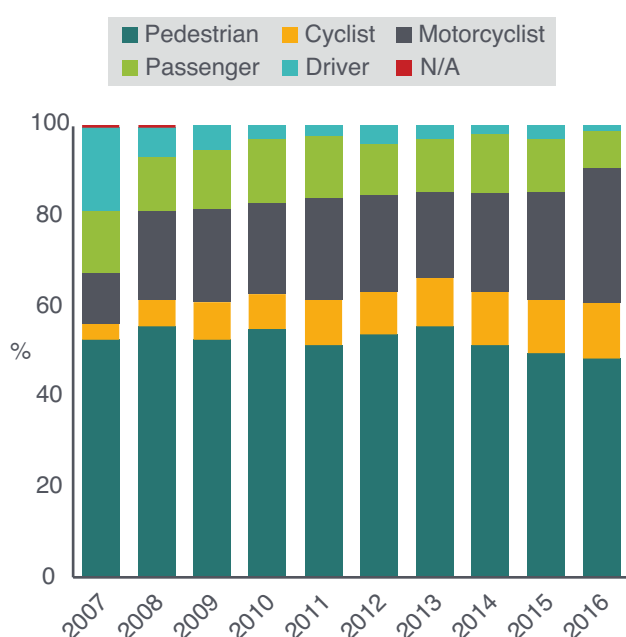
**Figure 3 Total number of collisions, and total number and rate of collisions with injured victims, 2007–2016**



Note: the dip in 2009 could relate to the consolidation of BRT phases 1 and 2 as well as the construction of phase 3.

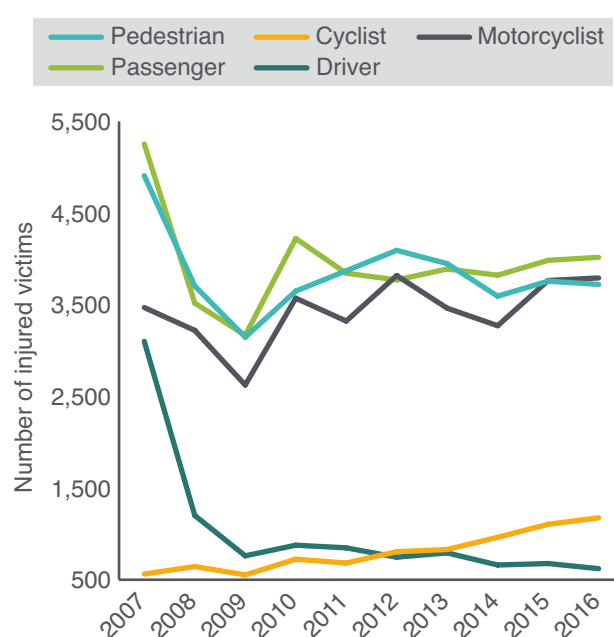
Source: Secretaria de Movilidad, 2016 (data processed by Vergel-Tovar).

**Figure 4 Distribution of fatalities from road collisions by road-user type, 2007–2016**



Source: Secretaria de Movilidad, 2016 (data processed by Vergel-Tovar).

**Figure 5 Road collisions involving injured victims by road-user type, 2007–2016**



Source: Secretaria de Movilidad, 2016 (data processed by Vergel-Tovar).



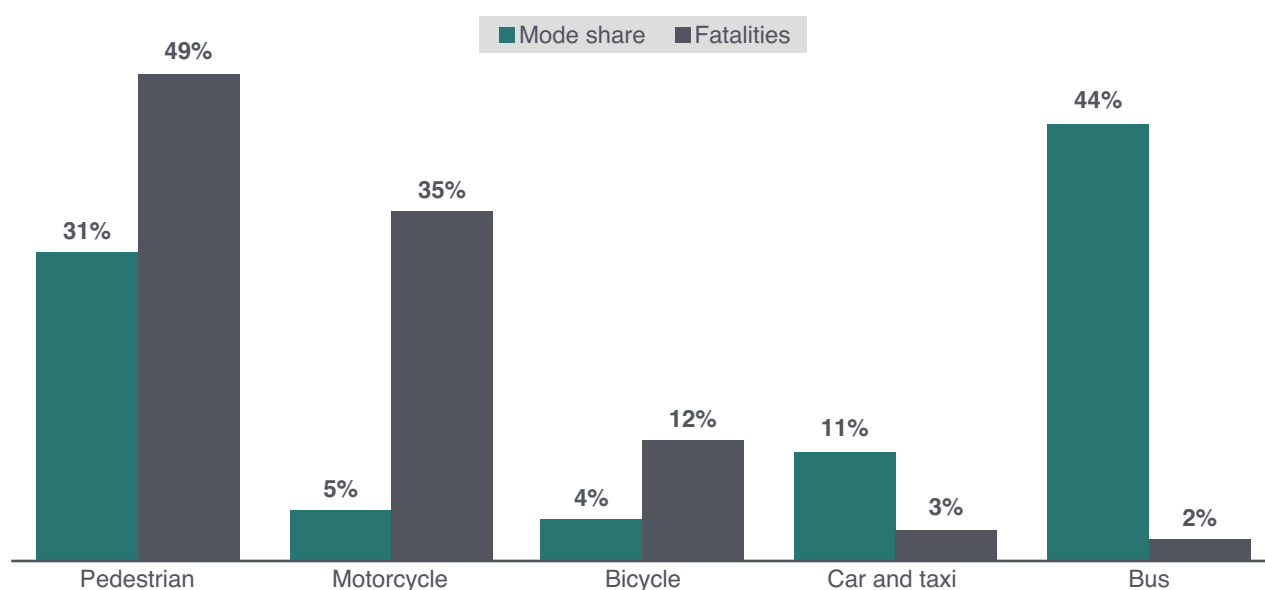
In terms of gender, 80% of traffic fatalities in Bogotá are men (Figure 7). While vulnerable users make up over 90% of fatalities for each gender, a higher proportion of bicycle and motorcycle fatalities are men, and a higher proportion of pedestrian fatalities are women. This is likely related to the overall higher rates of men riding bicycles and motorbikes: men make up 79% and 81% of trips by these modes, respectively.

The highest risk age group for traffic fatalities amongst both men and women is 20–30 years, with the next highest

risk groups being men aged 30 to 40 years and women aged 60 to 70 years (Figure 8).

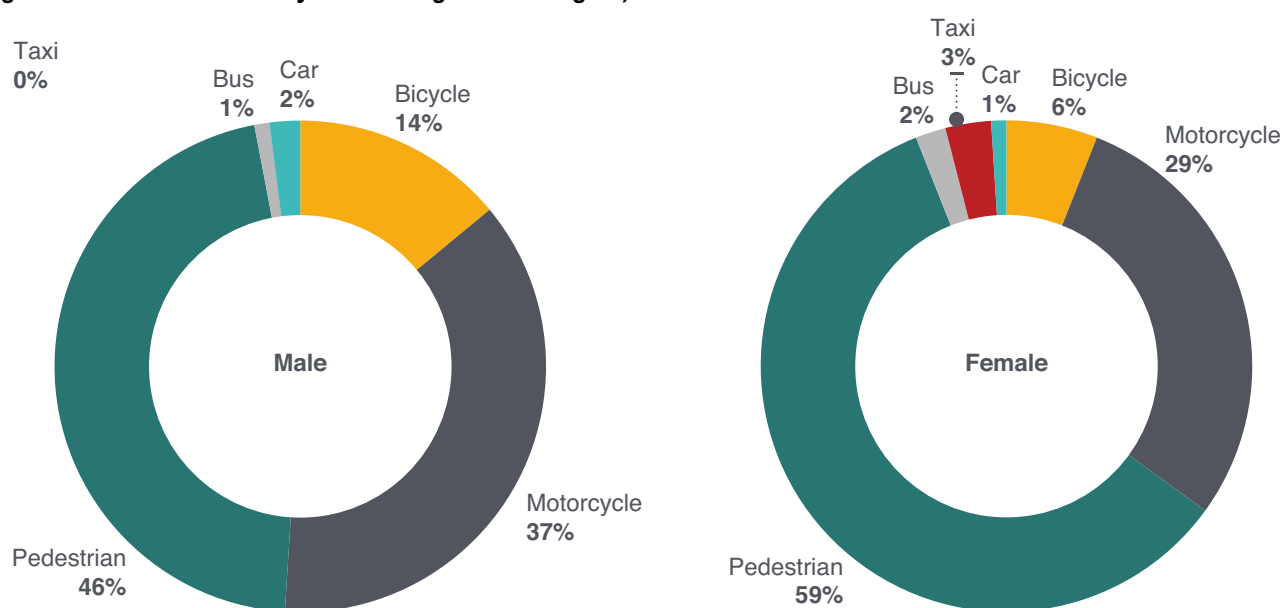
Although road collisions are concentrated in the city central business district – which is the main destination of most trips in Bogotá – the spatial analysis of collision data also found that road collisions are more severe (in terms of both fatalities and injuries) in the south of the city, which is characterised by a lower socioeconomic profile and less well-developed infrastructure.

**Figure 6 Fatalities by mode in relation to overall mode share in Bogotá, 2016**



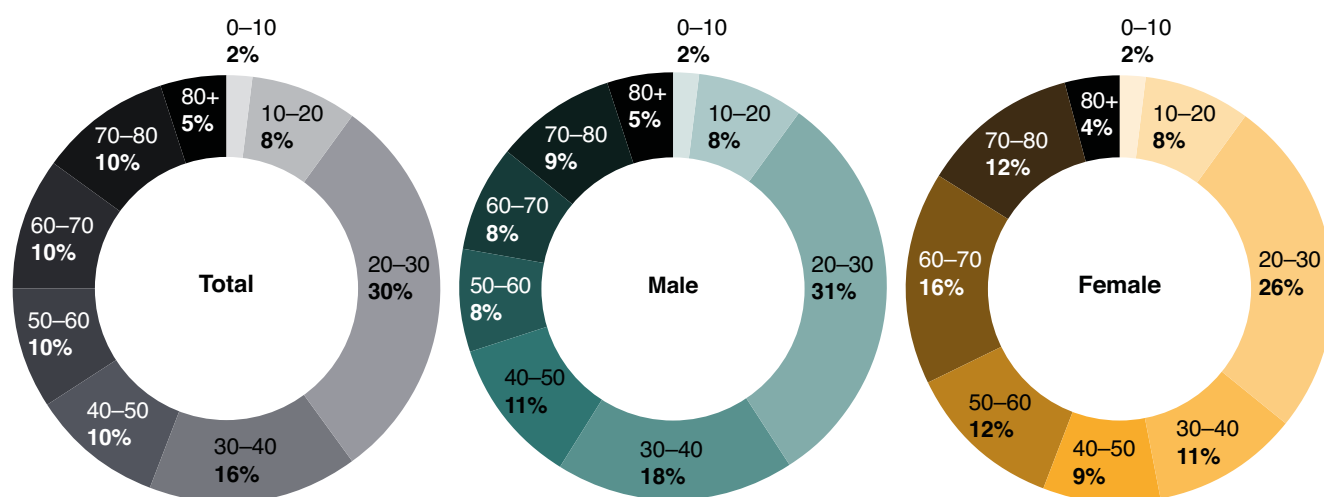
Source: Secretaria de Movilidad, 2016 (data processed by Segundo López).

**Figure 7 Traffic fatalities by mode and gender in Bogotá, 2016**



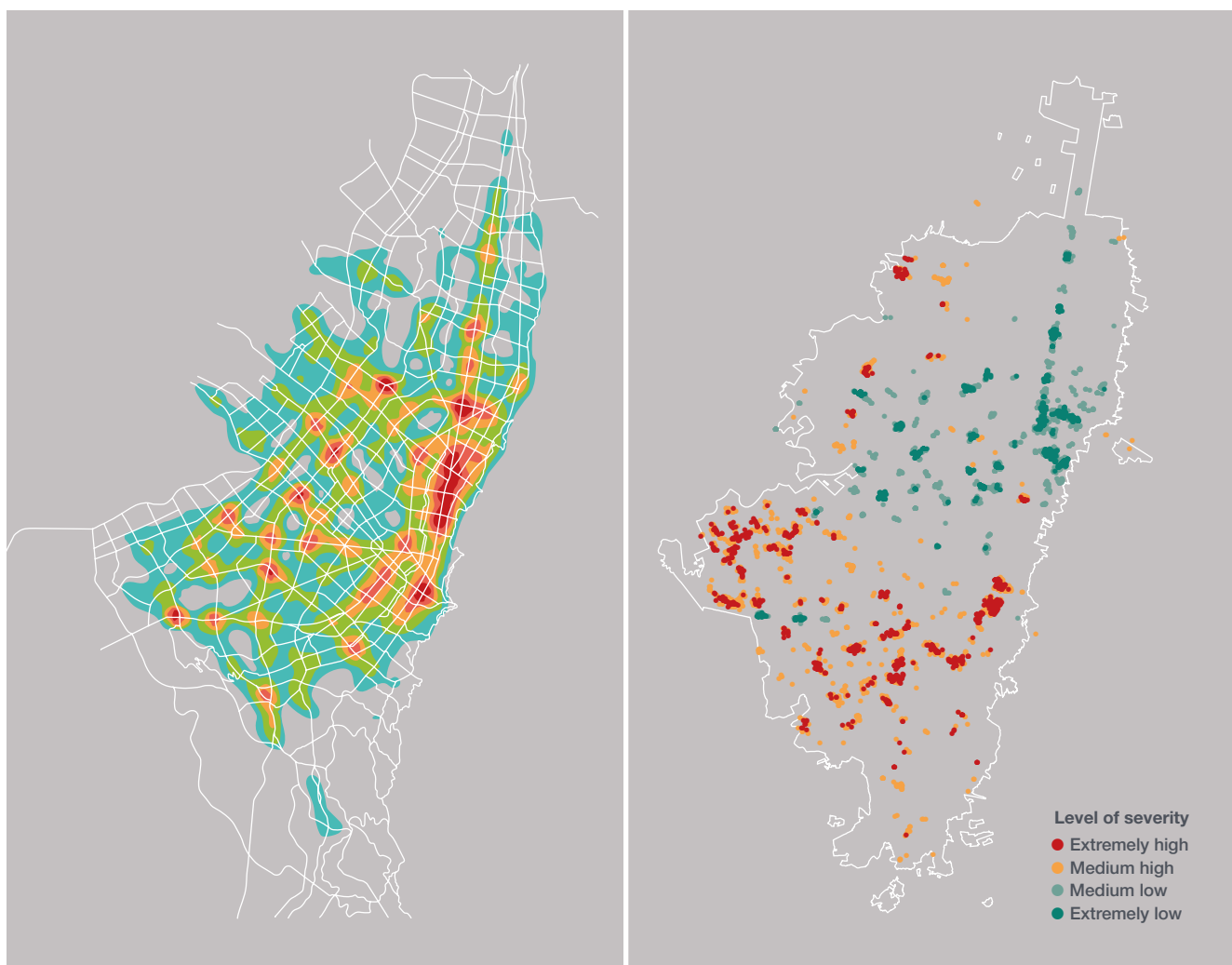
Source: Secretaria de Movilidad, 2016 (data processed by Segundo López).

**Figure 8 Traffic fatalities by age and gender in Bogotá, 2016**



Source: Secretaria de Movilidad, 2016 (data processed by Segundo López).

**Figure 9 Heat map showing road collisions and crash severity in Bogotá, 2016**



Note (right-hand map): Dark red and dark green at 99% level of significance. Light red and light green at 95% level of significance.  
Source: Secretaria de Movilidad, 2016 (data processed by Vergel-Tovar).

## 2 Approaches to road safety in Bogotá

Bogotá has undergone significant transformation over the last few decades. This transformation has included substantially improved road safety, which has been closely linked to mayoral leadership and vision: between 1992 and 2006, mayoral administrations were responsible for key changes in Bogotá that led to a dramatic drop in traffic fatalities (Figure 10; Box 1).

Road safety became a key public policy issue under Mayor Mockus's first administration (1995–1997). Bogotá was experiencing high levels of public violence and Mockus was under significant civil society pressure to reduce the city's high fatality rate that was in part, but not exclusively, related to crime, drug trafficking and internal conflict. In addressing this high death rate, his cabinet realised that a high proportion of fatalities in the city were caused by road traffic collisions.

As a result of the local government response to the elevated levels of homicides in the city, '... a protection of life campaign took off ... completely focused on road safety' (personal communication, March 2017, Bogotá).

Mockus was a proponent of the principle that life is sacred. A former university professor, he developed a theory of 'Citizenship Culture' based on his academic work. During his administration, the principle that life is sacred became a cornerstone of this approach (section 2.2: education). This influenced the approach of this administration towards road safety. Through street-level public education campaigns citizens were encouraged to become part of a mutual enforcement process, by expecting their fellow road users to behave respectfully to one another and to follow the road traffic rules.

### **Box 1 Key changes in the legal and institutional framework that have affected road safety**

1991	Constitutional change for decentralisation empowers an elected mayor in Bogotá
1992	Mayor Castro reforms local property tax processes, securing income for Bogotá
1993	National Road Safety Fund (Fondo de Prevención Vial) and Council established
1995	JICA formulates Urban Transport Master Plan
1995	Mayor Mockus transfers responsibility for enforcement and road traffic control from the Blue Police agency to the Metropolitan Police Department
1995	Mayor Mockus sells bonds in the Bogotá Electric company, securing income for Bogotá
1999	General Transport and Ground Transportation Law including the Seguro Obligatorio de Accidentes de Tránsito (SOAT)
2000	Mayor Peñalosa establishes TransMilenio S.A. to manage the BRT system
2000	Regulation and implementation of the SOAT
2002	National Road Traffic Code issued, Law 769, including regulations and enforcement procedures for seatbelt use and drunk-driving
2004	Requirement of seatbelt according to the National Road Code
2006	Mayor Garzón creates the Mobility Department, formerly the Department of Traffic and Transport, and established a Road Safety Division
2013	Reform to national road traffic law in increased fines and took zero tolerance to alcohol
2013	Creation of the National Road Safety Agency (NRSA), Law 1702, which requires cities to have a road safety action plan

In addition to the changes in public actions and expectations fostered by the Citizenship Culture approach, improvements in road safety in Bogotá were made possible by a series of additional policies, programmes and approaches, going back to the 1991 Constitution, which decentralised certain responsibilities to local governments, mostly fiscal policy, land use planning processes and enforcement.

Based on this study's qualitative data analysis, these can be grouped under three closely interconnected themes – education, safety and behavioural programmes; infrastructure; and enforcement. No single approach has improved Bogotá's road safety: interviewees and our qualitative analysis strongly pointed to the *combination* and interlinking of approaches as the reason for the city's drastic reduction in fatality rates, and critically the maintenance of these lowered rates over time (section 2.5).

Cutting across these different approaches are several key legal and institutional changes that have affected road safety in Bogotá (Box 1). These are broadly related to decentralisation, fiscal stability, and independence and accountability, and are explored in section 2.1. However, it is important to

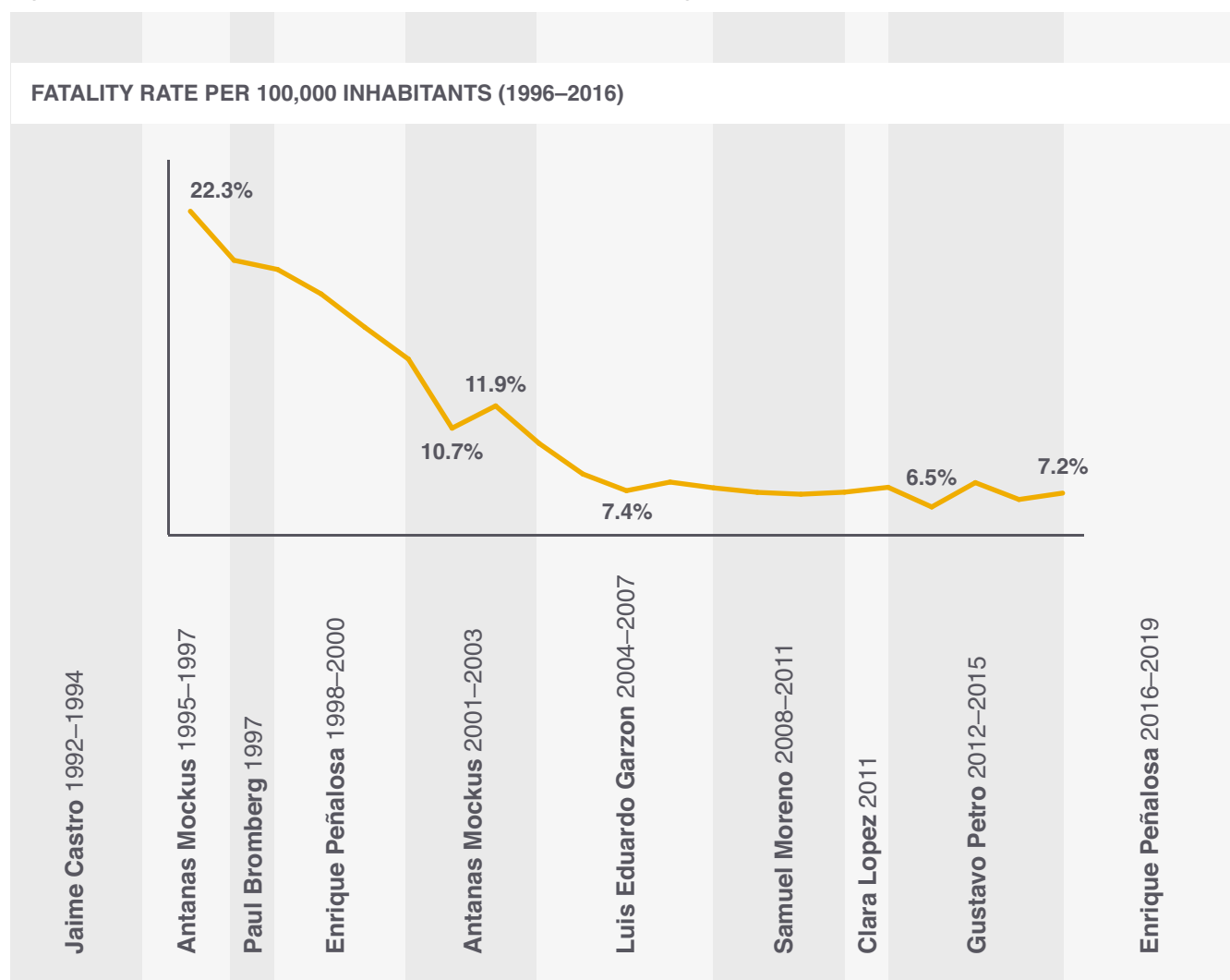
understand that they are in themselves interlinked, and also underpin each of the three emerging themes explaining road safety outcomes in Bogotá. For example, fiscal stability is clearly an enabling factor for all three approaches, especially for improving infrastructure, while accountability has contributed to fiscal stability and improved enforcement.

## 2.1 Changes in the legal and institutional framework

### 2.1.1 City level

Through a series of policies, programmes and approaches, mayoral administrations between 1992 and 2006 were responsible for a transformation in Bogotá that led to a dramatic drop in traffic fatalities (Figure 10). Mayor Peñalosa, whose second term began in 2016, now has an ambitious plan to build on and consolidate the successes in improving road safety. At the end of 2017 an integrated 'Vision Zero' based road safety strategy was formally adopted by the city. But this would not have been possible

**Figure 10 Traffic fatality rates and mayoral administrations in Bogotá, 1992–2016**



Source: qualitative data analysis using data from Medicina-Legal, 1999–2015; El Tiempo, 2017; WRI, 2017.

without key evolutions to the city's governance structures and approaches.

Colombia's 1991 Constitution decentralised certain responsibilities to local governments, including land use planning, and provided a new framework for city mayors, who were further empowered by resultant changes on local policy issues. City mayors during Bogotá's 'transformation' period (1995–2003) – namely Mockus and Peñalosa – were also independent candidates, and this enabled administrations to make other institutional changes, free of party political ties (see, for example, our subsequent discussion of the city traffic police reforms in this section).

At the city level, a strong base to support future mobility and road safety changes was established by Mayor Castro (1992–1994), who focused heavily on securing revenue for the city by implementing a fiscal reform and instilling public faith in institutions. By improving the city's financial security, this helped to secure the availability of funds to be spent on educational, infrastructure and enforcement programmes that influenced road safety outcomes. Mayor Mockus (1995–1997) continued to establish financial security for the city and improved the public willingness to pay taxes. He also implemented pedagogical measures, such as asking property owners to self-assess their property values for property tax purposes – measures that began to work due to the transparency and accountability of his administration – and sold bonds in the Bogotá Energy Company (A. Gilbert and Garces, 2008).

In his first term, Mockus also established a government model in which the relationship between the executive and the legislative powers was not mediated by clientelism. Under his administration, public faith in government was further restored and, combined with his improvements to property tax collection and Castro's fiscal policies, this allowed the administration to generate further revenue. This in turn helped finance sustainable mobility infrastructure projects – particularly in the Peñalosa's first-term administration and Mockus's second-term administration (section 2.3: infrastructure).

Another key institutional change under Mockus's administration was his reform of the city traffic police in 1995. Concerned about the inefficiencies and corruption, and based on his autonomy as an independent city mayor, Mockus's cabinet was able to transfer traffic enforcement responsibility from the Blue Road Traffic Police to the Metropolitan Police Department (the Blue Road Traffic Police was abolished by this reform). The change was helped by the increasing capacity of the National Police, with whom the mayoral administration secured an interinstitutional cooperation agreement to implement the changes. This agreement is still in place, with enforcement responsibility shared between the Secretaría de Movilidad and the Metropolitan Police. The National Police had a higher level of approval among the population, given their success in addressing security and crime issues by the end of the 1990s. When the local government traffic agents who were associated with corruption were replaced by those from an independent, metropolitan-oriented

organisation, efficiency and public perception of enforcement improved (section 2.4: enforcement).

As well as improving finance for infrastructure and public faith in government and enforcement, independence and accountability also helped to improve the continuity of infrastructure projects, especially those focused on sustainable mobility (section 2.3: infrastructure; Figure 11). Administrations could formulate and implement policies independent of party political ties, and cabinet staff during the three mayoral periods remained stable (mostly between Mockus's first term, Peñalosa's first term, and Mockus's second term) – including the heads of some of the city's key public-sector agencies. In fact, Mockus maintained half of Peñalosa's cabinet at the beginning of his second administration.

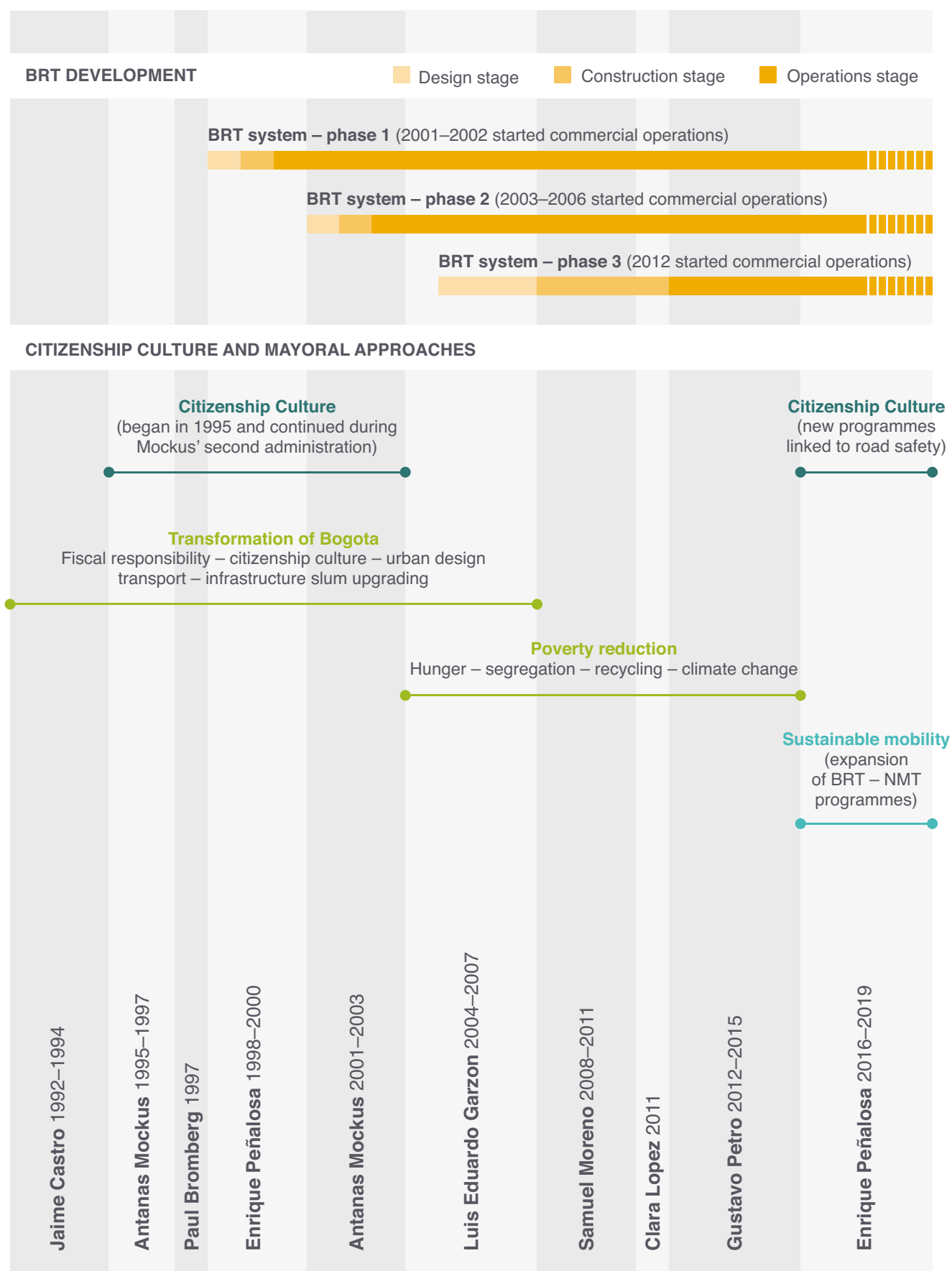
Peñalosa's first administration (1998–2000) combined Mockus's educational and behavioural approach with a focus on infrastructure for sustainable mobility. During the first Peñalosa administration, the bus rapid transit (BRT) system was designed and implemented, mostly the first stage of the system. Also, a transformation of the public space took place, with the improvement of sidewalks, the construction of bike paths and the construction of public facilities in lower income neighbourhoods.

The Citizenship Culture approach continued during Mockus's second term – which saw fatality rates drop dramatically in three out of the four years – and the subsequent three mayoral terms. This is the result of the combination of the education theme (section 2.2) and the infrastructure theme (section 2.3) identified in the qualitative data analysis, but also with the complement of the enforcement theme that began with the transfer of the enforcement responsibility to the Metropolitan Police during the first Mockus administration. Bogotá's transformation suggests that the combination of education, infrastructure and enforcement measures helped the city to reduce the fatality rate associated to road collisions.

The election of Luis Eduardo Garzón as the first city mayor from a left-wing political party signified a shift in policies due to his background as a successful union leader. His priority was poverty reduction at the beginning of his administration. During his administration, policies related to the expansion of the BRT system continued as well as the promotion of educational campaigns and enforcement measures that helped to maintain the fatality rate on road collisions below 10 per 100,000 inhabitants. Garzón also promoted citizen participation in violence prevention, including road collisions, and the involvement of community-based organisations. This was possible through the administrative reform he implemented, through which the Mobility Department was created. New organisational arrangements facilitated the distribution of responsibilities among several actors, for instance, the enforcement process constituted a shared responsibility between the Mobility Department and the Metropolitan Police Department.

The other two mayoral successors, Moreno and Petro, also left-wing politicians, continued the implementation of policies focused on poverty reduction with the addition of environmental issues, mostly in the Petro administration,

**Figure 11 Key periods of mayoral leadership in Bogotá**



Source: developed by the authors based qualitative analysis of key informant interviews; and on Berney, 2010; Alan Gilbert, 2006; Silva, Pérez, Ruiz and Martín, 2009.



but the expansion of the BRT system continued only to 19.5 km of phase 3 of the system. The pace of expansion of bike paths also slowed during these administrations. The left-wing governments focused on achieving a higher level of citizenship participation at the local level, mostly at the urban district government level, where the local city mayors appointed urban mobility managers in order to address local problems faced by citizens in their neighbourhoods.

Peñalosa's second administration (2016–) now seeks to combine the infrastructure-focused policy measures implemented during his first term with the more behaviour-oriented, Citizenship Culture measures implemented during the two Mockus administrations. At the same time, Peñalosa's second administration is also promoting enforcement measures with investments in technology and the improvement of the traffic light systems in the city in order to organise and manage the traffic flow with high-end technology measures (section 2.4: enforcement).

Another important milestone was the creation of the Mobility Department in 2006 and the inclusion of a road safety division. The creation of the Mobility Department was part of a major institutional reform conducted at the city level during the administration of Mayor Garzón. This occurred as part of a local government reform in which the main agencies and departments of the capital district were reorganised. The institutional reform in Bogotá responded to changes taking place in the city in terms of social and environmental issues. The reform created new departments as well as increasing the scope of previous departments. Thus, the Traffic and Transport Department became the Mobility Department where the focus was not only transportation planning but also the mobility of people from a comprehensive perspective, in line with international changes taking place on the transportation sector (sections 2.2, 2.3, 2.4).

## 2.1.2 National level

At a national level, efforts to address road safety began in the 1980s with the introduction of a new regulatory framework. Later in the 1990s, the FPV – which was funded by the private sector, mostly insurance companies – implemented several educational programmes. Given their direct financial interest in reducing traffic fatalities and injuries, these companies were motivated to be involved, and promoted several road safety campaigns through the institutional mechanism of the FPV. National management of road safety was further improved by the 2002 National Road Traffic Code (approved by Congress), and by amendments relating to the enforcement of seatbelt use as well as the reduction of tolerance and increase of fines for drink-driving.

In 2013, the national government created the National Road Safety Agency to design and implement policies at the national level as well as to provide guidelines to cities on road safety. The Agency also took control of the FPV, previously managed by the private sector with funding from the insurance companies. It also supports cities in relation to their road safety plans. The creation of the National

Road Safety Agency was one of a number of changes that took place in part as a result of the worldwide Decade of Action for Road Safety (2011–2020) proclaimed by the UN, as well as being influenced by multilateral agencies who were promoting such national-level institutional reforms in several countries throughout the region.

## 2.2 Education, safety and behaviour programme

The decentralisation process established by Colombia's National Constitution in 1991 determined that education and safety campaigns should be implemented through channels at the national and local levels. Public-sector institutions were mainly responsible for education campaigns that sought to increase the level of knowledge and awareness of road users (and future road users). The effectiveness of these programmes has also relied on private sector actors and civil society involvement. Over the years, there have been many different interpretations and applications of road safety education in Bogotá.

### 2.2.1 Civic responsibility

From a road safety perspective, the collection of policies known as 'Citizenship Culture' developed under Mayor Mockus, involved developing the capacity of members of the public to regulate each other on the use of urban space, particularly roads, a process often referred to as 'mutual regulation'. Mockus decided to integrate the 'Citizenship Culture' policy as a transversal approach across all policies during his two administrations. The principle of *life is sacred* became pivotal, and led his administration to focus on road safety as part of the strong interest in reducing the city's fatality rate. In cabinet meetings, representatives had to report on progress in relation to this principle and demonstrate how their respective departments were working towards reducing fatalities.

The first Mockus administration implemented innovative policies, programmes and projects that aimed to change people's behaviour in public spaces – for example, by increasing public awareness of the importance of following traffic regulations (Silva et al., 2009). Citizenship Culture policies encouraged and empowered people to have higher expectations of one another. The shift involved the public by empowering them to socially regulate those who were breaking the rules – an approach that was especially encouraged for road users.

Under Citizenship Culture and the '... protection of life campaign ...' (personal communication, March 2017, Bogotá), were a number of programmes, including:

- a 'black stars' programme, whereby the shape of a body was drawn on the pavement to mark the location of a road traffic fatality
- mimes performed at intersections to remind road users of safe-crossing rules and behaviour

- red cards (thumbs-up/thumbs-down) were used by road users to point out where people were breaking road traffic rules.

Other programmes under Citizenship Culture policies also had unanticipated side benefits for road safety. For instance, earlier closing hours for nightclubs that aimed to reduce violence and murder, also reduced drink-driving.

Citizenship Culture policies operated mainly within an informal institutional framework. They fostered a sense of social control by increasing the sense of civic spirit and responsibility, and represent an innovative approach to road-safety-oriented educational campaigns in Bogotá. During this period of ‘Citizenship Culture’, the traffic fatality rate fell steeply. The Citizenship Culture approach continued during Mockus’s second term – which saw fatality rates drop dramatically in three out of the four years – and during the subsequent three mayoral terms.

But views are mixed on whether the Citizenship Culture programmes were pedagogical experiments or policies with specific and measurable impacts on road safety. Some participants interviewed thought that educational campaigns are useful only *if* the infrastructure is available to facilitate safe behaviour – for example, adequate sidewalks, clearly defined road crossings and sufficient room for high volumes of pedestrians. Other participants thought that the infrastructure is itself the most powerful manner by which to modify people’s behaviour. Another view was that that educational campaigns come *first* and are *complemented* by infrastructure measures such as mass transit provision and the improvement of non-motorised transport infrastructure. They believe that educational campaigns can really influence people’s behaviour and expectations on road safety issues. This is certainly an interesting debate that, in Bogotá’s case has influenced the promotion of policies and programmes from both education and infrastructure approaches that aimed to change people’s behaviour, with different degrees of prioritisation, depending on the inclination of the staff members in charge within each administration.

## 2.2.2 Focus on risk awareness

During the second Mockus administration (2001–2003), the National Road Traffic Code was issued by the National Congress. Under this law, programmes aimed at changing behaviour found a more formal channel in traditional approaches such as training courses and educational campaigns. This Law, 769, 2002, assigned enforcement and education responsibilities to local governments, who implemented the campaigns in coordination with education institutions.

The FPV and the Urban Transport and Traffic Department began the implementation of educational campaigns at schools and training for road users, especially drivers. In contrast to the Citizenship Culture approach, which sought to change behaviour through social pressure, these programmes sought to increase *awareness of risk* – for instance, informing road users about the impacts of a traffic collision depending on the speed of travel or irresponsible behaviour regarding traffic rules.

In 2006, the responsibility for conducting these educational campaigns was transferred to the Mobility Department (formerly the Department of Traffic and Transport) after the institutional reform by Mayor Garzón. The requirement for educational campaigns was complemented by the issuance of Law 1503 by the National Congress in 2011, which sought to foster the education and training of road users. The Mobility Department continued with educational campaigns based on this more formal approach during the administrations of Mayor Moreno (2008–2011), Lopez (2011) and Petro (2012–2015). These policies aimed to influence the educational process of children and young people in accordance with the national regulations.

The FPV also played a role in education. This FPV conducted educational campaigns to support the Local Transportation Authority (first Traffic and Transport, then Mobility), and supported driver-safety courses that road users who had been cited for traffic violations could take in exchange for a discount on their fine. These campaigns complemented enforcement actions by the police (section 2.4: enforcement), and are attributed to successful behaviour changes such as an increase in seatbelt-use in the city, following traffic rules at intersections and adhering to speed restrictions. Some interviewees expressed scepticism regarding the FPV’s performance since its transfer to the newly created National Road Safety Agency in 2013. Some participants suggested the proactive role of the Road Safety Fund has slightly declined because of this shift out of the control of the private sector, and positive changes remain to be seen.

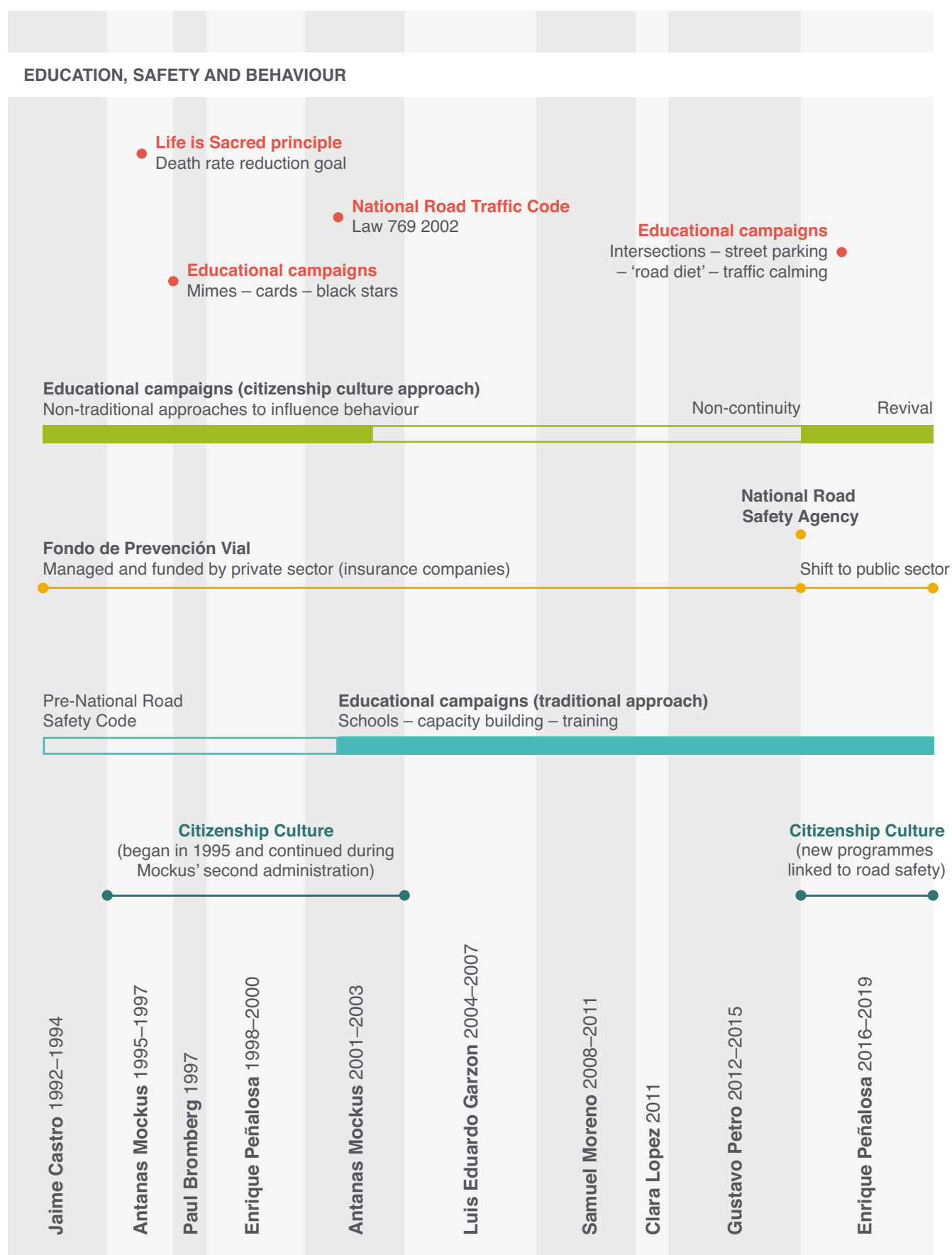
## 2.3 Sustainable mobility and infrastructure programmes

### 2.3.1 Implementation

Bogotá’s sustainable mobility programme encompasses the TransMilenio bus rapid transit (BRT) system and non-motorised transport infrastructure (Figure 13). It originated with the Urban Transport Master Plan (UTMP), which was formulated by the Japanese International Cooperation Agency (JICA) in 1995, under Mayor Mockus, and became the main transportation planning instrument for Bogotá at the end of the 1990s and the beginning of the 21st century. The plan, which was developed by Japanese experts with assistance from local transportation and urban planners, included the promotion of sustainable transport solutions such as heavy rail (subway, metro and commuter rail) and exclusive bus lanes to reduce travel times and increase the number of public transport users. Some interviewees suggested that the formulation of the UTMP was one of the first times that transportation and urban planners worked together towards a common goal in the city.

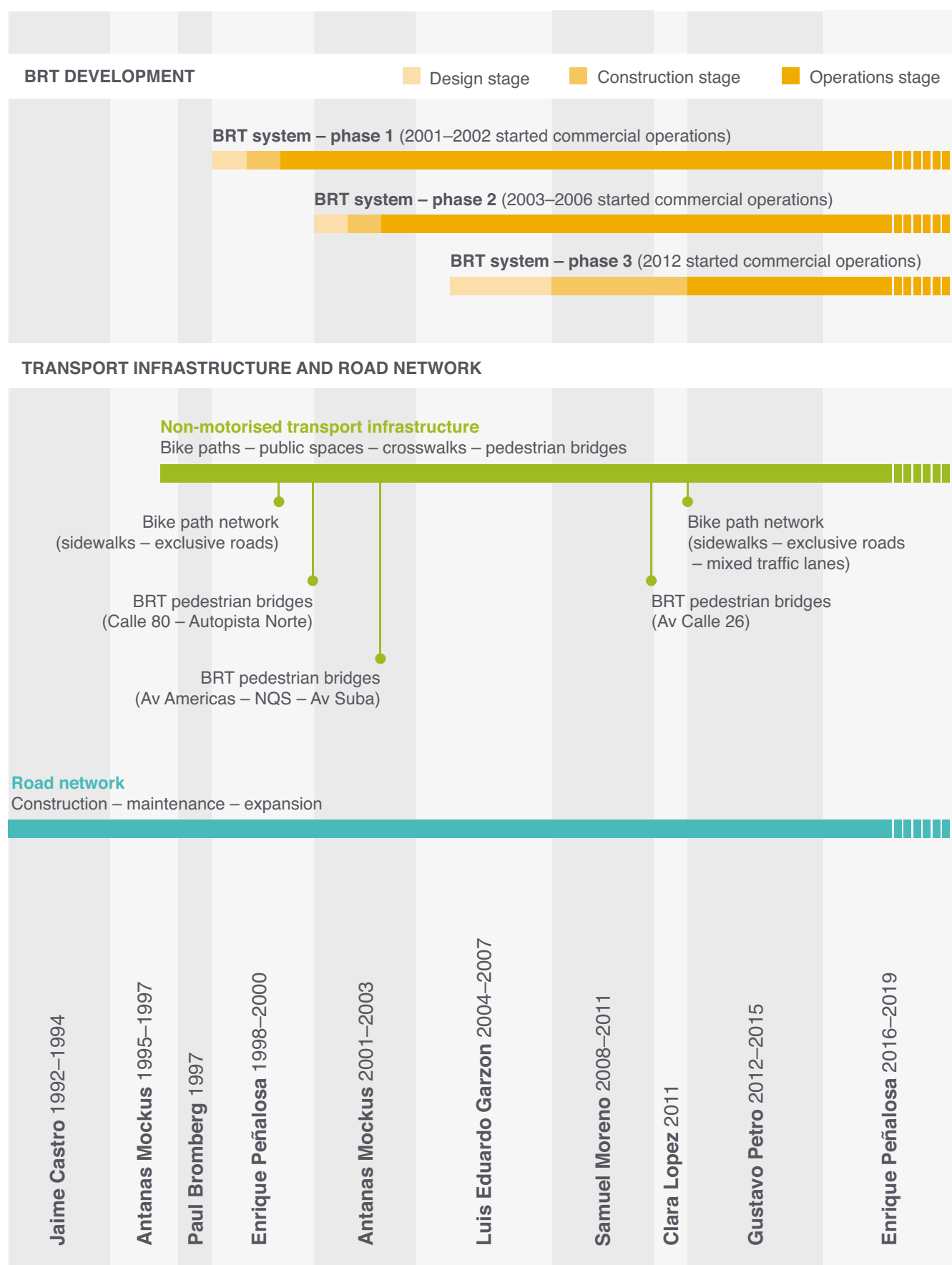
Implementation of the UTMP began under the first Mockus administration, which focused on exclusive lanes for buses along main arterial roads, improving the operational services of buses, and on road construction and maintenance. The Mockus administration distanced itself from the heavy rail project promoted by the National Government, given

**Figure 12 Education, safety and behaviour approaches over time**



Source: authors' own qualitative data analysis.

**Figure 13 Infrastructure and sustainable mobility approach over time**



Source: authors' own qualitative data analysis.

its high costs. (Later, in 1999, an earthquake in the Coffee Region in 1999 shifted National Government priorities and left the heavy rail project without enough resources from the national level side to be fully funded and implemented.)

All subsequent mayoral administrations continued to implement the BRT project and expand the non-motorised transport infrastructure to some degree – continuity that had been established by the first Mockus administration (section 2.1). The election of Mockus and Peñalosa as independent mayors supported this continuity because cabinet members were appointed based on their technical expertise rather than their political connections with the city council.

In 1998, after the end of Mockus's first mayoral term, Enrique Peñalosa was elected as mayor of Bogotá with an ambitious agenda for promoting sustainable transport solutions to address congestion and travel times. He continued to implement the UTMP via the development of the BRT system, known as TransMilenio, with support from the national government and technical assistance from the World Bank, especially along the Av. Calle 80 BRT corridor. His administration combined Mockus's educational and behavioural approach with a focus on infrastructure for sustainable mobility. But the earlier formulation and completion of the Plan provided a solid ground from a technical point of view regarding the policies, programmes and projects needed in Bogotá. Peñalosa had also inherited an administration with the fiscal and technical resources needed to implement such an ambitious infrastructure project (section 2.1).

During his first term, Peñalosa's administration implemented phase 1 (34.2 km) of the TransMilenio bus rapid transit (BRT) system (Vergel-Tovar, 2016) (Chapter 3). The first Peñalosa administration also promoted the construction of non-mobilised transport infrastructure, including the largest investment in bicycle lanes in the history of the city (Figure 12), and the reclamation and improvement of sidewalks, which previously served as parking areas for private vehicles in several areas of the city. Other developments included road improvement, and implementation of transportation demand-management strategies such as the restriction of private vehicles based on license plate numbers. Pedestrian infrastructure was incorporated into street designs through the creation of the first public-space division in the city planning department. The administration also developed urban design manuals. These efforts helped transform the city and people's behaviour on the streets (Berney, 2010).

The second Mockus administration (2001–2003) combined its earlier Citizenship Culture-led approach with Peñalosa's infrastructure and sustainable mobility goals, expanding the design and scope of the second and third phases of the BRT system. The second phase added 49.3 km of corridors to the system, with 55 BRT stations, and applied a complete-street design that included exclusive bus lanes, mixed traffic lanes, sidewalks and cycle lanes.

This phase included a wider intervention area in terms of the road section, reaching the street façade and even some

private properties along the new corridors. During phase 1, this kind of intervention applied only along sections of Av. Calle 80, while the approach of phase 2 was much more extensive, included whole road sections and acquired some properties along some corridors. As such, the process of land acquisition for this second phase involved discussion between transportation and urban planners. It also involved resettlement processes with residents following guidelines and procedures established by multilateral organisations, as had been the case – though on a smaller scale – in phase 1. The political economy of the urban space when making room for mass transit and non-motorised transport infrastructure is an issue further discussed in the qualitative data analysis. This administration also had a clear focus on increasing the availability of public space in the city. Except for one year, traffic fatality rates continued to drop rapidly during this period.

Despite general continuity, however, progress in the implementation of the BRT slowed down due to political pressure regarding specific corridors and conflicting priorities for implementation of heavy rail. Even though the provision of non-motorised transport infrastructure continued during the three terms of left-wing governments and the BRT project reached its third phase, the BRT system did not achieve the rate of expansion that was expected based on the design of the project in 2000. When finally implemented, phase 3 added only 19.5 km to the system, which has led capacity challenges and limited the ongoing impact of expanding infrastructure on road safety.

The current Peñalosa administration is moving forward with the expansion of the BRT project by including new trunk corridors along Avenida (Av.) 68, Av. Boyaca and Av. Carrera 7. It also seeks to revive the heavy rail project through the design and construction of an elevated first line of the project. The expansion of non-mobilised transport infrastructure also constitutes a key goal of this administration.

### 2.3.2 Infrastructure's role in behavioural change

The role infrastructure plays in the behaviour of road users is another important aspect of road safety. For instance, measures such as increasing the size of cross-walks to improve urban space and safety, beyond the parameters in commonly used engineering manuals:

*We increased the cross-walks – the traditional cross-walk has 8 meters, and here is where the discussions began. I am an engineer and I proposed to make them 15 meters wide ... in this way, it invites the pedestrian in a positive way ... we took the 7th avenue and we made it full of broad and big cross-walks (personal communication, March 2017, Bogotá)*

Several interviewees strongly supported sustainable mobility programmes on the basis that infrastructure could more effectively influence the behaviour of road users than education alone (see also 2.2: education). One interviewee stated:

*An effective way to condition people's behaviour is related to how the infrastructure is built and the enforcement by the police to make people follow rules, not by education. (personal communication, March 2017, Bogotá)*

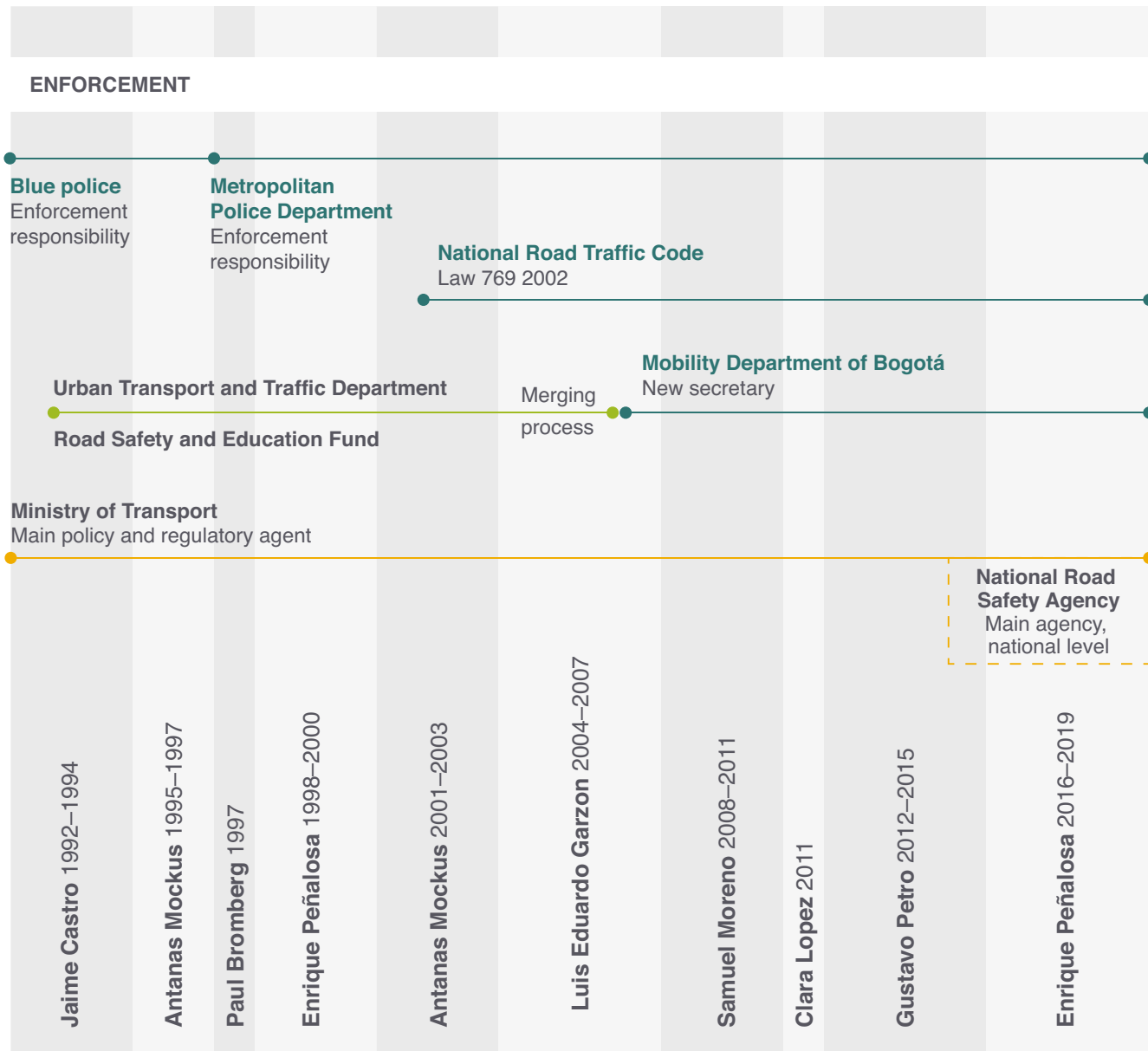
## 2.4 Enforcement programmes

Enforcement of traffic regulations in Bogotá was improved when responsibility was transferred from the Blue Road Traffic Police to the Metropolitan Police during the first Mockus administration (Figure 14). The local government traffic agents were well known for corrupt practices, including taking bribes during enforcement operations, and when they were replaced by enforcers from an independent,

metropolitan-oriented organisation, both efficiency and public perception of enforcement improved (section 2.1). Police enforcement in Bogota is complemented by informal institutions – that is, social expectations and pressure – first encouraged under Citizenship Culture policies (section 2.2: education). The combination of these two approaches – informal institutions and police control – evolved into the cooperation scheme that currently exists between the Mobility Department and the Metropolitan Police to coordinate on campaigns that aim to influence the behaviour of road users. For example, enforcement campaigns use financial incentives such as the reduction of traffic violation fines if offenders take driver safety courses at the Mobility Department.

Technology has also played a role in enforcement, with the provision of cameras at key intersections, the use of

Figure 14 Enforcement and control approach over time



Source: authors' own qualitative data analysis.



applications that inform drivers about the location of these cameras, the control of speed by the police using devices that take pictures of licence plates, and the use of devices by police officers to generate a fine via the system which is linked to driver licence numbers.

## 2.5 Integration of approaches

In terms of the relationship between education and enforcement, several participants mentioned that fines are usually more effective in changing behaviour, and gave the example of seatbelt use and drink-driving enforcement. This is related to the enforcement capacity of the local authority and use of technologies to support this task by the public sector and the effectiveness of applying fines.

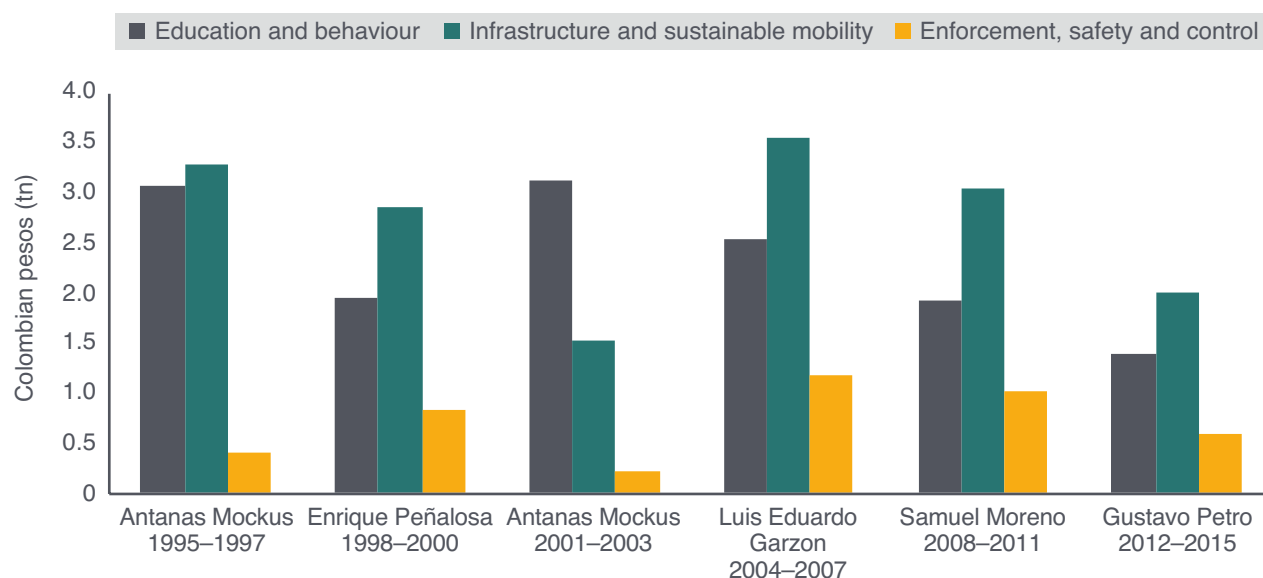
Several participants suggested a combination of Citizenship Culture policies and enforcement measures have had impacts on road safety behaviour and outcomes. Some suggested that the results included improved self-control, mutual control (between road users) and enforcement by local authorities, especially the police. An example of mutual control between road users was highlighted by a participant when referring to the *ciclovía* in Bogotá, whereby teenagers are trained to guide traffic:

*And road users obey these young people ... there may be friction from time to time, but few; people in general permit to be regulated willingly (personal communication, March 2017, Bogotá).*

Mayor Peñalosa began his second administration in 2016. The new administration has formulated a robust sustainable mobility and road safety agenda which is currently under design and implementation. The administration aims to reduce fatalities by implementing infrastructure measures such as traffic calming, and formulating and developing studies on specific road safety issues, such as motorcycle safety. In addition to the expansion of the BRT system, the intention is to implement an elevated heavy rail system, as opposed to the underground subway project promoted by Mayor Petro. The heavy rail project is still in the design phase and is therefore not analysed in this case study.

The Peñalosa administration has set major goals for the construction, maintenance and conservation of non-motorised transport infrastructure, which, along with transport demand-management policies, are part of an agenda that seeks to revive Citizenship Culture policies to transform road users' behaviour. The administration is also working on adopting the 'Vision Zero' approach to road safety, which shifts responsibility from road users to system designers (decision-makers, engineers, designers, planners, etc.) and states that no death or serious injury is acceptable on the roads (Larsson, Dekker and Tingvall, 2010). The introduction of the Vision Zero approach in Bogotá is currently taking place with the support of international organizations and donors. One of the key approaches to incorporating the Vision Zero principles is the formulation of a Road Safety Plan, which was formally adopted in December 2017. This could be the tipping point that engages a coordinated approach to road safety on the part of the public sector.

**Figure 15 Distribution of funding allocation under successive administrations**



Note: Based on the review of each administration's development plan and public reports on investments made by each administration. The total funding allocation was identified by reviewing the reports from the local government and public agencies looking at the implementation of the government plan for the entire mayoral period. Thus, the numbers refer to the total funding allocation for the entire mayoral administration period. The review was conducted by identifying those investments related to road safety based on the three approaches identified in the qualitative analysis. Source: SDP, 1997a; 1997b; 1997c; 2001a; 2001b; 2001c; 2003a; 2003b; 2003c; 2007; 2008a; 2008b; 2011a; 2011b; 2011c; 2015; 2016; 2017b; 2017c; 2017d.

# 3 The impacts of Bogotá's TransMilenio BRT system on road safety

## 3.1 Bus transport in Bogotá before BRT

Before the development of the BRT system, bus transport in Bogotá was characterised by high 'interaction effects' – incidents due to the mixing of buses with other traffic – as well as aggressive driving by competing drivers and dangerous pedestrian-crossing areas. Services levels were poor, with buses often stuck in congestion. The vehicles themselves were also much smaller than the current, newer models, which meant carrying fewer passengers per bus, and more buses to meet demand. This in turn meant greater distances travelled overall, and thus generally higher levels of risk.

The BRT system was conceived from suggestions set out in the JICA's Urban Master Plan, which recommended providing exclusive lanes for buses as part of an integrated public transport system of the city (JICA, 1996). The BRT project was influenced by the experience of Curitiba (Brazil) and Quito (Ecuador), but made some improvements, including larger stations, additional lanes next to them for surpasses, and feeder routes at the end of the trunk corridors (Ardila, 2004). The BRT system constitutes a surface, mass-transit system that would change these parameters, taking room from mixed traffic lanes and giving priority to buses along arterial roads. With plans for buses with higher capacities, segregated bus lanes, fixed routes and stations, and improved pedestrian access to stations, the BRT would mean significant changes to Bogotá's urban infrastructure, which could have considerable influence on traffic, road user behaviour and ultimately on road safety.

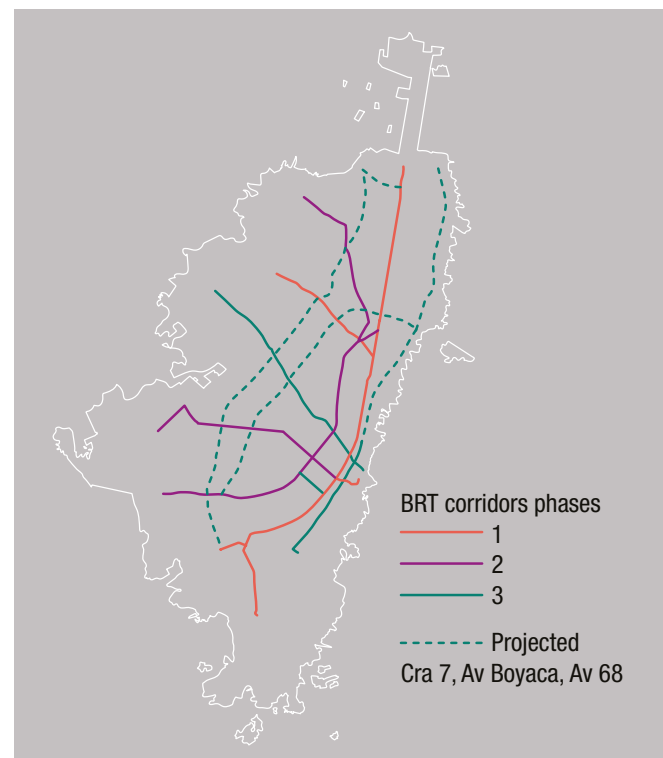
When interviewed for this study, experts that had been involved in the design and implementation of BRT phase 1 said that they had expected the operation of this mass transit system to reduce both travel times and collisions, especially along the busy Av. Caracas. When, after its implementation, they began to receive reports of reductions in collision numbers, they began to collect data to monitor the system's road safety impacts, and thus road safety performance was included in the BRT agency's mandate.

The BRT was expanded into a phase 2 and phase 3, which involved reoriented toward the 'complete-street'

approach piloted along Av. Calle 80 during phase 1. This meant making changes to wider street design, not only to bus lanes, and included exclusive lanes for BRT buses, mixed traffic lanes parallel to the corridor, and the addition of bike paths to sidewalks along the arterial roads, further increasing the opportunity to influence road safety. The approach was costlier, and subject to discussion at national and local levels, but was supported by Mockus's second administration (Vergel-Tovar, 2016).

Table 1 summarises the three phases of the BRT system and Figure 16 shows the location of the BRT corridors in Bogotá.

**Figure 16 BRT trunk corridors: phases 1, 2, 3, and 4 (projected)**



Source: TransMilenio SA (2016) Geoprocessing by Vergel-Tovar.

**Table 1 Three-phase expansion of Bogotá's BRT system (trunk corridors)**

BRT Corridor	Length (km)	Number of stations	Start date (operations)
<b>BRT system – phase 1</b>			
Calle 80	10.1	12	January 2001
Av. Caracas	11.9	14	January 2001 August 2001 <sup>i</sup> February 2002 <sup>ii</sup>
Autopista Norte	10.3	15	August 2001 <sup>i</sup>
Av. Jiménez	1.9	3	June 2002
<b>Subtotal phase 1</b>	<b>34.2</b>	<b>44</b>	
<b>BRT system – phase 2</b>			
Av. Americas – Av. Calle 13	13.0	16	November 2003 <sup>iii</sup> June 2004 <sup>iv</sup>
Av. NQS Central	10.6	11	February 2005
Av. NQS South	12.7	15	April 2006
Av. Suba	13.0	13	April 2006
<b>Subtotal phase 2</b>	<b>49.3</b>	<b>55</b>	
<b>BRT system – phase 3</b>			
Av. Calle 26	12.2	13	June 2012 <sup>v</sup> October 2012 <sup>vi</sup>
Av. Carrera 10	7.3	9	October 2012
<b>Subtotal phase 3</b>	<b>19.5</b>	<b>22</b>	
<b>Total all phases</b>	<b>103.0</b>	<b>121</b>	

Notes: <sup>i</sup> Expansion of Phase 1 with the opening of BRT Terminals Usme and Portal Norte; <sup>ii</sup> Opening of BRT Terminal Tunnel; <sup>iii</sup> Started operations until BRT station Banderas; <sup>iv</sup> Opening of BRT Terminal Portal Americas – full operation started; <sup>v</sup> Started operations with some BRT station and the BRT Terminal El Dorado; <sup>vi</sup> Full operation started.

Source: Global BRT Data, 2017; EMBARQ, 2009; TransMilenio SA.

## 3.2 Significant reductions in collisions and fatalities

The operational and infrastructure changes introduced during the first two phases of the BRT have had significant, positive impacts on road safety outcomes. Such were the improvements observed in Bogotá, an EMBARQ study recommended that safety outcomes be included in cost-benefit estimations of BRT projects. Data analysis from several studies shows significant reductions in collisions and fatalities over time after their implementation (from 2000 onwards), which could be attributed to the BRT system (Figure 16; EMBARQ, 2009; Andes and BID, 2011; Carrigan et al., 2013). Fatalities on the corridors reduced by 38% after phase 1 and 41% after phase 2 (Bedoya, 2010), with a subsequent study finding that, on Av. Caracas<sup>1</sup> specifically, fatalities fell by 48% (Duduta et al., 2014).

In 2012, one study suggested that the positive changes in road safety along two of the BRT corridors – Av. NQS and Av. Caracas – were a result of improvements to infrastructure and institutional arrangements, and the reorganisation of public transportation in the city. Removal of competition between bus drivers also resulted in safer practices and better

working conditions (Bocarejo, Velasquez, Díaz and Tafur, 2012). As well as preservation of life, studies suggest there have also been economic benefits. In 2013, a global BRT study found that a reduction in the number of collisions in Bogotá was one of the benefits of phase 1 and phase 2 of the BRT system and, by 2012, it had saved the city \$288 million (Carrigan, King, Velasquez, Raifman and Duduta, 2013).

In our analysis of collision data for BRT trunk corridors and a selection of non-BRT arterial roads (see Methodology; see also Figure 17), we found a similar drop in collisions and fatalities in BRT trunk corridors between 2007 (before construction began) and 2016 (four years after implementation), though high variations meant this data was not conclusive.

BRT trunk corridors Calle 26 and Carrera 10 experienced a significant reduction in collisions in 2009, which coincides with the beginning of the BRT construction process (Figure 18). Once operational in 2012, there was also a reduction in the number of collisions, but the indicator suggests a stronger reduction pattern along Av. Carrera 10 over time. After the BRT trunk corridor Av. Calle 26 began operation, this corridor experienced a 36% reduction in collisions (246 collisions less) between 2007 and 2013. BRT trunk corridor Av.

1 Although phase 1 didn't start operating *commercially* until 2001, it was operational in 2000.

Carrera 10 experienced a similar drop of 40% (239 less) over the same period.

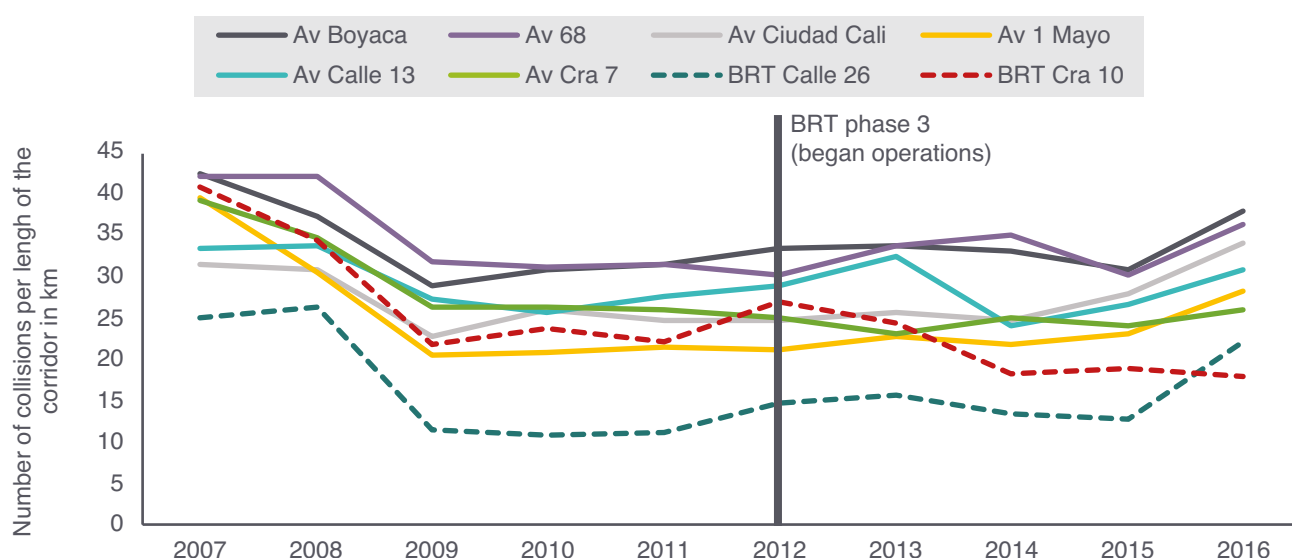
In terms of fatalities from road traffic collisions (Figure 17), our analysis suggests there has been a reduction in the pattern along the BRT trunk corridor Av. Carrera 10 of 56% between 2007 and 2016. Along both BRT trunk corridors, the number of pedestrian fatalities also fell. However, the data is not conclusive given the high variation of this indicator over time for arterial roads as well as BRT trunk corridors.

### 3.3 Wider impacts of the BRT in Bogotá

Road safety can be improved both by reducing risk — protecting people while they walk, bike or access public transport — and reducing the level of risk exposure by decreasing the number of vehicle kilometres travelled:

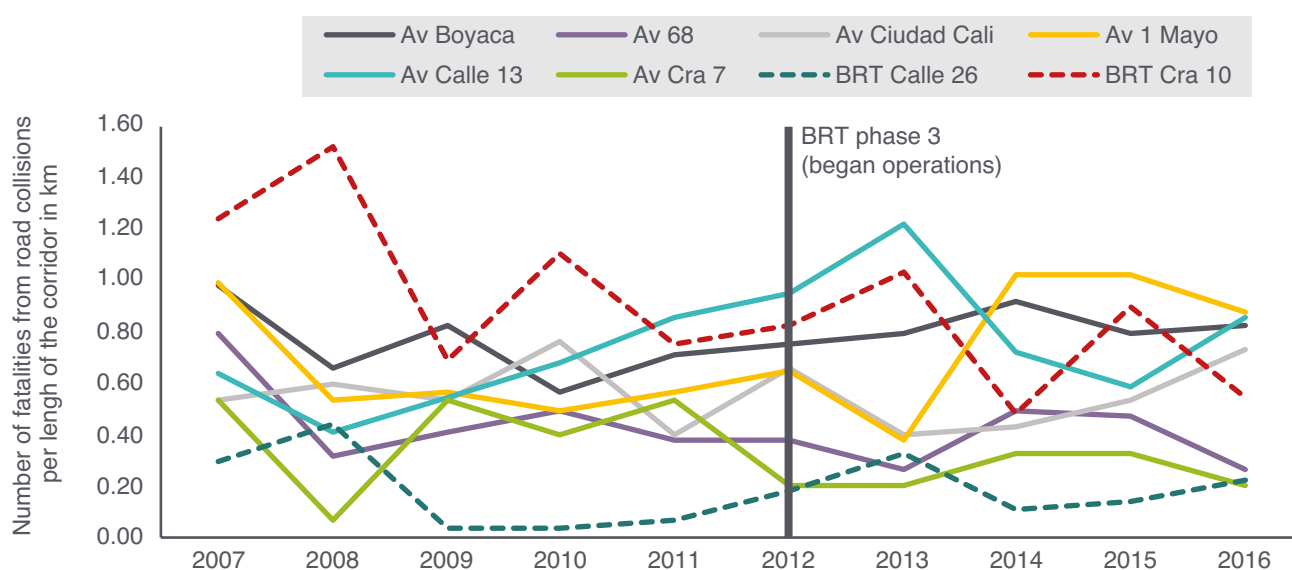
*If we are working on reducing exposure, increasing public transport and non-motorized transport travel*

**Figure 17 Total number of collisions on BRT (phase 3) corridors and non-BRT arterial roads, 2007–2016**



Source: Secretaria de Movilidad, 2016 (data processed by Vergel-Tovar).

**Figure 18 Total number of road collision fatalities on BRT (phase 3) corridors and non-BRT arterial roads, 2007–2016**



Note: controlled for length (buffer of 35 metres).

Source: Secretaria de Movilidad, 2016 (data processed by Vergel-Tovar).

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*instead of travel in private cars and motorcycles  
would reduce the number of vehicles per kilometre  
(personal communication, February 2017, Bogotá)*

For this reason, the overall safety impacts of Bogotá's BRT are likely to be much greater than the corridor-specific

impacts identified in this study. Interviewed participants noted that the implementation of 83.5 km of BRT in phases 1 and 2 coincide with the period of significant reduction in traffic fatalities for the whole of Bogotá, while the period in which BRT stalled (with only 19.5 km implemented) saw plateauing numbers of fatalities.

# 4 Challenges and unintended impacts of road safety strategies

Bogotá's progress on road safety has not been without challenges. Despite mayoral commitment on citizen participation and violence (and fatality) prevention, infrastructure expansion experienced some setbacks.

Traffic-related fatalities, which had declined dramatically under the Peñalosa and two Mockus administrations (1995–2003), continued to decline under Mayor Garzón (2004–2007). But from 2006, the fatality rate stopped its rapid decline and remained relatively stable throughout the subsequent mayoral administrations of Moreno (2008–2011) and Petro (2012–2015) (Figure 10). In the same manner as the strategies for improvement, the challenges for road safety are 'nested' within three main themes of education, infrastructure and enforcement, and are similarly a result of relationships *between* the themes, as well as the overarching theme of institutional coordination, reform and the legal framework.

## 4.1 Legal and institutional framework

### 4.1.1 Political pressures and corruption

Traffic-related fatalities continued to decline under Mayor Garzón (2004–2007) (Figure 10), who planned two new trunk corridors under the BRT project (Av. Calle 26 and Av. Carrera 10). But towards the end of Garzón's term, the BRT corridor along 7th Avenue was not approved for construction, due to public and political pressure, even though the adjoining BRT corridor along Av. Carrera 10 was approved (Mojica and Gomez-Ibanez, 2007). The two other lines that were planned were not constructed until after his administration.

Left-wing administrations continued with Samuel Moreno (2008–2011), but he was removed from office in 2010 due to a corruption scandal that sent him to jail. Clara López was appointed to complete his term as city mayor in 2011. However, the corruption scandal also delayed phase 3 of the BRT trunk corridors. Gustavo Petro (2012–2015) was then elected with an ambitious agenda on sustainable transport, poverty reduction, climate change mitigation and adaptation measures, and addressing socio-spatial segregation. Phase 3 of the BRT was completed

during his term, although overall his administration invested less in infrastructure and education and more in enforcement programmes especially those related to improve citizenship participation at the local level.

### 4.1.2 Working towards an integrated mobility system

During his campaign, Moreno promoted a heavy rail metro project, which took a predominant role in the urban mobility sector during his administration. This distanced him from previous mayoral administrations which were more focused on BRT. The focus on BRT was reduced and the administration set goals only for operations and the expansion of three stations.

In 2012, Gustavo Petro took office with a plan linked to environmental issues. He also set goals on the development of agreements with local districts and communities regarding urban mobility. During his administration, phase 3 of the BRT system began operations. The BRT trunk corridors Av. Calle 26 and Av. Carrera 10 became fully operational in the last quarter of 2012 (Hidalgo and King, 2014). These two corridors added 19.5 km to the BRT trunk network including 22 stations. However, this administration faced the challenge of continuing the BRT system network according to the plan designed during the Peñalosa administration in 2000, while also making a decision regarding the ongoing development of the heavy rail project started during the Moreno administration (Bassett, 2013: 22). The fatality rate was variable during this period but experienced a slight drop overall (Figure 10).

## 4.2 Education and behaviour

### 4.2.1 Shift in the FPV

The Fondo de Prevención Vial was formerly managed and funded by the private sector, specifically, the National Association of Insurance Companies. With the creation of the National Road Safety Agency in 2013, the national government transferred the fund to the public sector. Several interviewees suggested that this change created unexpected challenges in terms of education campaigns. Public-sector agencies in Bogotá used to request funding to



implement educational road safety campaigns. Now that the fund is managed and supported by the public sector, some interviewees felt that this has put financial constraints on education programmes. The National Association of Insurance Companies is not yet clear about its new role in relation to the fund or road safety campaigns.

## **4.3 Infrastructure and sustainable mobility**

### **4.3.1 Conflicts over space for pedestrians and cyclists**

The provision of infrastructure for non-motorised transport users included the construction of bicycle lanes to facilitate cycling as a safe and practical transport option. Initially, because bicycle mode share was so low, and taking space away from cars was very politically unpopular, bicycle lanes were constructed on sidewalks, reducing space for pedestrians. As the number of people cycling increased, cyclists were placed in conflict and competition with people walking. This has now been recognised as an issue and, since the last mayoral administration (Mayor Petro), there has been a shift to taking away road space from private vehicles along main arterial roads to create bicycle lanes (known as ‘road diet’). The current administration is promoting the continued construction of bicycle lanes as part of road infrastructure.

### **4.3.2 Negative outcomes of pedestrian bridge infrastructure**

Sustainable mobility infrastructure includes the provision of exclusive traffic lanes for the BRT and improved access for pedestrians to BRT stations, which has meant the use of segregated elevated pedestrian bridges on some corridors. Some interviewees suggested that the bridges have led to increased speeds along some BRT corridors. And although the bridges were intended to protect pedestrians, the additional walking distance and perception of risk to personal safety has been a deterrent to their use. Some pedestrians instead take risks by crossing arterial roads at street level even though level crossing infrastructure is not provided.

Where possible, pedestrians are given priority through crosswalks at road level, which is preferable for both pedestrian safety and accessibility. This approach has been used in the design of new phases of the BRT system such as Av. Carrera 10, where pedestrians can cross and access stations at street level. However, along corridors such as Av. Calle 26, the road section necessitates the use of pedestrian bridges to access BRT stations.

### **4.3.3 Rising pressure on BRT drivers**

Increasing demands on the BRT system have led to operational challenges. According to some interviewees,

higher ridership levels have led managers to find ways to hire bus drivers for extra hours. Research suggests that bus drivers may choose to work extra hours as part of their employment agreement, which represents a road safety challenge for the operation of the BRT system given the potential increase in risk-taking behaviour by overtired bus drivers, as well as delayed reaction times.

### **4.3.4 Risks associated with the integration of BRT buses and mixed traffic**

The implementation of phases 2 and 3 of the BRT system led to a discussion among planners regarding the extent to which BRT buses should share road space in mixed traffic lanes. Since it began in 2012, phase 3 of the BRT has adopted a combined approach, with buses being mostly segregated in exclusive lanes but also using the mixed traffic lanes to connect between corridors, in order to reduce the number of transfers a passenger must make between routes. The shift to a less rigid BRT operation by facilitating the circulation of buses along some mixed traffic lanes to connect different BRT corridors is an issue that emerged among some interviewees. They suggested this may have the unintended impact of increasing the risk exposure of BRT buses.

## **4.4 Enforcement and control**

### **4.4.1 Increased capacity and resource needs**

The development and implementation of the reduced-fines-for-training system have been an effective way to change road users’ behaviour, but the system has had the unintended consequence of increasing the Mobility Department’s human resource needs. More staff are required to run the driver safety courses and to pursue non-payment of fines. The fines and the training programme require complex institutional coordination between the Mobility Secretary (Secretaria de Movilidad) and the Metropolitan Police Department – a challenge that has not yet been resolved.

The National Road Traffic Code (Codigo Nacional de Transito), issued in 2002, focuses on enforcement and penalties at the expense of prevention measures and infrastructure design. Some interviewees suggested that the Code needs updating, and various efforts to do so have failed to date.

### **4.4.2 Rapid changes, new challenges**

The capacity of the public sector is challenged by the rapid pace of motorisation and the increasing number of motorcycles and bicycles on Bogotá’s road network. Traditional enforcement of road traffic regulations and control measures are not always responsive to the needs of the growing number of users of these modes.

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# 5 Key actors in the implementation of road safety measures

## 5.1 Overview

Public sector actors dominate the implementation of policies and programmes (Figure 19). The National Road Traffic Code issued by Congress determines the regulatory framework, which is primarily focused on enforcement. The Code assigns responsibility to the Ministry of Transport for developing the National Road Safety Plan and all input materials for educational campaigns that should be conducted by local road traffic authorities. The Code assigns responsibility to local authorities for conducting those educational campaigns.

The National Planning Department and the Ministry of Transport formulate and implement national urban transport policies. These two agencies also provide funding and support to local governments for the provision of transportation infrastructure. They influence local regulations, policies, and programs in the transport sector, mostly in terms of design and implementation of mass transit systems (such as BRT) for large cities and integrated urban transport systems for intermediate cities.

The National Agency for Road Safety, created in 2013 as part of the Ministry of Transport, is the national authority for road safety. It conducts the planning and management of road safety issues nationwide and is responsible for implementing the National Plan on Road Safety that was formulated by the Ministry of Transport. It also administers the FPV, formerly managed by the private sector through the National Association of Insurance Companies.

At the local level, the City Mayor of Bogotá is the main decision-maker in terms of road safety and mobility policies. The transport authority in Bogotá is the Mobility Department, which has responsibility for formulating and implementing road safety policies and programmes. TransMilenio coordinates the operation of the BRT system, while the Urban Development Institute provides the infrastructure and coordinates the maintenance of roads in the city. The Metropolitan Police Department (under the authority of the National Police Department) coordinates with the Mobility Department on traffic enforcement

and education as part of an interinstitutional cooperation agreement. The Mobility Department oversees public transport operators following national and local regulations.

## 5.2 Synergies between actors

In this study we identify five of the most influential synergies between actors for road safety outcomes in Bogotá.

### 5.2.1 City mayor–city council: policies, projects and monitoring

At the local level, the city mayor decides policies related to road safety while the city council approves planning instruments, such as the Development Plan. The relationship between the two depends largely on the mayor's political allegiance. Where the mayor was elected as an independent candidate (as were Mockus, Peñalosa and, to some extent, Petro) the relationship has focused more on specific policies and projects. Where, on the other hand, the mayor was elected as a representative of a political party (the case with Garzón, Moreno and partially Peñalosa's second administration) the relationship has been mediated by the representation of political parties in the local government cabinet.

As an independent mayor without any political affiliation, Mockus depoliticised the relationship with the city council by not treating the appointment of members of his administration as part of an exchange of favours with city council members. Instead, policies and projects became the priority for the local government, rather than political favours. Appointments were made based on technical expertise. This was a major shift in politics in Bogotá and gave Mockus more freedom. It was this relationship that provided the foundation for Mockus to abolish the Blue Road Traffic Police – well known for high levels of corruption including accepting bribes during enforcement operation – and transfer responsibility for enforcement and road traffic control to the Metropolitan Police Department (section 2.1: institutions; section 2.4: enforcement).

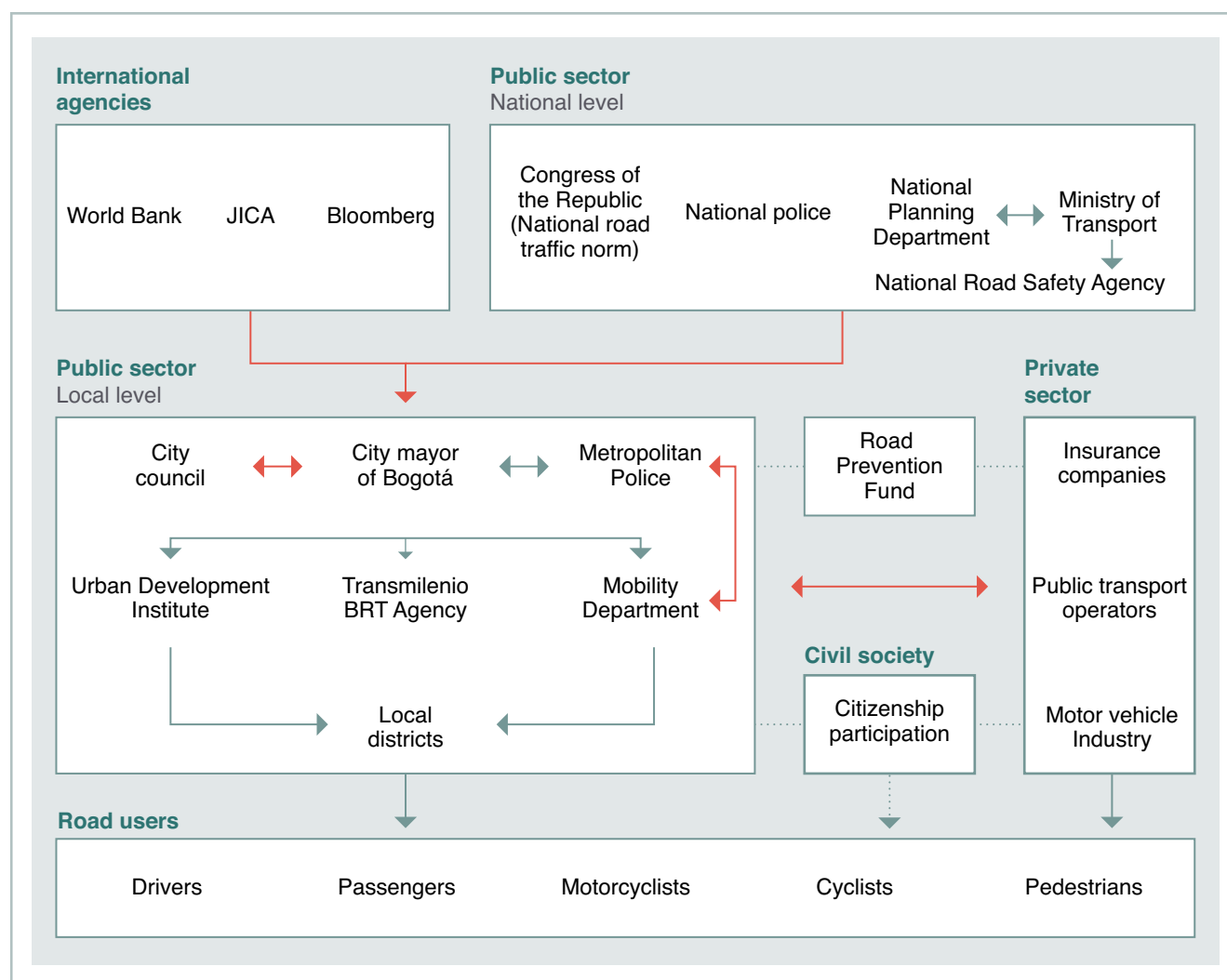
Funding is another key dynamic characterising the relationship between the city mayor and the city council. During the period of independent city mayors, the city council approved important financing decisions. For example, they approved the process of the sale of shares in the Bogotá Energy Company by the first Mockus administration – a move that subsequently provided an important source of funding for the first Peñalosa administration (A. Gilbert and Garces, 2008). This function is critical, because it meant that some programmes and projects could be approved and funded without the need for resources from the National Government. As such, the BRT project was initially funded by the city, and funding was also made available for non-motorised transport infrastructure projects, which were part of the public infrastructure consolidation plan implemented by Mockus and Peñalosa.

### 5.2.2 Mobility Department–Metropolitan Police: enforcement and road traffic control

The Mobility Department is the main authority in the city for policy formulation, programmes and implementation. It coordinates enforcement issues with the Metropolitan Police Department. Before the Mobility Department was created, this coordination role was played by two agencies: the Urban Transport and Traffic Department coordinated the formulation and monitoring of transport policies in the city; and the FPV oversaw fund allocation and implementation of policies and programmes.

The relationship between the current Mobility Department and the Metropolitan Police is based on a cooperation scheme between two public sector agencies, the former at the local level and the latter at the regional level. According to several participants in the semi-structured interviews, this relationship has worked well

**Figure 19 National and local actors influencing road safety in Bogotá**



Note: Based on the qualitative data analysis of semi-structured interviews. Lines and arrows suggest the direction of the influence in the relationship between actors. Dotted lines suggest the relationship is not current (for example, in the case of the insurance companies and the FPV). Red arrows highlight the relationships that were identified in this report as most critical in terms of synergies related to road safety outcomes.

given the division of tasks between both public agencies. The Metropolitan Police also allocates resources to municipalities within the urban agglomeration of Bogotá, as it is a regional authority beyond the city limits of Bogotá.

This relationship formalises enforcement efforts and road traffic control in the city. The Metropolitan Police Department oversees road traffic monitoring and legal assistance in the case of collisions. They also collect data on infractions, issue sanctions and submit this information to the Mobility Department. The Mobility Department is responsible for ensuring that penalty fees are paid by road traffic offenders. This function also includes managing their training-for-fine-reduction initiative (section 2.2: education; section 2.4: enforcement).

### **5.2.3 Local government–international organisations: technical assistance and funding**

International agencies have played a significant role in road safety outcomes in Bogotá. The first was the Japanese International Cooperation Agency (JICA), which formulated the Urban Transport Master Plan for Bogotá in 1995. This became the city's primary urban transport planning document, and its development facilitated a meeting between Bogotá's urban transport experts to discuss the proposals. Mayor Mockus adopted the plan to promote the implementation of exclusive lanes for buses along main arterial roads, which constituted the origin of the BRT system.

The World Bank became involved as a key funder for implementation of the Urban Transport Master Plan and an Urban Services Project. It also provided technical assistance, which included the development of a vision for the role that infrastructure could play in road safety outcomes – particularly the organisation of urban transport services in the city. The Urban Transport Master Plan's implementation was focused around the BRT project in Bogotá as part of the sustainable mobility policy, which began to take into account road safety indicators as positive outcomes of reorganising urban transport and providing infrastructure for mass transit and non-motorised transport road users.

More recently, the international agency Bloomberg Philanthropies has been providing technical assistance, capacity-building support and funding to Bogotá as part of the Bloomberg Initiative for Global Road Safety. The Initiative (in which WRI is a partner) supports the city in road safety efforts such as managing vehicle speeds, improving street and intersection designs, and formulating a Vision Zero Plan in conjunction with the Road Safety Plan formulated at the national and local levels.

### **5.2.4 National government–local government: decentralisation and infrastructure investments**

The autonomy devolved to Bogotá in the decentralisation framework provided by the National Constitution of 1991

has added tension to the relationship between national and local government. With regards to transport, a heavy rail project has been part of the national government agenda since the 1990s. In contrast, the Mockus administrations and the first Peñalosa administration favoured mass transit solutions that were less expensive. These administrations therefore supported the BRT project and took funding from international agencies such as the World Bank.

But this tension notwithstanding, the national government took the Bogotá BRT project as the reference point for its National Urban Transport Policy, which seeks to promote mass transit projects with BRT features in large cities and metropolitan areas nationwide. The implementation of the BRT project established a paradigm in which both levels of government promoted the project as a mass transit solution suitable for the city. However, the scope of the BRT system has been the subject of debate. In phase 2 and 3, the local government decided to broaden the scheme. In some areas, the BRT was expanded to a complete-street approach that included the provision of non-motorised transport infrastructure and improved mixed traffic lanes.

But while the city saw an opportunity to simultaneously improve all infrastructure along main arterial roads that were the subject of BRT investments, national government initially interpreted its funding responsibility as related to mass transit investments only, not urban infrastructure provision, and suggested the project's financial scope be redefined. This was later discussed among national and local administration representatives who, after some debate and in part due to pressure from Mockus, approved the change. This was reinterpreted and funded by the government after some debate, largely due to strong pressure and political will from Mockus.

### **5.2.5 Civil society and private sector involvement**

The emergence of community involvement and participation began with the election of the left-leaning Mayor Garzón, whose Development Plan focused on urban poverty and the reduction of urban inequality. Several urban mobility issues were discussed at the district level with local offices. The Garzón administration included community-based organisations in the implementation of policies including road safety educational campaigns. This bottom-up approach continued with the left-wing governments of Moreno and Petro, with more community involvement in the implementation of campaigns at the district and neighbourhood levels. For instance, each district in the city began to implement the role of the mobility manager at the level of the local mayoral unit. This role aimed to facilitate the interaction between the community and the mobility department of the city at the neighbourhood level to address issues related to urban transport and mobility.

# 6 Lessons learned

Although challenges remain, the case of Bogotá demonstrates that road safety can be improved in a relatively brief period, given the right combination of institutional reform and continuity across local administrations, educational campaigns, provision of infrastructure and sustainable mobility, and regulation and enforcement. Seven important lessons can be learned from Bogotá's experience in improving road safety:

- 1. National reforms can support city-level change.** The capacity for Bogotá to rapidly improve road safety was facilitated by changes in the regulatory framework at the national level: constitutional reforms that provided for the direct election of a city mayor by the people of Bogotá, devolution of road safety education responsibilities to the city, and the establishment of a National Road Safety Code and National Road Safety Agency. This is important because in the context of the reduction of the fatality rate between the 1990s and the beginning of the 2000s, the city mayors were independent candidates, without political attachments, which gave them the autonomy needed to implement reforms that contributed to the reduction of fatality rates.
- 2. A combination of technocratic and democratic approaches to public policies can generate desired outcomes such as the successful reduction of fatalities.** Following the empowerment of the elected city mayor, reforms at the city level helped generate an institutional framework that was conducive to improving road safety. This included a shift in the relationship between the mayor and the city councillors, secure funding for infrastructure through tax reforms and bond sales, high level international donor and multilateral agency involvement, changing enforcement responsibility from local traffic agents to the Metropolitan Police, reorganisation of public transport in the city around a BRT system, the introduction of bicycle infrastructure, and reorientation of the Department of Traffic and Transport to the Department for Mobility, with a dedicated road safety section.
- 3. International agencies have also had a significant impact on road safety in Bogotá.** This began when JICA helped the city to develop an Urban Transport Master Plan, and has continued with World Bank funding for the BRT and current support from Bloomberg Philanthropies to develop road safety management and action plans.
- 4. Linking the problem to broader issues to which the public can relate can drive public policy responses to road safety.** In Bogotá, the concept of road safety as a public policy issue emerged in the 1990s as part of the response to public demand for authorities to address the city's high homicide rates. The mayor and local government officials began to consider violence as a public health issue and included traffic fatalities as part of their discussion and approach. This is how the Citizenship Culture principle that 'life is sacred' emerged, and became the policy framework that guided public engagement programmes to address road safety issues.
- 5. Improved public transportation can have a significant impact on road safety for all modes.** The organisation of public transport services with the introduction of the BRT system has had a positive impact on road safety indicators due to improvements in the operational services. Initially, it provided a safe, public transport alternative to private vehicles, but now faces challenges as expansion of BRT corridors has stalled and demand has continued to increase, reducing the quality of the system provision.
- 6. Pedestrians and cyclists need distinct infrastructure.** The provision and improvements of non-motorised infrastructure have been related to an increase of more sustainable transport travel patterns, but in some cases space has been taken from away from other road users, creating conflicts between pedestrians and cyclists. Cyclists and pedestrians have different movement and safety needs, which must be addressed through dedicated design and infrastructure.
- 7. Road safety approaches are needed that target particularly high-risk groups, and are adaptive to changing travel and mode patterns over time.** While fatalities have dropped among car occupants, they are rising among cyclists and motorcyclists and require special attention. Along with pedestrian fatalities, cyclist and motorcyclist fatalities are disproportionate to the number of people making use of these modes of transport. This demonstrates the need for road safety strategies and actions to target the specific safety needs of vulnerable road users. Furthermore, to maintain road safety gains over time, interventions must be maintained, and improvements in infrastructure continued.

## 6.1 Recommendations for further research

This case study contributes to the emerging field of political economy in the urban transport sector, specifically on road safety issues. This section presents several recommendations for further research opportunities regarding the study of road safety and the political economy of urban transport from the perspective of urban space issues, allocation of road space for all road users and the power relationships between institutions and key actors:



1. **Gender.** This case study found that the gender perspective on road safety is an emerging issue regarding road safety outcomes and public policy design for urban transport. Interviewees suggested that gender is becoming a priority in the policy agenda. Research could investigate the differences in road safety outcomes on transportation modes by gender. Further studies could consider if – and how – gender is considered in the formulation and implementation of public and identify opportunities for improvement.
2. **Socioeconomic impacts.** Our analysis found that more severe crashes take place in poorer areas of Bogotá, which have less well-developed infrastructure, and that injuries and fatalities are concentrated among people walking and riding bicycles and motorcycles, who also tend to be from lower income groups than car occupants. Further research on the relationship between socioeconomic status and traffic fatalities could help inform future political and technical action on road safety.
3. **Drivers of investment and prioritisation.** This case study identified the level of investment by each mayoral administration by organising the different programmes and projects for each emerging theme identified in the qualitative data analysis. Based on this data, we recommend conducting further research on the political process within each administration to disaggregate the dynamics within and across administrations. Further studies could look at the evolution of road safety indicators, prioritisation within and across administrations regarding road safety indicators, and changes over time according to the investment levels identified in this study.
4. **Sustainability.** Policies and programmes implemented across administrations in conjunction with national regulations influenced road user behaviour and fatalities. The maintenance of a stable fatality rate in Bogotá, and perhaps even its further reduction, face challenges. The political economy of road space in terms of segregation of road users has shown issues such as the conflict between non-motorised and motorised transport users. In addition, the sustainability of these changes on road users' safety is threatened by increasing motorisation, especially of motorcycles. We therefore recommend further research into the sustainability of the measures implemented, the study of new indicators in addition to the number of traffic victims and further exploration of the distribution of urban space between road users.
5. **Mass transit investments.** The case of the expansion of the BRT system and the long-term process regarding the design and implementation of a heavy rail network in the city is deserving of a dedicated case study. We recommend the development of a second phase of the Harvard case study regarding the 'Battle of Avenue Septima' from a political economy perspective by including the discussions and differences across administrations towards the design and implementation of the heavy rail project. We also recommend including the dynamics related to the level of involvement and tensions between the national and local government regarding this type of infrastructure investment as part of the political economy analysis of mass transit investments in Bogotá.
6. **Built environment.** One key finding from this case study is the differences in interviewees' perceptions of the influence of infrastructure investments in urban transport on road user behaviour. Further studies could look at the influence of the built environment on road collisions. We recommend a study to calculate probabilities of road collisions and the fatalities or serious injuries based on the data generated in Bogotá, to test hypotheses suggested by participants in terms on how the infrastructure and built environment attributes might influence road safety outcomes.
7. **Technology.** The introduction of modern technologies for traffic enforcement should also be investigated. Also, the evolution of modern technologies in vehicles is an important aspect related to safety, especially in the case of motorcycles. We recommend conducting further studies looking the influence of new enforcement technologies on road users and the police in terms of effectiveness. We also recommend further studies looking at the impacts of new regulations on vehicle technologies aiming to reduce the risk exposure of road users on a road collision.
8. **Transit network.** The introduction of the BRT system formalised much of the bus network and reduced dangerous competition between drivers. We recommend conducting a comparative analysis between the formal transit system – which includes the BRT and the city's blue buses that are part of the formal Sistema Integrado de Transporte Público (SITP) system – and the 'semi-formal' transit system, which is known as 'SITP Provisional', to examine the political economy of the formalisation of semi-formal conventional buses in the city and the dynamics between the public and private sectors on this process. Furthering the understanding of how vested interests were overcome to improve and formalise the system could inform how this could be achieved on a broader scale throughout the transport system.
9. **The Fondo de Prevención Vial.** This has played a significant role in road safety education for Bogotá. This fund, which was initially financed and managed by the private sector, has now been integrated into the national government structure, but uncertainty remains about the implications of this. Further research to understand both why this change was made, and to monitor its impact on road safety in the future would be useful information for people working on road safety in Bogotá.



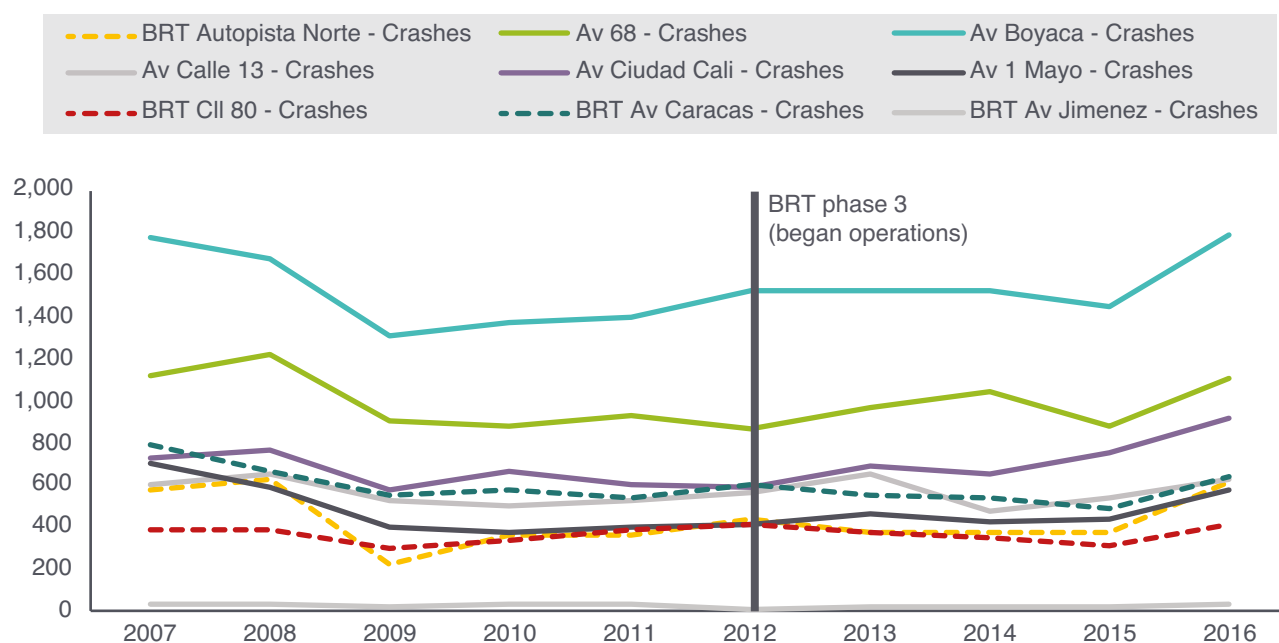
# References

- Alesina, A. (2007) *Program report: political economy*, vol. 3. Cambridge MA: National Bureau of Economic Research
- Andes, U.d.l. and BID – Banco Interamericano de Desarrollo (2011) *Fortalecimiento de la Seguridad Vial en el Transporte Urbano: El Caso de Bogotá*. Bogotá: BID
- Ardila, A. (2004) 'Transit planning in Curitiba and Bogotá: roles in interaction, risk and change' (PhD, Massachusetts Institute of Technology)
- Bassett, T.E. and Marpillero-Colomina, A. (2013) 'Sustaining mobility: bus rapid transit and the role of local politics in Bogotá' *Latin American Perspectives* 40(2): 135–145
- Bedoya, A. (2010) *Influencia en la accidentalidad vial en los corredores de TransMilenio por la implementación del sistema de transporte masivo durante la Fase I y II en Bogotá*. Pontificia Universidad Javeriana (<https://repository.javeriana.edu.co/bitstream/handle/10554/7072/tesis363.pdf?sequence=1&isAllowed=y>)
- Berney, R. (2010) 'Learning from Bogotá: how municipal experts transformed public space' *Journal of Urban Design* 15(4): 539–558
- Bocarejo, J., Velasquez, J., Díaz, C. and Tafur, L. (2012) 'Impact of bus rapid transit systems on road safety: lessons from Bogotá, Colombia' *Transportation Research Record: Journal of the Transportation Research Board* 23(17): 1–7
- BogotaComoVamos. (2016). Informe de Calidad de Vida Bogota.
- Carrigan, A., King, R., Velasquez, J. M., Raifman, M. and Duduta, N. (2013) *Social, environmental and economic impacts of BRT systems: bus rapid transit case studies from around the world*. Washington DC: World Resources Institute
- Dey, I. (2003) *Qualitative data analysis: a user-friendly guide for social scientists*. Routledge
- Duduta, N., Adriazola-Steil, C., Wass, C., Hidalgo, D., Lindau, L.A. and Sam John, V. (2014) *Traffic Safety on bus priority systems*. Washington DC: World Resources Institute
- El Tiempo (2017) 'Cada día mueren 18 personas en accidentes vehiculares en el país'. *El Tiempo*, 7 January ([www.eltiempo.com/colombia/otras-ciudades/cifras-de-accidentes-de-transito-en-2016-39192](http://www.eltiempo.com/colombia/otras-ciudades/cifras-de-accidentes-de-transito-en-2016-39192))
- EMBARQ (2009) 'Evaluation ex-post BRT system Bogotá' in *Evaluación Ex-Post Sistema de Transporte Masivo de Bogotá*. Informe 4: Preparado para el Departamento Nacional de Planeación
- Gilbert, A. (2006) 'Good urban governance: evidence from a model city?' *Bulletin of Latin American Research* 25(3): 392–419
- Gilbert, A. and Garces, M.T. (2008) *Bogotá: progreso, gobernabilidad y pobreza*. Bogotá: Editorial Universidad del Rosario
- Global BRT Data (2017) 'Global BRT data: across latitudes and cultures – bus rapid transit (ALC-BRT)'. EMBARQ, the International Energy Agency (IEA), the Latin American Association of Integrated Transport Systems and BRT (SIBRT) (<http://brtdata.org>)
- Hidalgo, D. and King, R. (2014) 'Public transport integration in Bogotá and Cali, Colombia: facing transition from semi-deregulated services to full regulation citywide' *Research in Transportation Economics* 48: 166–175
- JICA – Japanese International Development Agency (1996) *Master Plan for Urban Transport of Santa Fe de Bogotá*. Bogotá: Alcaldía Mayor de Bogotá.
- Larsson, P., Dekker, S.W.A. and Tingvall, C. (2010) 'The need for a systems theory approach to road safety' *Safety Science* 48(9): 1167–1174 (<https://doi.org/10.1016/j.ssci.2009.10.006>)
- Medicina-Legal (1999–2015) *Forensis*. Bogotá: Instituto Nacional de Medicina Legal y Ciencias Forenses
- Mojica, C. and Gomez-Ibanez, J. (2007) *TransMilenio: the Battle over Avenida Septima*: 25. Cambridge MA: Harvard University
- Rocha Menocal, A. (2014) *Getting real about politics: from thinking politically to working differently*. ODI Working Paper. London: Overseas Development Institute
- SDP – Secretaría de Planeación (1997a) Informe de avance del Plan de Acción Formar ciudad ([www.sdp.gov.co/portal/page/portal/PortalSDP/ciudadania/PlanesDesarrollo/FormarCiudad/1995\\_1998\\_FormarCiudad\\_b\\_Seguimiento\\_b\\_PlanAccion\\_Cronog.pdf](http://www.sdp.gov.co/portal/page/portal/PortalSDP/ciudadania/PlanesDesarrollo/FormarCiudad/1995_1998_FormarCiudad_b_Seguimiento_b_PlanAccion_Cronog.pdf))
- SDP (1997b) Plan de desarrollo económico y social y de obras públicas para Santafé de Bogotá ([www.sdp.gov.co/portal/page/portal/PortalSDP/ciudadania/PlanesDesarrollo/FormarCiudad/1995\\_1998\\_FormarCiudad\\_a\\_Plan\\_Decreto295\\_1995.pdf](http://www.sdp.gov.co/portal/page/portal/PortalSDP/ciudadania/PlanesDesarrollo/FormarCiudad/1995_1998_FormarCiudad_a_Plan_Decreto295_1995.pdf))
- SDP (1997c) Seguimiento de Ejecución de la Inversión a diciembre 31 de 1997 ([www.sdp.gov.co/portal/page/portal/PortalSDP/ciudadania/PlanesDesarrollo/EjecucionPresupuestal/EjecucionPresupuestalInversionDirecta\\_1997.pdf](http://www.sdp.gov.co/portal/page/portal/PortalSDP/ciudadania/PlanesDesarrollo/EjecucionPresupuestal/EjecucionPresupuestalInversionDirecta_1997.pdf))
- SDP (2001a) Balance de Cumplimiento de Metas Plan de Desarrollo ([www.sdp.gov.co/portal/page/portal/PortalSDP/ciudadania/PlanesDesarrollo/PorlaBogotáqueQueremos/1998\\_2001\\_PorlaBogotáqueQueremos\\_c\\_InformeFinal\\_f\\_Balanc.pdf](http://www.sdp.gov.co/portal/page/portal/PortalSDP/ciudadania/PlanesDesarrollo/PorlaBogotáqueQueremos/1998_2001_PorlaBogotáqueQueremos_c_InformeFinal_f_Balanc.pdf))
- SDP (2001b) Plan de desarrollo económico y social y de obras públicas para Santafé de Bogotá ([www.sdp.gov.co/portal/page/portal/PortalSDP/ciudadania/PlanesDesarrollo/PorlaBogotáqueQueremos/1998\\_2001\\_PorlaBogotáqueQueremos\\_a\\_Plan\\_Acuerdo06\\_1998.pdf](http://www.sdp.gov.co/portal/page/portal/PortalSDP/ciudadania/PlanesDesarrollo/PorlaBogotáqueQueremos/1998_2001_PorlaBogotáqueQueremos_a_Plan_Acuerdo06_1998.pdf))

- SDP (2001c) Seguimiento de Ejecución de la Inversión a diciembre 31 de 2000 ([www.sdp.gov.co/portal/page/portal/PortalSDP/ciudadania/PlanesDesarrollo/EjecucionPresupuestal/EjecucionPresupuestalInversionDirecta\\_2000.pdf](http://www.sdp.gov.co/portal/page/portal/PortalSDP/ciudadania/PlanesDesarrollo/EjecucionPresupuestal/EjecucionPresupuestalInversionDirecta_2000.pdf))
- SDP (2003a) Informe de Ejecución del Presupuesto de Inversión 2003 ([www.sdp.gov.co/portal/page/portal/PortalSDP/ciudadania/PlanesDesarrollo/EjecucionPresupuestal/EjecucionPresupuestalInversionDirecta\\_2003.pdf](http://www.sdp.gov.co/portal/page/portal/PortalSDP/ciudadania/PlanesDesarrollo/EjecucionPresupuestal/EjecucionPresupuestalInversionDirecta_2003.pdf))
- SDP (2003b) Plan de acción BOGOTÁ para VIVIR todos del mismo lado. Informe por entidades ([www.sdp.gov.co/portal/page/portal/PortalSDP/ciudadania/PlanesDesarrollo/Bogotáparavivirtodosdelmismolado/2001\\_2004\\_BogotáparaVivirTodosdelMismoLado\\_b\\_Seguimiento.pdf](http://www.sdp.gov.co/portal/page/portal/PortalSDP/ciudadania/PlanesDesarrollo/Bogotáparavivirtodosdelmismolado/2001_2004_BogotáparaVivirTodosdelMismoLado_b_Seguimiento.pdf))
- SDP (2003c) Plan de desarrollo económico y social y de obras públicas para Santafé de Bogotá
- SDP (2007) Ejecución del presupuesto de inversión 2007 a diciembre ([www.sdp.gov.co/portal/page/portal/PortalSDP/ciudadania/PlanesDesarrollo/EjecucionPresupuestal/EjecucionPresupuestalInversionDirecta\\_2007.pdf](http://www.sdp.gov.co/portal/page/portal/PortalSDP/ciudadania/PlanesDesarrollo/EjecucionPresupuestal/EjecucionPresupuestalInversionDirecta_2007.pdf))
- SDP (2008a) Plan de Acción - Componente de Inversión entidades ([www.sdp.gov.co/portal/page/portal/PortalSDP/ciudadania/PlanesDesarrollo/BogotáSinIndiferencia/2004\\_2008\\_BogotáSinIndiferencia\\_b\\_Seguimiento\\_a\\_PlanAcci.pdf](http://www.sdp.gov.co/portal/page/portal/PortalSDP/ciudadania/PlanesDesarrollo/BogotáSinIndiferencia/2004_2008_BogotáSinIndiferencia_b_Seguimiento_a_PlanAcci.pdf))
- SDP (2008b) Plan de Acción - Componente de Inversión y gestión por entidades ([www.sdp.gov.co/portal/page/portal/PortalSDP/ciudadania/PlanesDesarrollo/BogotáSinIndiferencia/2004\\_2008\\_BogotáSinIndiferencia\\_b\\_Seguimiento\\_b\\_PlanAcci.pdf](http://www.sdp.gov.co/portal/page/portal/PortalSDP/ciudadania/PlanesDesarrollo/BogotáSinIndiferencia/2004_2008_BogotáSinIndiferencia_b_Seguimiento_b_PlanAcci.pdf))
- SDP (2011a) Ejecución del presupuesto de inversión 2011 a diciembre ([www.sdp.gov.co/portal/page/portal/PortalSDP/ciudadania/PlanesDesarrollo/EjecucionPresupuestal/EjecucionPresupuestalInversionDirecta\\_2011.pdf](http://www.sdp.gov.co/portal/page/portal/PortalSDP/ciudadania/PlanesDesarrollo/EjecucionPresupuestal/EjecucionPresupuestalInversionDirecta_2011.pdf))
- SDP (2011b) Plan de Acción 2008–2012 ([www.sdp.gov.co/portal/page/portal/PortalSDP/ciudadania/PlanesDesarrollo/BogotáPositiva/2008\\_2012\\_BogotáPositiva\\_b\\_Seguimiento\\_a\\_PlanAccion\\_2012.pdf](http://www.sdp.gov.co/portal/page/portal/PortalSDP/ciudadania/PlanesDesarrollo/BogotáPositiva/2008_2012_BogotáPositiva_b_Seguimiento_a_PlanAccion_2012.pdf))
- SDP (2011c) Plan de Acción 2008–2012. Componente de inversión por Sector ([www.sdp.gov.co/portal/page/portal/PortalSDP/ciudadania/PlanesDesarrollo/BogotáPositiva/2008\\_2012\\_BogotáPositiva\\_b\\_Seguimiento\\_c\\_PlanAccion\\_2012.pdf](http://www.sdp.gov.co/portal/page/portal/PortalSDP/ciudadania/PlanesDesarrollo/BogotáPositiva/2008_2012_BogotáPositiva_b_Seguimiento_c_PlanAccion_2012.pdf))
- SDP (2015) Ejecución del presupuesto de inversión 2015 a diciembre. Informe consolidado por estructura del plan de desarrollo ([www.sdp.gov.co/portal/page/portal/PortalSDP/ciudadania/PlanesDesarrollo/EjecucionPresupuestal/1410\\_EjecPptal-InversionDirecta-Entidades\\_2015.pdf](http://www.sdp.gov.co/portal/page/portal/PortalSDP/ciudadania/PlanesDesarrollo/EjecucionPresupuestal/1410_EjecPptal-InversionDirecta-Entidades_2015.pdf))
- SDP (2016a) Plan de Acción 2012 - 2016 Componente de gestión e inversión por entidad ([www.sdp.gov.co/portal/page/portal/PortalSDP/ciudadania/PlanesDesarrollo/BogotáHumana](http://www.sdp.gov.co/portal/page/portal/PortalSDP/ciudadania/PlanesDesarrollo/BogotáHumana))
- SDP (2016b) Proyecciones Poblacion ([www.sdp.gov.co/portal/page/portal/PortalSDP/InformacionTomaDecisiones/Estadisticas/ProyeccionPoblacion:Proyecciones%20de%20Poblaci%F3n](http://www.sdp.gov.co/portal/page/portal/PortalSDP/InformacionTomaDecisiones/Estadisticas/ProyeccionPoblacion:Proyecciones%20de%20Poblaci%F3n))
- SDP (2017a) Ejecución del presupuesto de inversión 2017 a mayo. Informe consolidado por estructura del plan de desarrollo ([www.sdp.gov.co/portal/page/portal/PortalSDP/ciudadania/PlanesDesarrollo/EjecucionPresupuestal/1410\\_Ejec-Pptal\\_entidades\\_inversion-directa\\_201705.pdf](http://www.sdp.gov.co/portal/page/portal/PortalSDP/ciudadania/PlanesDesarrollo/EjecucionPresupuestal/1410_Ejec-Pptal_entidades_inversion-directa_201705.pdf))
- SDP (2017b) Ejecución presupuestal de la inversión directa ([www.sdp.gov.co/portal/page/portal/PortalSDP/ciudadania/PlanesDesarrollo/EjecucionPresupuestal](http://www.sdp.gov.co/portal/page/portal/PortalSDP/ciudadania/PlanesDesarrollo/EjecucionPresupuestal))
- SDP (2017c) Memorias de Planes de Desarrollo Distritales ([www.sdp.gov.co/portal/page/portal/PortalSDP/ciudadania/PlanesDesarrollo](http://www.sdp.gov.co/portal/page/portal/PortalSDP/ciudadania/PlanesDesarrollo)) Secretaria de Movilidad (2016) ‘Datos Accidentalidad’ (‘Accident data’) (electronic dataset, Secretaria de Movilidad)
- SDP (2017d) *Diagnostico Plan de Ordenamiento Territorial POT 2017*. Bogotá: SDP ([www.sdp.gov.co/portal/page/portal/PortalSDP/POT\\_2016/documentos/DIAGNOSTICO%20PLAN%20DE%20ORDENAMIENTO%20TERRITORIAL%202017.pdf](http://www.sdp.gov.co/portal/page/portal/PortalSDP/POT_2016/documentos/DIAGNOSTICO%20PLAN%20DE%20ORDENAMIENTO%20TERRITORIAL%202017.pdf))
- Secretaria Distrital de Movilidad (2015) *Encuesta de Movilidad*. Bogotá: Secretaria Distrital de Movilidad ([www.simur.gov.co/inicio](http://www.simur.gov.co/inicio))
- Silva, A., Pérez, F., Ruiz, F. and Martín, T. (2009) *Bogotá, de la construcción al deterioro (1995-2007)*. Bogotá: Universidad del Rosario
- Vergel-Tovar, C. (2016) ‘Examining the reciprocal relationship of bus rapid transit and the built environment in Latin America’ (PhD dissertation, University of North Carolina)
- Wales, J. (2017) *The political economy of road safety: a policy-oriented literature review*. ODI Report. London: Overseas Development Institute ([www.odi.org/publications/10739-political-economy-road-safety-policy-oriented-literature-review](http://www.odi.org/publications/10739-political-economy-road-safety-policy-oriented-literature-review))
- WHO – World Health Organization (2015) *Global status report on road safety 2015*. Geneva: WHO
- WRI – World Resources Institute (2016) *Cities safer by design*. Washington DC: WRI
- WRI (2017) *Las ciudades como foco de siniestralidad vial*. Paper presented at the XI Semana Seguridad Vial Bogotá, 2–3 October 2017

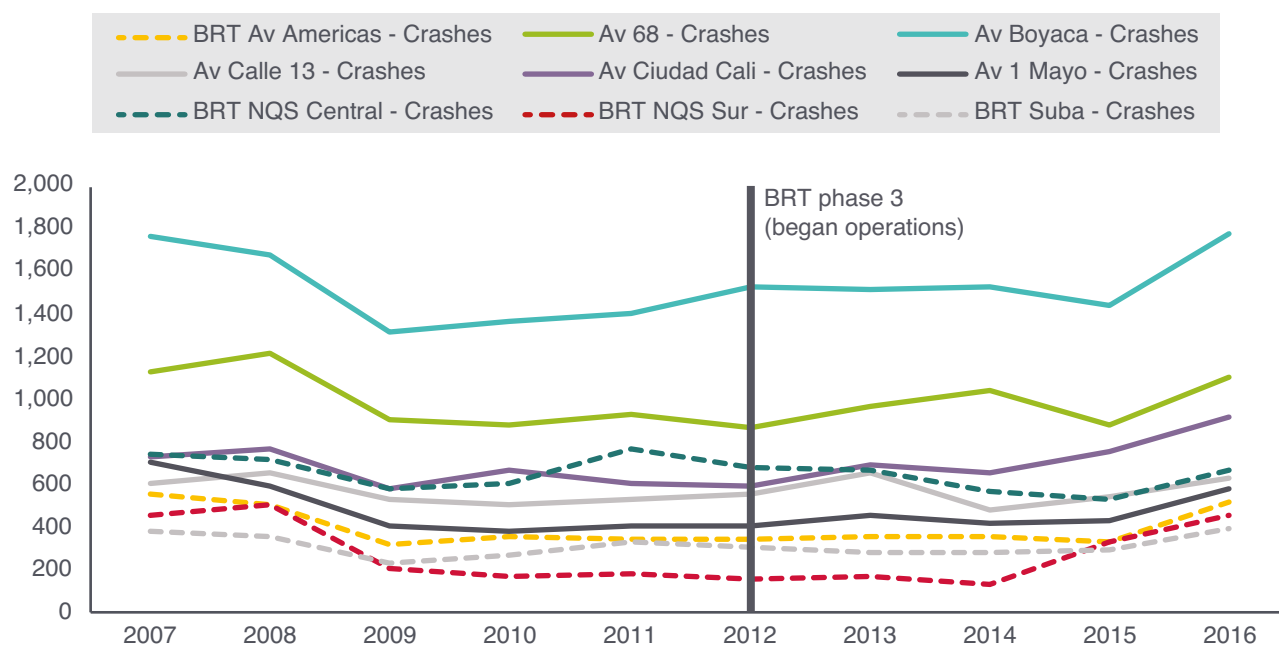
# Annex

**Figure A1 Total number of road collisions on BRT corridors phase 1 and arterial roads, buffer 35 metres (2007–2016)**



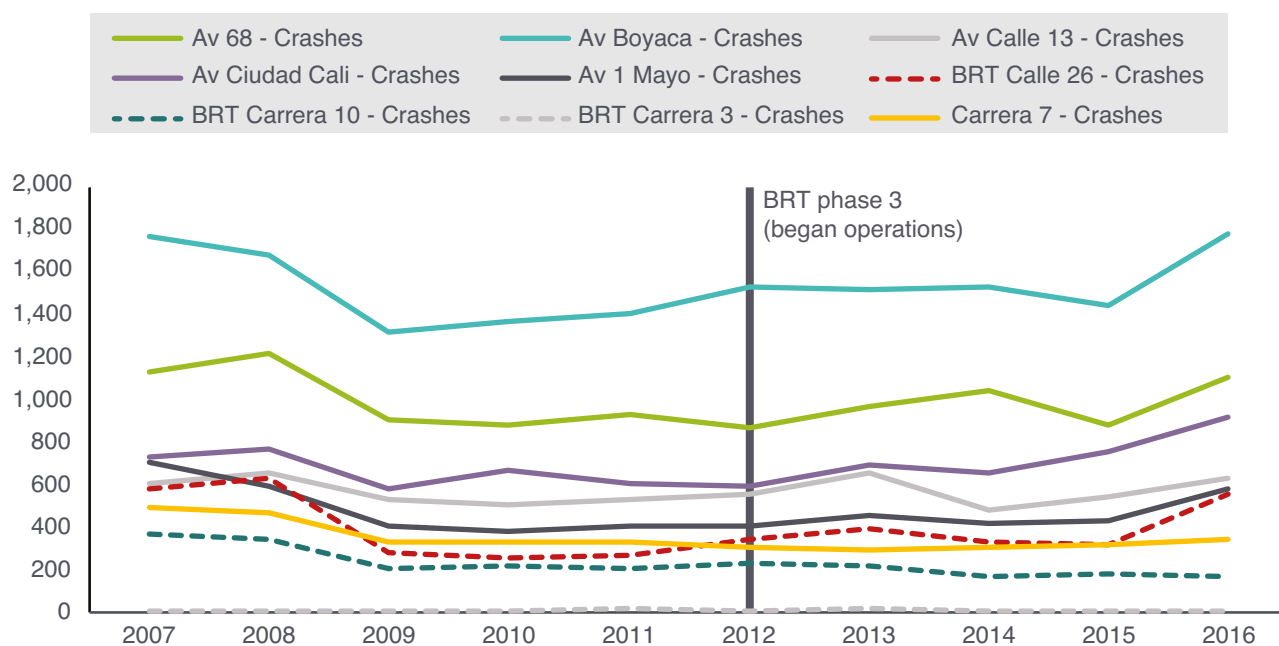
Source: Secretaria de Movilidad, 2016 (data processed by Vergel-Tovar).

**Figure A2 Total number of road collisions on BRT corridors phase 2 and arterial roads, buffer 35 metres (2007–2016)**



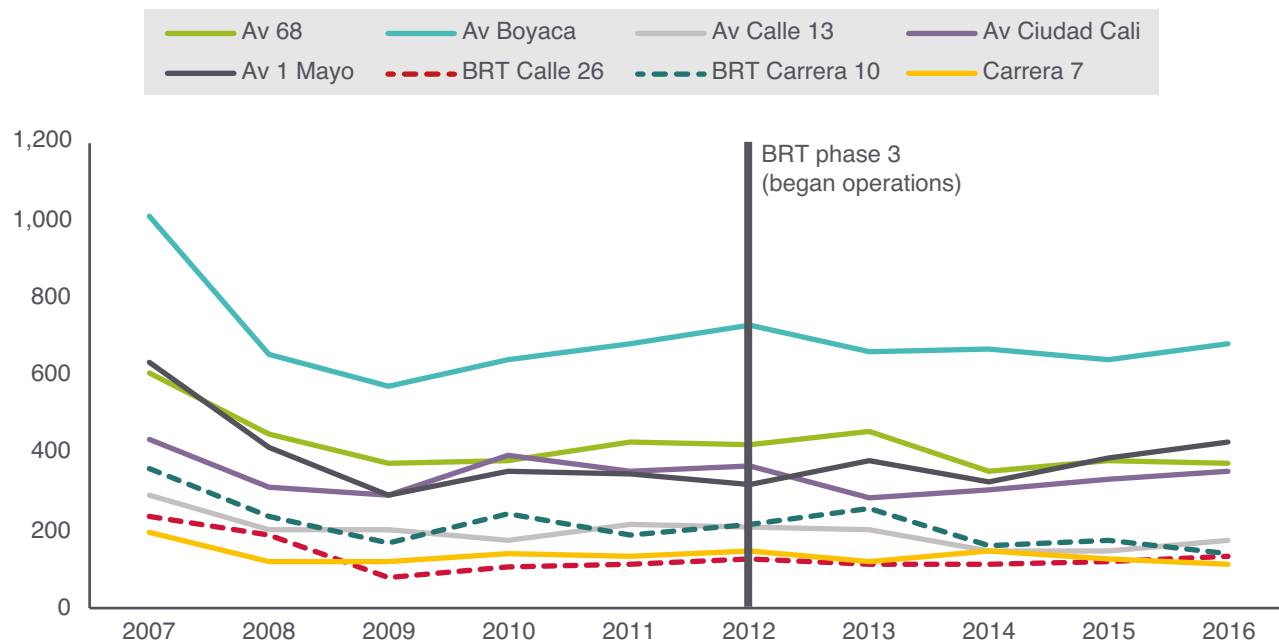
Source: Secretaria de Movilidad, 2016 (data processed by Vergel-Tovar).

**Figure A3 Total number of road collisions on BRT corridors phase three and arterial roads, buffer 35 metres (2007–2016)**



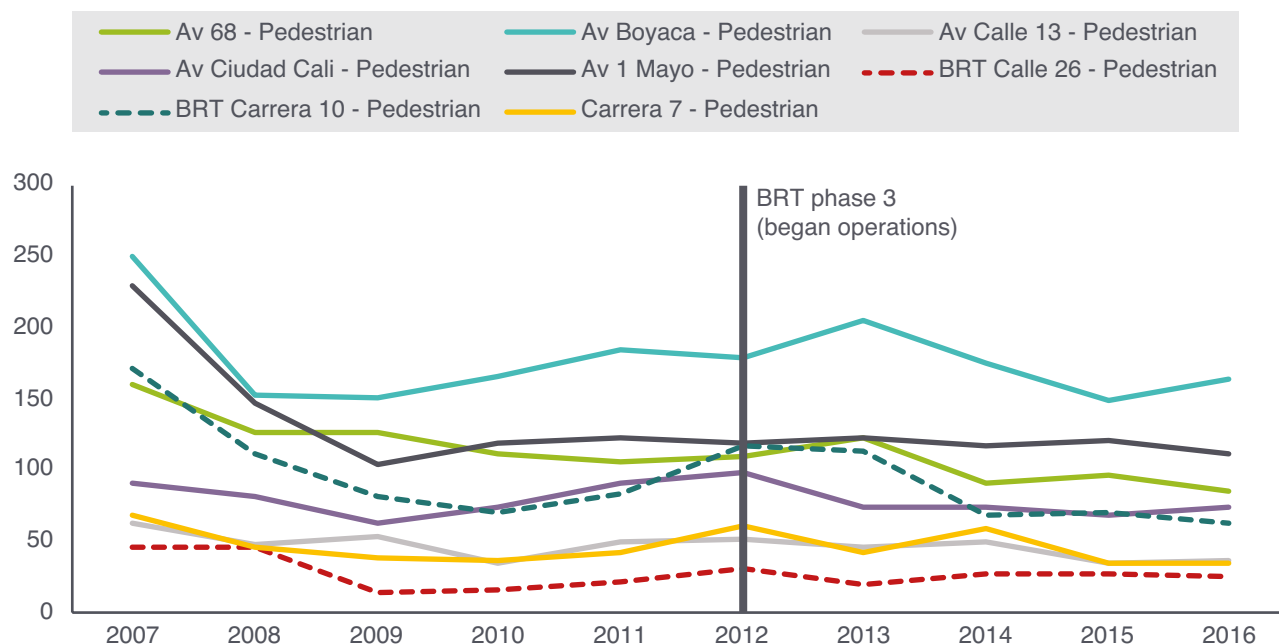
Source: Secretaria de Movilidad, 2016 (data processed by Vergel-Tovar).

**Figure A4 Total number of injured victims in road collisions on BRT corridors phase three and arterial roads, buffer 35 metres (2007–2016)**



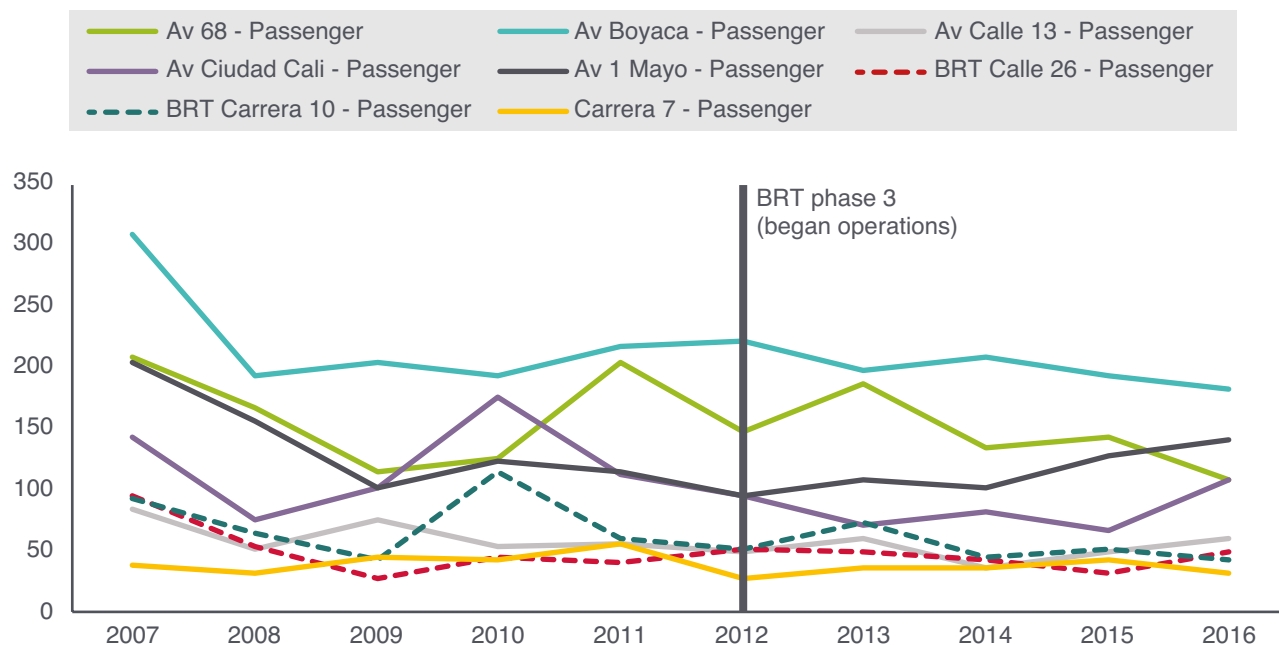
Source: Secretaria de Movilidad, 2016 (data processed by Vergel-Tovar).

**Figure A5 Total pedestrians injured in road collisions on BRT corridors phase three and arterial roads, buffer 35 metres (2007–2016)**



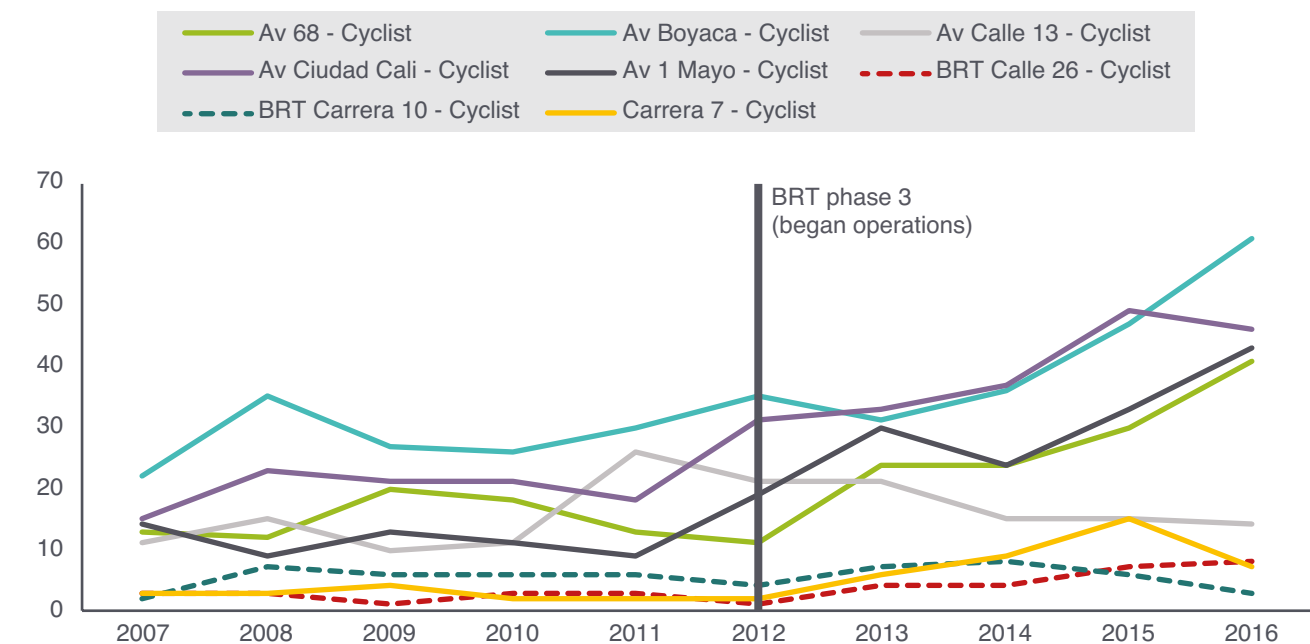
Source: Secretaria de Movilidad, 2016 (data processed by Vergel-Tovar).

**Figure A6 Total passengers injured in road collisions on BRT corridors phase three and arterial roads, buffer 35 metres (2007–2016)**



Source: Secretaria de Movilidad, 2016 (data processed by Vergel-Tovar).

**Figure A7 Total cyclists injured in road collisions on BRT corridors phase three and arterial roads, buffer of 35 metres (2007–2016)**



Source: Secretaria de Movilidad, 2016 (data processed by Vergel-Tovar).



**Table A1 National Road Traffic Code (Law 769 of 2002) and topics related to road safety**

Section	Main topics directly related to road safety
<b>Principles</b>	<ul style="list-style-type: none"> <li>Regulations aim to secure the safety of road users.</li> </ul>
<b>Definitions</b>	<ul style="list-style-type: none"> <li>Roads (adequate levels of safety and comfort)</li> <li>Seatbelt (prevention device in vehicles)</li> <li>Safety and prevention equipment (required in vehicles)</li> </ul>
<b>Authorities</b>	<ul style="list-style-type: none"> <li>The National Government will regulate the technical training, professional experience in education required for civil servants or transport authority.</li> <li>The Ministry of Transport will develop a National Road Safety Plan.</li> <li>The National Police will regulate the functioning of the Training and Specialization Road Safety Division.</li> <li>The Ministry of Transport will contribute to the development and functioning of the School for Training and Specialization Road Safety Division.</li> </ul>
<b>Vehicles</b>	<ul style="list-style-type: none"> <li>All vehicles must include a prevention and safety equipment in order to circulate along all roads nationwide.</li> <li>Freight transport vehicles must comply with toad safety regulations (vehicle and cargo).</li> </ul>
<b>Technical and mechanical review</b>	<ul style="list-style-type: none"> <li>Vehicle owners must comply with optimum mechanical and safety conditions of his/her vehicles to circulate along all roads nationwide.</li> </ul>
<b>General rules and education</b>	<ul style="list-style-type: none"> <li>It is an obligation of educational programs to develop courses previously designed by the National Government on road safety and traffic as part of the curriculum at pre-school, basic, secondary and media level education.</li> <li>The Ministry of Transport has 12 months to issue the regulation regarding the development of these educational programs and manuals.</li> </ul>
<b>Pedestrians</b>	<ul style="list-style-type: none"> <li>Pedestrians must not invade the area assigned to motorised vehicles, neither circulate on skates or skateboards or similar devices.</li> <li>Pedestrians must not do any of the following: i) carry out without precautions any elements that could obstruct or affect road traffic; ii) cross through prohibited sites or rail roads; iii) to stand in front or behind an engine on vehicle; iv) hang from vehicles in movement; v) risky behaviour for his/her own physical safety; vi) cross a road trough vehicular traffic at places located close to designated pedestrian crossings; vii) occupy the safety buffer area of rail roads (12mts); viii) board and off-board a vehicle in movement at any circumstances; ix) circulate through railways tunnels, bridges and viaducts</li> </ul>
<b>Penalty fees sanction</b>	<ul style="list-style-type: none"> <li>Those violating traffic norms will be sanctioned with penalty fees according to violations conducted by different transportation modes (a group of sanctions 1 (4 minimum legal daily salaries): non-motorised vehicles and animal traction) – 12 sanctions; ii) group of sanctions 2 (8 minimum legal daily salaries): driver/owner of private vehicle – 23 sanctions; iii) group of sanctions 3 (15 minimum legal daily salaries): driver/owner of private vehicle – 39 sanctions; iv) group of sanctions 4 (30 minimum legal daily salaries): driver/owner of private vehicle 5 (30 minimum legal daily salaries) – 15 sanctions; v) group of sanctions 5 (30 minimum legal daily salaries): driver/owner of private vehicle 5 (45 minimum legal daily salaries) – 4 sanctions.</li> </ul>
<b>Enforcement</b>	<ul style="list-style-type: none"> <li>The enforcement of sanctions because of road traffic violations will be conducted by road traffic authorities where the violation took place. The traffic authorities will be invested in coactive jurisdiction to enforce the payment, in case it will be necessary and the penalty fees will prescribe three years after the violation occurred.</li> <li>The road traffic authorities will adopt indispensable measures to facilitate the payment and collection of penalty fees payments and any other rights in their favour.</li> <li>Penalty fees will be the exclusive property of the road traffic authorities where the violation took place.</li> <li>The destination of payments collected from penalty fees will be devoted to road traffic, education, equipment's provision, gas and road safety plans, apart from the Colombian Federation of Municipalities and other private entities who are also designated to participate in the administration, processing, collection and distribution of penalty fees.</li> </ul>



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Cover photo: Motorbikes and taxis speed through Mumbai's streets © Aashim Tyagi/WRI India, 2015.



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