



REDUCING AND ENFORCING SPEED LIMITS IN BOGOTÁ: PROGRESS AND CHALLENGES

By Darío Hidalgo

INTRODUCTION

Road safety is a major public health challenge: 1.19 million people died worldwide in 2021 because of preventable traffic crashes (WHO, 2023). Recommended mitigation strategies include a combination of actions involving multimodal transport and land use planning; safer road infrastructure, vehicles and road use; and timely post-crash response, integrated into a safe system approach (WHO, 2021). This approach follows the Vision Zero approach to road safety, first introduced in Sweden (Kristianssen et al., 2018), which has resulted in significant reductions in road fatalities and severe injuries, particularly in Western Europe, Australia and Japan (ITF, 2023). Cities play a significant role in mitigating the burden, especially in middle- and low-income countries (Welle et al., 2018). The experience of Bogotá, Colombia, is relevant in this context.

Photo credit: Nick Fewings, 2019. <https://unsplash.com/photos/assorted-color-road-signs-srO-NYtFRz8>.

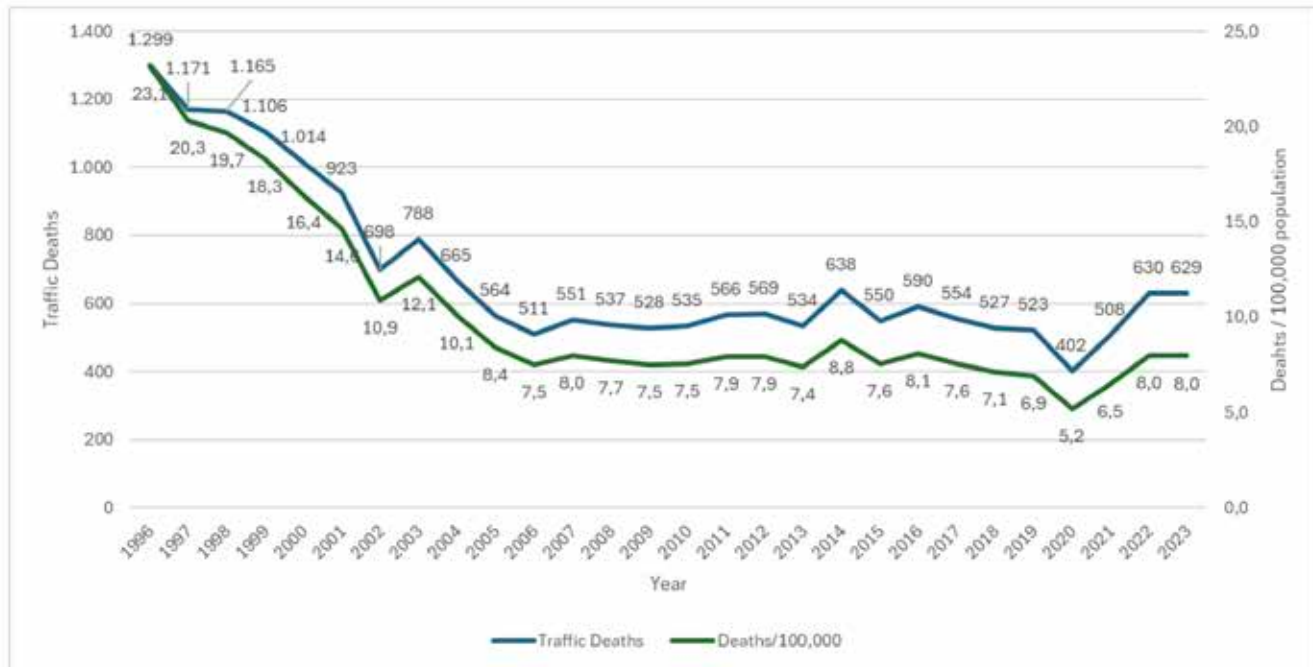


Figure 1. Traffic Deaths and Deaths/100,000 population in Bogotá, 1996-2023

Colombia is a middle-income country (USD \$6,624 per capita) (Data Commons, 2022); its capital, Bogotá, has a population of eight million people (Dane, 2021). The city has been recognized for achievements in sustainable mobility, including a 630 km bicycle network and a 114 km bus rapid transit (BRT) system TransMilenio (ICLEI – Sustainable Mobility, 2024). Walking (27.5%) and public transport (34.7 %) are the main modes of transport and bicycling became stronger in the last 20 years (7.3 %) (Secretaria Distrital de Movilidad, 2024a). The current fatality rate is 8.0 deaths per 100,000 population, down 66 % from 23.1 in 1996 (Figure 1).

Progress in road safety was significant between 1996 and 2006 due to a combination of changes in behavior and infrastructure (Vergel-Tovar, Sharpin & Hidalgo, 2018). Behavioral changes were the result of strong promotion of safe practices, under the name of “Cultura Ciudadana” (citizenship culture), combined with enforcement. Infrastructure included the construction of an extensive network of protected sidewalks, bike lanes and BRT. This was followed by a slight increase in the fatality rates between 2006 (7.5 deaths/100,000 population) and 2017 (8.1 deaths/100,000 population) as these policies lacked continuity.

Metric speed limits converted to English (rounded)

1.6 km/h	1 mph
30 km/h	20 mph
50 km/h	30 mph
60 km/h	40 mph

km/h= kilometers per hour
mph= miles per hour

In 2017 the city launched a road safety plan 2017-2026 under the Vision Zero principles (Secretaria Distrital de Movilidad, 2017). Its main component was the reduction of speeds to 50 km/h in seven arterial corridors, which recorded reductions of 17 % in road fatalities (López et. al, 2021). In 2020 the 50 km/h speed limit was extended to the whole main road network. In 2022 this speed limit was adopted nationally as the maximum for urban roads as well as a 30 km/h limit in residential and school areas. The speed reduction program included new speed cameras in ninety-two locations. As a result, fatalities and severe injuries declined by 21 % in the road sections with speed cameras (Valderrama et al., 2024).

This article explores these advances and challenges in road safety in Bogotá, with an emphasis on speed management. It is intended as a reference for city planners in large cities, especially in middle- and low-income countries facing rapid motorization.

It shows that the system's approach to road safety brings reductions in traffic deaths, but also the adverse impact of lack of continuity of public policies and emerging issues after the pandemic. The first section explains the steep decline in traffic deaths between 1996 and 2006 as well as the lack of progress between 2007 and 2016; the next section addresses the vision zero and speed management plans launched in 2017 and their effects on road safety. The last section shows the challenges after the pandemic: growth of motorcycle use and the apparent increase in aggressive driving behaviors. The article closes with conclusions and recommendations.

STRONG REDUCTION IN TRAFFIC FATALITIES (1996-2006) FOLLOWED BY A SLIGHT INCREASE (2007-2016)

Bogotá experienced a strong decline in traffic fatalities between 1996 and 2006: the number of deaths went down from 1,299 to 511 in this period (Figure 1; Ministerio de Transporte, 2024). Fatality rates declined by 66%, from 23.1 to 7.5. Vergel-Tovar, Hidalgo and Sharpin (2019) studied the political economy behind the policies during this period and concluded that the road safety achievements were the result of a combination of strong promotion of safe behaviors, changes in enforcement, and development of sustainable mobility infrastructure. According to these authors, this happened after passing a new constitution in 1991 that strengthened the authority of the city mayors and provided opportunities to improve the city finances, as well as various national and local policies (Figure 2).

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 Prevencion 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

Figure 2. Key changes in the legal and institutional framework that have affected road safety.

The authors highlight the actions of three city mayors: Antanas Mockus (in office 1995-1997 and 2001-2003), Enrique Peñalosa (in office 1998-2000 and 2016-2019) and Luis E. Garzón (in office 2004-2007).

Mayor Antanas Mockus (1995-1997, in his last year he was replaced by Paul Bromberg), launched policies to promote the protection of life, with strong and effective citizen culture campaigns (Mockus, 1999). They included protecting pedestrians, particularly at zebra crossings, and inviting people to approve or disprove behavior using two-sided cards with thumbs-up and thumbs-down pictures, among other activities in public spaces and the media. Respecting life was one of the key messages of these campaigns under the name “life is sacred,” which included actions to reduce homicides and traffic fatalities.

These actions were combined with stronger enforcement. During this administration, the local traffic police was replaced with national police, in a move to reduce corruption practices and improve enforcement. This change resulted in an increase in traffic citations and penalty revenues (Vergel-Tovar, Hidalgo and Sharpin, 2019).

Mayor Enrique Peñalosa (first term 1998-2000), continued the citizens culture campaigns, reinforced the police funding, and delivered a large-scale infrastructure program focusing on sustainable mobility. It included repairing sidewalks, building bicycle lanes and introducing the first three corridors of the TransMilenio BRT System (Hidalgo, 2004). The city also introduced car restrictions using license plate numbers as a demand-management strategy. These policies resulted in a decline in road fatalities, especially in the BRT Corridors (Bocarejo, et. al, 2012; Duduta et. al, 2014).

Mayor Mockus came back to office in 2001-2003. He continued the construction of sustainable mobility infrastructure and reinforced the “Citizens Culture” programs. The next mayor Luis E. Garzón (2004-2007) completed the first two phases of TransMilenio (84 km in 2006) and contracted its second phase (20 km, launched in 2012). He also continued the citizens culture policies implemented under his predecessors.

During his administration, the Secretary of Traffic and Transport was reorganized as Secretary of Mobility.

Due to changes in city leadership, the emphasis on road safety promotion, enforcement and infrastructure declined afterwards. There were no significant additions to the mass transit system and less attention to sidewalks and bike lanes (Alberti & Pereyra, 2020). The relationship of the local government with the national police was weak, the enforcement of driving behaviors became less stringent, and the initial citizens culture campaigns were slashed (Ángel & Rojas, 2016). There were also corruption scandals that diminished city governance (Muñoz-Monroy, 2018). Motorization also increased, particularly with a rapid increase in motorcycles. As a result of lack of continuity in public policies, the fatality rates remained stagnant and then increased between 2008 and 2017 (Figure 1).

THE VISION ZERO AND SPEED MANAGEMENT PLAN OF 2017

In 2015, Enrique Peñalosa was re-elected for the term 2016-2018. He initiated the replacement of obsolete bus fleets and advanced contracts for new mass transit corridors (Metro and BRT), as well as expansion of bicycle lanes and sidewalks (Peñalosa, 2024). His administration established a new road safety plan under the Vision Zero principles (Secretaria Distrital de Movilidad, 2017). The plan included a speed management plan, which emphasized defining safe speed limits based on road classification and surrounding environment; mechanisms to comply with the new limits (traffic calming and automated enforcement), and communications as a transversal strategy (Secretaria de Movilidad, 2019).

The speed management plan is based on international best practices adapted to the local context. **It recognizes speed as a key road safety factor** as well as local data. According to measurements by Johns Hopkins University and Universidad de los Andes, speeding was close to 40% in 2015 (Secretaria Distrital de Movilidad, 2018).

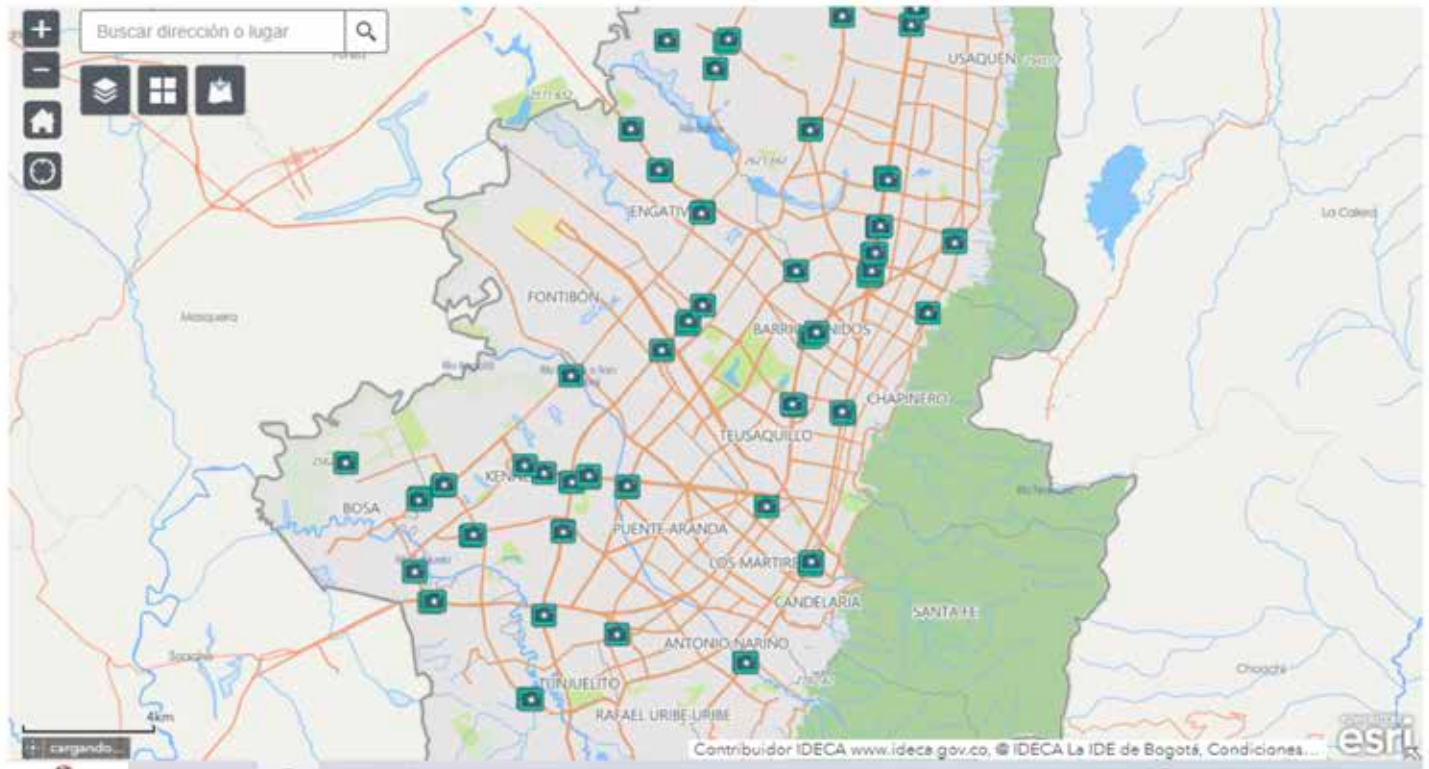


Figure 3. Speed Camera Locations in Bogotá, Colombia

Source: (secretaria Distrital de Movilidad, 2024b)

Under this program, the speed limit was reduced from 60 km/h to 50 km/h in six corridors in 2018 and 2019. Vertical and horizontal signs were replaced with the new speed limit, a media campaign was launched communicating the importance of these measures and police allocated special units for enforcing this measure. An analysis of speed records in 2017 and 2019 and the evolution of road crashes with victims shows that “the average speed reduction in the corridors with speed management was 1.48 km/h during daytime and 3.04 km/h during nighttime. In arterial corridors without speed management, the average speed reduction was 0.7 km/h during daytime and 2.2 km/h during nighttime. The speed management measure influenced a reduction of 16.6% in the number of fatalities and an increase of 10.5% in the number of crashes with injuries” (López et al., 2021).

A case study of the Vision Zero plan in Bogotá (ITF, 2022) identifies lessons from the speed management program (PGV), structured according to the five key components of the Safe System framework.

It concludes that the “program was made possible by a broad collaboration between the city of Bogotá, Bloomberg Philanthropies, local and international experts as advocates, the media, capacity building at the local level, and the use of evidence for the success of the first stages of the program in saving lives. The results show the importance of managing speeds to reduce both road crashes and serious casualties. The PGV also focuses on improving road safety through traffic-calming interventions that allow better interaction between all road actors. The evaluation of results from the early interventions was vital in demonstrating success and achieving city-wide speed limit reductions.”

In 2019 the city introduced an automated speed enforcement program. The city deployed seventy-two speed cameras to issue speeding tickets (Figure 3). The installation of speed cameras was accompanied by a media campaign. There were two changes in speed regulations afterwards: in 2020, during the pandemic, the speed limit was extended to all arterial roads in the city.

In 2022, 50 km/h was adopted as the default speed limit for urban roads, along with a 30 km/h speed limit for residential and school zones.

An analysis by Valderrama et al. (2024) shows that “traffic-related fatalities and non-fatal injuries decreased the most in locations where speed cameras were implemented. The average impact of speed cameras on traffic safety could be up to thirteen fewer fatalities annually. This figure is based on the difference in the change between segments where cameras were installed and segments with no camera, which is about 0.1 deaths less per kilometer for both post-intervention periods (2020 and 2021).

The decline in the rates for traffic-related fatalities adds up to 21% in the cameras’ locations and 3% citywide. The results in Bogotá add new empirical evidence from a speed-enforcement camera program implemented in a middle-income country city where motorcycle ownership continues to grow. The analysis also indicates a drastic reduction in pedestrians injured or killed in traffic-related crashes in locations with cameras.

The results in Bogotá are consistent with the impact such measures have had in other places in the world. A systematic review of fourteen observational studies shows reductions between 17 % to 71 % for deaths in the immediate vicinity of camera sites (Pilkington & Kinra, 2005). In Great Britain camera operations at more than 4,000 sites prevented around 3,600 personal injury collisions (PIC), saving around 1,000 people from being killed or seriously injured (KSI) (Allstop, 2010).

CHALLENGES AFTER THE PANDEMIC

During the pandemic, activity in Bogotá reduced substantially because of extended curfews. This impacted road safety in two ways: the reduced activity decreased exposure to traffic crashes, but also increased traffic speeds. The number of traffic fatalities in Bogotá was the minimum in record (402 deaths, 5.2 deaths per 100,000 population); nevertheless, the decline (-23 %) was smaller than the reduction in activity, estimated in -38 % according to WAZE records (Diaz, Sosa and Hidalgo, 2021).

After the pandemic there was a strong increase in traffic fatalities. This may be attributed to a surge in motorcycle use. According to the 2023 mobility survey, motorcycle use increased 19 % between 2019 and 2023 (Secretaría Distrital de Movilidad, 2024a). Motorcycle users became the most frequent victims of traffic crashes (46 %), and interaction with motorcycles is the most common fatal interaction for pedestrians (45 %) (Agencia Nacional de Seguridad Vial, 2024).

Road rage may be also a cause of the increased death toll after the pandemic. Most of the traffic fatalities among motorcycle users were between the ages of 20 and 35 years, mostly males. There is international evidence of the higher risk of road crashes among young and inexperienced drivers (Brake, 2024; Senserrick et al., 2017) as well as national evidence (Oviedo-Trespalacios & Scott-Parker, 2017). A study of crash records from 1990-2020 in Colombia shows that young and novice drivers show much higher crash probability, especially for motorcyclists and males (Guzmán, et al., 2023).

The city of Bogotá plans to increase the coverage of the speed camera program and started the introduction of speed bumps and geometry adjustments in high crash locations. The goal for the 2024-2027 period is a 15 % reduction in traffic fatalities (Secretaría Distrital de Planeación, 2024).

CONCLUSIONS AND RECOMMENDATIONS

Bogotá has reduced traffic fatalities by 52 % since 1996 through a combination of infrastructure, promotion of safe behaviors and enforcement. There was a reduction of 66 % in traffic fatalities between 1996 and 2006. The initial success did not continue between 2007 and 2017; rather traffic deaths remained stable (small overall increase).

In 2017 new road safety policies under the Vision Zero principles were established with a strong focus on speed management. Reducing and enforcing speed limits proved effective in Bogotá: the number fatalities in five initial corridors with a maximum speed of 50 km/h **declined by 17 % by 2019 and 21 %** in 72 road sections with speed cameras in 2020 and 2021. This contributed to a decline from 8.1 to 6.9 traffic fatalities per 100,000 population between 2016 and 2019.

Nevertheless, rapid growth in motorcycle use after the pandemic has contributed to increases in fatality rates afterwards. The fatality rate increased to 8.0 deaths per 100,000 population in 2022 and 2023. The city plans include strategies that have proven successful in the past: expanding the speed camera program and introducing speed reduction measures, such as speed bumps and geometry adjustments in arterials, and traffic calming strategies in residential and school zones. These plans require political will, investment and continued management, evaluation and adaptation.

The experience of the capital of Colombia shows that the Vision Zero systems approach for road safety, particularly speed management strategies, bring significant reductions in traffic deaths. But it also shows the difficulties associated with lack of continuity in public policies and the growing challenge of increased motorcycle use. There is also an indication of road rage after the pandemic which needs a stronger approach to licensing (e.g., practical driving exams, graduated driver licensing) and enforcement (e.g., paired speed cameras, average speed controls, penalty points systems for driver licensing). The general principles for speed management, such as infrastructure, campaigns and automate

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