



**SUSTAINABLE  
INFRASTRUCTURE  
PARTNERSHIP**



A VIEW OF BOGOTÁ CITY, COLOMBIA © PABLOACRUZ / ADOBE STOCK

# COLOMBIA

COLLECTING DATA TO  
IMPROVE THE SOCIAL  
AND ENVIRONMENTAL  
SUSTAINABILITY OF  
MOBILITY SYSTEMS IN  
BOGOTÁ, COLOMBIA



2024

## The International Good Practice Principles for Sustainable Infrastructure

set out ten guiding principles that policymakers can follow to help integrate sustainability into infrastructure planning and delivery. They are focused on integrated approaches and systems-level interventions that governments can make to create an enabling environment for sustainable infrastructure. This case study illustrates specific aspects of one principle in a country context, showing good practices and challenges, and considering potential for advancement or replicability.

## GUIDING PRINCIPLE 10: EVIDENCE-BASED DECISION-MAKING

The planning and management of infrastructure throughout the life cycle should be informed by key performance indicators that should promote the collection of data, including data that is disaggregated by stakeholder groups. Regular monitoring of infrastructure performance and impacts is necessary to generate data, which should be made available to all stakeholders.

### BACKGROUND

The share of the population living in urban areas in Colombia has increased from 46.72 per cent in 1960 to 81.43 per cent in 2020 (UN Habitat 2023). At the same time, the population grew from 16 million to more than 50 million inhabitants (World Bank 2023). Bogotá, the capital of Colombia, experienced an increase in population from around 6.7 million in 2005 to almost 8 million inhabitants in 2021. The population growth is expected to continue (Bogotá Cómo Vamos 2023).

With this population growth and the accompanying urbanization, congestion and pollution in the city of Bogotá increased significantly. More than three quarters of the population became exposed to harmful levels of air pollution (Organisation for Economic Co-operation and Development [OECD] 2021). According to Movilidad Bogotá (2023), Bogotá is often assessed to be one of the most congested cities in the world (Movilidad Bogotá 2023 & World Economic Forum [WEF] 2020). The main reason is that the total number of private vehicles has more than doubled between 2008 and 2022, and men between the ages of 26 and 60 are the primary users of those private vehicles.

The economic cost of traffic has reached USD 1.8 billion and is equivalent to the overall annual investment in health (Movilidad Bogotá 2023). With regard to wider social sustainability, violence and inequalities have risen after increased urbanization (including in terms of provision and investment in walking and cycling infrastructure). In many cases, these problems impact women in particular, restricting their options for fearless mobility in the city, especially at night.

Bogotá has recently strengthened a range of infrastructure-related data systems, addressing both social and environmental sustainability. During the COVID-19 pandemic, as the government imposed restrictions to fight the spread of the virus, the air pollution in the city of Bogotá decreased approximately 80 per cent in the context of reduced traffic and decreased industrial activity (WEF 2020). Air quality monitoring stations in the city enable dynamic live tracking on the environment website of the government. Due to the evidence created by several years of ongoing data collection, the city decided to implement several initiatives to contribute to more sustainable mobility (WEF 2020).



The Government of Colombia has begun to address the public and environmental concerns related to transport efficiency issues via the initiatives presented in this case study. The successful implementation of data-driven strategies to address these issues represent an overall framework of possible approaches to combat air pollution, and improve public transport and the security of disadvantaged population groups.

## TRANSPORT, MOBILITY AND OPEN DATA

The SITP (*Sistema Integrado de Transporte Urbano de Bogotá*) is the integrated public transport system of Bogotá, which integrates the TransMilenio, TransMiCable (as described below), traditional buses and a new Metro to be completed in 2024.

In 2000, the city of Bogotá implemented the TransMilenio, a Bus Rapid Transit System (BRT) covering 12 lines totaling 114.4 kilometers in 2022, which has proven to be an effective public transport solution that cities worldwide adopt.<sup>1</sup> The TransMilenio won the Sustainable Transport Award in 2005 and again in 2022. On a daily average the system carries 2.4 million passengers on 17,335 buses; 1061 of which are electric, while 336 are hybrid.

<sup>1</sup> The TransMilenio is designed with separate and independent bus stops differing from the SITP bus stops.

By 2030, Bogotá plans to have a rate of 100% e-bus procurement (Transformative Urban Mobility Initiative [TUMI] 2019). Besides the BRT, Bogotá operates a cable car named TransMiCable which provides a complementary service connecting more than 700,000 inhabitants of Ciudad Bolívar with the TransMilenio (TransMilenio 2023).

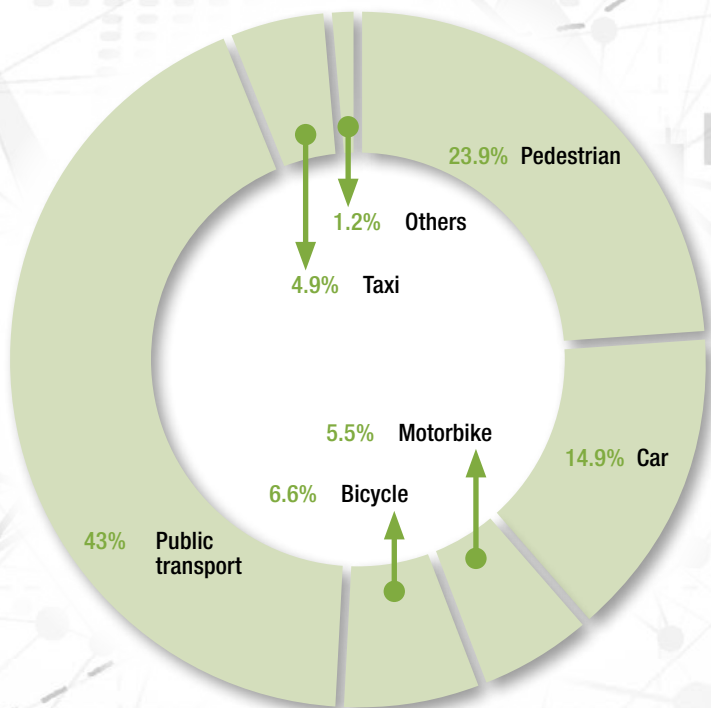
Between 2015 and 2021 the bicycle infrastructure in Bogotá was also expanded. The strategic plan of the city is to further increase bicycle lanes to 830 kilometers to mobilize even more sustainable individual mobility (TUMI 2022). This ambition is supported by the so-called “Ciclovía bogotana”, the cycleway Sunday. Every Sunday from 7:00 a.m. to 2:00 p.m., the main streets of the city are only open for non-motorized traffic. Bogotá was the first city worldwide to launch this kind of car-free day on its streets and – today - more than 1.5 million inhabitants make use of this weekly event (Instituto Distrital de Recreación y Deporte [IDRD] 2023).



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A THREE WAGON TRANSMILENIO BUS CROSSING GABRIEL GARCIA MARQUEZ JOURNALIST PARK WITH SIMON BOLIVAR TEMPLE AND OFFICE BUILDINGS IN THE BACKGROUND

**FIGURE 1 MODAL SHARE BOGOTÁ 2019**



Source: Based on Movilidad Bogotá 2020

Complementarily, with the National Development Plan 2010 to 2014, Colombia set a major priority for transparency, open government and data innovation. During this time, the country became a member of the Open Government Partnership (OGP). OGP is a multilateral initiative to promote and support transparency, participation and combatting corruption (OGP 2023). The efforts of the government are visible in the OURData-Index, an Index by the OECD to measure the success of governments in implementing open data policies. In 2015 Colombia, ranked 11th, 4th in 2017, and 3rd in 2019, proving the successful efforts of the government in availability, accessibility and support of data reuse (OECD 2023).

Colombia's open data policy has visible effects in Bogotá. Through the approach, the city was able to deliver the capacity to measure, collect, analyse, sort and display a large number of indicators and variables connected to the environment and mobility. These measures are an essential feature to integrate evidence-based decision-making.

## DATA INNOVATION FOR SUSTAINABLE INFRASTRUCTURE IN BOGOTÁ

With data monitoring and digital innovation, Bogotá is able to address several transport and mobility challenges at the same time. For example, in 2019, the Development Bank of Latin America and the Caribbean (CAF), TUMI and the District Secretariat for Women addressed the problem of violence and sexual harassment which restricted the mobility of women in Bogotá, especially during nighttime. The project “Me Muevo Segura” (I move safely) is the first attempt to map a city's entire public transport and cycling network and geo-referencing dangerous places. The successful implementation of the pilot incorporated 14,311 safety perception surveys along the TransMilenio and SITP routes. The data collection was supported by the mobile application Safetipin, to visualize and analyse the geographical areas affected by the inadequate infrastructure. The pilot demonstrated and promoted the use of gender-disaggregated data to result in evidence-based decision making. The outcome of the assessment and the use of spatial data evolved into a “tactical urbanism”<sup>2</sup> approach. This allowed for targeted solutions to combat violence and incorporated the redesign of five public spaces for improved safety (TUMI 2020).

<sup>2</sup> Tactical urbanism is an intervention approach which involves the joint efforts of government administration and citizens, aiming to improve the public spaces designed for users in the medium- and long-term) (TUMI 2020).

## ENVIRONMENTAL DATA AND INTERNATIONAL COLLABORATION

Building on these efforts, Bogotá has also taken steps to collect environmental data related to its transport and mobility systems to help reduce congestion and improve air quality. On the UN International Day of Clean Air for Blue Skies on the 7<sup>th</sup> of September 2022, Bogotá launched the collaborative Microsensor Network. The city's air quality monitoring network has 20 stations and will be complemented by 300 microsensors throughout the city by 2025 to improve the monitoring system. The microsensors measure particulate matter and are equipped with optical technology, which enables real-time collection and transmission of information.

“Information is the basis of rigorous decision-making and this project is one of those key elements to determine exactly what actions to take and where these should be taken for change to be real,” said then Mayor of Bogotá, Claudia López (Bogotá 2022).

Since 2012, Colombia has also been a partner of the UNEP Initiative Climate & Clean Air Coalition (CCAC) to reduce short-lived Climate Pollutants. This partnership supported Colombia with strategic national planning which produced the state's first National Air Quality Strategy for 2018-2020. The work has included the training of national stakeholders to undertake integrated GHG mitigation analysis, which is an essential part for the Nationally Determined Contributions (NDCs) agreed upon under the Paris Agreement (CCAC 2023).

## DIGITAL INFRASTRUCTURE AND CITIZEN ENGAGEMENT

One way that Colombia was able to reach these accomplishments and deliver the diverse projects described was by implementing efficient digital infrastructure. The initiative “Dates Abiertos” was launched as a response to the commitments made in the action plan for OGP. As of 2023, the portal covered 7,264 datasets by 1,161 entities and is managed by the Ministry of Information Technologies and Communications. As an additional asset, the project covers courses and guides for public education (Colombia, Datos Abiertos 2023). This success story attracted experts and specialists for evidence-based decision-making, spreading awareness and the use of open and public data. Additionally, it creates positive side effects for science, innovation, public participation and the state-citizen relationship. Bogotá has its own database (Datos Abiertos Bogotá) which, for example, makes key performance indicators on public transport available for all users (Datos Abiertos Bogotá 2023).

The involvement of citizens in projects like “Me Muevo Segura” is advantageous for building trust in the government to promote changes and innovations for shifts towards sustainable approaches. The better access and display of data is an additional important factor to improve participation and transparency in decision-making.





## REPLICABILITY

With long term prioritization of open data availability, digital infrastructure and strategic planning, governments are able to create an environment that fosters and values evidence and monitoring of data for future decisions. Partnerships with international organizations can help build the capacity to activate and assess the necessary conditions for investment.

The innovative approach by Bogotá and TUMI, for instance, requires a public administration with strong data management skills, and requires actors to invest in inter-institutional coordination. TUMI published a Replicability Manual to ease the implementation of this innovative evidence-based approach and foster sustainable, gender-responsive infrastructure in other cities in Colombia and worldwide. As a result of implementation in Bogotá, the initiative received requests to likewise replicate this innovative approach (TUMI 2021).

## KEY INSIGHTS



- ▶ With the priorities set by the Government of Colombia for open data policies, the capacity for data collection and provision and the necessary digital infrastructure was created. This enabled innovation and tracking of progress towards sustainable mobility systems.
- ▶ International initiatives, organizations and partnerships can foster and accelerate change towards sustainable infrastructure. Colombia and its capital are an example of how cooperation and collaboration at different levels have built capacity to move towards a clean environment and more efficient and responsive infrastructure provision.
- ▶ The data innovations in Bogotá that address women's security, air pollution and public transport represent a framework of possible interventions and implementations in countries and cities with similar issues.

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## ACKNOWLEDGEMENTS

The Sustainable Infrastructure Partnership (SIP) is a platform led by the United Nations Environment Programme (UNEP) to promote and support integrated approaches to sustainable infrastructure planning and development. This case study was developed by Maximilian Beck, with guidance from Joy Aeree Kim, Rowan Palmer and Joseph Price (all UNEP). The SIP would like to thank Verena Flues (Deutsche Gesellschaft für Internationale Zusammenarbeit [GIZ]) for her valuable inputs, and is grateful to Ana Fernández Vergara, Carly Koinange, Désirée Leon, Daniyal Moazzam, Beatriz Martins Carneiro, Shunsuke Nakai and Chengchen Qian (all UNEP) for their reviews and support.

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