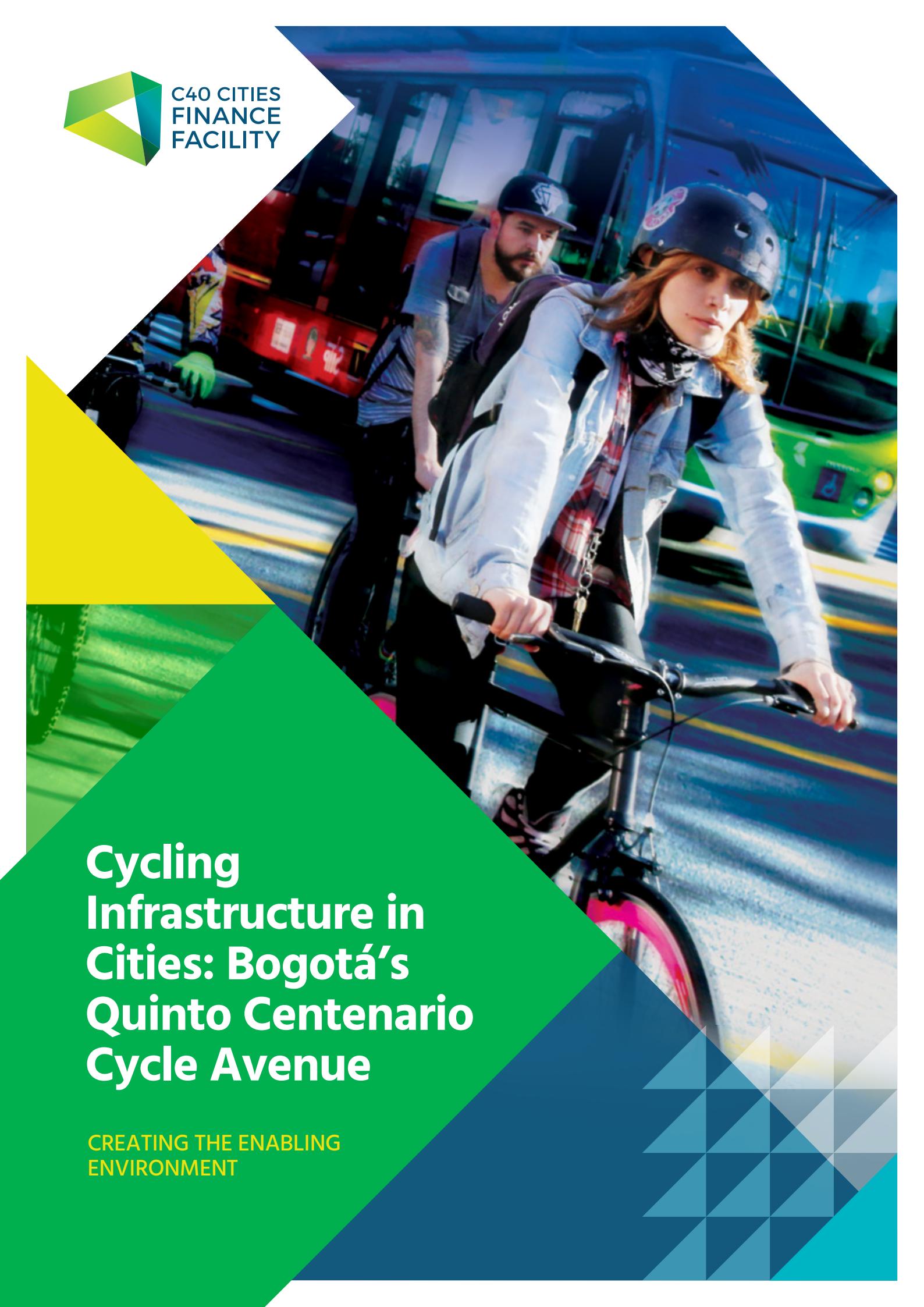




C40 CITIES
FINANCE
FACILITY



Cycling Infrastructure in Cities: Bogotá's Quinto Centenario Cycle Avenue

CREATING THE ENABLING
ENVIRONMENT

About the C40 Cities Finance Facility

The C40 Cities Finance Facility (CFF) facilitates access to finance for climate change mitigation and resilience projects in urban areas by providing technical assistance to develop cities' sustainability priorities into bankable investment proposals.

The CFF aims to deliver project preparation and capacity development, and to widely share knowledge and establish partnerships between cities and financiers. Funded by the German Federal Ministry for Economic Cooperation and Development, the Government of the United Kingdom and the United States Agency for International Development, the initiative is implemented by Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH together with the C40 Cities Climate Leadership Group. Bogotá, Mexico City and Durban are the first cities to receive technical assistance.

Disclaimer: This report is based on project documents, including update reports, presentations, and technical studies, for the Quinto Centenario project.

Please cite this publication as either:

- Moro, Aris, Andrew Eil, and Prajwal Baral (2018). "Cycling Infrastructure in Cities: Bogotá's Quinto Centenario Cycle Avenue – Creating the Enabling Environment".
- C40 Cities Finance Facility (2018). "Cycling Infrastructure in Cities: Bogotá's Quinto Centenario Cycle Avenue – Creating the Enabling Environment".





Contents

Executive Summary	6
1. Introduction	8
1.1 Planning Cycling Infrastructure	8
1.2 Financing Cycling Infrastructure	9
1.3 Benefits of Cycling Infrastructure	9
2. Bogotá, Colombia: A City (Re)Dedicating Itself to Cycling Infrastructure	10
2.1 The CicloRutas	10
2.2 Plan Bici	12
2.3 Key Characteristics of Cycling in Bogotá	13
3. Quinto Centenario (5C) – Preparing and Implementing Bogotá’s first ‘Cycling Avenue’	14
3.1 Governance	16
3.2 Investment	17
3.3 Stakeholder Engagement	19
3.4 Political Leadership	20
3.5 Workplan Development	21
3.6 Remaining Challenges	22
4. Lessons Learned	20
5. Conclusion	21
Bibliography	22
Acknowledgements	23

Executive Summary

Cities are key to addressing climate change. To mitigate and adapt to it, however, large investments in sustainable infrastructure are required in sectors such as transport, energy, buildings and waste. Trillions in infrastructure spending worldwide are needed to meet demand, and, to deliver these investments, cities face the universal challenge of accessing finance, be it public or private, local, national or international.

New initiatives such as the C40 Cities Finance Facility (CFF) are bridging the gap between cities and finance. The CFF facilitates access to finance for climate change mitigation and resilience projects in urban areas by providing technical assistance to develop cities' sustainability priorities into bankable investment proposals. Bogotá is one of the cities receiving technical assistance during the CFF's first phase. The CFF's goal is to support a cycling transformation in Bogotá through the development of new, high-quality cycling infrastructure. The city is building on its past efforts and is undertaking an ambitious plan to build new infrastructure. The Quinto Centenario project, a planned, safe and fast cycling avenue, symbolises how Bogotá's cycling infrastructure will look in the near future.

The CFF's assistance has so far helped Bogotá in developing a governance system, scoping the mobilisation of potential financing sources, engaging key local stakeholders such as cycling groups and businesses, and creating a detailed workplan for the Quinto Centenario project. Mayoral leadership and support from the national government have proven crucial in ensuring continued focus. The city still faces a number of important challenges in implementing the Quinto Centenario project, such as inadequate security, competition for road space, limited resources, and may yet face resistance from negatively impacted stakeholders.

What Bogotá has done, however, even at this early stage, has already yielded many lessons for other cities wishing to create an appropriate enabling environment for the development of cycling infrastructure:

- Citizens' ownership and a supportive culture for cycling are essential to the success of cycling infrastructure projects, and to ensuring their legacy across different city administrations.
- To be successful, projects of this importance should be included in and supported by broader urban development and mobility strategies.
- Support by high-level local government officials, particularly the mayor or mayors of involved cities, is key to the success of ambitious infrastructure projects such as the Quinto Centenario project.
- The creation and updating of an overarching document that outlines the project's progress is a crucial project management tool.
- Cities interested in replicating projects such as the Quinto Centenario ought to carefully consider the objectives of any new institutional framework before implementing one.

Bogotá, through the Quinto Centenario project, is consolidating its role as a leader on cycling and sustainable mobility in Latin America and in the world. Upcoming reports on the project's prefeasibility and feasibility stages and on its financing strategy will provide a complete picture of how Bogotá has worked to implement the Quinto Centenario project throughout the project development phase.



1. Introduction

Since the middle of the twentieth century, the world's rapid urban growth has ushered in a dramatic rise in the use of private cars. Policies have tended to accommodate rather than limit this growth, resulting in urban sprawl and ever-increasing demand for private, motorised travel. However, car-centric urban transport has many negative social and environmental consequences, including air and noise pollution, traffic accidents, high levels of traffic congestion – leading to lost time and productivity – high greenhouse gas emissions, and increased social inequality. These challenges are repeating themselves in developing country cities, which is where approximately 90 per cent of global population growth is expected to occur in the coming decades (UN DESA, 2014).

These risks have been highlighted for decades, and so have corresponding solutions. The issue has, however, seen renewed interest in recent years. The New Climate Economy (2014) urges urban planners and designers to shift to compact, connected and coordinated urban development, including integrated transport systems to connect mixed-use, employment, housing and commercial clusters. The international community has also introduced the concept of sustainable urban mobility as a key development objective in Sustainable Development Goal 11 (UN, 2015; see Box 1). The New Urban Agenda and the Brasilia Declaration on Road Safety have recently articulated this vision of transportation in cities, with the latter calling for 'rethink[ing] transport policies in order to favour more sustainable modes of transport' (WHO, 2015).

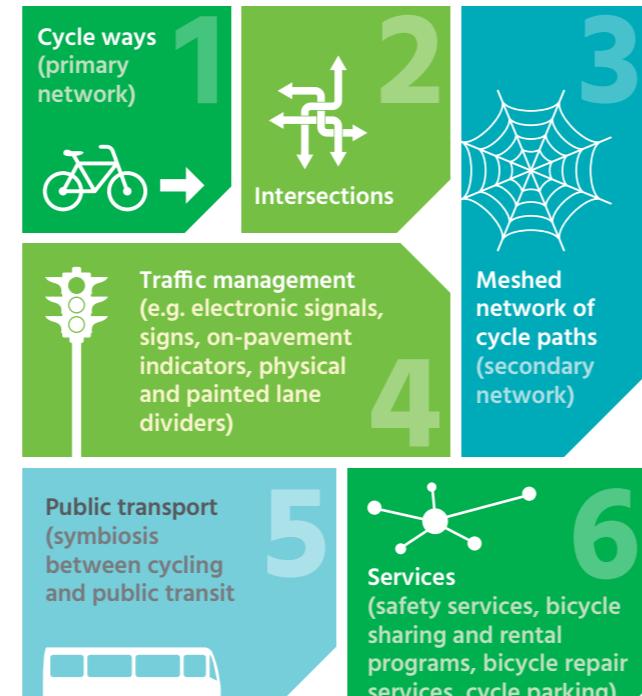
BOX 1
Sustainable Development Goal (SDG) 11: "Make cities inclusive, safe, resilient and sustainable." One of the targets associated with SDG 11 relates to transport: "By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons." UN, 2015.

Increasing the sustainability of transport in cities requires both old and new approaches. Walking and cycling have long been the cornerstone of urban mobility, but, after decades of neglect, they are slowly making a comeback as viable transportation options. Cycling is the focus of this report.

1.1 Planning Cycling Infrastructure

There are a number of approaches to planning and developing cycling infrastructure. One approach is the 'network/segregation approach' that aims for cycling to develop 'separate, dedicated infrastructure, with its own technical design norms. The basic assumption is that cycling and road traffic are incompatible, so separate networks are needed for safety and to serve the needs of both.' The 'holistic/mixing approach' attempts to reclaim for cycling the entire network of existing streets and roads. This approach recognises the need to adapt existing urban environments into 'high-quality urban public space, shared by all and open to various social uses' (PRESTO, 2010). A hybrid approach may employ mixed approaches and 'invisible' cycling infrastructure (e.g. traffic calming, traffic reduction, junction treatments and speed management) (PRESTO, 2011; PRESTO 2010).

Any cycling infrastructure, whether segregated cycling paths or integrated on existing roads, has six main components and numerous sub-components (GIZ, 2011)



GIZ, 2011
FIGURE 1

1.2 Financing Cycling Infrastructure

Cycling is one of the most sustainable and cost-effective means to improving transport. Unlike roads or public transit systems that require extensive and expensive construction projects, cycling infrastructure need not be large-scale to succeed in improving mobility within the city and in reducing travel times. Cycling infrastructure entails lower capital and operating costs, and often has the smallest construction footprint among all transport modes (UN HABITAT, 2013). Cycling infrastructure also has low costs for users: only energy is required – bicycle rental and parking fees, if needed, are usually low-cost – and bicycles are usually inexpensive (*ibid*).

Despite its relatively low costs, cycling infrastructure is sorely lacking in many urban areas. This is primarily because urban planning and transportation policy has actively promoted private motorised vehicles at the expense of sustainable modes of transport such as cycling (*ibid*). Additionally, developing a financially sustainable business model to cover capital and operating costs and deliver cycling infrastructure is not straightforward.

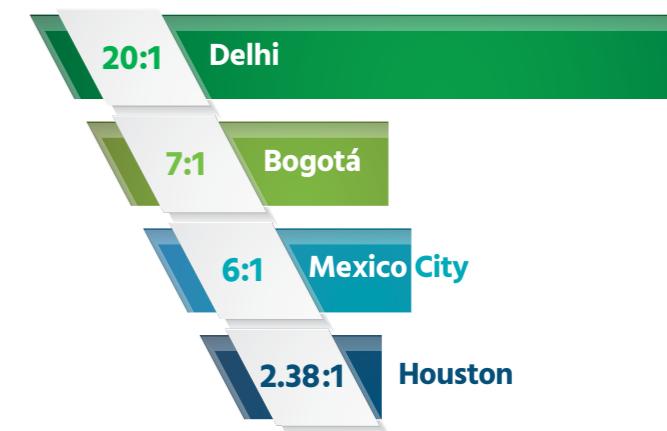
With respect to capital costs, the lack of viable financing options has proved to be an obstacle. Financing for cycling infrastructure is usually limited to government funds (*ibid*), with cycling often being completely ignored or allocated an insufficient budget. Financing through debt markets or public-private partnerships to raise capital for up-front infrastructure investments is often essential, but has proved elusive: cycling infrastructure does not generate revenue through fares or tolls, hence private investors and international lending agencies are often unwilling to provide project-based financing due to fears of missed repayment.

To cover operating costs, cities may draw from revenues from advertising and corporate sponsorships (e.g. Barclays Bank formerly and now Santander Bank for London's bike-sharing system). However, this is often limited and is still not sufficient to cover operating costs – as is the case for most public transport infrastructure. A public subsidy is often required.

1.3 Benefits of Cycling Infrastructure

Although the financial costs of cycling infrastructure may be hard to recoup, the social and economic benefits of cycling are enormous. In Amsterdam, for every dollar invested in improving cycling infrastructure, the city enjoyed USD \$1.50 in benefits (UN HABITAT, 2013). Similar calculations for Delhi, Bogotá, Mexico City and Houston estimated the ratio of benefits to costs to be 20:1, 7:1, 6:1, and 2.38:1, respectively (C40 Cities, 2016; C40 Cities, 2017). In Mexico City and Houston, these benefits were found to be diverse and sometimes surprising: they include reduced traffic and air pollution, improved public health outcomes due to exercise and better air quality, increased commercial activity and jobs, lower crime, lower urban temperatures, lower greenhouse gas emissions, and more affordable urban mobility (C40 Cities, 2016; C40 Cities, 2017).

Ratio of benefits to costs



UN HABITAT, 2013; C40, 2016; C40, 2017
FIGURE 2

2. Bogotá, Colombia: A City (Re)Dedicating Itself to Cycling Infrastructure

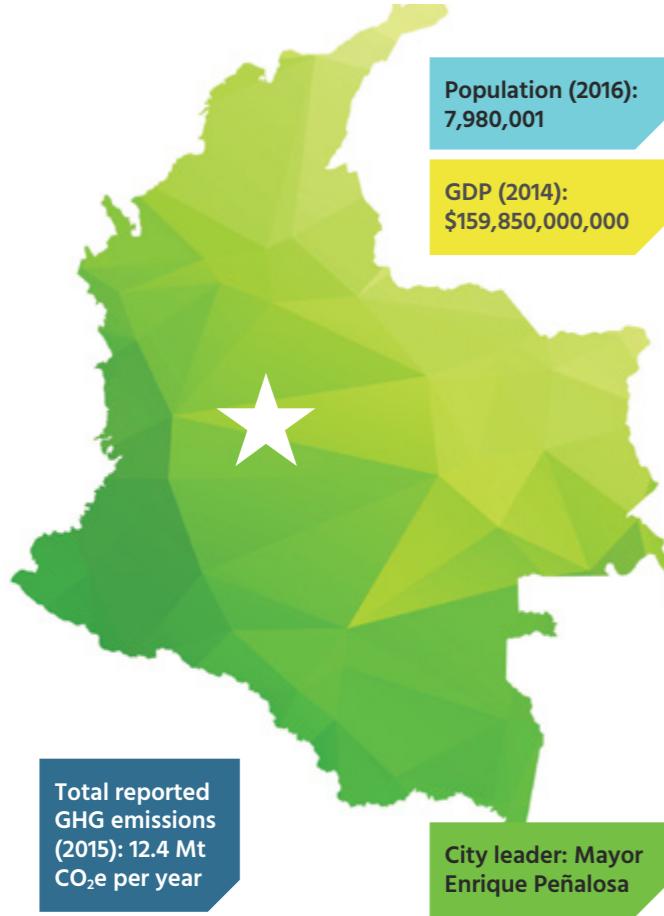


FIGURE 3

2.1 The CicloRutas

Building on the popularity of the Ciclovía, since the early 1990s, and particularly during Enrique Peñalosa's first term as mayor (1998-2001), Bogotá invested heavily in cycling infrastructure, building a world-class network of cycle lanes, known as 'CicloRutas'. During the construction and implementation of the TransMilenio, Bogotá's iconic Bus Rapid Transit (BRT) system, cycle lanes were built alongside the trunk lines, as well as through various city districts, providing a broad socioeconomic cross-section of the population access to many destinations in the city. The US\$180 million that the city spent on bikeways from 1990 to 2002 was about half the amount the entire United States

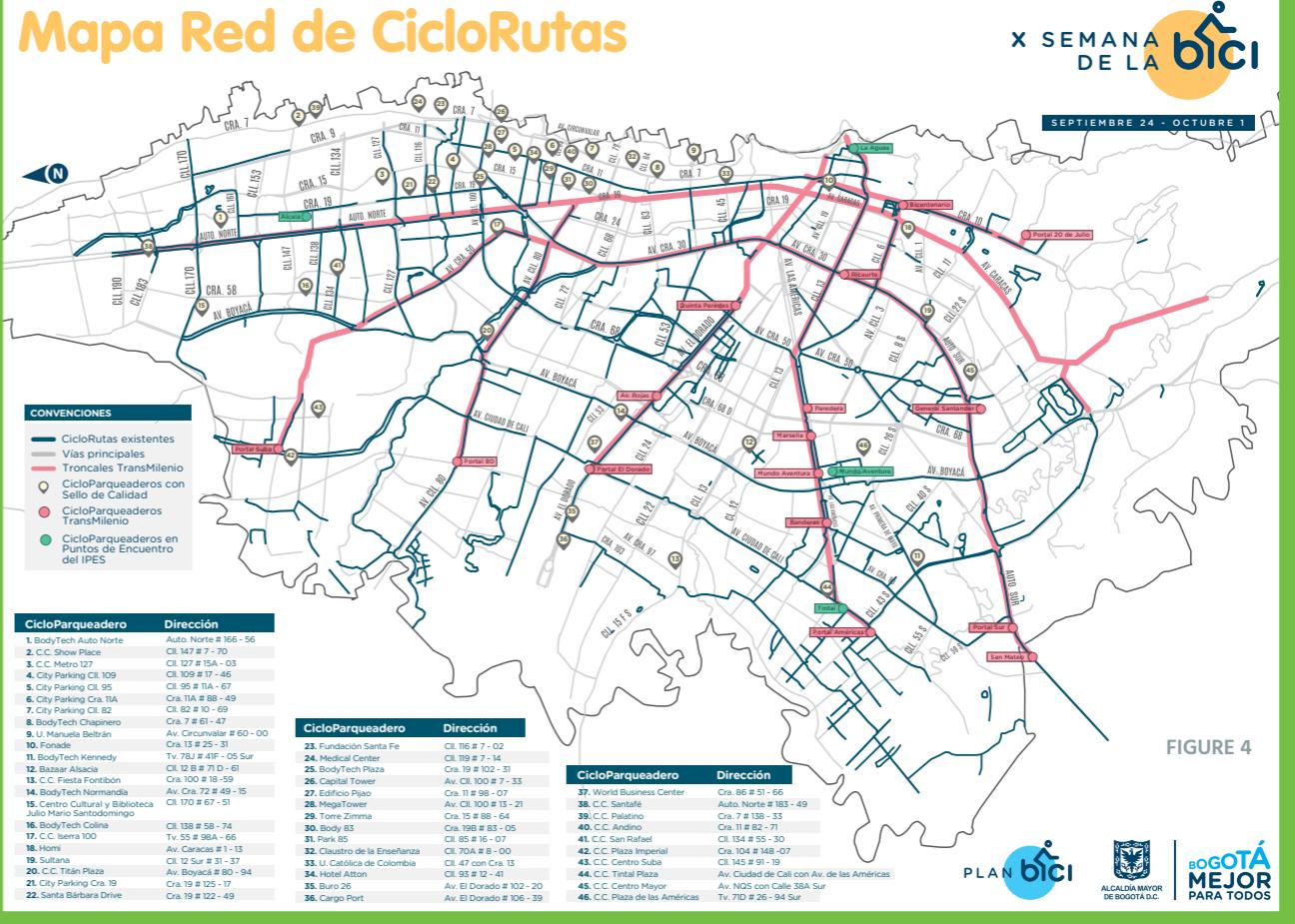
Cycling has long been rooted in Colombian culture. In cities, this tradition was largely lost as the country underwent a process of urbanisation in the twentieth century. In urban areas, cycling has been, until very recently – and in many circles remains – regarded primarily as a sport or as an activity for children, and not as a mode of transport. There is also a widespread belief that cycling is only for those who cannot afford a motorcycle or a car instead. These views are starting to change as Colombian cities such as Bogotá, Medellín, Cali, Montería, Pasto, Manizales, among others, have begun to embrace cycling and to provide cycling infrastructure (Pattiasina & Pinzón, 2015).

Following a campaign by activists, in 1974 Bogotá organised its first 'Ciclovía' (Hidalgo, 2014). The Ciclovía, now a popular cycling event taking place from 7 a.m. until 2 p.m. every Sunday and on holidays, involves the closure to vehicles of 120 kilometers of main roads to allow people to cycle, run or walk without traffic; as many as 1.5 million cyclists and others take advantage of it every week (Cervero et al., 2009). Bogotá's initiatives to close roads to vehicular traffic have been replicated in several other cities across the world; cities across Colombia have put in place Ciclovías, as have others in Latin America, such as Santiago, Quito, and Mexico City, and even cities in the United States and India (Hidalgo, 2014).

Bogotá also schedules the Día sin Carro every year, a car-free day which began in 2001; in 2015, the city's 15th annual car-free day, Bogotá also kept the streets motorcycle-free for the first time (Rogala, 2015), and in 2017, 1.8 million bicycle trips were registered.

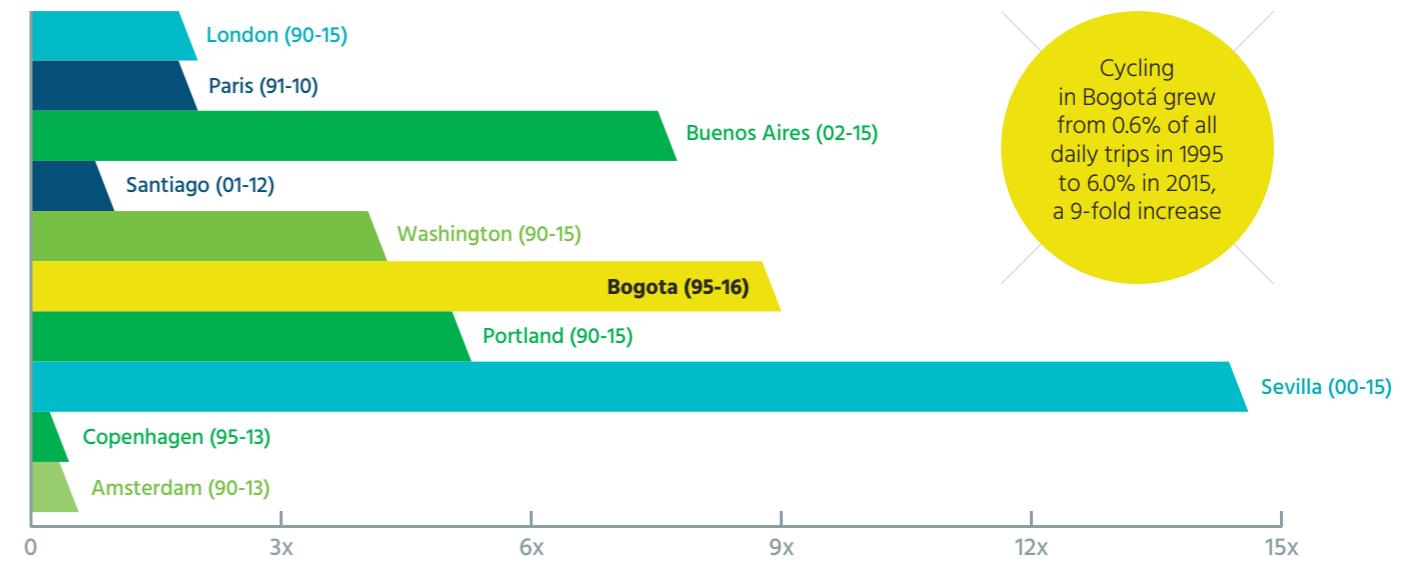
spent annually on cycling infrastructure in that era (Hook, 2004, in Cervero et al., 2009).

The rapid construction of over 400 km of protected cycle tracks in the 1990s led to a cycling boom in the city. Since the construction of the CicloRutas, the share of daily trips by bike has quintupled from under 1 percent in 1995 to an estimated 5 to 6 percent of all trips as of 2016. This figure has continued to increase throughout, even despite a lag in construction of new cycling routes and infrastructure since 2001: from 2005 to 2011, the cycling trips rose 57%, and from 2011 to 2015, there was an increase of 30% of bicycle trips (Buis and Guzmán, 2017). Bogotá boasts one of the world's largest and most rapid increases in cycling as a share of all urban trips.



Today, the CicloRutas in Bogotá cover 476 km and connect citizens to major BRT routes, parks, and community centres (Uniman, Duarte and Cruz, 2017; see figure 1). The design of the CicloRutas took into consideration the topography of the

city – both artificial and natural features, including services, amenities, hills and waterways – to create the best possible flow and function (C40 Cities, 2011).



Increase in cycling mode share in Europe and the Americas, ca 1990-2015.
Edited from Pucher & Buehler (2017).

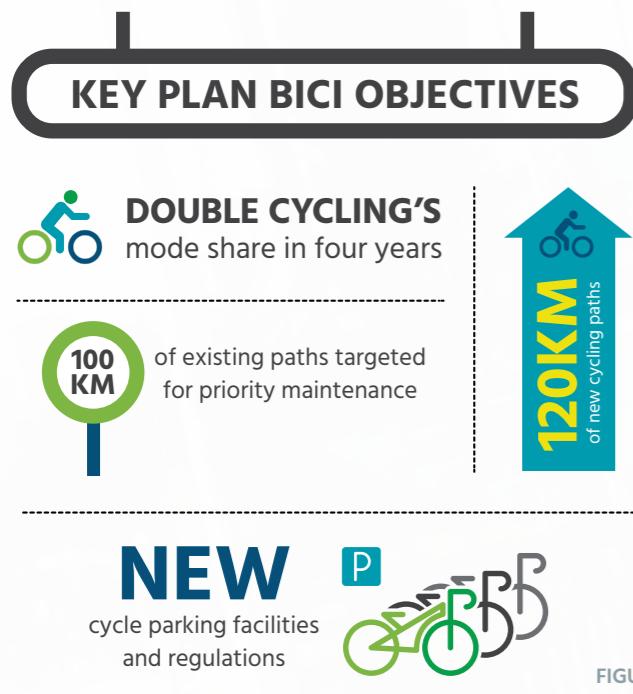
FIGURE 4

FIGURE 5

Cycling in Bogotá grew from 0.6% of all daily trips in 1995 to 6.0% in 2015, a 9-fold increase

2.2 Plan Bici

Re-elected for a second term in 2015, Mayor Peñalosa has committed to invest in cycling and public transport infrastructure to make it the best in the developing world. His administration has set a long-term target to double the CicloRutas network in extent over the next twenty years. The goal, echoing a similar commitment made in Mayor Peñalosa's first administration (Peñalosa, 2002), is to promote cycling over motorised travel in newly built neighbourhoods and to ingrain a 'bicycle consciousness' in the minds of younger citizens (Bogotá D.C., Plan Bici, 2016). The administration has a grand vision to be achieved by 2038 (the 500th anniversary of the city's founding) of making Bogotá the 'cycling capital of the world' (*ibid*), and having bicycle routes within 500 meters of every household in the city (*ibid*).

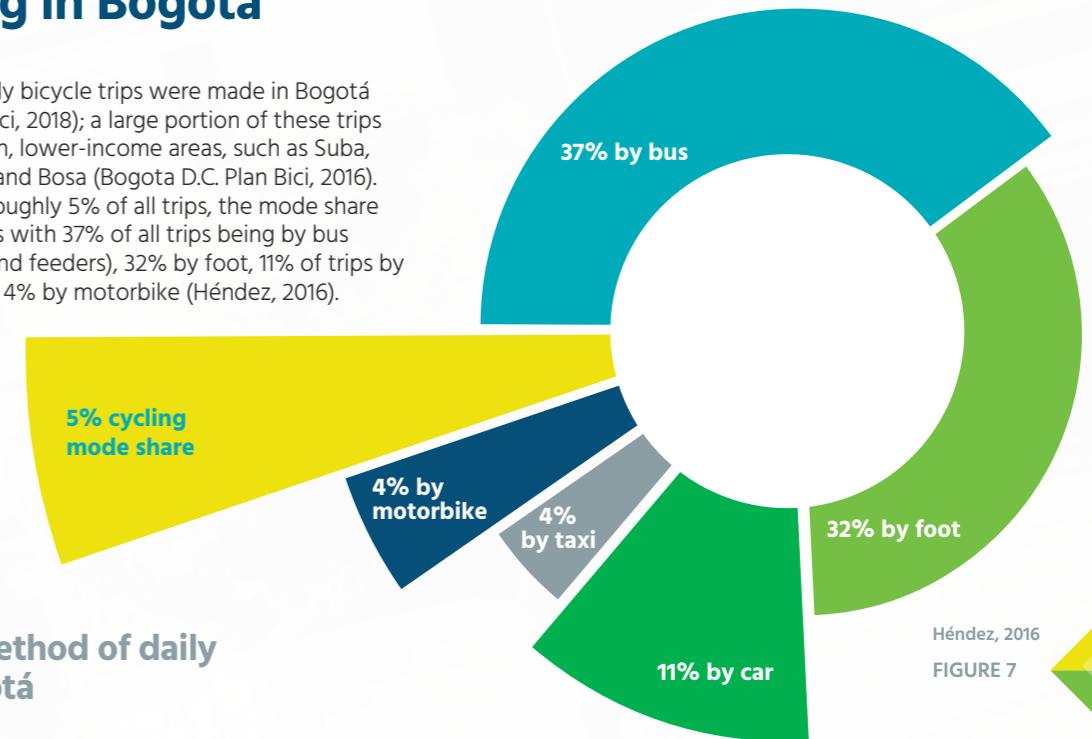


The city has a four-year plan, from 2016 to 2020, to promote cycling, known as Plan Bici. Its main objective is to double the mode share of cycling to 10% of all trips by 2020. To achieve this, the Secretaría Distrital de Movilidad (SDM; Department of Mobility) seeks to build at least an additional 120 km of new cycling paths, of which 80 km have been designated as high-priority. An additional 100 km of existing paths are targeted for priority maintenance (SDM, 2016).



2.3 Key Characteristics of Cycling in Bogotá

In 2015, 635,000 daily bicycle trips were made in Bogotá (Bogota D.C. Plan Bici, 2018); a large portion of these trips are made in western, lower-income areas, such as Suba, Engativá, Kennedy and Bosa (Bogota D.C. Plan Bici, 2016). Corresponding to roughly 5% of all trips, the mode share of cycling compares with 37% of all trips being by bus (Transmilenio BRT and feeders), 32% by foot, 11% of trips by car, 4% by taxi, and 4% by motorbike (Héndez, 2016).



One in ten people in Bogotá cycle every day (Uniman, Duarte and Cruz, 2017). According to surveys, most bicycle trips are for commuting: 70% for work and 20% for studying (Uniman, Duarte and Cruz, 2017). Health and leisure are also major drivers of cycling use, particularly among middle- and higher-income residents (Alonso, 2017). Bogotá's dense, flat and mixed-use neighbourhoods are ideal for cycling. Three-quarters of daily trips in the city are less than 10 kilometers in length, a distance that bicycles can often cover faster than cars given the city's congested streets.

BOX 2

Although Bogotá has collected some data about why and where its residents cycle, the city is attempting to formalise how it gathers information about the origin and destination of all cycling trips. Currently, it is working to map journeys more accurately through data collected by mobile apps, and is building relationships with other cities that have undergone the process, such as London. The latter, through the Strategic Cycling Analysis (Transport for London, 2017), calculated future urban development across the city to identify where the greatest number of cycling trips would take place, identifying 25 corridors where to prioritise interventions. A similar analysis in Bogotá could help city officials plan and design high quality cycling infrastructure to cater to present and future demand.

Cycling is also popular as a feeder mode of transport for the TransMilenio BRT. CicloRutas already connect some neighbourhoods to BRT stations, but the lack of safe, segregated cycling routes and cycle parking facilities throughout the city remains a significant obstacle to intermodal cycling-BRT commuting. A survey of TransMilenio riders found that 52% would be willing to make the trip to the stations by bicycle if the appropriate infrastructure were present: cycling is quicker than walking and more reliable than the 'alimentadores', the BRT feeder buses (Moreno and Miralles-Guasch, 2017).

There has been significant progress in providing cycle parking facilities in recent years. However, Bogotá remains behind in providing sufficient parking to enable the intermodal integration of cycling, and a multi-pronged strategy is in place to bridge this gap. The city is planning to increase the amount of parking available – mostly through U-shaped cycle racks on streets. SDM is working on new pro-bike parking regulations and carried out an extensive survey of cyclists to determine parking demand. It has also established a certification programme for existing spaces (which awards gold and silver certificates depending on the facility's quality) to promote high-quality parking. The programme has, as of early 2018, certified 62 locations with more than 6,000 parking spaces. Additional on-street bike parking installations, and further pro-parking regulations are planned.

3. Quinto Centenario (5C) – Preparing and Implementing Bogotá’s first ‘Cycling Avenue’

Bogotá applied for support from the C40 Cities Finance Facility (CFF) in early 2016 to implement its ambitious cycling infrastructure plans. Following a thorough due diligence process, the CFF committed to support the development of the Quinto Centenario (5C; ‘500th anniversary’) project. The 5C is a first-of-its-kind 25-km ‘cycle avenue’ crossing the city from north to south and connecting citizens from low, middle and high-income neighbourhoods with jobs, schools and recreational opportunities. The project will directly reduce greenhouse gas emissions and, by promoting a shift to sustainable mobility, will help to establish cycling as a low-carbon transportation option in Bogotá. Moreover, through the CFF’s emphasis on creating replicable, sustainable financing models, the 5C will be a model for other cities of how to finance cycling infrastructure. Technical assistance is delivered in partnership with the Inter-American Development Bank and the World Resources Institute.

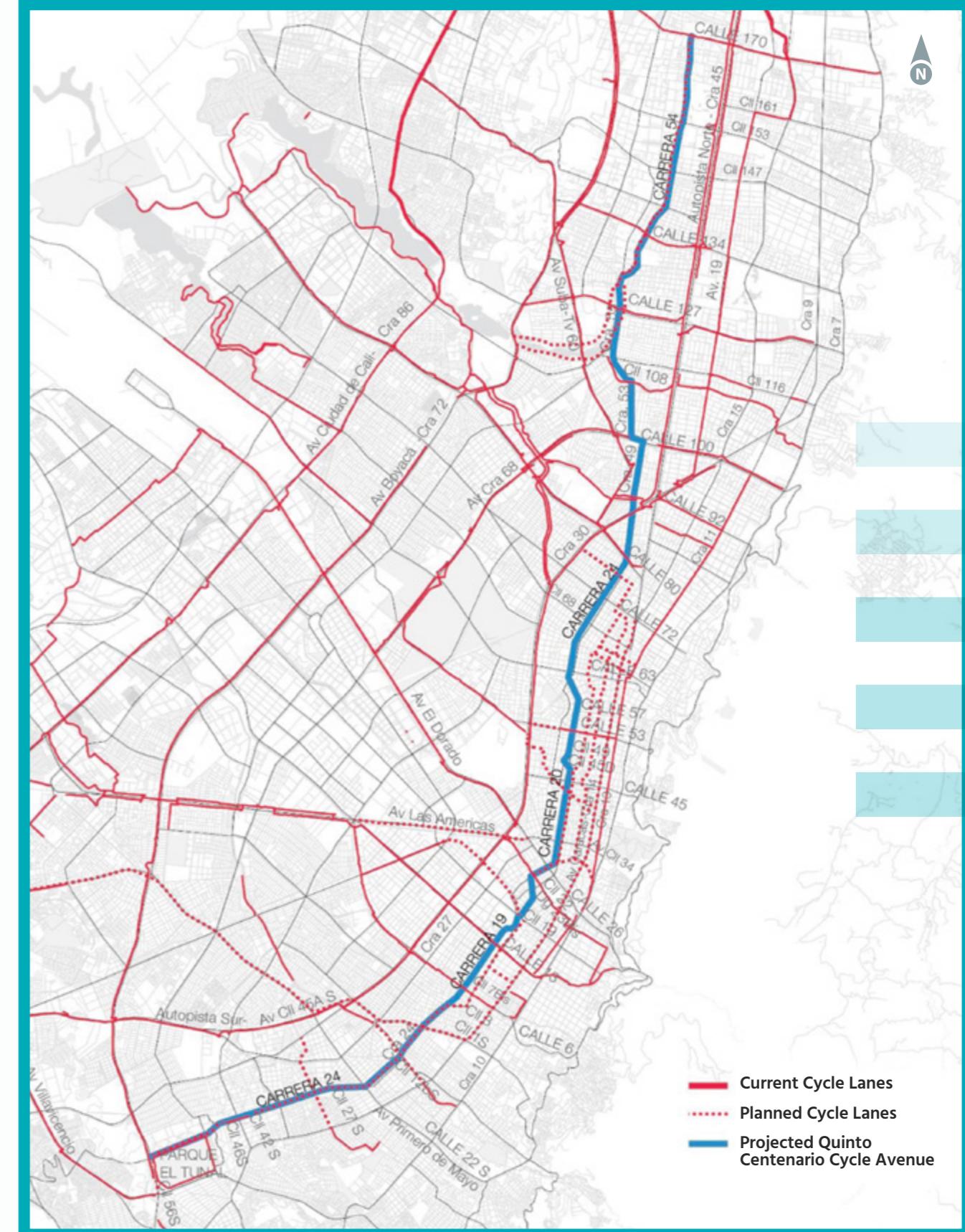
The 5C cycle avenue is a key component of Plan Bici: when completed, it will constitute a central cycling artery connecting separate sections of the existing network of CicloRutas, joining the city’s northern and southern neighbourhoods, its central business district with residential areas, and Bogotá’s historical downtown with commercial and recreational areas in the south (Buis and Guzman, 2017). The 5C will symbolise the city’s vision on sustainable mobility in the run-up to its 500th anniversary. It also aims to change the way the city plans, designs, and implements cycling infrastructure, creating a new standard of sustainability and safety in Bogotá. Through the CFF, Bogotá is receiving dedicated technical assistance from urban infrastructure experts.

The proposed 5C cycle avenue runs 25 kilometers in length. The first dedicated, fast cycling corridor in Latin America, 5C will pass through seven urban districts or localidades (Suba, Barrios Unidos, Teusaquillo, Los Mártires, Antonio Nariño, Rafael Uribe, Tunjuelito), running from El Tunal Park in the south to 170th Street in north. The 5C project builds on Bogotá’s existing but inconsistent mix of cycling infrastructure, and is designated as a ‘cycling avenue’. Based on a preliminary forecast of 34,000 users per day, it is projected to save at least 67,000 tons of CO₂e between 2018 and 2030, while also improving air quality along the route.

The 5C corridor promotes a modal shift from cars and public transport to bicycles, particularly for trips between two and ten kilometers in length (roughly 10 to 40 minutes in length), by positioning cycling above motorised transportation modes. Along the 5C route, cycling will compete with public transport and cars in terms of cost, convenience, and travel time.

The project will connect with the existing CicloRutas network in several places, knitting together presently disconnected segments, and will link to the Transmilenio BRT network at one terminus and nine other stations. It will include bicycle parking facilities, measures to enhance the security of cyclists such as adequate street lighting, and promote economic development through improvement of public spaces along the route. Flood-resilient features, such as drainage and grades, and safety enhancements such as barriers from traffic, painted lanes and street signs, and street lighting are also envisioned. The project will incorporate context-sensitive and low-impact design features: there will be different types of road cross sections along the 5C’s route according to each area’s specific context. Finally, the project is expected to spur urban renewal interventions in some of the currently neglected areas that will be crossed by the 5C route.

Related, Bogotá also hopes that the development of the 5C will provide the city with a toolkit for addressing the chronic, intractable issue of flooding, which is likely to be worsened by climate change. Cycling paths in Bogotá are often impassable in inclement weather, which can occur throughout the year. The 5C is expected to include high-quality drainage features to prevent these incidents.



Proposed Quinto Centenario cycling avenue project

FIGURE 8

3.1 Governance

The SDM oversees all of Bogotá's mobility projects. The Gerencia de la Bicicleta (Cycling Department) sits at the core of SDM, and leads the project's planning and implementation. This centralised management structure was put in place by Mayor Peñalosa: cycling lacked a defined institutional structure previously, and its management was split across the administration. The city is hoping to formalise its role beyond the end of the current administration.

Although other city departments remain involved in cycling affairs – e.g. the Institute of Urban Development (IDU) designs and manages construction of lanes, intersections and bike bridges, and the District Institute of Recreation and Sports (IDRD) promotes cycling as an element of a healthier lifestyle, and manages the Ciclovía – the Gerencia de la Bicicleta is tasked with the implementation of Plan Bici and the 5C, including (most) planning and design tasks.

The CFF is providing technical assistance for the 5C project according to the city's needs with the help of a dedicated project advisor based in SDM. The Inter-American Development Bank (IADB) and the World Resources Institute (WRI) support the delivery of technical and financial studies.

The city administration has recognised that cycling infrastructure has a cross-cutting nature, with impacts on transport, other urban infrastructure, economic development, health, and the environment. Consequently, a governance structure of cycling is also cross-sectoral in nature. Bogotá has therefore used the 5C project as an opportunity to experiment with two new governance structures.



FIGURE 10

3.2 Investment

A key challenge for the 5C, and for all cycling infrastructure, is that it does not directly generate revenue, as opposed to other forms of urban infrastructure such as public transport or water. The CFF has tailored its technical assistance to find an answer for this very challenge, and to provide a replicable model of how to source financing for cycling infrastructure for other cities to adopt.

With the CFF's support, the city is currently estimating the overall costs of the project. Similar to other cities, Bogotá is constrained by the availability of financing, borrowing limits, and competing priorities. Several initial cost estimates for the 5C have been produced, which combine different

technical options while retaining the high standards of infrastructure sought by SDM. The prefeasibility and feasibility studies will analyse these different components in detail. More sophisticated and accurate cost estimates will inform the project's financial modelling.

Bogotá is exploring different revenue models, including a hybrid model with potentially varying approaches for different segments of the 5C corridor. The use of corporate social responsibility funding, advertising, and parking fees is being explored, as is land value capture (also known as 'tax increment financing') resulting from tax revenues on appreciated property and land values along the 5C corridor. The city may need a combination of central government transfers, donor support and tax revenues to fund specific segments of the corridor. The financing options and solutions at Bogotá's disposal will be covered in an upcoming report.

3.3 Stakeholder Engagement

The SDM is responsible for communications around mobility and has a large team working on the overall communication strategy for Plan Bici and for 5C. This multi-pronged effort includes many public outreach events, including the CicloVías, the Día sin Carro, and the Semana de la Bicicleta (Bicycle Week). Now in its tenth year, the Bicycle Week is held in September and includes guided tours, lectures, exhibitions and recreational activities focused on cycling in Bogotá.

There are several stakeholder groups promoting cycling in Colombian cities, particularly in Bogotá. These organisations, including NGOs such as Despacio and Fundación Ciudad Humana, conduct social research and gather data on cycling, organise events to encourage cycling among new users, and plan Critical Mass rides – regular, unplanned group rides held to highlight the importance of cycling in cities.

The city has been drawing on these stakeholders' expertise and experience of engaging with communities and relevant interest groups. For example, SDM held a planning workshop with local stakeholders to discuss options for the 5C route. The workshop convened more than 35 cycling experts and civic advocates and served to generate key inputs and alternatives for the pre-feasibility assessment of the 5C route. The participants strongly supported the construction of a cycling corridor segregated from traffic but connected to services and amenities such as cycle parking facilities, sustainable eateries, and recreational spots. The participants also suggested improvements to some of the city's other cycling policies.

The city has also consulted businesses, particularly large companies based in the central business district who have long been supporters of initiatives to improve mobility and liveability in Bogotá. Some have already expressed interest in advertising along the 5C or to introduce electric bicycles infrastructure such as charging stations.

BOX 3

Cycling groups play a critical role in creating an enabling environment for cycling in any city. In London, the London Cycling Campaign has lobbied successive administrations to develop high quality cycling infrastructure through policy advice, local campaigning and effective demonstrations such as 'die-ins' to demonstrate the demand for safe cycle routes in the city. The relationship between cycling groups and the city need not be adversarial, and cities are well-placed to encourage demand for cycling infrastructure: Portland, Oregon, was the first city in the United States to hire a Bicycle Coordinator, who through relentless engagement with residents and community groups spearheaded a campaign for greater accessibility for cyclists. Portland now boasts 500km of cycle lanes and aims to increase the mode of share of cycling to 25% by 2030.

One key area of private sector engagement is the Centro de la Bici, a planned 12,000 m² building dedicated to cycling innovation, learning, and policy. The centre, which will be located in the south-western district of Bosa, is proposed as an example of Bicycle-Oriented Design (BOD) and will feature a technical institute offering courses and apprenticeships in bicycle manufacturing, and spaces for bicycle-related start-ups and companies to develop. An international competition was held in late 2017 to choose the architecture firm that will design the centre. In addition to engaging businesses in the job-creation and commercial aspects of the cycling centre, the city is looking for corporate sponsorship for the project.

However, the city still needs to garner the support of smaller businesses along the 5C route, especially in lower-income neighbourhoods in the south. This includes car mechanics and informal street vendors who are currently utilising the public road space to conduct their business, and who will be negatively affected by construction and by the eventual operation of the corridor, which must remain obstacle-free. Communication and outreach activities will take place throughout the project preparation phase, to avoid potential resistance and to alleviate any impacts on those affected by the project.

3.4 Political Leadership

The 5C benefits significantly from the mayor's personal buy-in and engagement. Mayor Peñalosa aims to build a city where everybody is able to cycle, especially children. The mayor's initiatives include frequent public pronouncements on the benefits of cycling and the establishment of cycling goals. His efforts ensure that cycling projects, including the 5C, remain on track.

BOX 4

Mayor Peñalosa's focus on children while advocating for more democratic roads and better, safer cycling infrastructure echoes the tactics of the Stop de Kindermoord ('stop the child murder') campaign in Amsterdam and the Netherlands in early 1970s. Fuelled by public outrage over the high number of traffic fatalities, including more than 400 children in 1971, the campaign successfully lobbied national and local governments to invest in cycling infrastructure instead of motorised transport, and led to the establishment of the Dutch Cyclists' Union (van der Zee, 2015).

The Colombian national government has also supported Bogotá and other Colombian cities to develop sustainable mobility projects, including cycling infrastructure. The Colombian Ministry of Transportation has helped create a strong enabling environment for sustainable transport infrastructure by providing financial and technical support for cycling and transit-oriented development interventions. Of specific relevance to the 5C is the Nationally Appropriate Mitigation Action (NAMA) for Active Transport and Demand Management, whose objective is to reduce greenhouse gas emissions by encouraging cycling and reducing private car use. The 5C is now a pilot project under this NAMA, and is receiving advice from the Colombian national development bank FINDETER and the GIZ program TRANSfer to set up a robust monitoring, reporting and verification system for potential climate financing.

The national government's work on TOD has been supported by another NAMA since 2013. The NAMA TOD is funded by the NAMA Facility and implemented in partnership with the Center for Clean Air Policy (CCAP), KfW and the Colombian Development bank FINDETER: it has delivered USD \$20 million in technical and financial resources to catalyse the establishment of TOD neighborhoods in five Colombian cities (Robledo, undated).

3.5 Workplan Development

A core element of the CFF's assistance is to support SDM with the development of a detailed project workplan. SDM officials worked intensively in early 2017 to draft the project workplan document, which outlined detailed goals, objectives, activities, and key steps for the 5C project over a 24-month period, from March 2017 to March 2019. The CFF is supporting the project throughout Phase 2.



Of these, Phase 1 was completed in September 2017. The second stage, or prefeasibility and feasibility studies, began in November 2017.

The workplan, although complete, is a living document and is continuously revised and updated. It underwent adjustments throughout the first half of 2017 based upon new information from procurement, planning, and design processes. The development and updating of the workplan, led by SDM with support from the CFF, has proven a challenging and time-consuming process. These efforts have required diligence, copious hours of management, and significant adjustments throughout the planning process, but have kept the project on track. The constant revision of the workplan has enabled the city to identify challenges early, when strategic or operational steps can be taken to address them, rather than deep into implementation when course corrections are often difficult and costly.

3.6 Remaining Challenges

Despite the efforts outlined above to ensure the project moves forward at the required pace, the 5C still faces several challenges. These include competition with private and public transport for limited road space, limited safety and security risks, and encroachment by small businesses upon public space. With respect to the latter challenge, the city will work to secure the support of local residents, business, drivers and pedestrians who may face disruptions and negative impacts from road closures and construction works.

BOX 5

When talking about urban transport, the issues of safety and security should be treated as separate and are not to be confused (World Bank, 2002). Safety is related to the vulnerability to accidental injury, generally involving a collision between one or more vehicles in which the vehicle itself causes the injury. Security is related to the 'vulnerability to intentional criminal or antisocial acts suffered by those engaged in trip making' (ibid.: 65), and includes thefts, harassment, and personal injury.

An issue that the 5C must address is the perceived and real lack of security of cyclists in Bogotá. Cities planning cycling infrastructure generally only focus on safety, but cyclists are not only vulnerable to other vehicles: they are also at risk of muggings, thefts and personal harm, as they are often seen as an easy target. Security issues are present in many other cities in developing countries, but Bogotá is unique among established cycling cities around the world to face this issue severely. Many residents, particularly women and those who can afford public and private transportation, cite security concerns as one of the reasons for why they do not cycle. The city has responded with enhanced policing and improved lighting along cycling routes, and is studying international best practices in search of effective solutions. More broadly, Bogotá is working on comprehensive programmes to improve security, not just around cycling.

The safety of cyclists also remains a serious issue. In 2016, more than 60 cyclists died in road accidents in Bogotá (SDM, 2018). However, in recent years, Bogotá has prioritised the road safety of the most vulnerable road users, reducing fatalities by 17% in 2017 (*ibid.*)

Finally, the durability of political support for cycling infrastructure beyond the end of Mayor Peñalosa's term remains an unknown. The hope is that the creation of high-quality infrastructure and the continued increase of cycling in Bogotá will encourage the development of further projects. The strength of support for cycling in Bogotá suggests that ensuring citizens' ownership of cycling infrastructure will facilitate the development of this and further projects.

4. Lessons Learned

With respect to creating an appropriate enabling environment for cycling infrastructure, lessons can already be drawn on what has worked for the 5C project and what has not:

- Cycling has long been rooted in Colombian culture, and Bogotá's initiatives such as Ciclovía and its car-free day have been replicated across the world. The city is attempting to tap into this popular support and translate it into participation and ownership in the 5C project, through communications, events, and various forms of stakeholder engagement. Citizens' ownership of a cycling infrastructure project and a supportive culture for cycling are integral to the success of such projects, and to ensuring their legacy across different city administrations.
- The 5C is a key element of Plan Bici, and Plan Bici has been crucial in ensuring the continued progress of 5C. Without this city-wide strategy as a backdrop, the 5C project would have been unlikely to see the light. Cycling infrastructure projects of this magnitude should be included in and supported by broader urban development and mobility strategies.
- Mayor Peñalosa's personal commitment has ensured the continued development of cycling infrastructure in Bogotá. This support is expressed through his public statements on the benefits of cycling and his vision for the city. Support of local high-level political leaders is key to the success of ambitious infrastructure projects such as the 5C.

• The development and continuous updating of the project workplan has proven a challenging and time-consuming task. However, these efforts have ensured that the city was able to identify potential issues at an early stage, and that strategic or operational actions could be taken to address them. The creation and continual maintenance of an overarching document outlining a project's progress is a crucial project management tool.

• Bogotá spent considerable time establishing a complex institutional structure to manage all cycling activities, and the 5C in particular. The centralisation of decision-making around cycling within SDM has proven extremely useful, as has the cross-departmental nature of the steering committee on cycling. The 5C's Project Implementation Unit, however, has gone through a number of revisions, and the city hopes that its new focus on strategic issues will increase its effectiveness going forward. Cities interested in replicating projects such as the 5C ought to carefully consider the objectives of each institutional framework before implementing one.

5. Conclusion

The Quinto Centenario cycle avenue is an ambitious infrastructure project by any standard. The 25 kilometre-long cycle avenue is envisioned to drive the city's global leadership on cycling: Bogotá aims to become the cycling capital of the world in the next few decades.

To realise this ambition, the city has committed political, human and financial capital to Plan Bici, a broad and farsighted plan for making cycling a fast, convenient and safe mode of transport. The Quinto Centenario project serves as a key element of Bogotá's Plan Bici, while building on a successful history of cycling and extensive cycling infrastructure. The CFF's assistance has helped Bogotá develop a governance system for the project and scope potential financing options; it has supported the engagement of key local stakeholders such as cycling groups; it has ensured continued political buy-in; and it has aided the creation of an exhaustive project workplan.

The Quinto Centenario project aims to do for cycling infrastructure what the Transmilenio did for Bus Rapid Transit systems around the world in the early 2000s. In the same way that Bogotá once showed the world how to design and build a low-cost, simple, and efficient form of mass transit, the city now aims to provide a sustainable, replicable, and scalable model for how other cities can plan and finance high-quality cycling infrastructure.

The city is now ready for the next two crucial steps towards making the Quinto Centenario cycle avenue a reality: the prefeasibility and feasibility studies, and the design and financing of the project. The next briefs in this series will explore Bogotá's work in these areas.

Bibliography

Alonso, J., 2017. "Conferencia Internacional de la Bicicleta: más que dos pedales." September 22, 2017. Accessed February 15, 2018, from: <http://amp.dw.com/es/conferencia-internacional-de-la-bicicleta-m%C3%A1s-que-dos-pedales/a-40649721>.

Pattiasina, N. and Pinzón, C., 2015. "Cycling in Colombia Report of a fact finding mission by the Dutch Cycling Embassy."

Dutch Cycling Embassy. Accessed February 15, 2018, from: <https://www.rvo.nl/sites/default/files/2015/07/Cycling%20in%20Colombia.pdf>.

Bogotá D.C., Alcaldía Mayor de, 2016. "Plan Bici: La bicicleta en Bogotá." Accessed February 15, 2018, from: <http://www.simur.gov.co/documents/10180/100374/Plan+Bici/cc9f22a4-4375-4f22-8aaf-c3229d31f3d6>.

Bogotá D.C., Alcaldía Mayor de, 2018. "Plan Bici: Preguntas frecuentes." Accessed February 15, 2018, from: <http://www.planbici.gov.co/preguntas-frecuentes/>

Buis, J., and Guzmán, M., 2017. "Ciclo-Alameda Quinto Centenario: Resumen Ejecutivo Fase Idea." Unpublished internal document.

Cervero, R., Jacoby, E., Gomez, L.F., Neiman, A. and Sarmiento, O.L., 2009. "Influences of Built Environments on Walking and Cycling: Lessons from Bogotá." International Journal of Sustainable Transportation, 3(4), pp. 203-226.

C40 Cities Climate Leadership Group (C40 Cities), 2011. "Bogotá's CicloRuta is One of the Most Comprehensive Cycling Systems in the World." Accessed February 15, 2018, from: http://www.c40.org/case_studies/bogot%C3%A1%20is-one-of-the-most-comprehensive-cycling-systems-in-the-world.

C40 Cities, 2016. "Benefits of Climate Action: Piloting a Global Approach to Measurement." Accessed February 15, 2018, from: <http://www.c40.org/researches/measuring-benefits>.

C40 Cities, 2017. "Benefits of Climate Action: Houston: Benefits of the White Oak Bayou Greenway." Accessed February 15, 2018, from: <https://drive.google.com/file/d/0B1VfkGgXc6qOOEFkN3VoQ3Bzamc/view>.

Despacio, 2017. "Taller Identificación de imagen y alternativas de trazado 5C." Unpublished internal document. April 17, 2017.

GIZ, 2011. "Muenster, Germany: An Example of Promoting Cycling in Cities – Components of a High Quality Bicycle Infrastructure." A Short Survey. Case Studies in Sustainable Urban Transport #2. Accessed March 7, 2018, from: http://sutp.org/files/contents/documents/resources/C_Case-Studies/GIZ_SUTP_CS_An-Example-of-Promoting-Cycling-in-Cities_EN.pdf

GOPA Infra, 2017. "Plan de trabajo: Avenida para bicicletas V Centenario." March 2017. Unpublished internal document.

Héndez P.A.P., 2016. "Desarrollo orientado al transporte sostenible en Bogotá: La influencia de la localización de los usos del suelo en los patrones de movilidad como estrategia de adaptación al cambio climático." Accessed February 15, 2018, from: https://upcommons.upc.edu/bitstream/handle/2117/101380/123BCN_HENDEZPEDRO.pdf?sequence=1&isAllowed=y.

Hidalgo, D., 2014. "How ciclovias contribute to mobility and quality of life in Latin America and in cities worldwide." October 22, 2014. The City Fix, World Resources Institute. Accessed February 15, 2018, from: <http://thecityfix.com/blog/ciclovias-mobility-quality-life-latin-america-cities-worldwide-dario-hidalgo/>.

Hook, W., 2004. "Automobile Dependency and the Global Cultural War: Lessons from Bogotá." Sustainable Transport, 16, pp. 1-3.

Moreno, C. & Miralles-Guasch, C., 2017. "The Bicycle As A Real Feeder To The Transmilenio System In Bogota And Soacha." International Journal of Transport Development and Integration, 1(1), pp. 92-102.

New Climate Economy, 2014. "Better Growth, Better Climate: The New Climate Economy Report – The Global Report. The Global Commission on the Economy and Climate." Accessed March 7, 2018, from: http://newclimateeconomy.report/2014/wp-content/uploads/sites/2/2014/08/NCE-Global-Report_web.pdf

Peñalosa, E., 2002. "Urban Transport and Urban Development: A Different Model. Berkeley , CA: University of California, Center for Latin American Studies". Accessed March 7, 2018, from: <http://clasarchive.berkeley.edu/Events/spring2002/04-08-02-peñalosa/index.html>

PRESTO, 2010. "PRESTO Cycling Policy Guide." Accessed March 7, 2018, from: https://ec.europa.eu/energy/intelligent/projects/sites/iee-projects/files/projects/documents/presto_policy_guide_cycling_infrastructure_en.pdf

PRESTO, 2011. "Promoting Cycling for Everyone as a Daily Transport Mode – Lessons Learnt in Five Very Different Cities." Accessed March 7, 2018, from: http://www.rupprecht-consult.eu/uploads/tx_rupprecht/Presto_lessonslearntbrochure_EN_web.pdf

Pucher, J. and Buehler, R., 2017. "Cycling towards a more sustainable transport future." Transport Reviews, 37(6), pp. 689-694.

Robledo, J.M., undated. "Transit Oriented Development NAMA Colombia: 'We want to create greener, more liveable cities'" NAMA Facility. Accessed March 7, 2018, from: <http://stories.nama-facility.org/colombia-greener-cities/>

Rogala, A., 2015. "Friday Fun: Bogota, Colombia celebrates its 15th annual car-free day." February 6, 2015. The City Fix, World Resources Institute. Accessed March 7, 2018, from: <http://thecityfix.com/blog/friday-fun-bogota-colombia-annual-car-free-day-2015-bicycling-walking-active-transport-alex-rogala/>

Secretaría Distrital de Movilidad, 2016. "Bogotá, cycling capital of America: goal of the Bike Plan of the Peñalosa town hall." Accessed February 15, 2018, from: <http://www.transitbogota.gov.co/web/node/1631>

Secretaría Distrital de Movilidad, 2018. "Bogotá, la ciudad líder en salvar vidas por siniestros viales a nivel nacional" Accessed February 28, 2018, from: <http://movilidadbogota.gov.co/web/node/2507>

Transport for London (TfL), 2017. "Strategic Cycling Analysis – Identifying Future Cycling Demand in London." Accessed February 15, 2018, from: <http://content.tfl.gov.uk/strategic-cycling-analysis.pdf>

United Nations (UN), 2015. "Sustainable Development Goals." Accessed March 7, 2018, from: <http://www.un.org/sustainabledevelopment/sustainable-development-goals/>

UN DESA, 2014. "World Urbanization Prospects: The 2014 Revision." Accessed March 7, 2018, from: <https://esa.un.org/unpd/wup/publications/files/wup2014-highlights.pdf>

UN HABITAT, 2013. "Planning and Design for Sustainable Urban Mobility – Global Report on Human Settlements, 2013." Accessed March 7, 2018, from: <https://unhabitat.org/planning-and-design-for-sustainable-urban-mobility-global-report-on-human-settlements-2013/>

UN HABITAT, 2017. "New Urban Agenda." Habitat III. Quito, Ecuador, 17-20 October 2016.

Uniman, D.L., Duarte, M. and Cruz,J.J., 2017. "Bogotá: Cycling Capital City." Alcaldía Mayor de Bogotá and GIZ Cooperation. Unpublished internal presentation. July 2017.

Van der Zee, R., 2015. "How Amsterdam became the bicycle capital of the world." The Guardian. 5 May 2015. Accessed February 15, 2018, from: <https://www.theguardian.com/cities/2015/may/05/amsterdam-bicycle-capital-world-transport-cycling-kindermoord>

World Bank, 2002. "Cities on the move: A World Bank urban transport strategy review." Washington D.C, U.S.A.

World Health Organization (WHO), 2015. "Brasilia Declaration on Road Safety: 2nd Global High Level Conference on Road Safety: Brasilia, Brazil, 18-19 November 2015". Accessed March 7, 2018, from: http://www.who.int/violence_injury_prevention/road_traffic/Final_Brasilia_declaration_EN.pdf?ua=1

Acknowledgements

This report was written by Aris Moro, Knowledge and Partnership Manager, C40 Cities Finance Facility, and by Andrew Eil and Prajwal Baral, independent consultants. The authors are particularly grateful to Carolina Hernandez Galeano, Senior Project Advisor for Bogotá, C40 Cities Finance Facility.

Others who provided comments and suggestions include Sergio Eduardo Martinez Jaimes, Manisha Gulati, Mariola Panzuela, Oliver Walker, Sarah Schneider and Antonia Burchard-Levine.

C40 Cities Climate Leadership Group
3 Queen Victoria Street, City
London EC4N 4TQ
United Kingdom

Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH
Potsdamer Platz 10
10785 Berlin
Germany

E contact@c40cff.org
W c40cff.org

Funding partners:



Federal Ministry
for Economic Cooperation
and Development



Funded by
UK Government



USAID
FROM THE AMERICAN PEOPLE

Implementing agencies:

giz Deutsche Gesellschaft
für Internationale
Zusammenarbeit (GIZ) GmbH



Implementing Partners:

