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From Transmilenio to Cycle Networks- Lessons Learned from Bogotá's Comprehensive Urban Mobility Planning

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TUMI Transformative Urban Mobility Initiative

2022 Sustainable Transport Award

Timeline of Bogotá's Major Milestones:

1974
First Ciclovía, car-free Sunday, is launched - first for South America and one of the first in the world

2000
TransMilenio opens with innovations in BRT design, integration of bicycles and bike lanes

2005
The first ever Sustainable Transport Award is given to Bogotá

2011
Introduction of first electric buses in a pilot

2016
Launch of the Plazoletas project (rebranded to Barrios Vitales in 2020)

2017
Establishment of the Vision Zero Program

2020
Introduction of 120 km of pop up cycle lanes

2020
Signing of the Bogotá's Climate Emergency Declaration requiring creation of zero emission policy

2020
Public campaign focusing on redesign of Avenida Séptima into a green corridor

2021
Bogotá Capital District stops contracting public transport fleet vehicles that use fossil fuels

2021
Launch of the Public Policy of the Bicycle

2021
Draft of the Zero and Low Emission Mobility 2023-2040 Policy

2022
172 electric buses begin operation under a new model

2022
Launch of the Blocks of Care project

2022
Launch of the La Rolita public transport service

2022
Launch of the bikeshare system with TemBici

2022
Bogotá wins the STA for a second time

1. Background

The Colombian capital of Bogotá has long been a leader in innovation in sustainable transportation. Source: Carlos Felipe Pardo.

Bogotá, Colombia, has been a leader in sustainable mobility for decades. It won the first Sustainable Transport Award in 2005 and then again in 2022. But its efforts towards sustainable mobility began long before that. Bogotá has consistently been at the forefront of sustainable and equitable innovation that continues up to today, including ciclovía, bike integration, bus rapid transit, public space reclamation, parking reform, and land use planning. It has also been a leader in inclusion, from prioritizing children and parks development to now with its explicit focus on gender and centering the care economy in its plans.

Like many major metropolitan areas, Bogotá has grown tremendously over the last century; from a population of just 325,000 in 1938, it has increased twentyfold, to over 7.5 million residents today. To accommodate the influx, the urban area has expanded, with the greater Bogotá region sprawling to 30 times its original size by 2010. Such rapid development has led to socio-spatial segregation with unequal urban development, and enhanced the risks posed by climate change to the city's most vulnerable population.

But by rethinking both the urban land use and the modes of transportation available to city residents, the city of Bogotá has undergone a series of successive structural and behavioral changes that have made it increasingly sustainable. While the legacy of Bogotá is long, this case study will touch on some of the history but focus more on how the city responded to the pandemic and leveraged that for a new vision of cities committed to combating climate change and centering care and inclusion.

Throughout the first decade of the 21st century, land use plans were developed to address these urban planning issues. These were updated in 2004 and 2019 to include steps for preparing the city to mitigate climate change impacts, become more inclusive and integrated, and to utilize the benefits of dense populations to create a more compact, liveable city. At the same time, plans to expand upon the successful BRT system and incorporate further cycling infrastructure were underway as a successive series of local governments worked to make the city more bicycle and pedestrian friendly and to mitigate greenhouse gas emissions.

The start of the pandemic in 2020 rushed the implementation and adaptation of public squares for community use that was already in the works and saw the incorporation of "pop-up" bike lanes to accommodate the pandemic-related social distancing measures. Restrictions on work led to fewer cars on the road while more citizens took to bicycling on pop-up bike lanes in order to abide by public health measures. Officials studied this temporary infrastructure carefully and decided to maintain some of the cycling routes permanently while also responding to the dilemmas posed by a return to vehicular traffic and enhanced cycle usage.

Through the integration of public transportation, land use planning and cycling options, officials hope to close the distance gap, addressing the high income disparities in the city by offering affordable options for work and care-related trips. The impacts of climate change will likewise continue to be considered in planning and public transport implementation, as parts of the city will be prone to landslides while the most populous regions will be subject to flooding.

Bogotá's recent key achievements:

84 km of emergency cycle lanes implemented during the pandemic, of which 34 km became permanent

About 900,000 daily bike trips

17,000 square miles of roadway repurposed for pedestrian use

A fleet of 1,485 e-buses, with 1,292 in circulation, the second largest after China

94,300 tons of CO_2 reduced annually due to addition of electric buses

2 million vehicle-kilometers traveled reduced each week due to the HOV exemption decree promoting carpooling

2. Ciclovías to Ciclorutas

Temporary cycle lanes during 2020. Source: Carlos Felipe Pardo.

Through a combination of infrastructure implementation, supportive policies, and public programming and activities, Bogotá has created one of the most extensive cycle lane networks in the world, 593 kilometers in total, and achieved one of the highest rates of cycling in Latin America. Bike ridership increased by 40% in the four years before the pandemic to 6.6% and then during the height of the pandemic, it reached about 14%. Currently, it is estimated to be at 8%.

Bicycle ridership was already growing for many years before the pandemic, with pro-bike policies introduced by a series of successive mayors over the last 40 years, including Mayor Penalosa's two administrations. The social distancing restrictions brought on by the COVID-19 pandemic in 2020 catapulted the efforts to make the city more bicycle-friendly and was an impetus to fast-track changes to bicycle infrastructure and to experiment with routes. The newly integrated cycling infrastructure led many residents to rethink their daily commutes and sparked a new willingness to adopt the bike as a preferred means of transportation.

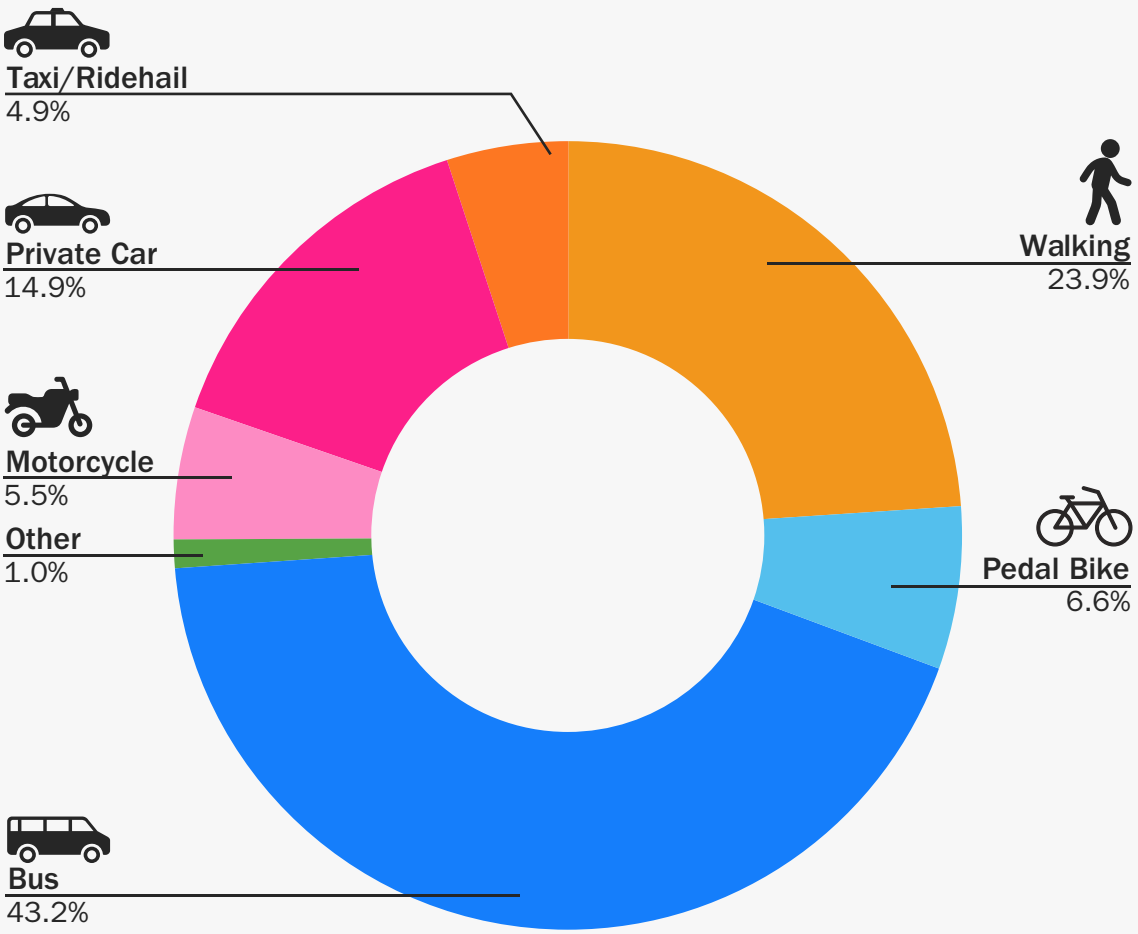
The city's experimentation with cycling began many decades before. In 1974, the city became the first city in South America and one of the first in the world to introduce Ciclovía, an event which sees major thoroughfares closed to vehicle traffic in order to make way for pedestrians and cyclists. Officially adopted in 1976, these Sunday traffic closures allowing for safer cycling, skating, and strolling have grown over the years to 120 kilometers of open streets for people and cyclists, with over 1.5 million taking part each week in 2022. Ciclovías have allowed people to experience what their streets would be like if they didn't have to compete with cars and motorized traffic, and showing how good walking and cycling can be when it is safe.

Bogotá's ciclovías allowed many users, including the smallest ones, to enjoy the road space. Source: Carlos Felipe Pardo.

In 1998, construction began on a cycling network known as the Red de Ciclorrutas that created safe bicycling routes. Initially integrated into pedestrian sidewalks, the project grew from 8 kilometers of bike lanes in 1998 to 240 kilometers two years later. The city also invested in integrating cycling with the public transport system, including creating secure and protected bike parking at terminals and stations of the newly opened bus rapid transit system, TransMilenio.

Today, the cycling network includes more than 593 kilometers of permanent cycle paths, 162 kilometers in the roadway, 299 integrated within sidewalks, 124 as shared, low-speed spaces, and 5 kilometers of cycle bridges and tunnels. Bicycle ridership has steadily increased in the city as a result of those initiatives. As ridership rose, policies evolved to keep up with both population increases and shifts in transport methods.

Modal split in Bogotá in 2019. Cycling trips are now estimated at 8%, or about 900,000 daily trips. Source: Secretaría Distrital de Movilidad de Bogotá (2019), Encuesta de Movilidad 2019.



In 2016, a change in the Colombian traffic code expanded the rights to the street space for cyclists, who could now ride on a whole traffic lane, not just the kerb, and could legally ride in groups. One of the politicians spearheading the legislative initiative was Claudia Lopez, who was elected as mayor of Bogotá and began her term in January 2020. Shortly after her inauguration, the pandemic hit, and her administration quickly pivoted to emergency response, as everyone struggled to understand transportation in the face of a pandemic.

They quickly decided to focus on enhancing cycle safety and better integrating cyclists through dedicated infrastructure. The city created 84 kilometers of cycle lanes within a few months, being one of the first cities to adopt cycling as such a quick and extensive solution to the pandemic, serving as a beacon to other cities who followed suit.

These lanes often paralleled Bogotá's bus rapid transport (BRT) system routes to serve as a safer option during the pandemic to buses, while also connecting cyclists to both the public transport network and to other cycle lanes. In doing so, planners worked on assessing the most suitable routes considering traffic volumes, network connectivity and population density. They also understood the need for more vulnerable populations, such as older people or immunocompromised people, as well as essential workers who were typically lower income residents, to be able to travel without endangering their health.

The response was an overwhelming success almost immediately, with a ten- to twenty-fold increase seen in the number of bicyclists in certain areas across the city. To compare, the cycling mode share grew exponentially over the years. Between 2011-2015 by 44%, then between 2015-2019 by 38%. During 2020-2022 alone, the cycling mode share grew by 6%, then 8% as reported by the Mobility Secretariat of Bogotá.

Along the heavily-trafficked Calle 13 corridor, for example, one in three vehicles is now a bicycle. The city's most beloved thoroughfare, Avenida Séptima, was traditionally used only by cars; the addition of 17.7 kilometers of protected bike lanes has led to over 1,800 cyclists using the route during rush hour (up from just 35). Overall, the city estimates that the number of daily users went from 335,000 in March 2020, to 665,000 cyclists in February 2021. The expansion of the cycling network has a tremendous impact on low income populations who bike more frequently to reach employment and services.

Changes in the number of cyclists after emergency bike lanes were constructed. Source: City of Bogotá.

	kilometers of emergency cycle lanes implemented during the pandemic	# of cyclists during peak hours before 2020	# of cyclists during peak hours in 2020	% change in a number of cyclists
Calle 13	3.6	1696	7400	336%
Calle 7	17.7	35	1800	5043%
Carrera 9	6.95	525	3500	567%

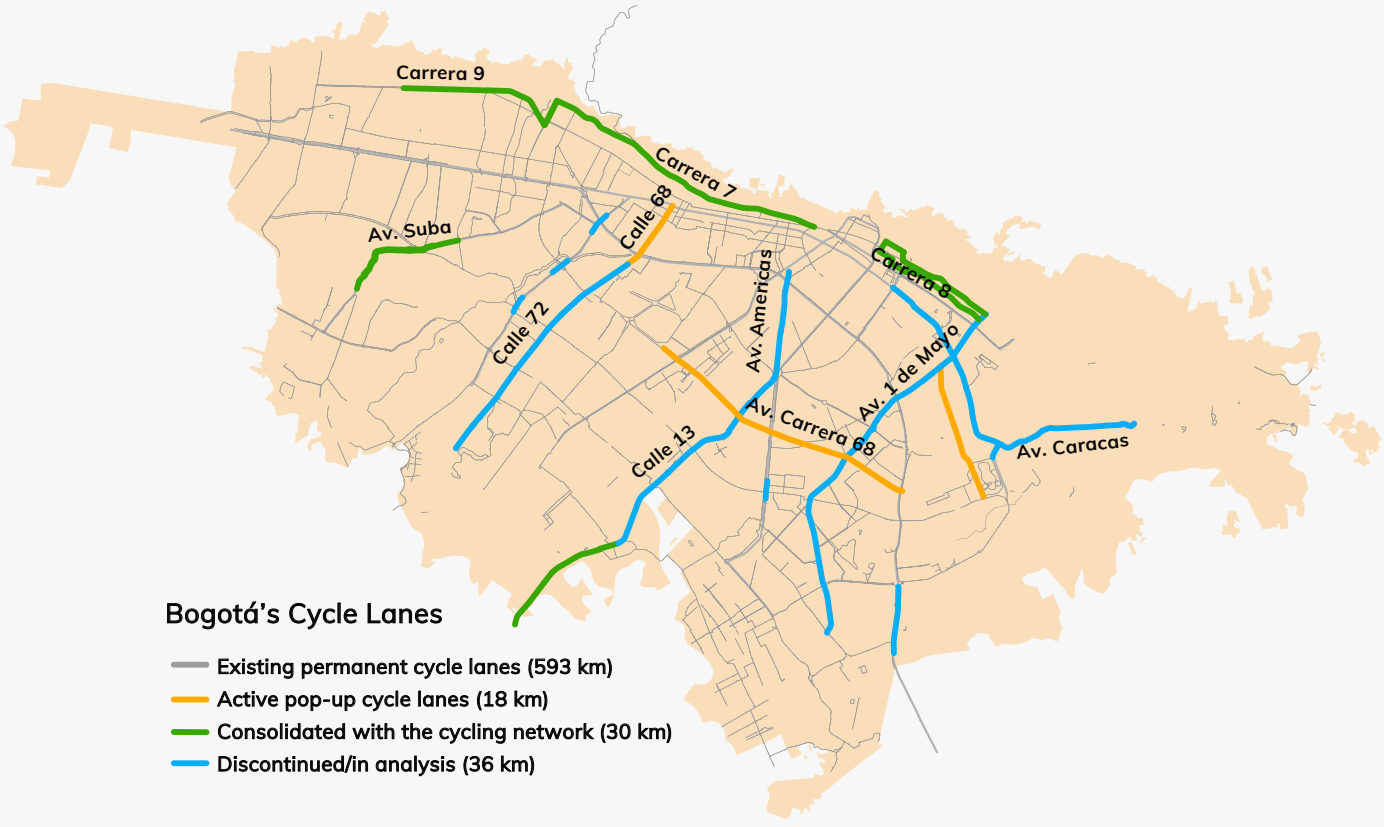
Throughout 2021, 34 km of pop-up bike lanes were converted into permanent lanes in the roadway and absorbed into the cycling network, with 18 km remaining as temporary and the rest undergoing assessment for a permanent implementation. The process of converting the temporary cycle lanes into permanent ones included constant readjustment and monitoring of the changing mobility patterns, frequencies and total usage by cyclists in the corridors while considering maximum impact particularly for vulnerable groups.

Nicolás Estupiñán, the former Secretary of Mobility of Bogotá said in a presentation for the 2022 Sustainable Transport Award, "*We were convinced we were not going to get it [placement of the cycle routes] right the first time and that it would need to be rectified in later iterations.*" That open-minded approach to implementation allowed city planners to remain flexible as they experimented with optimizing the newly integrated means of transportation.

In addition to the pandemic cycle lanes, the city was also keen to ensure that this pivot would be made sustainable and equitable through policy. In February of 2021, they adopted Acuerdo 804, or Agreement 804, which made biking a priority as a means of transport in the city and which authorized the city to redistribute road space to create temporary emergency bicycle lanes.
The Secretariat of Mobility also created the Politica Publica de la Bicicleta, or the Public Policy of the Bicycle. Formalized in February 2021 after a two year process, the policy aims to improve the physical and cultural conditions of Bogotá to make the city more hospitable to cyclists, with a focus on gender inclusion and making it safer for women to cycle. One of the aims of the current administration is to ensure that gender is factored into all policies as a transversal issue that cuts across all departments, programs, and projects. The policy also allocates 2.2 billion Colombian Pesos (approximately 485,000 USD) to realize this policy by 2039.

Supportive infrastructure including wayfinding and bike parking has also been deployed throughout the city. The city has begun piloting signage on cycle paths that serve as mile markers and provide distances to destinations in order to help cyclists better understand and plan their trips. Wayfinding is one barrier for newer cyclists as they may be unfamiliar with the streets and the destinations they are going to. The city has also expanded bicycle parking, which will help cyclists integrate with other forms of transport (e.g. bike to train) and gain a sense of trust that their bikes can be parked safely. To help increase that trust, as well as encourage the private sector to implement bike parking, the city has developed a special recognition system for bike parking called Quality Seals. Parking facilities that have safe and comfortable conditions for cyclists can be awarded this seal of quality, and cyclists know that their bikes will be safe and secure there. These efforts have ensured 50,293 parking spaces in the current bicycle network- 24,650 of which are certified by the quality seals.

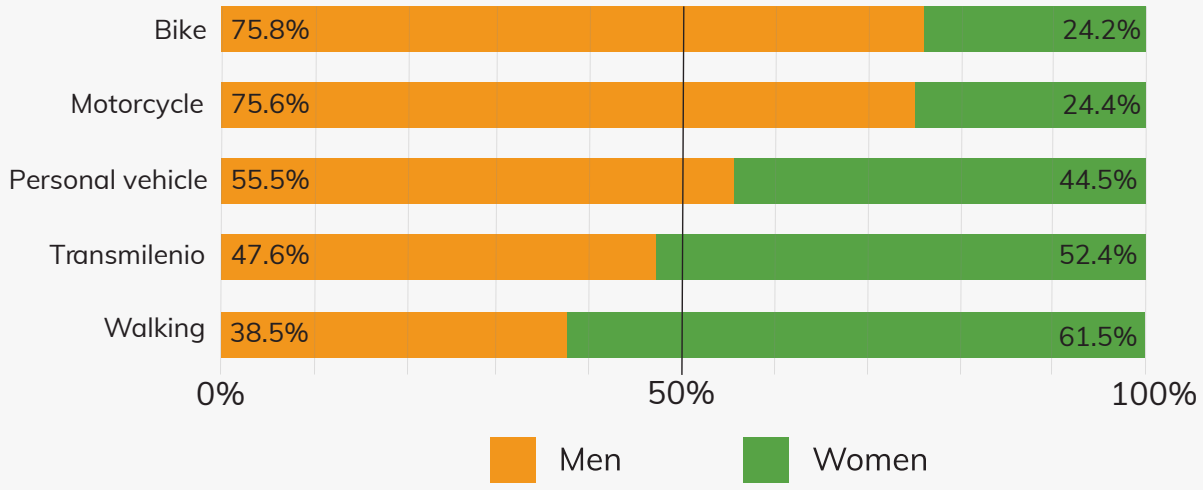
Map of Bogotá's cycle lanes including distribution of the 84 km of emergency bike lanes as of 2022.
Source: City of Bogotá.



In September 2022, the first ever bikeshare system for the country was launched. It currently has 3,300 bicycles and 300 stations, contracting Tembici as the operator. The system offers a mix of regular bicycles and electric bikes, as well as 150 hand bikes, 150 cargo bikes, and 150 bicycles that have child seats, in an aim to be one of the most diverse and inclusive bikeshare systems in the world. Many bikeshare stations are co-located near public transport stations, and the system uses the same fare card as for Transmilenio, making it easier to transfer from one to the other. The city is also offering a 20% discount for low income riders. The cycles are designed to have low horizontal bars to make them more accessible for people regardless of gender, age, or body type, with low center of gravity to ensure stability, and front baskets to help accommodate different people' s carrying needs.

These aforementioned policies and projects are the beginning for improving cycling conditions for all, but as mentioned, the administration is integrating gender issues throughout all projects and programs of the city. Women riders account for about 24% of all cyclists. For women in particular, increasing cycling means creating safe, protected cycle lanes, addressing problems of personal security and harassment, adding safe parking facilities and creating educational programs to teach them how to ride and maintain their bikes. The inclusion of baskets and child seats on bikes and cargo bikes in the public bike system is directly aimed at women who need bikes to meet their caregiving responsibilities. The city has begun some of these measures and hopes to get more women cycling to address some of the access they, specifically workers and caregivers, face.

Bogotá's modal split by gender for selected modes of transport illustrates gender disparity in access to cycling. Source: Bogotá's Household Survey, SDM (2019).



Bogotá's development of pop up cycle lanes and integrating them into the network has helped increase access to safe mobility options for women. Source: City of Bogotá

In parallel, in December 2020, Bogotá launched an updated Public Policy for Women and Gender Equity to help address gender issues including safety, access to opportunities and mobility needs. The administration created a Gender Action Plan, part of which includes objectives specific to urban mobility. To develop the Gender Plan, usage patterns were analyzed in the localities with lowest use of bikes among women (particularly in the neighborhoods of Ciudad Bolívar, La Candelaria and San Cristóbal and Usme).

These policies informed the planning, evaluation and design of cycle infrastructure. For example, the locations of bikeshare docking stations are near well-lit, public and regularly-visited areas around-the-clock with considerations of security, accessibility and safety for women. The 10-year span of the policy and a designated budget of USD $638 million allows for the continuity of the actions beyond the current administration.

3. Advancements with Public Transport Systems

Electric vehicle of the Transmilenio BRT system. Source: City of Bogotá.

Bogotá was recognized with a Sustainable Transport Award in 2005 for its innovative TransMilenio bus rapid transit (BRT) system, which became an example to the world of a high quality, high capacity modern bus system. TransMilenio transformed our understanding of BRT with innovations in contracting, service delivery, and infrastructure design. It helped create a faster and better organized system for existing users and encouraged people to get out of their cars. By 2010, the bus system had transported more than 3 billion passengers and reduced carbon emission so significantly it was recognized by the UN as a Clean Development Mechanism (CDM). The city has since then continued to innovate and work to transform its public transport system to improve service delivery for its residents. This included expansion of TransMilenio, creation of the Integrated Public Transport System (SITP) which brought all informal operations into an integrated, formal system managed by TransMilenio, the opening of the cable car system as part of that SITP, and the construction of a metro.

Bogotá was once again a first mover with electrification of its bus fleets. Air pollution levels in Bogotá, especially the levels of particulate matter, often surpass healthy limits as laid out in public health guidelines; poor air quality contributes to at least 2,000 deaths in the city every year. To date, the city has acquired 1,485 electric buses for its public busing system, which, upon full implementation, makes its fleet the largest e-bus fleet in Latin America, with the greatest number of e-buses in use by a municipality outside of China. As of September 2022, 1,061 electric buses have been in operation.

After conducting some pilots on electric buses (e-buses) and hybrids over the past decade, in 2019, Bogotá made a commitment to electrify its bus fleet more intentionally and began expanding its bus electrification pilot and saw a gradual increase of the electric bus fleet including the zonal and feeder routes. The integration of e-buses into the fleet came as part of the city's overall plan to decarbonize public and private transport, as well as a result of the national government's 2019 Law #1964, which included the goal for all mass transport to be 100% electric by 2035. Since 2020, increasing numbers of e-buses have been deployed incrementally, with over 1,000 in operation now.

The new electric fleet consists of standard 12-meter buses with capacity of 60 - 80 passengers, and smaller, 9-meter buses with capacity of 30 - 50 passengers. The buses, besides being equipped with electric motors producing zero local emissions and little noise pollution, also feature elements that improve travel experience such Wi-Fi access, USB ports, and audio visual prompts with travel information, as well as spaces for wheelchairs and for users who require a guide dog.

During the expansion of the bus electrification pilot, Bogotá saw an opportunity to adjust the bidding and contracting model. This was mainly due to the fact that the financial model for electric buses is the inverse of diesel buses, where the upfront costs of electric buses are higher than diesel buses, but the ongoing operating costs are lower. The city decided to change the contracting structure, inspired by the experience of Santiago de Chile. In this model, the procurement and provision of buses is tendered separately from the contract for operating the services, as opposed to the previous model where the company receiving a concession was required to be the owner of the fleet and of the depot as well as provide the services. Separating the two, operations and provision of the vehicles, has several advantages: it introduces different stakeholders into the process (at various stages); and it allows for the diversification of risk and lower interest rate) between actors.

Transmilenio has also included in its model a mechanism to give operators the opportunity to decide which fleet provider they want to work with. Thus, the tenders for the supply and operation of the fleet are held at the same time. In each of the tenders, the operators were required to indicate which supplier they wanted to work with. After studying the proposals submitted jointly by the operator and manufacturer, the best "couple" was assigned a concession to each party. This mechanism allows companies to negotiate the terms of their relationship in advance, with minimal intervention from Transmilenio. Furthermore, specifications regarding vehicle maintenance and training have to be included in the tender submitted by both parties. In these terms, often the supplier assumes the responsibility of maintaining the fleet at the beginning of the concession. This allows the operator to learn about the new bus technology before it takes over the maintenance of the fleet.

Through a progressive training process, maintenance becomes the responsibility of the operator, while the manufacturer assumes the supervising responsibility. If the service delivery changes due to poor maintenance, both parties are held responsible. Additionally, the operators typically are responsible for purchasing spare parts directly.

To date, no incidents have been reported in supplier-operator relations that have affected the regular operation of the system. However, if this situation were to occur, both the operator and the provider would be affected. Indeed, Transmilenio designed remuneration criteria that align incentives with requirements of the operating plan, so that both parties are responsible for service delivery. Thus, the fleet provider must supervise the maintenance carried out by the operator. If any unit were to fail or if there was a shortage of the vehicles to comply with the operating plan, the remuneration to both parties would be affected.

To incentivise the operators to consider electric bus technology instead of running the EURO VI vehicles, Transmilenio offered longer concessions to operate electric bus fleets, 15 years instead of 10. In the last bidding process, the operators had an option to submit a tender for the Euro VI or electric buses. In this process, 596 electrical units were assigned and 4 of the 5 companies that applied to supply the fleet were associated with an operating company, showing private sector interest in electric buses, thus economically viable, and that private actors have an interest in creating the supplier-operator relationships before applying for tenders.

Overall, the new buses will benefit an estimated 570,000 users each day. The city has estimated that the switch to e-buses will reduce CO_2 emissions by 155,000 tons and particulate matter by 37 tons each year when the full fleet of 1,485 buses is in operation. This fleet is equivalent to planting 148,000 trees in Bogotá to capture CO_2. That will be especially beneficial for those who reside in the southwest quadrant of the city, where most of the bus lines run and which has the highest pollution levels and largest number of low-income residents in the city.

These gains are the result of forward-thinking planning as well as successful management, especially on the communications side. Throughout the planning, procurement, and implementation processes, the city remained in continuous contact with structuring agents, legislators, manufacturers, suppliers, operators, financiers, insurers, and energy distributors. The coordination among a multitude of actors proved integral to the successful implementation of the plan.

Additionally, as the city seeks to electrify its bus fleets, it also launched La Rolita, a newly inaugurated publicly-owned bus company. La Rolita gives the city some more options when in negotiations or when problems occur with private operators. La Rolita is part of the Integrated Public Transport System (SITP), using the same fare media, which helps with the continuity of trips and helps people access TransMilenio, the main trunk routes, from the peripheral areas.

The transfers between La Rolita and Transmilenio are free for up to 200 Colombian pesos. Thus far, the company operates 195 electric buses on 11 routes that benefit more than 35,000 users from more than 21 neighborhoods of Ciudad Bolívar.

La Rolita is notable for its strategies to ensure gender equity and to continue environmental sustainability efforts. As an initiative led by the Mobility Secretariat, La Rolita aims to educate, train, and help women recategorize their driving license to then be eligible to become drivers of buses for the company. The program has already included over 450 women and continues to empower many to take up leadership roles in a historically male-dominated sector.

The city estimates that the e-buses will reduce the CO_2 emissions by155,000 tons annually when the full fleet is operation. Source: City of Bogotá.

4. Increasing Street Safety and Walkability

Barrios Vitales in Bogotá help slow down traffic and bolster local activity. Source: Carlos Felipe Pardo.

Like many cities that experienced fast growth in the 20th century, Bogotá's rapid expansion led to urban planning that prioritized automobiles and motorcycles. As a car-centric urban area, however, the dangers to those who chose other sources of transportation was felt resulting in high traffic crashes and fatalities. Ensuring the safety of those outside of motor vehicles became an essential element in the shift toward more sustainable mobility. School children, for example, take an estimated 1.2 million trips related to their studies, over half of which are made on foot, according to the Bogotá Mobility Survey conducted in 2019. Crash statistics show that, on average, 1,200 people under the age of 15 are injured and 12 die each year due to crashes involving pedestrians. That makes children twice as likely to die in a road crash than adults. The city's comprehensive approach to planning meant prioritizing the most vulnerable users; that became even more important during the pandemic-related shutdowns in 2020. While bicyclists and pedestrians were prioritized and given greater, more secure space, the number of automobiles on the road decreased. So, too, did the number of traffic-related fatalities.

Though that drop has not borne out in the post-shutdown time period, it is evidence that targeted interventions and programs can reduce traffic injuries and enhance street safety.

Vision Zero and Speed Management

Vision Zero program aiming to reduce traffic fatalities was inaugurated in 2017 and has evolved in the last couple of years to include more stringent regulation and expand the slower speed limits to more streets across Bogotá. In the decade prior to the plan's adoption, traffic fatalities in Bogotá had plateaued at a high level of 500-600 a year, with 72% of fatalities occurring on arterial roads; 96% of fatality victims were vulnerable users, such as the youth. The current Mayor of Bogotá set a goal to reduce overall and youth fatalities by 20% during her four years in office from 2020.

As part of the initial plan, the city began a Speed Management Program incorporating engineering, data, education, enforcement (e.g. through speed cameras), and communication strategies to manage safe speeds across the city. The program has three focus areas:

1. Arterial corridors where speeds were reduced from 60 to 50 km/h.
2. Commercial areas where speed limits were reduced to 40 km/h.
3. Residential areas and school zones where maximum speeds were reduced to 30 km/h.

The implementation of the speed management strategy has been carried out in different phases:

- **Phase 1:** In October 2018, the speed limit was reduced to 50 km/h on five arterial and strategic corridors of the city identified as priority in terms of road crashes.
- **Phase 2:** in April, July and November of 2019 the speed was also reduced to 50 km/h on five additional corridors of the city.
- **Phase 3:** in May 2020, further measures were deployed to aid mobility initiatives during the COVID-19 pandemic, including enforcing the new 30 km/h speed limit in over 2,200 school zones to ensure the safety of school children.

In 2019, it was recorded that traffic deaths fell by 21% across 10 corridors (as compared to annual averages from 2015-2018) and 28% the following year. This translates to 46 and 92 lives potentially saved annually due to lower speeds of travel, respectively. The speed limit changes made in May 2020 in the wake of the pandemic were made permanent in 2021 through Decree 073. In recognition of this effective Speed Management Program, Bogotá won an International Road Safety Award and has benefited from partnerships with a variety of organizations.

Kids First: Safety for School Children

School children walk for the majority--58% percent--of their trips to school. After statistics showed that children under 15 are twice as likely to die in traffic than pedestrians over the age of 16, the city of Bogotá began implementing a collection of initiatives part of the road safety initiatives to make roads safer for them to travel on as cyclists and pedestrians.

The Kids First program is aimed at making trips on foot safer, especially for low-income school children. One of these Kids First initiatives is known as Ciempies, or “walking school buses.” Funded in part by Bloomberg Philanthropies, Ciempies has students gather at a meeting point to walk together to school safely. A similar idea has been executed by Al Colegio en Bici, which leads groups of students to school on bike. Based on the notion that traveling in groups is safer than traveling alone, the two programs have helped more than 6,000 students from 100 schools to get to class. Kids who took part reported feeling safer during these walks than while traveling with parents or alone. Finally, Kids First sought to create school zones, where speeds from vehicular traffic were slowed down using traffic calming design measures.

Walking caravans of kinds also known as Ceimpies help kids reach the school safely. Source: City of Bogotá.

Since September 2020, these programs have been expanded to help children find safe ways to interact and attend in-person learning sessions even when social distancing was key to their safety. Children gathered in parks and other public spaces to play and learn during school hours. The Kids First programs enrolled 3,000 students in 2018 and 7,000 in 2019, dropping to 3,000 in 2020 due to the pandemic closures.

Street markings and tactical urbanism are affordable and a quick way to increase street safety for pedestrians, including youth. Source: City of Bogotá.

Revitalizing Public Space

The city's approach to increasing road safety also includes tactics to redistribute road space more equitably to bolster neighborhoods as the anchors for pedestrian activity. The Plazoletas Bogotá initiative created back in 2016 applied fast and low-cost interventions to transform roads that presented mobility problems into more walkable areas. The project was amplified during the pandemic shutdowns and rebranded as Barrios Vitales (Vital Neighborhoods). Barrio Vitales aims to allow residents to safely reach essential services in less than 30 minutes by walking or cycling and will continue to improve safety and accessibility while connecting key hubs with prioritized districts. Bogotá's new Land Use Plan (POT) proposes the implementation of 33 Vital Neighborhoods throughout the duration of the program till 2024, one for each Local Planning Unit (UPL). The District Secretariat of Mobility is responsible for leading the street transformation projects in order to prioritize sustainable modes, redefine the street, increase safety and develop a strategy for citizen participation. The size of the neighborhoods may vary depending on the road characteristics and context of the area. So far, the first Barrio Vital was implemented in San Felipe.

Barrio Vital in the San Felipe neighborhood. Source: Carlos Felipe Pardo.

Community Survey after the construction of tactical urbanism interventions for one of the Barrio Vital. Source: Secretariat of Mobility of Bogotá.

The pandemic further hastened the pedestrianization of public squares. While implementing bicycle lanes in some areas, officials reconfigured street space to allow for better social distancing. To accelerate these pedestrianization projects, the city sought the cooperation and coordination of agencies and organizations including the Secretariat of Economics, the public transport office, the national police, and the Institute of Urban Development. In addition to enforcing stricter vehicle standards and designating key pedestrian corridors, the city responded to gender-specific safety needs by increasing surveillance and replacing lighting for enhanced visibility. They foresaw potential hurdles to the community's acceptance of walking as a preferred means of transport and adjusted plans accordingly.

The Bogotá A Cielo Abierto project, or "Bogotá, Open Sky" converted sidewalks, squares, parks, and roads to active public spaces after local businesses reopened following pandemic-related closures. The program revitalized about 600 restaurants and other types of economic activities, indirectly creating 55,000 new jobs. The second phase of the project launched in March of 2022 expanded the program to other areas of the city to further foster social inclusion, local heritage, leisure and economic development. To support this, a land use law (Acuerdo 552) was amended to include new uses that would revitalize communities. Many of these new spaces have been made tax exempt to help with pandemic recovery and the city continues to look into similar, more permanent policies.

5. Addressing Climate Change

Buses and cycle lanes, together with regulating motor vehicles on streets, a win-win situation for addressing climate change. Source: Gabriel L. Guerrero via Shutterstock.

As transport accounts for nearly half of all greenhouse gas emissions in the city, decision makers sought to update the land use plans and climate targets more recently to focus on clean buses and expansion of cycling networks. In recent years, both the national and local governments have made strides to take action in reducing impacts of climate change, with the national government committing to net zero emission mobility by 2050 and Bogotá declaring the climate emergency in December of 2020, the first Latin American City to do so. This declaration set out time bound actions and policy requirements for climate mitigation to help reduce the greenhouse gas emissions by 50% in 2030. Currently, a new Zero and Low Emission Mobility Policy is in the works, with a goal of further reducing public transport fleet using fossil fuels.

In another effort to address climate change, the city has been working on reducing vehicle-kilometers traveled. In early 2022 the city modified a policy of Pico y Placa (Peak and Plate) under which only half the number of vehicles would be permitted on roads during peak hours. Previously, access to roads was limited by license plate numbers, with even-numbered licenses prohibited from driving during peak hours on odd-numbered days and vice versa. This resulted in wealthier residents purchasing a second vehicle as a workaround for the Pico y Placa regulations.

In order to make this policy more equitable, while also discouraging more vehicle procurement, which often induces demand, in September 2020, the Pico y Placa Solidario was implemented. During its implementation, citizens were able to secure a six-month exemption permit by paying a fee of US$400, which went to public transportation improvements. In 2021 the city made some improvements in the program by offering three different options for purchase: 1 day of exemption, 1 month, and the six-month scheme. Also, a flat fee was modified based on factors like: environmental (it costs more if the vehicle is more pollutant), commercial value (it costs more if the vehicle is more expensive), and license plate registration (it costs more if the vehicle is registered outside of Bogotá). Research showed that these exemptions would discourage wealthier residents from purchasing a second vehicle as a workaround for the Pico y Placa regulations, thus keeping the number of vehicles on streets limited.

Other exempted vehicle classes include ambulances and hybrid vehicles, adding up to a total of 20,000 exemptions out of the city's 1.94 million vehicles.

In 2020, the city added yet another exemption to the list to encourage car-pooling — for vehicles with three or more people (at least two passengers and the driver), otherwise known as high-occupancy vehicles, or HOV. By allowing for an exemption based on the number of occupants in a car, the city is providing a cheaper alternative for those who cannot afford an exemption permit.

The city is investing in electric buses, as seen here at a depot and charging facility, as a response to climate change. Source: Jens Giersdorf/ TUMI.

6. Fostering Inclusive Access Through Land Use and Mobility Planning

Bogotá's cycle lanes and urban density. Source: Carlos Felipe Pardo.

Throughout the first decade of the 21st century, land use plans were developed to address urban planning issues. These were updated in 2013 and 2019 to include steps for preparing the city to mitigate climate change impacts, become more inclusive and integrated, and to utilize the benefits of dense populations to create a more compact, liveable city. In September of 2021, the District Administration issued a proposal to revise the Bogotá City Master Plan - Bogotá POT, under the slogan "Bogotá Reverdece 2022-2035" ("Bogotá Turns Green") aiming to make Bogotá greener, healthier and more inclusive through space revitalization programme called Blocks of Care. Gender has become a transversal focus for all policies of the city, culminating in developing a specific part of the plan focused on care infrastructure, as most caregivers are women.

In recent years, Bogotá has realized how gender dynamics play an essential role in how people interact with public spaces and transport systems. Women in Bogotá, especially those from low-income households, have far less access to the opportunities and mobility services in the city than men, which results in an increasing gender and income gap and higher exposure to road safety risks. The work on updating the Public Policy for Women and Gender Equity which was passed in 2020, not only increased the inclusivity lens in mobility planning, but also provided opportunities for cross-sectoral and stakeholder collaboration. Women's voices have been facilitated through councils, roundtables and working groups to encourage participation and integrate their concerns in policy interventions. Several government agencies were mobilized to come together in the most pioneering program for gender inclusion.

In Bogotá, about 3.6 million women out of 4 million total perform unpaid care work. With the overwhelming majority of caregivers being female, the pandemic has revealed issues in mobility access and their impacts on daily caregiving duties. However, with the current political support, which has prioritized gender-inclusive city planning as part of its vision for the future in its Public Policy for Women and Gender Equality, the new social support program called the City Care System aims to change the situation for caregivers.

Creating the District System of Care is among the most vital commitments of the Mayor's public policy. The intent is to redistribute responsibility between the district, country, private sector, communities, and the households. The District System of Care (acronym "SIDICU") articulates existing and new services to meet the demands and care needs of people who require high levels of support, such as children under five years of age, people with disabilities, the elderly, and caregivers. The physical manifestation of the institutional collaboration under the SIDICU are the "blocks of care", which are targeted interventions and programs that bring greater access to services and opportunities to caregivers who need it most. The Bogotá Land Use Plan proposes the strategy of care blocks anchored around a neighborhood facility (Community Development Center) with a 800 meter radius area of influence around.

The current development goal is to launch and operate 20 care blocks by 2023 and 45 in total for the initial phases. The distribution of care blocks relies on factors such as care demand, the density of caregivers, poverty, and participatory budgets. Currently there are 10 care blocks in operation, and one of these blocks coincides with a Vital Neighborhood El Porvenir. A specific strategy is being developed for this area involving the District Secretariat of Mobility (SDM) and the District Secretariat of Women (SDMUJER) to carry out street improvements impacting mobility for women, caregivers and people who require care within the neighborhood. Each care block is designed to provide services such as education, healthcare, trainings and workshops, housing to help day-to day activities. The care blocks are meant to be physically accessible and walkable spaces with the services and spaces clustered in a walking distance from each other.

The city is investing in a concept called care blocks, like pictured here, that brings together services for caregivers including health care, classes, community laundry, to help alleviate the pressures and costs caregivers face. Source: Secretaría de la Mujer.

7. Next Steps for Bogotá

Avenida Séptima, a 23 km roadway, is proposed to become a greenway connecting important city destinations. Source: Gabriel L.Guerrero via Shutterstock.

Bogotá's green corridors and multimodal integration are approaches that will help the city further bolster its commitment to addressing equity issues and mitigating climate change articulated in the city's POT. Green corridors are Bogotá's newest plan to help support the advancement in safe sustainable mobility and reduce air pollution in the city, while providing opportunities for the residents to enjoy the city space. Avenida Séptima, or Seventh Avenue, is considered one of the most important roads in Bogotá, covering 23 kilometers and crossing the eastern portion of the sprawling city. It is perhaps the only corridor that traverses neighborhoods at every income level, from the poorest to the extremely wealthy. It is also the most contested space in the city.

In 2020, the new administration proposed the creation of a green corridor on Seventh Avenue as a safe, convenient and a zero emissions public transport solution for the city, and a model project of civic engagement in the planning process. To achieve this project, the city reversed the normal course of planning a city infrastructure project. Instead of starting the conversation with an analysis of traffic engineering - such as capacity, connectivity needs, and infrastructure costs - the city government proposed integrating the voices and imagination from the public. During a special public campaign in October 2020, residents were invited to submit their vision for Avenida Séptima through Streetmix, an open-source platform and a tool for designing street profiles. A custom version of Streetmix was elaborated on by NUMO and included life cycle emissions analysis. Over 7,000 submissions were received and the results showed that participants favored active transport modes and the use of public transport. Following this, the city issued a more concise design proposal for the green corridor that incorporated the voices of the public. The plan is to allocate 50% of the space for pedestrians and create 16 new plazas which will encourage people to linger on 7th Avenue.

This project is expected to be the first of more than 15 green corridors to be built by Bogotá over the next 12 years. This vision intends to encourage a new mobility culture which prioritizes pedestrians and non motorized transport, incorporates nature and public spaces.

Multimodal integration is Bogotá's strategy to further bolster mobility and access in the city. The new multimodal approach articulated in the POT evolves 17 years of learning about different trip patterns and mobility needs. One of the multimodal pilot projects is the Portal de las Americas being developed in partnership between the City of Bogotá, the Metro Company and CIUDAT (Center for Urban Interventions for Advanced Transportation Development supported by Finderter). The Portal de las Americas is set to be upgraded as a major transfer station between TransMilenio and local feeder bus lines.

The proposal includes a mix of land uses, live - work spaces, recreational areas and walkable streets. Under this plan, the Metro Company will acquire land and develop real estate in the areas adjacent to the new stations. As the project develops, the adjacent low-income neighborhoods will see improved access to transit, public space, and jobs, and the potential for new affordable public housing.

Portal de las Americas is an important terminal for Transmilenio and is being redeveloped to be more of an integrated multimodal site.
Source: De EEIM - Trabajo propio, CC BY-SA 4.0

8. Lessons learned

Pop-up cycle lanes appeared as a result of quick decision making and ability to adapt due to city-wide emergency during the pandemic. Source: Carlos Felipe Pardo.

The implementation of sustainable transport methods and alternatives in Bogotá reveal that lasting change to transportation structures requires forward thinking and political will over the long term. Changes have come about incrementally and then, due to the pandemic closures, quite suddenly, showing the power of patience and perseverance combined with flexibility. Planning endeavors that envision long-lasting success have proven just as vital to ensuring community opt-in as did adaptability to respond to residents' concerns.

Bogotá's success in increasing cycling in the city builds on decades of work and over 20 years of dedicated funding, but also due to strategic planning in the last two years which linked new cycle lanes to the existing cycling network while also mirroring BRT lines and enabling access to key destinations in the city. While the pandemic allowed a unique opportunity to quickly transform the city's streets, this was only made possible by warming the public up to the idea through prior initiatives such as the Sunday car-free streets days. Bogotá city planners showed themselves nimble during the fast-paced implementation of the bicycle infrastructure, responding quickly yet flexibly; willingness to change and to view the initial plans as experimental allowed for adaptation according to residents' needs. At the same time, while cycling quickly caught on in the city due to the public health emergency, the reception has dimmed slightly as pop-up bike lanes grew permanent and car drivers returned, along with them congestion. While it is more efficient and equitable to maintain corridors that afford space to cyclists and pedestrians, there is some understanding that political fights may exist as a result. Existing class inequalities can be seen in the modes of transportation chosen so it is important for those interested in issues of social justice to recognize the bicycle as a tool of liberation, connecting the most vulnerable populations with access to better-paying jobs as well as healthcare.

Communication with the population at large, explaining the thinking behind decision-making and adapting to resident feedback, has thus been understood to be key to keeping the progress that has been achieved under pandemic conditions. The city's plans include further interventions to ensure safe and equitable transit options exist for women, children, and those from the lower income neighborhoods and aims to reduce individualized motor vehicle transport within

the city limits. Accomplishing that will require buy-in from those car owners who will be most impacted. Testing out incentives for stepping out of the car has proven successful only on a limited basis and finding new options to retain both bicycle infrastructure on busy thoroughfares and the ability to navigate with those vehicles around on the road are next steps for the city to address.

With the COVID-19 arrival, uncertainty appeared regarding the number of users in the Integrated Public Transport System (SITP) of Bogotá, and a reduction of fare revenue that required the city to rethink the system operations.

The frequency of the buses, and the supply were adjusted to reduce crowding of users at bus stops while ensuring efficiency of the service. This was to both satisfy the demand considering public health while reducing operational costs, which were already stretched due to the lower demand. These adjustments also included optimization of the personnel as well as dealing with regular technical maintenance and common issues in the bus fleets.

Bogotá's pop-up cycle lanes mirrored the BRT lines to enable greater access to mobility options. Source: City of Bogotá.

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