

Urban mobility for more and better opportunities



Urban mobility for more and better opportunities

ImpactoCAF is an initiative created by the Department of Development Contributions and Impact Evaluation, under the Planning and Development Impact Division of CAF. The elaboration of this document was carried out by Matías Italia.

Andrés Alcalá, Guillermo Alves, Alejandra Botero, Cristian Grisales, Andre Jacobsen, Daniel Ortega, Angie Palacios, Cecilia Paniagua, Emil Rodriguez, Harvey Scordia and Catalina Vanoli provided valuable comments and suggestions to the document.

Additionally, this document benefited from the contributions of Álvaro Aguillo, Pablo Fernández, Alejandro Fuenmayor, Agustina Hatrick, Carolina Hoyos, Pablo López, Lesbia Maris, Fernanda Marquez, José Padrón, Melina Petracca, Mariana Poskus, Iñaki Regueiro, Juan Pablo Salazar, Jorge Tapia and Bárbara Zamora.

Graphic design: Humaga / La Plata, Buenos Aires, Argentina
www.humaga.com.ar

Editorial review: Rosario Inés De Rosa

© 2023 Corporación Andina de Fomento

The ideas and approaches contained in this edition are the sole responsibility of their authors and do not compromise the official position of CAF.



Urban mobility for more and better opportunities

Today, more people live in urban areas than in rural ones. Latin America and the Caribbean (LAC) is one of the most urbanized regions in the world, with 81% of its population residing in urban zones.^{1,a}

This trend is driven by the greater opportunities cities offer, such as employment, education, healthcare, and social activities. Moreover, the ability to access and provide these services depends on the capacity for people and goods to move within cities. In this regard, transportation is a key element in enabling citizens to access these benefits, both in terms of quantity and quality.

However, in LAC, significant gaps exist in terms of access to and quality of urban mobility, compounded by various negative externalities such as traffic congestion, road accidents, and environmental pollution, the levels of which are considerable in the region.

Ensuring access to quality of urban transport, while limiting its adverse impacts, is crucial to guaranteeing that Latin Americans and Caribbeans can safely, equitably, and sustainably access the opportunities cities offer.

Ensuring access to quality of urban transport, while limiting its adverse impacts, is crucial to guaranteeing that Latin Americans and Caribbeans can safely, equitably, and sustainably access the opportunities cities offer.

Through these actions, along with urban planning through appropriate regulations, countries in the region will contribute to achieving the Sustainable Development Goals (SDGs) set in the United Nations 2030 Agenda.

^a This value is very close to that of North America (83%) and higher than Europe (75%), Asia and the Pacific (51%), and Africa (44%). Furthermore, it is projected that the urbanization process in LAC will continue to increase in the coming years, reaching nearly 88% by 2050 ([United Nations, 2019](#)).



Urban transportation issues in LAC

Access to public transport and active mobility in LAC is still limited, and furthermore, there are issues with the quality of these modes of transportation.

In Latin America and the Caribbean (LAC), most citizens use public transport and active mobility, like biking and walking, to access opportunities available in cities. These modes account for nearly 70% of trips in various cities across the region.²

However, access to these modes is still limited: over 20% of Latin Americans don't have a formal public transport option within 10 minutes of their residence.³ While active mobility accounts for almost 30% of urban trips in LAC,⁴ less than 4% of road infrastructure is dedicated to pedestrians and cyclists, significantly lower than Europe's (19%).⁵

The quality of public transport and active mobility also presents challenges. In LAC, user experiences tend to be less favorable than in other regions: not only are travel times longer than in advanced economies (+20%)—despite shorter average travel distances—but waiting times and their variability are also greater, affecting service reliability.⁶ This leads to dissatisfaction among users, with statistics indicating that one in three users rates the quality of public transport in LAC as poor or very poor.⁶

This quality issue is also evident in active mobility infrastructure, such as sidewalks. Surveys in the City of Buenos Aires and Bogotá show that 9% and 17% of sidewalks, respectively, are in poor condition.⁷



These problems disproportionately affect specific population groups, leading to access inequities.

These problems disproportionately affect specific population groups, leading to access inequities. This is the case for people with disabilities, who are more affected by poor urban infrastructure; women, who face greater insecurity in public transport,⁸ with one in ten reporting sexual assault or harassment;³ and low-income families, who travel further to bus stations (8%) and spend a significant portion of their income on public transport.⁴ Moreover, these limitations are exacerbated for the latter two groups, who rely more on these transport modes.³

In recent decades, declining public transport quality, combined with rising household incomes and prioritization of road infrastructure investment, has led to increased motorization rates in the region.^b This shift to private motorized transport has reduced the use of public transport and active mobility.^c

As mentioned earlier, this increases traffic congestion, road accidents, and environmental pollution, exacerbated by inadequate urban planning.⁹

Regarding traffic congestion, it's a significant issue in the region: Bogotá and Lima rank first and fourth among the most congested metropolitan areas in 2022.¹⁰ The time lost to congestion incurs substantial economic costs, nearly 1% of the annual Gross Domestic Product (GDP) in cities like Montevideo and Buenos Aires.¹¹



b This is evident both in the increase of automobiles in the region and in the massification of motorcycles ([Rodríguez et al., 2015](#)).

c Contrary to what happened in other regions, such as Europe, where the use of public transport and active mobility increased ([Rivas et al., 2019](#)).

In addition to these issues, there are negative externalities generated during mobility, such as traffic congestion, road accidents, and environmental pollution.

The economic costs are intensified by the harmful effects of motorized transport on the environment and health, due to emissions like carbon monoxide (CO), carbon dioxide (CO₂), nitrogen oxides (NO_x), sulfur dioxide (SO₂), and particulate matter (PM). CO₂ emissions are particularly concerning as a major greenhouse gas (GHG) contributing to global temperature rise and its negative environmental and health impacts, such as floods, droughts, food, and water insecurity.¹²

Although LAC emits less CO₂ in absolute terms compared to other regions, the transport sector contributes a higher proportion of emissions (37%), even compared to the Organisation for Economic Co-operation and Development (OECD) countries (27%).^{13,d} This pollution is reflected in air quality: excessive exposure to particulate matter contributed to nearly 180,000 deaths in LAC in 2019, accounting for 5% of the region's deaths.¹⁴



Additionally, increased private vehicle circulation and congestion can lead to road accidents. In LAC, transport-related injuries caused 112,000 deaths in 2019, 3% of total deaths. This situation worsens for specific groups, like children aged 5–14, where road accidents accounted for 13% of deaths, and men aged 15–49, with 14% of deaths.^{15,e}

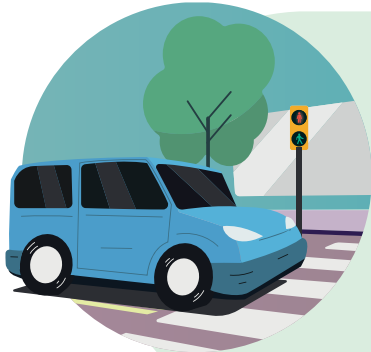
Traffic also contributes to urban noise pollution,¹⁶ negatively impacting human health, including cardiovascular diseases and cognitive impairment, among other ailments.¹⁷

Negative externalities are also evident in urban freight transport. While cargo transport represents 25% of urban vehicles, it contributes 40% of CO₂ emissions,¹⁸ and exacerbates congestion and severe accidents, as cargo mobility peaks often coincide with traffic peaks and involve a variety of vehicle types.¹⁹ These externalities derived from passenger and goods transport generate an economic cost that, according to a study in Mexico, could represent between 3 and 5% of the country's GDP.²⁰

d Additionally, the picture is similar when analyzing per capita emissions ([IEA, 2023](#)).

e It should also be noted that although there has been a slight decrease in deaths from road accidents in the region over the last 20 years ([IHME, 2020](#)), the SDG Target 3.6, which aimed to halve the number of deaths and injuries from road traffic accidents by 2020, was not met ([United Nations](#)). In response to this situation, the Second Decade of Action for Road Safety 2021–2030 was proclaimed in 2021, reaffirming the same goal and encouraging governments to implement policies and programs to reduce road accidents ([WHO, 2021](#)).

CAF's action in urban mobility and its impact



Aware of the problems and needs of the region, CAF supports countries by creating tools for the development of sustainable, inclusive, accessible, and safe urban mobility systems. These systems aim to provide access to opportunities and improve coverage, quality, and efficiency, while also mitigating their negative externalities. This action is part of CAF's goal to create sustainable habitats through greener, fairer, and more prosperous cities and communities, placing people at the center of these efforts.

Therefore, CAF promotes the development of integrated mobility systems, driving clean, safe, and sustainable transport focused on improving the quality and coverage of public transport and its decarbonization.

To illustrate CAF's contributions to urban mobility, we have categorized the actions into four types:

- » **public passenger transport**
- » **active mobility**
- » **urban roads**
- » **urban logistics**

From 2018 to 2023, CAF financed 36 credit operations totaling USD 2.6 billion for urban mobility components,^f benefiting six countries in the region: Argentina, Bolivia, Brazil, Colombia, Ecuador, and Uruguay.

CAF'S ACTION OVER THE PAST 6 YEARS (2018-2023)

36 credit operations

with urban mobility components

\$2.6 billion
dollars

6 countries

supported through credit operations

^f The total amount of these credit operations, which includes other components not related to urban mobility, amounts to USD 3.4 billion.

Public passenger transport



In the past six years, CAF has approved 11 credit operations dedicated to mass passenger transport, totaling USD 1.66 billion, benefiting five countries in the region: Argentina, Bolivia, Brazil, Colombia, and Ecuador. These credit operations involve the development of infrastructure for BRT (*Bus Rapid Transit*), Metro, Urban Railways, Cable Cars, and Buses (terminals and exclusive lanes), directly benefiting 8.1 million Latin Americans.

CAF'S ACTION OVER THE PAST 6 YEARS (2018-2023)

\$1.66 billion
dollars

11 credit operations

with the development of infrastructure
for passenger transportation

- 1 BRT
- 5 Metros
- 2 Urban Railways
- 1 Cable Car
- 3 Bus terminals
and exclusive lanes

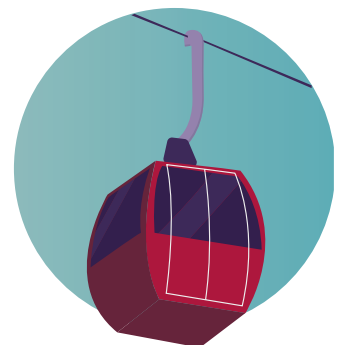
5 countries

Argentina, Bolivia, Brazil, Colombia, and Ecuador

8.1 million

beneficiaries

CAF's action improves access and quality of public transport in the region. The impact of these initiatives translates into reduced travel times. According to research findings, infrastructure development for public passenger transport can reduce travel times by 1% to 34%.²¹ For example, CAF's support in cable car systems may have cut travel times by 22%, saving nine minutes per trip and benefiting users by USD 0.6 per trip.²²



Scientific studies show that such investments can increase public transport use by 6% to 48%, and reduce private car and taxi use.



Reduced travel times incentivize public transport use and discourage private transport. Scientific studies show that such investments can increase public transport use by 6% to 48%,²³ and reduce private car and taxi use.²⁴ CAF has financed five metro credit operations in the last six years, and a study on the expansion of Line B of the Mexico City Metro indicates that the beneficiaries of this investment increased their use of the metro by 48% and reduced their use of buses by 20%.^{25,g} Similarly, the investment in Bolivia's cable car system not only decreased travel times but also increased the use of public transport and reduced the use of private transport.²⁶

In turn, shorter travel times results in employed individuals spending less time commuting, and job seekers can access higher-quality employment opportunities, leading to improved working conditions and productivity of companies and employees. According to rigorous evidence available, CAF-funded transport infrastructure investments enable direct beneficiaries to access various job opportunities, by increasing employment rates (5%)²⁷ and also the number of hours dedicated to work (between 12% and 19%)²⁸ as well as quality, by reducing the rate of informal hiring (-7%)²⁹ and increasing monthly income (32%).³⁰

As citizens can travel faster and at lower costs, they have better access to education, health, and recreational services,²⁶ enhancing their skills and competencies.

All these positive effects that investments in public transport generate in various quality of life indicators are also evident in aggregate indicators that consider the general effects of these investments within cities, such as, for example, the potential change of residence of individuals and businesses. In this regard, the BRT infrastructure in Colombia may have impacted on an increase in per capita product (between 2.5% and 5%) and in the well-being of citizens^h (between 0.6% and 2.3%).³¹

These improvements in various quality-of-life indicators for the region's citizens, resulting from CAF's support for public transportation, become even more significant as they are capable of achieving greater inclusion and equity. The evidence shows that this financing has greater effects on women,³² lower-income households,³³ and minorities.³⁴ For example, in Peru, the development of BRT and metro infrastructure led

g This reduction in the use of another public transport mode, such as buses, is explained by the comparative advantages that the metro offered to users.

h Where the well-being of citizens depends on wages, transportation costs, and living expenses, among other components.

to an increase in the use of public transport by women, as it became more convenient and safe for them, which resulted in an increase in their employment rate (between 8% and 17%) and their hourly income (between 12% and 23%).³⁵

Furthermore, investments in infrastructure for public passenger transport, by discouraging private transport, lead to a reduction in the negative externalities associated with motorized transport: they reduce vehicular congestion on urban roads, environmental pollution, and road accidents (by decreasing vehicle flow and congestionⁱ).

Investments in infrastructure for public passenger transport, by discouraging private transport, lead to a reduction in the negative externalities associated with motorized transport.

In this regard, metro and railway lines could improve, in the short term, congestion on highways and urban roads near these modes of transport, resulting in shorter travel times for these users, even during peak hours, and lower costs.³⁶

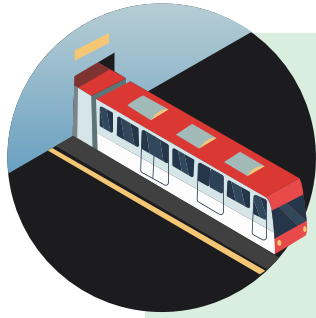
As for the effects on environmental pollution, evidence from the investment in BRT infrastructure in Mexico indicates that CAF's action may have reduced, in the short term, CO emissions (between 6% and 7%), and PM₁₀ (between 7% and 9%),³⁷ as well as NO_x (between 5% and 7%).^{38,j} Similar effects are found outside the region, following investment in metro and railway lines. The implementation of metro lines reduces CO emissions in the short term (between 5% and 34%),³⁹ PM_{2.5} (between 3% and 28%)⁴⁰ and PM₁₀ (between 2% and 3%);⁴¹ while the opening of railway lines reduces PM_{2.5} emissions (3%)⁴² and NO_x (between 1% and 2%).^{43,k}



i Congestion increases the time vehicles need to travel, which leads to higher emissions and a greater likelihood of traffic accidents. Additionally, vehicles spend more time idling, which results in significantly higher fuel consumption and increased emissions (CAF, 2024: RED 2024 [unpublished document]).

j The results mentioned not only correspond to the implementation of the BRT but also to the incorporation of more efficient buses (Bel and Holst, 2018).

k These investments in public transport will not reduce emissions if they do not succeed in discouraging private passenger transport, and in specific cases, they could even increase emissions in the short term (Wang et al., 2020; Sun et al., 2019-c).



Bogotá Metro and greenhouse gas emission reduction

CAF supports the design, construction, and operation of Line 2 of the Bogotá Metro with a USD 255 million loan, set to benefit approximately 2.5 million users.

Results of an ex-ante evaluation, using a methodology validated by the [United Nations](#), indicates a reduction in CO₂ equivalent emissions of 14.8 MtCO_{2e} over the initial expected 30 years of metro operation. Annually, this amount represents 5% of Bogotá's emissions.⁴⁴

In relation to the effects on road accidents, the construction of a new tram line led to a one-sixth reduction in car accidents on surrounding streets,⁴⁵ and the introduction of night buses reduced the number of accidents among people aged 15 to 29 by 37% and the number of injuries by 24%.⁴⁶ Additionally, the decrease in congestion can also reduce road accidents, and evidence for the region indicates that a 10% decrease in traffic congestion could reduce road accidents by 3%.⁴⁷ On the other hand, research on the effects of BRT infrastructure finds that it may have reduced road accidents in Brazil, Colombia, and Mexico,⁴⁸ including severe road accidents.⁴⁹

CAF's contribution to public passenger transport improves access to and the quality of these services, evidenced by a reduction in travel times and an increase in the use of public transport in the region.

In summary, CAF's contribution to public passenger transport improves access to and the quality of these services, evidenced by a reduction in travel times and an increase in the use of public transport in the region. This has helped to improve the working conditions of Latin Americans and Caribbeans and access to services. This action by CAF also generates inclusion and equity, by improving job opportunities for women, lower-income citizens, as well as minorities. Furthermore, by discouraging the use of private transport, these investments limit the generation of negative externalities associated with such transport, reducing traffic congestion, environmental pollution levels, and road accidents.

Active mobility



CAF'S ACTION OVER THE PAST 6 YEARS (2018-2023)

27 credit operations

with active mobility components
(cycling infrastructure and/or sidewalks)^l

20 credit operations

with the construction of cycling infrastructure

↳ corresponding to a
distance of **305 km^m**

19 credit operations

with the construction and improvement of sidewalks

5 countries

Argentina, Bolivia, Brazil, Ecuador and Uruguay

CAF's investment in bike paths may have increased bicycle use by 11 to 48%.

CAF's action contributes to improving access and quality of active mobility in the region, which is crucial as three out of ten trips in LAC are made using these modes of transport.⁴ These improvements also promote greater inclusion and equity, as women and lower-income individuals are more frequent users of these modes,³ with expected greater benefits for these population groups.ⁿ

CAF's support for cycle infrastructure investment is vital as it enhances cyclist protection and encourages active mobility. Evidence shows that investment in active mobility infrastructure promotes walking and cycling. For instance, CAF's investment in bike paths may have increased bicycle use by 11 to 48%, with greater effects when cyclists perceive increased safety.^{50,o} Interventions encouraging cycling (including cycle infrastructure) lead to more bicycle commuting and could

^l Cycle infrastructure refers to urban road infrastructure, both on and off the roadway, designated for the safe circulation of bicycles, which includes bike lanes, bike paths, and cycle routes, among others.

^m Calculation made with the number of kilometers projected at the start of each project.

ⁿ Regarding the state of evidence on investments in sidewalks and cycling infrastructure, it is important to note that there are few studies estimating the causal effects of these investments. Therefore, we will complement this evidence with studies that evaluate the effects of these investments, although they do not allow for assertions about the causality of these effects.

^o In addition to safety, the quality of bike lanes and sidewalks (measured by their length and width) also encourages active mobility ([Aziz et al., 2017](#)).

reduce private car use.⁵¹ These also bring health benefits that active mobility promotes: higher levels of walking and cycling are associated with a reduction in sedentary lifestyles, diabetes, blood pressure, psychological distress, and a lower risk of cardiovascular diseases and cancer, among others.⁵²

By providing citizens with economical, sustainable, and safe transportation options, investments in sidewalks and cycling infrastructure can improve access to job opportunities, as well as goods and services. In this sense, there is a positive relationship between investment in this infrastructure and levels of employment and sales.⁵³



Also, to the extent that these investments discourage private motorized transport, especially for short trips, this would lead to a reduction in the negative externalities associated with it.

On one hand, investments in cycling infrastructure could, in the short term, reduce vehicular congestion by discouraging the use of private motorized transport. However, these investments can also increase congestion by allocating urban road space for the exclusive circulation of cyclists. In line with this last point, a study finds that they generated greater congestion on urban roads,⁵⁴ and contrary to expectations, there is no evidence of a substitution effect between cars and bicycles, which minimizes the positive effect of bike lanes on congestion.^p

CAF's financing of cycling infrastructure may have reduced greenhouse gas emissions in the region.

On the other hand, CAF's financing of cycling infrastructure may have reduced greenhouse gas emissions in the region, which would help reduce environmental pollution. It is estimated that investments in bike lanes in Bogotá could reduce GHG emissions by between 0.04% and 0.23% of the city's annual emissions.^{55,q} Additionally, bicycle use can reduce annual emissions by 2.4%.⁵⁶ Interventions that, in addition to cycling infrastructure, include investments for pedestrians in sidewalks and pedestrian crossings would also reduce GHG⁵⁷ and CO₂⁵⁸ emissions per capita, which would be explained by a reduction in motorized trips.

p Furthermore, a study indicates that bike lanes did not affect congestion levels in the intervened districts and avenues, and may even have reduced congestion on certain avenues, even while maintaining vehicle volumes ([New York City Department of Transportation, 2014](#)).

q In addition to the different methodologies used to calculate emission reduction, the differences in the estimates are due to the lengths of the bike lanes, which vary between 52km and 592km.

Lastly, the development of cycling infrastructure, by separating and organizing traffic from different modes of transport on urban roads, would allow cyclists to travel more safely and reduce accidents between bicycles and other vehicles. The risk of road accidents would decrease as investment in cycling infrastructure discourages the use of private transport, although it could also increase with the higher use of bicycles. Some studies in Europe indicate that cycling infrastructures do not seem to impact road accidents.⁵⁹ However, they do not find that the investments have discouraged the use of private motorized transport, which would minimize the positive effect of bike lanes on road safety. It should be noted that the rate of fatalities from road accidents in Europe is lower than that of LAC,¹⁵ so it would be expected that the impact of these interventions on road safety would be greater in our region.^r

The infrastructure of sidewalks and bike lanes financed by CAF improves access to and the quality of active mobility in the region.

In summary, the infrastructure of sidewalks and bike lanes financed by CAF improves access to and the quality of active mobility in the region. By increasing the protection of users, it promotes walking and cycling, which can improve people's health, and could also discourage the use of private cars. This greater access to economical, sustainable, and safe modes of transport is associated with increases in employment levels and sales. Furthermore, as the use of private motorized transport is reduced, CAF's action leads to less environmental pollution and can improve safety for cyclists.



^r On the other hand, a study indicates that bike lanes may have reduced road accidents, both for cyclists and pedestrians ([New York City Department of Transportation, 2014](#)).

Urban Roads

CAF'S ACTION OVER THE PAST 6 YEARS (2018-2023)

29 credit operations

with the construction, improvement,
and/or rehabilitation of urban roads

5 countries

Argentina, Bolivia, Brazil, Ecuador and Uruguay



As highlighted in [ImpactCAF - Roads](#), CAF's support for road infrastructure investment can reduce travel times and costs, leading to greater market access, and increased exports, employment, production, and productivity. It can also expand economies and reduce poverty levels. Furthermore, it facilitates access to health and education services, increasing enrollment and school attendance.

Although more limited, evidence on urban roads suggests that CAF's action could increase household consumption and investment levels.^{60,s}

While road investments encourage car use,⁶¹ this doesn't necessarily translate into higher levels of congestion, environmental pollution, or road accidents.

Based on research findings, an increase in road infrastructure is accompanied by a proportional increase in vehicular traffic,⁶² meaning these investments don't typically solve city congestion problems but don't significantly worsen them either.

Regarding environmental pollution, CAF's support for proper road maintenance can also contribute to its reduction.⁶³ Good road quality and smooth pavement improve vehicle efficiency by allowing more constant speeds, potentially leading to reduced CO₂ emissions.⁶⁴

^s This type of intervention could also increase vehicle ownership ([Gonzalez-Navarro and Quintana-Domeque, 2016](#)).

Lastly, CAF-funded road infrastructure investments could also reduce road accidents and their severity,⁶⁵ thanks to improvements in pavement quality.^t

Grade-separated railway crossings

Through a USD 75 million loan, CAF financed the construction of ten vehicular and pedestrian grade-separated crossings in the Metropolitan Region of Buenos Aires, aiming to improve urban connectivity.

This project will prevent contact between railway services and the road network, as well as separate railways from pedestrian circulation, reducing the risk of road accidents and improving vehicular circulation and railway operation frequency.

CAF contributes to the development of an infrastructure network of quality public and collective spaces, based on an integrated and inclusive approach, ensuring versatility and safety for a diverse range of users and mobility types.

Streets, besides being used for passenger and goods transit, can also function as work and leisure spaces, among other activities. Therefore, CAF contributes to the development of an infrastructure network of quality public and collective spaces, based on an integrated and inclusive approach, ensuring versatility and safety for a diverse range of users and mobility types.

An example is the design and implementation of **Complete streets**, which allow different mobility modes and activities to coexist in the same public space. This addresses the needs of various user types and ensures comfort, safety, and inclusiveness.⁶⁶ Complete streets can offer various benefits to residents, such as improving pedestrian and cyclist safety and comfort, reducing air pollution and noise, and boosting economic activity, among others.⁶⁷



^t Furthermore, including road safety audits in the design of these infrastructure projects also improves the quality of the infrastructure and could reduce the number of accidents.

Complete streets and CAF's support to the City of Fortaleza



With a USD 83 million loan, CAF supported the city of Fortaleza (Brazil) with the *Aldeia da Praia - Fortaleza City con Futuro Program*.

This program involved infrastructure and service works, such as the refurbishment of tourist corridors, the enhancement of culinary districts, and the renovation and improvement of various public space access points. The aim was to enhance urban development in the city and boost its tourism potential and competitiveness.

These investments facilitated the coordination and integration of the city's tourist attractions and are an example of interventions based on the concept of complete streets. This approach seeks to create spaces that are equitably and efficiently distributed among users of urban roads, directly impacting the cities' economic activity.

Such streets not only enhance the economic activity of cities but also contribute to reducing the risk of road accidents and environmental pollution by discouraging the use of individual motorized transport.⁶⁶

Urban logistics

CAF'S ACTION OVER THE PAST 6 YEARS (2018-2023)

3 credit operations

with urban logistics (markets, logistic center and urban roads) components

2 countries

Brazil and Ecuador

These interventions are:

ECUADOR

1. **Cuenca Unida Program, Municipality of Cuenca, Ecuador.**

CAF financed the repaving of **urban roads** (38.5 km) to improve accessibility and connectivity to public spaces and services, like parks and markets, with a USD 48 million loan. The construction of a **logistics center** (Centro Logístico de Transferencia de Víveres y Mercados) connected to the retail supply network and a new **market** (Centro de Abastos Azuay). These projects ultimately aim to address the congestion issues of the El Arenal Market, which currently exceeds its functional capacity.

BRAZIL

2. **Infrastructure, Economic, and Socio-Environmental Development Program of Itapipoca (PRODESA), Brazil.**

This program involves the construction of two **markets** and the renovation of the historic Cereales market. The aim is to accommodate the street vendors who currently congest the streets surrounding the central market.

3. **Urban, Social, and Environmental Integration and Development Program, Municipality of Camaçari - State of Bahia, Brazil.**

This program will implement five new **markets** and refurbish two existing ones, reducing congestion around the central market caused by informal sales in the surrounding area. Additionally, the works will improve food provision and reduce the distances required to access it.

CAF's financing aimed at building and relocating markets seeks to reduce the externalities caused by vehicular and pedestrian congestion around central markets, especially when the road infrastructure is not equipped for such activity (both for the flow of people and goods). Therefore, by relocating these markets, alleviating congestion through new markets, or via an integrated network of markets, positive outcomes for cities could be generated. However, decentralization might lead to a price increase as the economies of agglomeration derived from the concentration of vendors in a single market, which positively affect the reduction of prices paid by consumers, would no longer exist.



These markets aim to reduce negative externalities linked to urban logistics, such as heavy vehicle traffic on unprepared urban roads and noise levels, among others.

While evidence on the impact of these interventions is limited,^u CAF designed a [guide](#) featuring a selection of projects promoting good practices in sustainable and safe urban logistics.¹⁹

Regarding central market relocation, notable examples include:

- **Mercabarna, Barcelona:** Different supply markets were moved to an area with excellent communications, while the old markets were converted into public spaces and a university.
- **Gran Mercado Mayorista de Lima (Peru):** A public market was relocated from downtown Lima to an area further from the urban center, with the goal of reducing heavy vehicular traffic.
- **Parque Agroalimentario de Montevideo:** This initiative, which will include the Fruit and Vegetable Market, will be relocated from the city center to a more distant area (La Tablada).

These markets aim to reduce negative externalities linked to urban logistics, such as heavy vehicle traffic on unprepared urban roads and noise levels, among others. However, if logistic distribution is not coordinated and decentralized properly, sellers might have to increase their travel distances.^v

On the other hand, in connection with the Cuenca Food and Market Logistics Transfer Center, cases of urban distribution micro-platforms are highlighted. These are small break-bulk platforms that consolidate cargo at a single point and then distribute it to the final delivery point using more efficient and sustainable transportation systems, avoiding the multiplication of delivery vehicles circulating in areas with high commercial density. As they increase logistical efficiency, it is expected that they will reduce the number of kilometers traveled by distribution vehicles, which could lead to lower levels of congestion, environmental pollution, and road accidents.¹⁹ It is important to note that if logistical distribution is not properly planned and monitored, these interventions may not achieve the expected benefits.

^u To date, we have not identified any work that rigorously evaluates the impact of public markets and logistics centers. Regarding the component of repaving urban roads, there is evidence that investment in road infrastructure impacts greater market access, increased production and productivity, among other positive outcomes ([ImpactCAF - Roads](#)).

^v As pointed out in a study analyzing the relocation of Melbourne's wholesale fruit and vegetable market ([Aljohani and Thompson, 2018](#)).



Paseo del Bajo project in Buenos Aires City

In 2017, CAF financed the construction of the Paseo del Bajo, a critical 7.1 km road corridor in Buenos Aires City, with a USD 400 million loan. This project aims to enhance the city's connectivity with the metropolitan region's transport network and optimize urban transit and logistics.

The Paseo del Bajo features four exclusive lanes for trucks and long-distance buses and eight lanes for light vehicles, benefiting over 135,000 people who cross the city daily. It also includes green spaces and bike paths to encourage recreation and promote sustainable mobility.

Key impacts of the project include reduced travel times and costs, leading to improved competitiveness for businesses and increased productivity. Additionally, the modal separation between light and freight transport helps decrease logistics costs associated with domestic and international trade, GHG emissions, and noise pollution.

Other CAF-supported actions

CAF'S ACTION OVER THE PAST 6 YEARS (2018-2023)

29 technical cooperation projects

related to urban mobility

\$21 million
dollars

CAF promotes mobility systems aligned with urban development and encourages the strengthening and innovation in mobility management.

These resources aimed to achieve two objectives: promote mobility systems aligned with urban development and encourage the strengthening and innovation in mobility management.

Regarding the first objective, CAF assists countries in developing comprehensive mobility plans. They aim to foster compact city development and planning for controlled urban

expansion, integrating transportation policies with land use. As for the second objective, CAF collaborates in enhancing the management of people and goods transportation. This includes developing strategies to address critical aspects of the negative externalities of motorized mobility; collecting and utilizing data for the planning, design, and implementation of sustainable mobility systems; applying new technologies; and creating innovative business models for transportation systems in partnership with the private sector.

Key projects supported include:



» **E-MOTION Electric Mobility and Low Carbon Transport:**

Aiming to promote the transition to electric mobility in Latin America, it is a joint effort between CAF, the French Development Agency (AFD), the German Development Bank (KfW), and the German Technical Cooperation (GIZ). In this regard, CAF and the Green Climate Fund (GCF) will allocate USD 231 million for the E-MOTION Program in Panama, Paraguay, and Uruguay, supporting the deployment of electric vehicles.

» **Electric Bus Pilot Monitoring Study:**

This study aims to analyze the technical, operational, economic, and environmental feasibility of electric buses in Buenos Aires City. It is a collaborative effort involving the Buenos Aires City Government, the private sector, and bus line operators. The study revealed that the two electric buses, which replaced two diesel technology buses, reduced CO₂ equivalent emissions by 62%.⁶⁸

» **Urban Mobility and Logistics Plans:**

These plans aim to provide a diagnosis of mobility issues and develop solutions for the challenges cities face in terms of people and goods movement. In collaboration with cities and supported by the European Union, KfW, and AFD, since 2018, 15 urban mobility and logistics plans have been developed in Brazil, Bolivia, Colombia, Ecuador, Panama, and Peru.

» **Pre-investment in Transportation Systems:**

Designed to enhance regional mobility systems, notable efforts include conducting pre-feasibility studies for transportation systems in various cities such as Tarija (Bolivia), Fortaleza (Brazil), and Sucre (Peru). Additionally, feasibility studies have been carried out for various public transport projects, including the tram line in Panama's historic center, the Integrated Transport System of Piura (Peru), and the BRT system in Trujillo (Peru).

- » **Ella se mueve segura (She Moves Safe):** This initiative includes various efforts aimed at understanding the urban social realities experienced by women and the limitations created by harassment in public transport, to propose actions addressing this issue. In collaboration with the FIA Foundation, an interdisciplinary study was conducted on women's perception of safety in public transport in Buenos Aires, Quito, and Santiago.⁸ Additionally, in partnership with the German Agency for International Cooperation (GIZ) and its Transformative Urban Mobility Initiative (TUMI), support was provided to the District Secretariat for Women in Bogotá for the implementation of the [Me Nuevo Segura Project](#). This project involved measuring vehicular roads and bike paths to develop a safety index and conducting surveys on women's perception of safety in public transport. Following Bogotá's experience, CAF also supported the Secretary of Transport and Public Works of Buenos Aires City to replicate this project in the city's informal neighborhoods.⁶⁹



- » **Bogotá al Derecho:** This project aims to improve pedestrian infrastructure to ensure that people with disabilities can move smoothly through the city, in a joint effort with the Mayor's Office of Bogotá. To implement this initiative, CAF is financing a diagnostic study on the pedestrian infrastructure that needs improvement to ensure greater accessibility, a proposal for solutions coordinated among various state institutions, and an analysis of financial sustainability.
- » **Latin American Urban Mobility Observatory (OMU):** This regional public platform provides solid, reliable, and updated information on transport and urban mobility^w in 29 cities, enabling citizens and governments to make informed decisions and define evidence-based policies. OMU was developed jointly with the Inter-American Development Bank (IDB) and regional cities.

^w Namely: indicators of accessibility, congestion, coverage and quality of public transport, among others.

- » **TUMI Data:** This project aimed at improving the region's mobility systems through the use of technology and quality data was funded through a technical cooperation with GIZ for €800,000. Academic research was conducted to address mobility issues, and technological innovations were applied in Bogotá, Cuenca, Fortaleza, and São Paulo. Additionally, digital tools for decision-making were developed, including a chatbot for citizen reports on mobility.



In summary

Urban transportation is a key element for citizens to access the various opportunities cities offer, such as jobs, education, health services, or social activities. However, in LAC, there are gaps in access and quality of urban mobility. For instance, over 20% of Latin Americans do not have a formal public transport option within 10 minutes of their home, and the road infrastructure for pedestrians and cyclists is low compared to the number of trips made using these modes. Added to these issues are the negative externalities generated during mobility, such as vehicular congestion, road accidents, and environmental pollution.

Recognizing these challenges and committed to the region's development, CAF finances and mobilizes resources to improve access and quality of urban transport through projects in public transportation, cycle infrastructure, urban roads, and urban logistics.

These interventions have led to reduced travel times via public transport and enhanced cyclist safety, increasing the use of public transport and cycle infrastructure by 6% to 48%. This has improved the working conditions and access to various services for people in Latin America and the Caribbean.

Furthermore, CAF's initiatives positively impact urban mobility by discouraging the use of private motorized transport, thereby helping to limit and reduce associated negative externalities such as traffic congestion, road accidents, and environmental pollution. Collectively, these efforts do more than transform urban mobility; they also significantly enhance the quality of life for citizens, forging the path for a more sustainable and inclusive future in the region.



References

- 1 [United Nations \(2019\)](#) and [World Bank \(2022\)](#)
- 2 [WHO \(n.d.\)](#) and [ECAF \(2016\)](#)
- 3 [ECAF \(2016\)](#)
- 4 [WHO \(n.d.\)](#)
- 5 [Giraldez et al. \(2022\)](#)
- 6 [Rivas et al. \(2019\)](#)
- 7 [Vasconcellos et al. \(2019\)](#) and [Instituto de Desarrollo Urbano \(2022\)](#)
- 8 [Allen et al. \(2019\)](#)
- 9 [Estupiñán et al. \(2018\)](#)
- 10 [Índice de Tráfico de Tomtom \(2022\)](#)
- 11 [Calatayud et al. \(2021\)](#)
- 12 [Parry et al. \(2007\)](#), [Watts et al. \(2015\)](#), [European Environment Agency \(2016\)](#), [IPCC \(2023\)](#) and [Allub et al. \(forthcoming publication\) at www.caf.com](#)
- 13 [IEA \(2023\)](#)
- 14 [Health Effects Institute \(2020\)](#) and [IHME \(2020\)](#)
- 15 [IHME \(2020\)](#)
- 16 [Navas Duk et al. \(2021\)](#)
- 17 [WHO \(2011\)](#)
- 18 [ICLEI \(n.d.\)](#)
- 19 [CAF \(2019\)](#)
- 20 [ITDP \(2019\)](#)
- 21 [Guerra \(2014\)](#), [Majid et al. \(2018\)](#), [Martinez et al. \(2018\)](#), [Garsous et al. \(2019\)](#) and [Fageda \(2021\)](#)
- 22 [Garsous et al. \(2019\)](#)
- 23 [Guerra \(2014\)](#), [Xie \(2016\)](#), [Gonzalez-Navarro and Turner \(2018\)](#), [Majid et al. \(2018\)](#), [Martinez et al. \(2018\)](#), [Martinez et al. \(2020\)](#) and [Wang et al. \(2023\)](#)
- 24 [Combs and Rodriguez \(2014\)](#), [Xie \(2016\)](#), [Zhang et al. \(2016\)](#), [Lalive et al. \(2018\)](#), [Martinez et al. \(2018\)](#), [Lin et al. \(2021\)](#) and [Yu et al. \(2020\)](#)
- 25 [Guerra \(2014\)](#)
- 26 [Martinez et al. \(2018\)](#)
- 27 [Holzer et al. \(2003\)](#), [Bocarejo et al. \(2014\)](#), [Asahi \(2016\)](#), [Mayer and Trevien \(2017\)](#), [Martinez et al. \(2018\)](#), [Scholl et al. \(2019\)](#) and [Martinez et al. \(2020\)](#)
- 28 [Asahi \(2016\)](#) and [Scholl et al. \(2019\)](#)
- 29 [Zárate \(2022\)](#)
- 30 [Martinez et al. \(2018\)](#), [Scholl et al. \(2019\)](#) and [Martinez et al. \(2020\)](#)
- 31 [Tsivanidis \(2023\)](#)
- 32 [Asahi \(2016\)](#), [Martinez et al. \(2020\)](#) and [Velásquez \(2022\)](#)
- 33 [Heres et al. \(2014\)](#) and [Balboni et al. \(2020\)](#)
- 34 [Holzer et al. \(2003\)](#)
- 35 [Martinez et al. \(2020\)](#)
- 36 [Yang et al. \(2018\)](#), [Fageda \(2021\)](#) and [Gu et al. \(2021\)](#)
- 37 [Bel and Holst \(2018\)](#)
- 38 [Bel and Holst \(2018\)](#) and [Espinoza Escobar and Gutierrez Fernandez \(2021\)](#)
- 39 [Chen and Whalley \(2012\)](#), [Goel and Gupta \(2017\)](#), [Lu et al. \(2018\)](#) and [Zheng et al. \(2019\)](#)
- 40 [Lu et al. \(2018\)](#) and [Xiao et al. \(2020\)](#)
- 41 [Xiao et al. \(2020\)](#)
- 42 [Fageda \(2021\)](#)
- 43 [Lalive et al. \(2018\)](#)
- 44 [Environmental Secretariat of Bogotá \(2023\)](#)

- 45 [Budiakivska and Casolaro \(2018\)](#)
- 46 [Lichtman-Sadot \(2019\)](#)
- 47 [Sánchez González et al. \(2021\)](#)
- 48 [Bocarejo et al. \(2012\) and Duduta et al. \(2012\)](#)
- 49 [Goh et al. \(2013\)](#) and [Truong and Currie \(2019\)](#)
- 50 [Kraus and Koch \(2021\)](#)
- 51 [Goodman et al. \(2013\)](#)
- 52 [Sinnott et al. \(2011\)](#), [Celis-Morales et al. \(2017\)](#) and [Ma et al. \(2021\)](#)
- 53 [Hack \(2013\)](#), [New York City Department of Transportation \(2014,\)](#) and [Liu and Shi \(2020\)](#)
- 54 [Schrauth \(2023\)](#)
- 55 [Reich \(2022\)](#), [Environmental Secretariat of Bogotá \(2023\)](#) and (CAF [internal document], 2023a)
- 56 [Massink et al. \(2011\)](#)
- 57 [Ngo \(2016\)](#)
- 58 [Brand et al. \(2021a, 2021b\)](#)
- 59 [Li et al. \(2017\)](#) and [Schrauth \(2023\)](#)
- 60 [Gonzalez-Navarro and Quintana-Domeque \(2016\)](#)
- 61 [Duranton \(2011\)](#)
- 62 [Duranton \(2011\)](#) and [Chen and Klaiber \(2020\)](#)
- 63 [ImpactoCAF - Roads and EAPA, EUPAVE and FEHRL \(2016\)](#)
- 64 [Moussa \(2023\)](#)
- 65 [Bock et al. \(2021\)](#) and [Quyang et al. \(2022\)](#)
- 66 [Alegre Escorza et al. \(2022\)](#)
- 67 [Litman \(2015\)](#)
- 68 [Maio et al. \(2021\)](#)
- 69 [CAF \(2023\)](#)