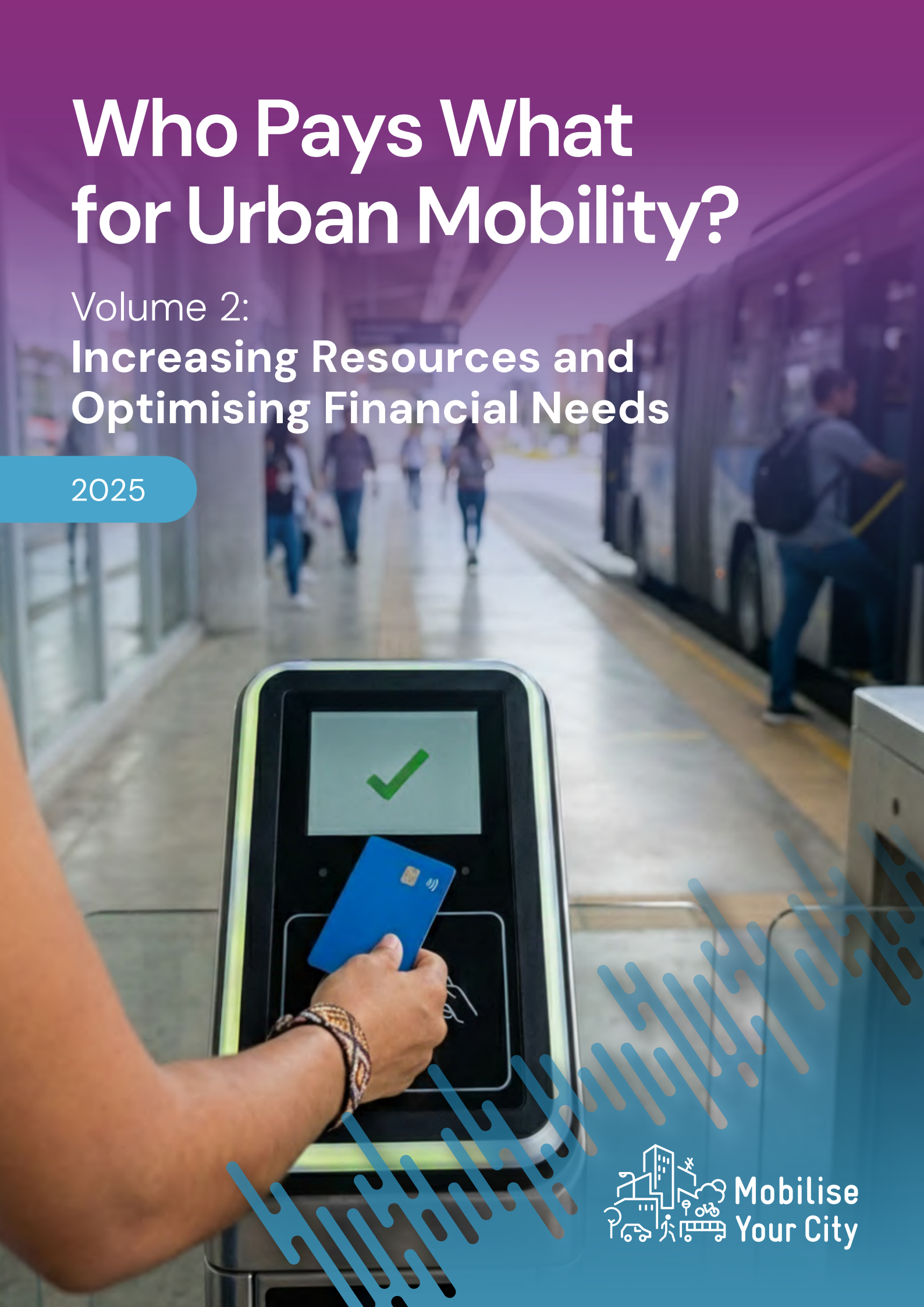
Who Pays What for Urban Mobility?

Volume 2:
Increasing Resources and Optimising Financial Needs

2025



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Title
Who Pays What for Urban Mobility?
Volume 2: Increasing Resources and Optimising Financial Needs

Published and distributed
December 2025

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About this publication

Urban mobility needs are steadily increasing worldwide, particularly in rapidly growing cities of the Global South. The development of sustainable and efficient urban mobility systems to meet this increasing demand is vital to these countries' development paths, as they provide a strong backbone for ensuring access to jobs, public services, socio-economic opportunities, economic development, and freedom of movement.

Financing the development of urban mobility systems, however, poses a challenge for decision-makers in cities of the Global South. Setting the right financing policy, both in terms of objectives and instruments, is a complex task. It requires an analysis of the characteristics of a given city and its urban mobility systems, the institutional framework and its stakeholders, the overall vision for urban mobility in the city and the country, the available public funding and capacities, as well as a wide variety of funding and financing mechanisms that could be leveraged to achieve the set objectives.

This two-volume publication provides decision-makers with (i) a framework for designing an urban mobility financing policy and (ii) approaches to increase resources and optimise financial needs. Rather than offering ready-made answers or prescriptive solutions, this publication establishes a structured framework and key considerations to support decision-makers and urban mobility practitioners in designing and implementing their urban mobility financing policy.

The publications are structured in two volumes:

- Volume 1: Designing an urban mobility financing policy.
- Volume 2: Increasing resources and optimising financial needs.

These publications build on the **handbook of good practices – who pays what for urban transport**, developed by MEDDE and CODATU for AFD.

Introduction and Executive Summary

The first volume in the Who Pays What for Urban Mobility? Provides an analytical framework for decision-makers in cities of the Global South to formulate efficient and effective urban mobility financing policies. This second volume starts with a review of potential revenue sources and how to mobilise them more effectively, then guides readers in maximising available revenues to improve urban mobility.

Key takeaways from Volume 2 are summarised below:

What resources are available for urban mobility, and how can they be optimised?

Resources for urban mobility can take multiple forms and be mobilised in various ways, for investment or for operations:

- Revenues from direct beneficiaries of urban mobility systems:
  - Public transport users: Fare revenues
  - Users of individual modes: Taxes on petrol products, tolls, parking, taxes on vehicle ownership and private usage.
- Revenues from indirect beneficiaries:
  - Employer contributions: contributions through taxes on payroll, direct support to employees, refund of part or all of the transport costs, and organisation of employees' transport.
  - Property and shop owners, businesses, developers, residents and retailers: Revenues generated through land value mechanisms.
- Indirect revenues from urban mobility systems: advertising using the spaces and equipment of urban mobility systems.
- Direct and indirect taxes allocated to the urban mobility sector (local, regional or national resources) that can be directed to the industry through investment or operation subsidies.
- Grants and concessional financing from funding agencies and development institutions.

Infrastructure investment can be funded by a range of actors at the local, regional, and national levels. This requires checking the coherence and effectiveness of investment decisions against the overall sector financing policy and objectives.

How to do more with available funds?

Defining the right mix of funding sources, as described in Volume 1, should be carefully considered. Equally important is determining how best to leverage these sources.
For example, how to optimise the overall cost of the urban mobility systems for public authorities.

Three main levers are available for decision-makers to maximise the impact of available funding:

- Improving the financial performance of urban systems through an analysis of the revenue-to-cost ratio of their formal public transport networks (paratransit networks being assumed self-sustained and not supported by public authorities). Some key and commonly used operational indicators in the public transport industry can be used to conduct this analysis.
- Leveraging private financing to reduce the investment burden of public authorities, or spread public expenditure over a long period, through the use of Public-Private Partnerships.
- Finding new financing sources to reduce financing costs, such as climate-related investment mechanisms.

A detailed description of each of these levers is provided in CHAPTER 2.

Box 1

Funding vs. Financing

Funding and financing are distinct concepts often used interchangeably, but they differ in key ways that vary depending on context. In this handbook, we distinguish them as follows:

Funding vs Financing

- Funding refers to money available for a specific purpose without repayment obligations. It comes from users of a service or an infrastructure in the form of fees, from governments and their entities through budget allocations or dedicated tax and fee instruments, or from donor organisations as grants. Funding relates to obtaining financial resources to (re-)pay the upfront and ongoing expenditures.

In a broader sense, it can encompass the revenue levied from users.

- Financing is the broader process of obtaining financial resources to match expenditure at each point in time. Usually financing refers to mobilize financial resources to cover initial investments, including debt financing and fundraising, most of these resources must be repaid at a later stage, usually with interest or dividends: the difference between the total financial resources required for the desired purpose (i.e. required financing) and the available funding at each point in time needs to be secured as loans or credit lines from banks and financial institutions, or as equity from investors expecting a return and the capacity to sell their equity interest for a price. These financial instruments enable matching present expenditure needs (for example, one-time investments or temporary deficits) with future funding.

Together, funding and financing constitute financial resources available at a given point in time.

In summary, Who pays what for urban mobility? uses funding to designate the actual money available to pay for urban mobility and uses financing as the broader method of balancing available funding with desired expenditures over time by complementing funding with repayable financial instruments (e.g. debt financing tied to repayment obligations)

Chapter 1

Primary funding sources for urban mobility

This chapter provides an overview of the primary financial resources available for urban mobility. It analyses existing funding mechanisms, identifies potential revenue streams, and offers practical recommendations to optimise resource mobilisation and improve the financial sustainability of urban mobility systems.

1.1 Global overview of urban mobility funding sources

As detailed in Volume 1, three main types of financial resources are mobilised for the urban mobility sector:

- Public funds, which can take the form of general budget funded by taxpayers through direct and indirect taxes, or of loans and grants mobilised from banks and funding agencies.
- Direct beneficiaries or urban mobility systems (users)
- Indirect beneficiaries of urban mobility systems include property owners, shops and businesses, and employers.

All these resources are mobilised in different ways in the urban mobility sector, for investment or for operation.

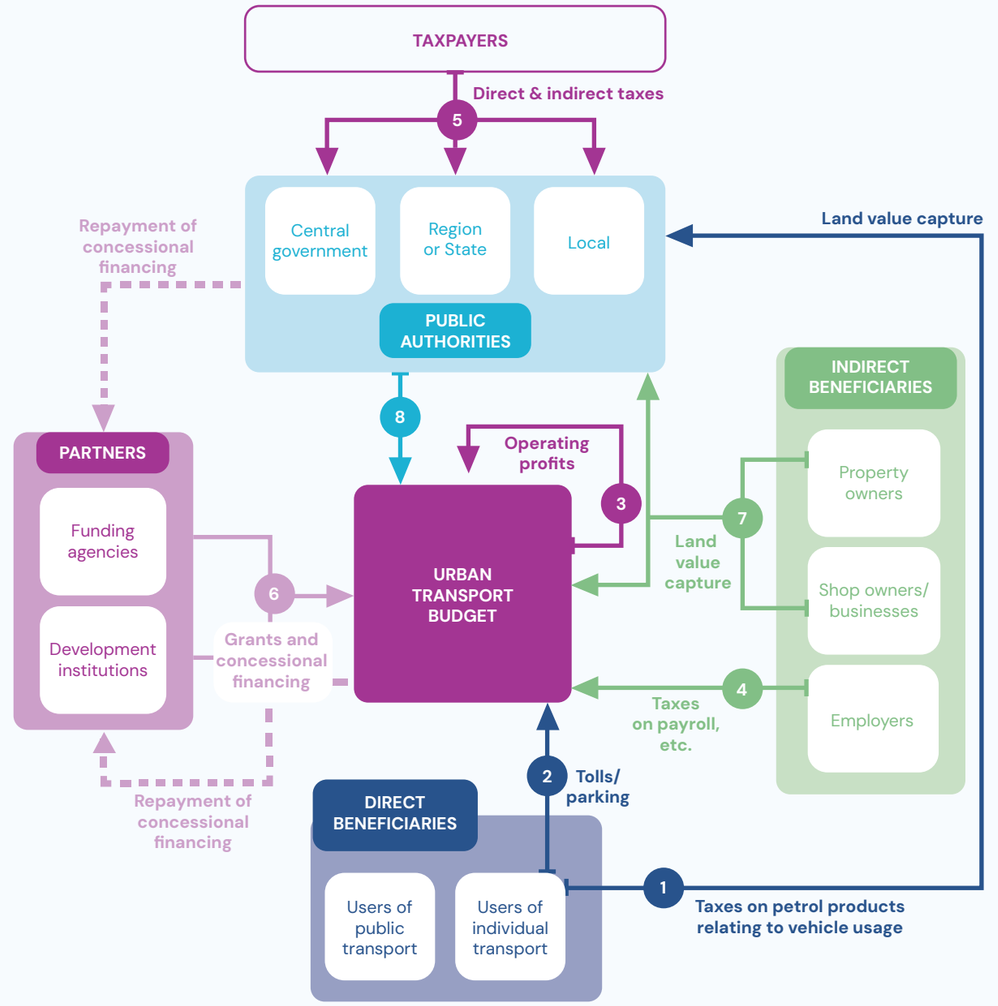
1.1.1. Resources for investments

Investments in urban mobility typically encompass road infrastructure and construction projects, car parks, traffic management tools, public transport infrastructure, rolling stock, ticketing systems, and road works associated with the development of public transport or non-motorised modes of transport.

In the context of ongoing decentralisation policies, new actors are emerging at regional and local levels, leading to increasingly diverse financing arrangements. Local authorities and national development banks are taking on a growing role in funding mobility-related projects. While this diversification of sources can expand the overall volume of funds available for urban mobility investments, it also introduces risks to coherence and efficiency if a clear and coordinated financing policy is not established.

The graph on the right, together with the subsequent paragraphs, provides an overview of the different financial resources that can be mobilised for urban mobility investments. A more detailed description of each category is presented in the following sections of this chapter.

Figure 1: **Who finances investment in transport projects?**



The primary sources of financing in the transport sector include:

1. Road users and transport operators:

Private cars, trucks and bus transport operators (with certain exemptions) pay taxes on petroleum products, which are allocated to national or local budgets. These taxes are typically allocated within national or local budgets, and part or all of the revenues may be earmarked for urban mobility investments. However, as noted previously, revenues from public transport fares are seldom sufficient to cover operating costs and therefore cannot be used to finance capital investments.

2. Congestion charges, tolls, and parking fees:

The same users may also have to pay for congestion charges, infrastructure tolls and parking, which are allocated to the local public authority (or urban mobility authority when it exists).

3. Operating surpluses:

Where the transport system generates an operating surplus, these profits can be reinvested to improve or expand the system, thereby contributing to its long-term sustainability.

4. Employers' contributions:

Employers may be subject to payroll-related taxes or business levies that are allocated for the local public authority or urban mobility authority when it exists. Such mechanisms can provide a predictable and stable source of funding for public transport and related mobility infrastructure.

5. Taxpayers' contributions:

Citizens contribute to urban mobility financing through direct and indirect taxes to the national, regional and local budgets. A portion of these revenues may be allocated to investments in urban mobility infrastructure and services, depending on government priorities and fiscal arrangements.

6. Grants and concessional financing:

Public authorities can mobilise grants, concessional loans, and other forms of financial support from national or international financial institutions. Such funding often targets strategic urban mobility projects, capacity development, or pilot initiatives aligned with broader development and climate objectives.

7. Land value capture mechanisms:

Property owners, shop owners, developers, residents, and retailers may contribute indirectly to transport investments through mechanisms that capture part of the increase in land or property value generated by new transport infrastructure. These instruments—commonly referred to as land value capture mechanisms—can include betterment taxes, development charges, or negotiated developer contributions.

8. Public authority budget allocations:

Finally, national, regional, and local public authorities contribute to urban mobility financing from their own budgets.
These resources are typically derived from a combination of direct and indirect beneficiaries, taxpayers, and financial partners. They may be used to co-finance projects or to support the operation and maintenance of mobility systems.

1.1.2. Resources for operation

It is rare to find public transport systems that are profitable and can cover the full cost of operating. In fact, most public transport operators, whether public or private, rely on public funding to offset operational revenue shortfalls. Compared to developing countries, developed countries are generally able to fund a larger share of operating costs, providing higher subsidies in proportion to their financial abilities. They also benefit from innovative funding models, such as land value capture or employer contributions. To fund urban mobility operations, the following resources are available:

→ Revenues from direct beneficiaries:

- Fares collected from public transport users are used directly to fund the operating costs of public transport systems.
- Tolls paid by users of private motorised transport modes (congestion charging, parking charges, infrastructure tolls) if this revenue is allocated to urban mobility (directly to the urban mobility authority if it exists, or to the local public authority).

→ Revenues from indirect beneficiaries:

- As for resources available for investment funding, property owners, shop owners and businesses, developers, residents and retailers, through various modalities, can pay a portion of the property value gains generated by the construction of a transport infrastructure in their vicinity. This can be materialised through a land value capture mechanism and, if dedicated to urban mobility, can also fund operations.
- Employers can also pay a proportion or the totality of their employees' public transport fare, through direct compensation or through a tax paid to local authorities.
- Indirect revenues from urban mobility systems: Advertising companies that use the spaces and equipment of urban mobility systems pay a portion of their advertising revenue to the urban mobility authority, the local public authority, or the transport system operators.

→ Subsidies from public authorities to cover the operational deficit.

Photo: **Nopparuj Lamaikul**

1.2. Revenues from public transport system users

Farebox revenue is generally the primary source of revenue for public transport operators or authorities. Volume 1 of this publication details the key aspects that must be considered when defining public transport fare policy.

This section will dive into the different types of fare policies that decision-makers can implement.

1.2.1. A variety of fares can be implemented

A range of fares for different target groups

→ **Frequent & occasional users**

- Weekly and monthly passes are one-way public transport users can benefit from reduced fares compared to single-ticket buyers. Such passes secure user loyalty and increase occupancy rates. It must be noted, however, that weekly or monthly pass subscription models face implementation hurdles in developing cities, where households receive income daily, thereby reducing their purchasing power and their ability to make an advance payment for such a subscription.

- In public transport networks where this is offered, weekly and monthly pass holders tend to represent the majority of customers, which can lead to lower farebox revenue (as the unit price per ticket is lower). Revenue from one-off, single-ticket purchases can offset this decline.

→ **Social fares & solidarity fares**

- Despite being called "public" transport, the fares of public transport services can remain out of reach for a subset of the population in low- and middle-income countries. This is why certain cities or transport authorities offer discounted fares for specific groups, such as students, people with disabilities, unemployed individuals, or older people. Increasingly, however, there has been a shift in this approach, with transport authorities recognising that need should be evaluated based on income rather than vulnerability. There is still debate over the form in which this fare subsidy should be made, either as a direct contribution to governmental social stipends or to transport authorities' annual budgets.

Box 2

Transport fares set by income – The example of Strasbourg

Before Strasbourg, several French cities had already introduced similar fare schemes, such as Dunkirk in 1994, Brest in 2006, and Grenoble in 2009. Until 1 July 2010, fares for users of Strasbourg's public transport system were set according to their social status without taking income levels into account. This approach resulted in an unfair and unequal system, in which lower-income users, such as young people and single-parent households, ended up paying more than higher-income groups. Following public consultation processes, these cities introduced new fare schemes to promote fairness and social solidarity. Since then, public transport fares have been determined by household income level, based on the family quotient (quotient familial) calculated by the state's National Pension for Family Allowances. More details about how to direct subsidies to people experiencing poverty are provided in Volume 1, "Designing an urban mobility funding policy".

At the end of 2011, approximately 18 months after the introduction of the new fare scheme, the feedback was highly positive. Key outcomes included:

- 16,000 new pass holders across all fare categories;
- An additional €2 million in commercial revenue, bringing the annual total to approximately €40 million;
- 68,500 beneficiaries of the new solidarity fare, representing 58.2% of all pass holders.

This fare scheme has remained since its introduction in 2011. It comprised six fare categories structured around two complementary levels:

→ A basic fare calculated according to age: In 2024, the standard monthly fare was €56. A half-fare (€28) is applied to people aged 4-25 and to seniors aged 65 and above.

→ A progressive discount is applied depending on a household's income levels.

→ This fare scheme relies on a robust, mature social system capable of assessing and targeting users reasonably and efficiently, ensuring both social equity and financial sustainability within the public transport network.

Photo: **Kankan**

Fares by journey type

Fare amounts can be defined in different ways:

A flat fare is a single fare which remains the same across a geographical area, regardless of the mode of transport used or the distance travelled. Flat fares can apply for the entire day or at specific times. This type of fare is attractive to users who travel long distances and can help transport authorities manage fare collection and redistribution. Flat fares may disadvantage transport operators when most users take long trips. It can also have the unintended effect of increasing urban sprawl by promoting longer trips.

A kilometre-based fare is one based on distance travelled, as in Washington (USA) and Tokyo (Japan). This ensures that revenue is proportional to cost. However, it can be complex to implement, as it requires adequate ITS systems to enable check-in and check-out at all stations/stops. Another disadvantage of this fare model is that it can unfairly affect lower-income groups who tend to live farther from the city centre in more affordable areas on the periphery and are charged higher fares to cover longer distances.

A progressive fare is often a compromise between the operational needs of the transport system and broader urban policy objectives. In this case, "progressive" refers not to income levels but to the distance travelled or the geographical extent of a journey. Two main approaches are generally used to define such systems:

- Concentric ring system: The metropolitan area is divided into circular zones radiating out from the city centre. The fare increases with the number of rings crossed, reflecting the distance travelled from the central area. This model is typically suited to monocentric cities, where most journeys converge towards a single core.

- Zone-to-zone system: The territory is divided into multiple fare zones that may not be strictly concentric. Fares are calculated according to the number of zones crossed between the origin and destination. This approach is often applied in polycentric metropolitan areas, where several sub-centres generate complex travel patterns.

Both models aim to ensure fairness and cost recovery by linking fares to travel distance or scope, while allowing flexibility to adapt to local urban structures.

Box 3

Vale Transporte in Brazil - Covering costs for employees with the lowest income

In 2013, a new progressive fare system was introduced on the KRL Jabodetabek line in Jakarta's suburban train network, along with a new ticketing system called COMMET (Commuter Electronic Ticketing), which enabled the purchase of monthly passes.

The progressive fare combined a basic fare and an additional fare. At launch, the basic fare was set at Rp. 3000 (€0.21) for the first five stations, which rose by Rp. 100 (€0.07) every three stations.

In 2015, this structure was replaced by a distance-based fare that remains in effect: a basic fare of Rp 3,000 for the first 25 km, plus Rp 1,000 per additional 10 km. In comparison, the ticket fare for a one-way trip on the Yogyakarta Line Commuter train is 8,000 IDR in 2023.

Only one week after the implementation of this new fare system, rail passenger numbers in the Greater Jakarta area increased by 30%. The Ministry of Transportation, which subsidises the fare, distributed Rp. 1.1 trillion (€ 65 million) in subsidies to the Commuterline in 2016, representing 70% of total rail transportation subsidies.

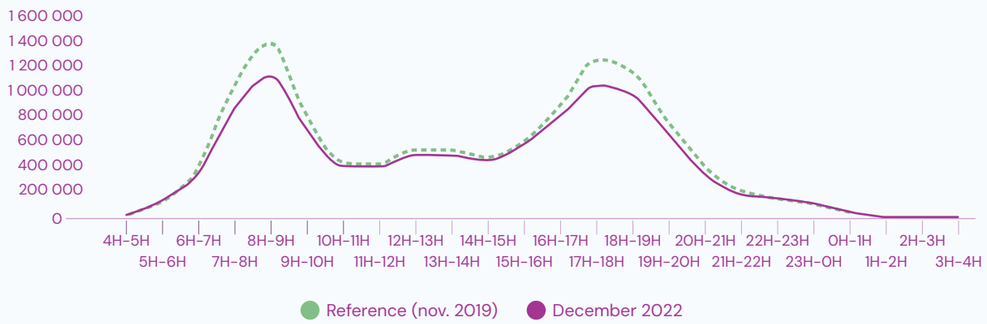
Photos: **Carlos Felipe Pardo**

Varying fares depending on travel time

It can be beneficial to introduce variable fares based on the time of day a trip is made. Such a fare structure encourages passengers who are not constrained by fixed schedules to travel during off-peak hours, when fares are lower. This helps reduce passenger volumes during peak periods and smooth out demand across the day. The graph below illustrates the distribution of public transport trips during a typical weekday in Île-de-France, where no time-dependent fares are currently applied. It clearly shows that most trips occur during peak hours.

This trend can be observed in most cities around the world. Some towns, however, do decide to implement variable fares, such as in London, Washington DC, Curitiba, Rennes, and Santiago. In Santiago, for example, a survey showed that after the introduction of variable fares, travel shifted by 4% from peak to off-peak hours.

Figure 2: **The number of trips conducted over the course of a weekday in Île-de-France per hour in 2022 and 2019**



Source: Open Data Île-de-France, December 2022

Box 4

Variable fares to counterbalance peak journey times

In Santiago, Chile there are three types of fares: off-peak (750 CLP, approximately €0.76), peak (11% higher, applied from 7 am to 9 am and 6 pm to 8 pm) and super off-peak fares (11% reduction, used from 6 am to 7 am and 8.45 to 11 pm). On Saturdays, Sundays and public holidays, all trips are charged at the off-peak rate. A passenger survey indicated that this fare differentiation led to a 4% modal shift, with users adjusting their travel times to take advantage of lower fares.

In Curitiba, Brazil, a special Sunday fare was introduced between 2005 and 2017, offering a 50% reduction on Sundays compared to weekday fares. The objective was to encourage leisure travel among low-income groups, particularly those who do not receive any employer transport subsidies on Sundays.

In Rennes, France, the Ganéo system was in place until 2013 to offer discounts to occasional travellers who chose to travel during off-peak periods. The system provided a 10% reduction on weekdays and a 20% reduction on Sundays and public holidays, promoting a more balanced use of public transport throughout the week.

Photo: **Onur Kayaci**

1.2.2. How to attract new customers?

Efficient management of public transport systems consists of reducing operating costs per km and increasing revenues per km. Preventing ticket fraud — where a user avoids paying a fare — is an essential part of optimising revenue. Users committing ticket fraud can sometimes account for between 10 to 20% of all users, which has a significant impact on an operator's commercial performance. Maximising ridership is another way to enhance revenue. This can be done by optimising passenger loads while maintaining or improving high-quality service levels.

This section provides an overview of the different ways to maximise farebox revenue and ridership levels. In all logic, it is essential to note that any growth in farebox revenue must be balanced against the impact this can have on occupancy levels. Furthermore, any effort to increase ridership must be matched with strategies to balance demand and supply.

Developing an integrated network

Public transport networks are often characterised by multiple modes that must be managed alongside each other. An integrated ticketing system can encourage passengers to switch between modes with ease, at no extra cost, thereby boosting connectivity and the attractiveness of public transport systems.

The underlying principle of fare integration is that a single ticket provides access to all modes of transport, regardless of the companies that operate them. In general, the fare is lower than the sum of the fares of each system, which is favourable to users but unfavourable to stable traffic revenues. Nevertheless, integrating fares makes the offer more appealing and can lead to higher demand volumes, which may partially offset the rate reductions.

However, fare integration requires the use of an advanced electronic ticketing system and management tools, formal agreements, the development of revenue distribution methods among the various operators and the ability to manage complex financial flows between operators. The adopted system must also be scalable and allow operators to enter and exit.

A great example of an integrated fare model is the Transjakarta system in Jakarta, Indonesia. Some recent initiatives are currently ongoing in several African cities, namely Tunis and Abidjan. Both cities are studying the possibilities of integrating their public transport networks. The projects are expected to be implemented in the coming years.

In developing cities with many owner-drivers, the issue is their integration into the system.

Box 5

The "single ticket" in the São Paulo urban area, Brazil

In this megalopolis of 20 million inhabitants, the São Paulo State Secretariat for Metropolitan Transportation (STM) coordinates interurban transport within the metropolitan area. Under the aegis of STM, the metro, rail lines, and rapid bus systems are managed and operated. Meanwhile, the City of São Paulo and the surrounding municipalities have their own urban transport authorities, primarily responsible for bus networks. Historically, each system used separate fare and ticketing systems, meaning users had to pay multiple times when transferring between modes, a factor that discouraged multimodal travel.

To address this fragmentation, in May 2004, STM decided to integrate fares across its three leading operators and reached an agreement with SPTrans (the municipal transport authority) to introduce the Bilhete Único ("single fare"). This integrated ticket allows passengers to make up to four journeys within three hours. In 2006, the system was extended to include the metro and commuter rail networks, further facilitating multimodal travel.

The success of the Bilhete Único led to the introduction, in 2013, of a "single monthly ticket" enabling unlimited travel across partner networks, including the metro. In 2024, this monthly ticket cost 362 reais (approximately €63). By 2019, nearly five million trips were made daily using the Bilhete Único, accounting for 56% of all public transport trips in São Paulo, a strong indicator of the system's widespread adoption and effectiveness.

Photo: **Bianca Monteiro**

Designing multimodal fares and infrastructure

To further increase the attractiveness of public transport services, multimodality is key. Measures to improve multimodality include Park & Ride facilities where drivers can park their cars and complete their journey by public transport, secure bicycle parking areas, and the construction of non-motorised transport infrastructure.

Box 6

Park & Ride fares in Grenoble, France - encouraging modal transfer to public transport

To encourage vehicle owners to leave their cars on the outskirts of town, the transport authority introduced a P&R system. 15 car parks, offering 2,800 spaces, are located along the tram lines. For €2.60 or €3.60, depending on the car park, drivers can leave their cars in a secure car park and make a return trip on public transport for the driver and passengers (up to five people). This represents a beautiful fare for four or five people sharing a car. A standard ticket for public transport costs €1.60 (valid for one hour, including connections and return journey). For public transport pass holders, P&R car parks are free.

To tackle growing urban traffic congestion and air pollution, the city of Beijing has operated several park-and-ride (PNR) facilities near central subway and bus stations - most of which are more than 10 km away from the centre - to complement the rapid development of public transport and encourage vehicle owners to leave their cars on the outskirts of the town. In 2014, the mean PNR fare was 2 yuan (€0.23) per hour, thanks to a mean subsidy of 6,89 yuan per parking lot per day to promote its use, totalling 25 million yuan (€2 million).

Photo: **Google Maps Screenshot**

Setting up intelligent passenger information systems

Another key feature to consider in promoting public transport systems is the use of intelligent passenger information systems. Facilitating real-time information on frequencies and connections with other lines can be a determining factor in encouraging ridership in a multimodal urban transport network. Targeted advertising campaigns can enable authorities to inform the public about the service and offer.

Box 7

Advertising campaigns to promote access to public transport in Toronto and Jakarta

In Toronto, the operators of Viva (a BRT system launched in 2005) ran a large-scale information campaign to attract a new customer base — those who generally use private forms of transport — and to encourage users aged 15 to 45, who account for 46% of the region's population. They explained Viva's advantages: 15% to 20% faster travel time than with a car, high-frequency service, real-time information, and connections with all of Greater Toronto's networks. The "Ride Viva Now" campaign was a success. In 2006, the Viva BRT line recorded 7 million trips, a figure that had grown to 22 million by 2012.

In 2021, in Jakarta, the United Nations Development Programme (UNDP) and the Indonesian Women with Disabilities Association (HWDI) launched the one-month campaign CINTABILITAS to promote safe and accessible public transport for people with disabilities, particularly those who were vulnerable during the COVID pandemic. The campaign produced an infographic video on disability-inclusive education. It used posters and branding at bus stops, commuter line train stations, and MRT stations to convey the importance of accessible public transport for people with disabilities.

Photo: **Jason Ng**

Implementing smart ticketing

Ticketing is a tool at the service of a fare policy. By replacing paper tickets with advanced technologies (cards with memory chips or magnetic cards), different fare grids can be implemented. It also facilitates citizens' access to the transport system, as in the case of Belfort, and allows operators and transport authorities to better track passenger data and make informed decisions to plan the system.

1.3. Revenues from users of private motorised modes of transport

"Private transport" is not limited to people; it also includes the transport of goods. It is often private transport users who reap the benefit of transport infrastructure, mainly road usage and reduced congestion spurred by public transport users. Yet it is also private transport users who generate the most negative externalities, including pollution, the consumption of city space, and road accidents. Increasingly, cities and transport planners are calling on private transport users to help offset these negative externalities by contributing to the costs of improving and expanding public transport and active transport systems.
Different forms of taxation on vehicle ownership and use exist worldwide, including vehicle ownership taxes, tolls, paid parking, and congestion charges, and are further detailed in the following sections. Some of these instruments are more commonly applied in developing countries, primarily because of their relative simplicity, lower implementation costs, and greater social acceptability.

Beyond generating financial resources, taxing the ownership or use of motorised vehicles can also serve as an effective policy tool to influence travel behaviour and encourage modal shifts towards more sustainable modes. For such measures to be effective, however, it is crucial to ensure that the urban mobility system can absorb the resulting modal transfer. Their design should also consider the potential impacts on different categories of traffic, such as goods transport and tradespeople.

Where possible, revenues from vehicle-related taxes should be earmarked for urban mobility rather than being directed to national budgets, as is often the case. The same principle can apply to net revenues from tolls and paid parking, which, under appropriate conditions, can make a significant contribution to financing sustainable mobility initiatives.

To ensure public acceptance, the introduction of measures such as congestion charging or paid parking must be accompanied by an efficient and attractive public transport system and safe, accessible infrastructure for active mobility. Travellers should not feel penalised or excluded, but rather perceive clear benefits such as reduced congestion, improved air quality, and enhanced urban liveability.

Finally, communication and awareness campaigns are essential before implementation, helping to build understanding and acceptance among users. Policymakers should also account for a key paradox: as congestion and car use decrease, revenue generation may decline. This dynamic should be considered carefully in financial planning and long-term sustainability assessments.

1.3.1. Taxes on vehicle ownership and private usage

Taxes are usually linked to the ownership or use of an individual motorised vehicle. Ecotaxes, which are still in their infancy, are part of the "polluter pays" principle and are designed to offset the costs a municipality incurs to scrap vehicles and to address the nuisances caused by pollution.

In France, since 2007, a "bonus-penalty" system has been in place to discourage people from buying more polluting vehicles.
The system, which was supposed to pay for itself, was not as successful as planned, and the deficit had to be covered by the State budget.

In addition, in developing countries, revenues from taxes on vehicle ownership and private use are often limited and insufficient to cover road maintenance costs.

Taxes on vehicle purchase and registration

The purchase of a vehicle generally entails paying registration taxes, often calculated based on factors such as engine power or, for heavy vehicles, the number of axles. These taxes are typically paid by each new owner at the time of vehicle registration.

In Lagos, Nigeria, the Lagos Metropolitan Area Transportation Authority (LAMATA) benefits from a dedicated transport fund that draws revenue from several vehicle-related sources, including new vehicle registration taxes, vehicle administration fees, road taxes, parking charges, and tolls. Together, these sources account for approximately 50% of the fund's total revenues, providing a significant and stable contribution to the financing of urban mobility initiatives.
In Japan, a vehicle purchase tax is applied at 5% of the purchase price for private vehicles and 3% for professional-use vehicles—tax redc for professional use. Reductions are possible when purchasing low-emission cars. The tax is collected by the local authority and used to maintain the road network.

Singapore was the first country to launch a Vehicle Quota System (VQS), implemented in 1990 to control the rapid growth in private vehicle ownership. Under this system, the Land Transport Authority (LTA) sets, every six months, a quota of Certificate of Entitlement (COE) registration certificates, allocated across different vehicle categories. These certificates are distributed through bimonthly auctions, ensuring a market-based approach to vehicle ownership. Each COE is valid for ten years and may be renewed upon payment of the average auction price over the three months preceding its expiry. For the period February to July 2013, the quota was set at 19,263 COEs.

In Denmark, vehicle ownership is subject to very high taxation. In 2012, the registration tax on new vehicles amounted to 105% of the first €10,600 of the purchase price and 180% on the remaining amount, effectively doubling the overall cost of acquiring a vehicle.

Such taxes on vehicle ownership are relatively easy to implement and are found in almost all countries, both developed and developing. They not only provide a significant source of public revenue, but they also serve as policy instruments to moderate vehicle ownership and encourage the use of more sustainable modes of transport.

Box 8

Vehicle licence plates in China: auctions in Shanghai or lottery in Beijing?

In 1994, the city of Shanghai introduced a vehicle license auction similar to Singapore's Vehicle Quota System, but initially without distinguishing between vehicle categories. Monthly online auctions are accessible after registration and open to eligible participants, who can bid for license plates. In April 2013, 11,000 licence plates were auctioned at an average price of €10,000. Given the soaring auction prices, the authorities decided to impose price limits and to distinguish between private and company vehicles. In 2018, the average winning bid reached 88,176 yuan (approximately €11,150), a price exceeding the cost of many domestically produced cars. That same year, Shanghai generated nearly 2 billion yuan in revenue from licence-plate sales, representing around 2% of the city's total fiscal income.

Deeming the system unfair, the city of Beijing introduced a free monthly lottery, known as Yaohao, in 2011 to allocate vehicle license plates. That year, the city decided to issue 20,000 license plates per month, representing only one-third of those awarded in 2010. The lottery system is open to permanent residents or those who have paid taxes in the city for at least five years. Registration is straightforward and remains valid for 3 months, allowing three successive draws. Over time, however, the number of applicants grew dramatically, while the annual cap on new registrations was reduced, leading to a sharp decline in winning odds — from 9.4% in January 2011 to just 0.2% by the end of 2019. As a result, the average waiting time to obtain a licence plate rose to 26 months. A study found that this delay reduced the probability of switching to car use by 16% among commuters who had waited this long. Both cities had approximately 2 million private vehicles in 2004. Six years later, a considerable difference was noted: Shanghai had 3.1 million cars, while Beijing had 4.8 million. In both cities, however, public acceptance of these regulatory measures has remained limited, mainly due to concerns about fairness and transparency in the allocation process and the use of auction revenues.

- In 2012, the city of Guangzhou (Guangdong province) adopted a mixed system, combining features of Beijing's and Shanghai's auction, while introducing incentives for green vehicles.
  The authorities decided to issue 120,000 licence plates over 10 years, ha"If the number issued in 2011. The distribution of these plates was as follows: 10% for "green" vehicles through a free lottery system (small and medium-sized cars with a fuel economy of at least 20%);

- 50% for vehicles with a motor of less than 2.5 litres via a free lottery system (Beijing system);

- 40% for other vehicles via an auction system with no price limits on the Shanghai/ Singapore models.

Photos: **Carlos Felipe Pardo**

Taxes on vehicle use

Taxes on vehicle use can take various forms depending on the country and policy objectives:

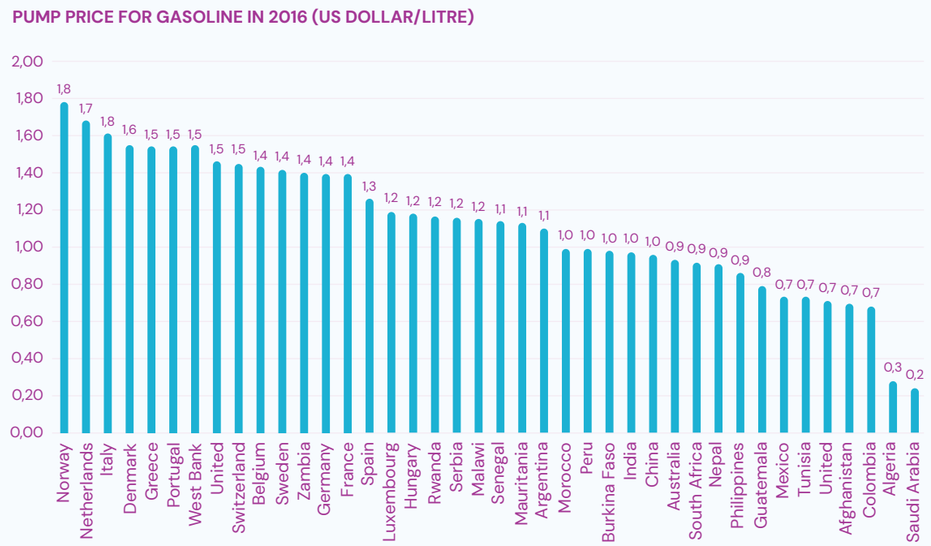
- Annual or periodic tax:
  - In Chile, an annual motor vehicle tax is applied, with a minimum of $30 USD, increasing in proportion to the vehicle's value. 35% of the tax revenues is allocated to city budgets, while the remaining 65% paid into a Communal Municipal Fund managed by the central government, which redistributes it to towns after evaluating their needs.
  - In Denmark, a semi-annual tax is collected, with the rate varying according to the vehicle's fuel consumption.
- Right-to-drive certificates: In Singapore, Certificates of Entitlement (COEs) are sold at auction and are valid for a fixed period, granting the right to own and operate a vehicle.
- Annual tax disk: In Morocco, vehicle owners must purchase an annual tax disk. For example, in 2013, the tax for vehicles with less than 8 CV of engine power was €31 for a petrol vehicle and double that amount for a diesel model.
- Annual motorway pass: In Switzerland, drivers must buy a yearly motorway pass to access the national motorway network and drive on all of the country's motorways. The pass costs 40 Swiss francs (€33), is valid for one year, and in 2011 generated €246 million in revenue from sales of around 9 million passes.
- Heavy vehicle charges: In several European countries, In Germany, Slovenia, Austria, and the Czech Republic, a road usage fee applies to heavy vehicles exceeding 3.5 tonnes, contributing to the maintenance and financing of road infrastructure.

Despite their potential, revenues from these taxes are most often directed to national budgets, providing only indirect support for public transport. Like taxes on vehicle purchase and registration, these measures are relatively easy to implement and therefore common in both developed and developing countries, though their designs and objectives vary widely.

Fuel taxes

Fuel tax is another standard instrument used by governments to encourage modal shift towards public transport, internalise the negative externalities of motorised transport, and generate additional revenues for public authorities. In Medellín, Colombia, the construction of the metro system was primarily financed through taxes on fuel and cigarettes, creating a new source of revenue for public authorities and directly supporting significant public transport investments. In Germany, the Länder provinces receive revenues from federal fuel taxes. For instance, Bavaria uses part of this funding to subsidise suburban rail operations, covering 40% of operating costs. In Colombia, an additional fuel tax applies at the point of sale, with rates of up to 25% on petrol and 8% on diesel. In 2012, this revenue stream brought in almost 552,208 million pesos (€210.8 million) to regional governments and nearly a billion pesos (€38.2 million) to local authorities in Colombia. The additional fuel tax provided 20% of the investment cost for the first three phases of Bogotá's Transmilenio system. In the State of California, United States, 70% of fuel and heavy vehicle tax revenue ($6.2 billion in 2012) is allocated to the transport sector. Of this amount, 10.4% supports public transport, while the remainder is directed toward road and highway maintenance.
Fuel tax policies, however, vary significantly between countries. The graph below shows the price of a litre of diesel at the pump in 2016 across various countries. It includes the cost of crude oil, transport and distribution, the refining margin, and fuel taxes. The variation observed across countries, although partially explained by transport and distribution costs, is mainly due to differences in tax rates. Conversely, in some nations as Venezuela, Iran, Saudi Arabia, and Algeria, fuel remains heavily subsidised, which discourages modal shift and increases public expenditure on fossil fuel consumption.

Figure 3: **Pump price for gasoline in 2016 in various countries ($US/litre)**



Source: © www.thecityfixlearn.org

1.3.2. Toll systems

Tolling systems can be introduced to generate revenue for infrastructure investment, to help regulate traffic and limit congestion, or to promote public transport and active modes. Fares can be adjusted in favour of specific modes (freight vehicles, tourist buses), depending on the number of passengers or the type of vehicle. Funds raised can potentially be used to finance the urban mobility sector. Tolling systems can be challenging to implement and face backlash, especially if they contribute to inequity and if no alternatives are available.

Tolls for road infrastructures

Charges on urban road infrastructure are primarily introduced to generate revenue for expansion and the improvement of existing networks. In some cases, the funds are also used to finance new infrastructure, such as roads or bridges, or to build a new road or bridge designed to reduce traffic on existing roads. Only users who are prepared to pay for time and/or convenience gains are charged, for example, by paying an urban toll for a bridge in Abidjan. In other instances, the user has no choice but to pay the toll, such as in the San Francisco Bay Area, where all eight bridges that cross the bay charge tolls.

When road infrastructure works are carried out, most of the new revenue generated tends to be absorbed in repaying the initial investment loan. Once the infrastructure costs have been covered, any surplus net revenues can be invested in public transport or other urban mobility projects (e.g., cycling lanes), provided certain conditions are met:

- The infrastructure is operated by an urban mobility authority that can transfer generated revenue directly to the urban mobility sector.
- The infrastructure is operated by an independent public entity, which must transfer its operating profits to an urban mobility authority.
- If the infrastructure is operated through a Public-Private Partnership, a portion of the funds is used to pay the operator, with the remainder transferred to the public transport sector in accordance with the contract terms.
- Suppose a fully privatised subcontractor operates the infrastructure. In that case, net profits cannot be used to finance public transport unless explicitly stated in the concession agreement, which can be dissuasive to potential subcontractors.

Box 9

Bridge tolls in Abidjan, Ivory Coast

The Government of the Ivory Coast began introducing tolls on road infrastructure as an alternative to financing road maintenance. This includes urban road infrastructure, such as bridges in Abidjan.

In 2014, the government introduced a toll on the Henri Konan Bedié Bridge (also called the third bridge) operated through a PPP contract. Tolls range from 500 FCFA to 3,000 FCFA, depending on the vehicle category. Almost 100,000 vehicles use the bridge daily, as it provides a significant time saving (15 minutes compared to 2 hours before).

The government announced that the new "fourth bridge" will also charge a toll.


Photo: **World Bank**

Congestion charging

Congestion charging requires users to pay a fee to enter designated zones in urban areas. This measure primarily targets private vehicles, although in some cases it may also apply to public transport vehicles, usually at a reduced rate. While congestion charging has proven effective in several cities, its implementation can be particularly challenging in developing countries, especially where public transport networks are insufficiently developed. In such contexts, issues of equity and social acceptance often pose significant barriers.

Congestion charging schemes can serve several key objectives:

- **Reducing congestion in city centres**

The main objective of cities such as Singapore, London, and Stockholm has been to manage traffic entering central areas and to free road space for public transport and professional use, notably by:

- Encouraging a modal shift towards public transport and active mobility.
- Discouraging motorists from driving at certain times or along specific routes.

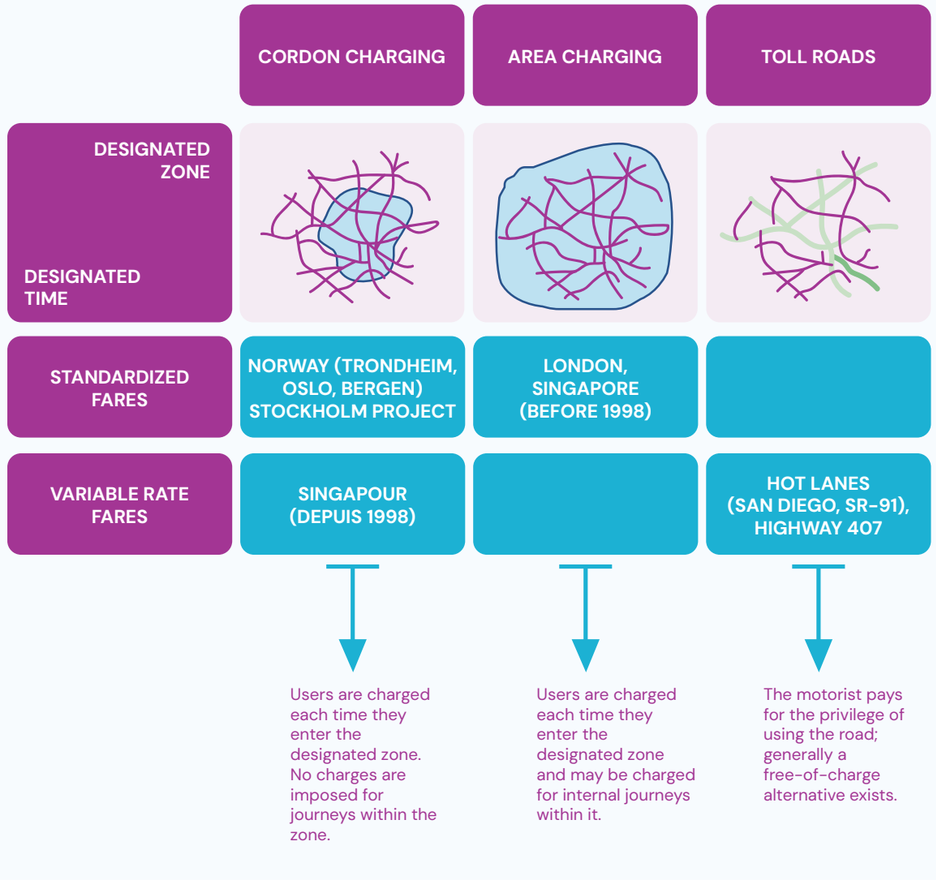
- **Reducing pollution**

- By alleviating congestion, these schemes help reduce emissions and improve air quality. They also ensure that private vehicle users bear a fairer share of the environmental costs generated by their journeys.
- Raising funds for sustainable mobility investments. Congestion charging can generate dedicated revenues for transport infrastructure and urban mobility improvements. For instance, in Oslo, a toll was introduced in 1990 for a limited period to finance bypasses and tunnels aimed at reducing congestion in the city centre. The charge was designed primarily as a fundraising tool rather than a traffic-reduction measure.

The design of a congestion charging scheme depends on its primary objectives. It may vary in terms of the geographical area covered, the level of charges, and the time periods during which the charges apply.

Three main types of systems can typically be identified—**cordon charging, area charging, and toll roads**—which are illustrated in the figure below and described in more detail in the following sections.

Figure 4: **Types of congestion charging**



Source: Adapted from Certu

Cordon charging

Under a cordon charging scheme, users are charged each time they enter a designated zone. The boundary, or cordon, often surrounds the city centre. This type of congestion charging was implemented in several cities around the world, including Singapore, Stockholm and Milan. It is particularly suited to urban areas where limited access points, such as Manhattan in New York City.

Singapore was the pioneer in introducing congestion charging, launching its first system in 1975. The initial scheme targeted vehicles with fewer than four passengers entering the business district during peak hours. In 1998, the city introduced a fully Electronic Road-Pricing system that uses on-board units, prepaid smart cards, and cameras to automatically detect vehicles at 60 entry points to the town. Charges vary by time of day, encouraging drivers to adjust their travel times and routes. As a result, traffic during peak hours has decreased significantly, and motorists have learned to plan their journeys more efficiently. Tolls are periodically adjusted to maintain average speeds of 45–65 km/h on express lanes and 20–30 km/h on other roads.

In 2006, Singapore introduced a new generation of smart cards usable not only for road tolls, but also for public transport fares, parking, and even retail purchases. Today, the system is fully automated, with rates dynamically set according to location, time of day, vehicle type, and real-time traffic conditions.

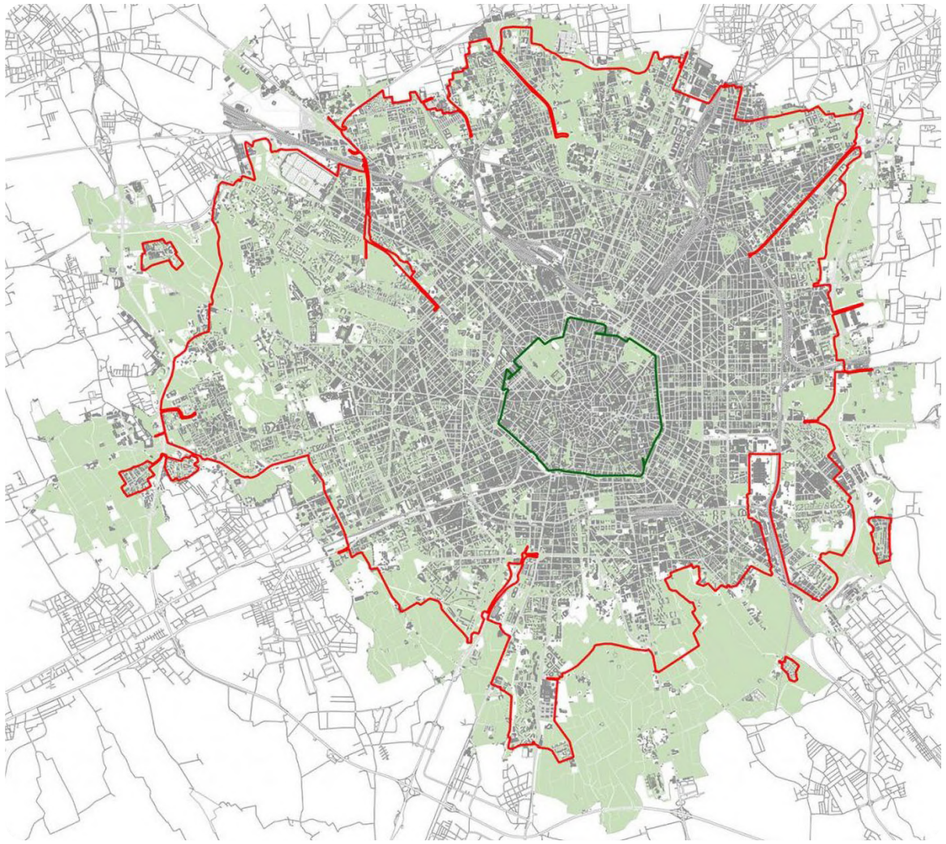
In 2008, gross revenue was approximately $125 million Singapore dollars (€71 million), with about 10% allocated to operating costs. After initial investments, amounting to roughly €93 million in 1998, were recovered, the Land Transport Authority (LTA) has continued to generate an annual net revenue of $100 million Singapore dollars (€57 million), which is paid into the general government budget. It isn't easy to evaluate the extent to which this revenue contributes to the public transport system.

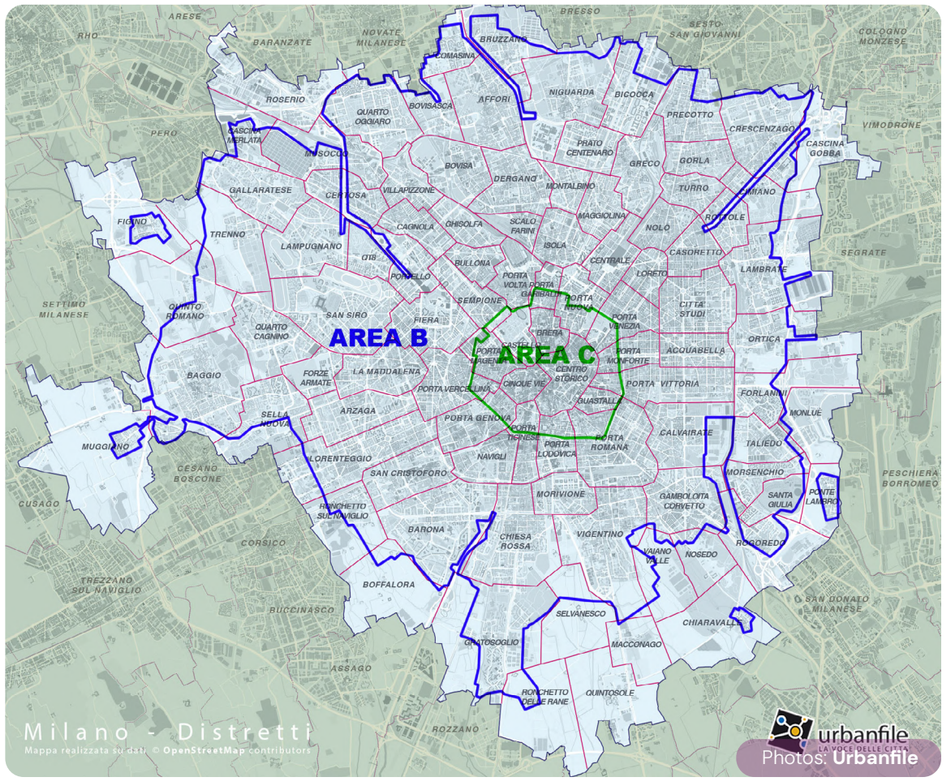
Box 10

Milan's "Area C" congestion charge

In 2012, Milan introduced the Area C congestion charge to reduce traffic congestion and pollution, replacing the earlier Ecopass scheme implemented in 2008. The charging zone covers 8.2 km² in the city centre.
Access to the zone is free for motorbikes, scooters, and low-emission vehicles, including electric, hybrid, LPG, biofuel, or natural gas-powered vehicles. Conversely, highly polluting vehicles—including petrol vehicles with Euro 0 standards and diesel vehicles rated Euro 1 to Euro 3—are prohibited from entering the area.
As of 2023, the daily charge is €7.50 between 7:30 a.m. and 7:30 p.m. Residents are entitled to 42 free entries per year and benefit from a reduced rate of € 3.
By 2021, the average daily number of vehicle entries had decreased by 38% from 2012 levels, demonstrating the measure's effectiveness in curbing congestion. In 2018, the scheme generated €33 million in revenue, 16% of which covered operating costs. The remaining 84% was reinvested to strengthen public transport and develop sustainable mobility projects.


Photo: **Babak Habibi**





Photos: **Urbanfile**

Box 11

Bogotá's "Pico y Placa" and "Pico y Placa Solidario" Schemes

Bogotá is among the most congested cities in the world, ranking first globally in 2019.
To address this challenge, the city introduced the "Pico y Placa" scheme in 1995, an odd-even driving restriction based on the last digit of vehicle license plates. Under this policy, vehicles are prohibited from circulating on specific days depending on their plate number. Initially, the system restricted 20% of the fleet daily; by 2020, this share had increased to 50%.
In 2020, Bogotá implemented a major market-oriented reform known as "Pico y Placa Solidario", allowing drivers to pay an exemption fee to avoid the odd-even restriction.
he reform initially applied a flat fee for all vehicles, but in 2021, the city introduced a differentiated fee structure based on:

- The municipality of registration
- The vehicle's commercial value and emission level.

High-emission, high-value vehicles pay higher exemption fees than cleaner or lower-value vehicles, reinforcing environmental and equity principles. As of 2024, the daily standard fee stood at COP 63,600 (€15). All revenues generated by the system are reinvested in public transport improvements.

A recent impact study revealed that, despite a 9% increase in traffic, the reform generated a significant overall welfare gain. The positive outcome stemmed from restoring many socially valuable car trips that were inefficiently rationed under the original system, particularly benefiting middle-income users, who experienced an estimated annual welfare gain of USD 759 million. Conversely, high-income individuals faced longer travel times, resulting in an estimated yearly welfare loss of USD 506 million.

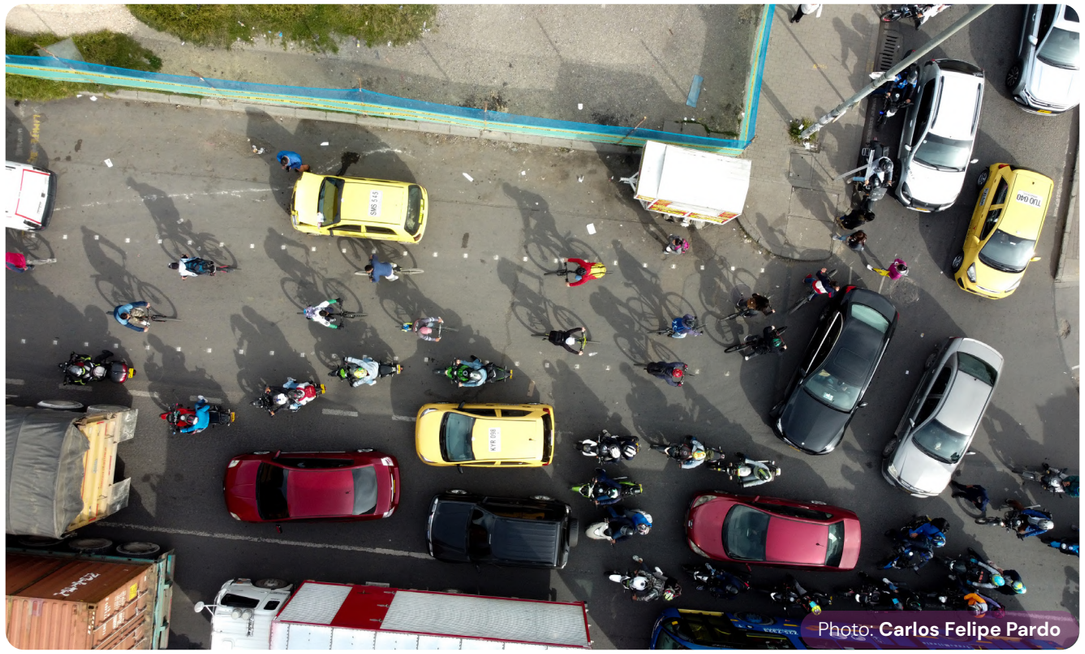


Photo: **Carlos Felipe Pardo**

Photos: **Carlos Felipe Pardo**

Area charging

Under an area charging system, users pay a single charge for circulating within a defined zone during a specified period (for example, a day). The charge may be variable, depending on the distance travelled within the zone or the time spent there. This approach aims to manage both the volume of traffic and the duration of vehicle presence in dense urban areas, offering flexibility in adapting fees to congestion levels and time-of-day patterns.

Box 12

New York City charging area

New York City has implemented a congestion pricing plan, which is the first of its kind in the United States. The plan, which was approved on March 27, 2024, charges cars $15 to enter Manhattan below 61st Street. Trucks are subject to even higher tolls. The tolls are set to begin on June 30, 2024.

This plan aims to reduce traffic in the Congestion Relief Zone, which includes local streets and avenues in Manhattan at or below 60th Street. The toll is expected to reduce the number of vehicles entering the zone by 100,000 per day.

Some exemptions and discounts are, however, available for certain vehicle owners. For instance, most government vehicles are likely to get full exemptions. Taxis will not be affected by the toll, but drivers will be charged a $1.25 surcharge per ride. The same policy applies to Uber, Lyft, and other rideshare drivers, though their surcharge will be $2.50.

Source: **congestionreliefzone.mta.info** (14 May 2024)

Photo: **Bruce Schaff**

Box 13

London's congestion charge: a successful example not replicated in other British cities

The London Congestion Charge, introduced in 2003 by Transport for London (TfL), is widely recognised as one of the most successful urban road pricing schemes in the world. Its primary objectives were to reduce traffic congestion, improve travel reliability, and promote a modal shift towards public and active transport.

The scheme initially covered 22 km² of central London, including the city business district, and was later expanded in 2007 to 40 km² before being reduced back to its original boundaries in 2011. Vehicles entering the zone between 7:00 a.m. and 6:00 p.m., Monday to Friday, are required to pay a daily charge of £10 (or £9 with the auto-pay system). Residents benefit from a 90% discount, and several categories of vehicles —including buses, taxis, emergency vehicles, motorcycles, and low-emission vehicles —are exempt. The system relies on automatic number plate recognition (ANPR) cameras to identify vehicles and verify payments.

Results have been striking within the first year: traffic entering the zone fell by 15%, and congestion levels dropped by around 30%.
The scheme also contributed to a notable increase in bus ridership and improved travel time reliability. Revenues from the charge are ring-fenced for reinvestment in public transport, cycling infrastructure, and road safety improvements.
Despite its success, no other British city has adopted a similar congestion charge, mainly due to political resistance, public opposition, and concerns over social acceptability. London thus remains the only UK city to have implemented such a large-scale, sustained congestion charging scheme.

The objectives of London's congestion charging policy for 2010 were to:

- Achieve a 15% reduction in road traffic (excluding motorcycles) within the charging zone;
- Achieve a 20–30% reduction in traffic congestion within the zone; and
- Encourage a modal shift of 20,000 passengers towards public transport during charging hours by 2020.

According to research conducted by Transport for London (TfL) in 2011, these goals were largely met or exceeded:

- Traffic volumes (excluding motorcycles) in the city centre decreased by 21% compared with 2000 levels.
- Congestion levels fell by 35% between 2002 and 2007, resulting in an average increase in traffic speed from 14 km/h to 17 km/h. However, this trend reversed after 2007, with congestion returning to pre-charge levels (average speed of 14 km/h). This reversal is attributed to the reallocation of road space to bus lanes, pedestrian areas, and cycle routes, as well as to frequent roadworks that disrupt traffic flow.
- Bus ridership increased by 6% during charging hours, and between 2001 and 2011, total bus journeys rose by 54%, while passenger-kilometres increased by 67%.

One of the key objectives of the congestion charge was to generate sustainable funding for public transport, with an initial target of ‚Ç¨180 million per year. This target was not fully achieved, primarily due to two factors:

- The high operating costs of the system, which represented about 40% of gross revenues in 2011-2012 (down from 50% in 2007-2008);
- The scheme's own success, which reduced car traffic and therefore revenue from charges.

Nevertheless, the financial results remain noteworthy. In the 2011–2012 financial year, gross revenues reached approximately €263 million (around 5% of TfL's total gross revenue), while operating costs totalled €104 million.
The resulting net revenue of €159 million was fully reinvested in public transport and active mobility infrastructure.

The London experience has inspired other large UK cities, though replication has so far been unsuccessful due to public opposition:

- In Manchester, about 80% of residents voted against a proposed congestion charge of £5.78 (€6) during peak hours within a 128 km² zone.
- In Edinburgh, a similar proposal to finance the construction of Tram Line 3 (15 km, estimated at €380 million) was rejected in a public referendum.

These experiences illustrate that, while allocating revenues to socially beneficial projects is crucial, public support depends equally on clear communication, transparency, and the perceived fairness of the measure. Effective engagement and explanation of benefits are therefore essential to gain public acceptance of congestion charging policies.

Photo: **Jay Wennington**

Photo: **Michael Fousert**

High-speed toll roads

High-speed toll roads are usually major urban expressways leading directly into city centres. These tolls aim to maintain free-flow conditions for paying users while reducing congestion on toll-free routes. A notable example is the High-Occupancy Toll (HOT) Lane system, developed in the United States. Initially introduced in California in the 1970s as High-Occupancy Vehicle (HOV) Lanes, reserved for vehicles with multiple passengers, they were later adapted to allow single-occupant vehicles access in exchange for a toll. This transformation increased lane utilisation and improved overall traffic efficiency, providing a flexible mechanism to balance equity, reliability, and revenue generation in heavily congested corridors.

Conditions for implementing congestion charging

For congestion charging to be effective, the public transport network must offer high performance, sufficient capacity, and service quality capable of absorbing the additional demand generated by the modal shift from private vehicles. Public transport must be reliable, efficient, and affordable, ensuring the shift is not perceived as social discrimination. If these conditions are not met, congestion charging may discourage travel within the charged area, potentially leading to a decline in economic activity or encouraging users to divert their trips to other zones where journey costs are lower.

Social acceptance is a critical factor for success. It can only be achieved through transparent communication that helps users understand that congestion generates socio-environmental costs, and that charging for road use can create collective benefits such as cleaner air, improved public health, and higher economic productivity. Congestion charging can be viewed as a form of “pay-to-pollute” licence.

As demonstrated in London, public acceptance often increases after implementation, once residents experience tangible improvements in travel conditions and quality of life.

In London, for example, the introduction of congestion charging was not met with strong opposition, despite the cancellation of the western extension in 2011, four years after its introduction. This relative acceptance may be explained by the scheme initially covering a limited area, where fewer than 15% of trips were made by private car even before the trials began. The introduction of congestion charging also had a positive impact on the property market. Within six months of the zone’s expansion, the cost of rented office space rose more sharply within the charged area than in comparable districts without congestion charging. Overall, the measure appears to have been better accepted by Londoners than by the rest of the country. In 2003, over 60% of London residents viewed congestion charging positively, compared with 43% outside the capital.

For congestion charging to succeed, traffic management and public transport policies must be closely aligned, supported by robust institutional arrangements. This is best achieved through an urban mobility authority responsible for all transport modes and policies, ensuring coherent planning, regulation, and implementation. This is the case in London, Singapore, and Milan, where the respective authorities—Transport for London (TfL), Land Transport Authority (LTA), and Azienda Trasporti Milanesi (ATM)- oversee the coordination of all aspects of urban mobility.
In cities without a single authority overseeing all modes, close collaboration among transport institutions is essential.

The institutional framework must ensure that each stakeholder’s roles and responsibilities are clearly defined and well coordinated. This is exemplified by Stockholm, where the Swedish Road Administration developed and manages the congestion charging system. At the same time, the City of Stockholm’s Transport Department is responsible for expanding public transport services and managing the Park & Ride scheme.

Paid parking

Paid parking is a mechanism through which users contribute financially for the use and occupation of public road space, and the revenues collected can be partially or fully reinvested to finance urban mobility projects. When designed coherently, paid parking can also serve as an instrument to promote modal shift, especially when it is aligned with broader urban mobility and transport policies.
In practice, parking policies often represent a delicate balance between meeting user needs by providing adequate public parking and managing the limited availability of urban space to minimise the negative externalities of private motorised vehicles. Well-designed parking strategies can also include free or reduced-rate parking to encourage sustainable modes of travel, such as public transport and active mobility.

A means of boosting modal transfer

For many years, in cities around the world, decision-makers assumed that the growth in motorised vehicle use should be accompanied by an increase in the number of available parking spaces, both on-street and in car parks, and by the application of minimum parking requirements for new developments such as office buildings or residential complexes.

This approach has contributed to a rise in road traffic and congestion, as well as to a disorganised use of urban space, creating conflicts between different road users and deteriorating the quality of life in cities.

By contrast, limiting the supply of parking spaces and regulating their availability according to specific criteria, such as parking duration, as practised in Barcelona, can help control car use in city centres and encourage a shift towards more sustainable modes of transport. However, this approach requires that the local authority possess both the institutional capacity to manage parking supply (through regulation, pricing, and enforcement) and the ability to provide credible mobility alternatives to absorb the resulting modal shift.

An increasing number of cities, including Paris and Montréal, are now adopting parking restrictions not only to manage demand but also to generate new sources of public funding for sustainable urban mobility initiatives.

A source of revenue for public transport

A well-designed, effectively implemented parking policy can be a significant source of revenue for urban mobility systems. When managed strategically, parking revenues can help cover operating costs and even finance new investments in public transport and sustainable mobility infrastructure.

In France, for example, the operating cost of one on-street parking space is estimated at approximately €350 per space per year, including enforcement and personnel costs. By comparison, revenues average around €1,000 per space per year, including income from fines.

For underground car parks, operating costs typically range between €800 and €1,600 per space annually, while above-ground multi-storey car parks cost about half as much. At the street level, parking lots are even less costly, with operating expenses of €200-€400 per space per year.

To ensure the effective use of net parking revenues, they should be integrated into the broader urban mobility policy. This integration is more readily achieved when a single urban mobility authority oversees all transport modes, as in San Francisco and Nantes, where revenues are directly reinvested to enhance public transport and sustainable mobility options.

In Australia, the system is less integrated and applies primarily to private parking.
Yet, all revenues are nevertheless dedicated to funding public transport infrastructure, demonstrating how parking management can be leveraged as a stable and equitable funding source.

Box 14

Using parking policy to support the shift toward public transport

The San Francisco Municipal Transportation Agency (SFMTA) brings together MUNI, the municipal transit agency responsible for operating public transport, and the city's traffic and parking management authorities. It manages all aspects of municipal urban transport policy, including 40 city-owned paid car parks and all on-street parking.

Parking revenues are derived from user parking permits, resident permits, parking fines, and half of the 25% tax on private parking income. In 2012, total parking revenues reached USD 263 million, accounting for one-third of SFMTA's total budget.

In Australia, three major cities —Sydney (1992), Perth (1999), and Melbourne (2006) —have introduced taxation systems for non-residential parking. These taxes are designed to encourage the use of public transport and to finance the development of urban transport infrastructure. In Sydney, the tax applies to private, non-residential off-street parking. It is calculated pro rata temporis for occasional parking use (for example, car parks adjacent to places of worship) and based on an average space size of 25.5 square metres (including access) for unmarked car parks. As of 1 July 2013, the tax per parking space was set at:

- €1,500 per year in the city centre.
- €550 per year in the rest of the city.

During the 2010–2011 financial year, these taxes generated €74 million in revenue, all of which was allocated to the development and maintenance of public transport infrastructure. In Great Britain, the Transport Act 2000 introduced two key policy tools: road user charging schemes, of which the London Congestion Charge is the best-known example, and the Workplace Parking Levy (WPL), a tax on company car parks that local authorities may implement across part or all of their jurisdiction.

At the end of 2011, the City of Nottingham adopted a Workplace Parking Levy for a period of 23 years to help reduce traffic congestion and partly finance the extension of the Nottingham Express Transit tramway (Phase 2) and the renovation of railway stations. The levy, introduced in April 2013, is an annual licence fee of £334 per parking space (around €400). It applies citywide to employers providing more than 10 parking spaces, affecting around 500 employers and 3,000 spaces. Exemptions apply to essential services such as hospitals, as well as disabled parking and visitor spaces.

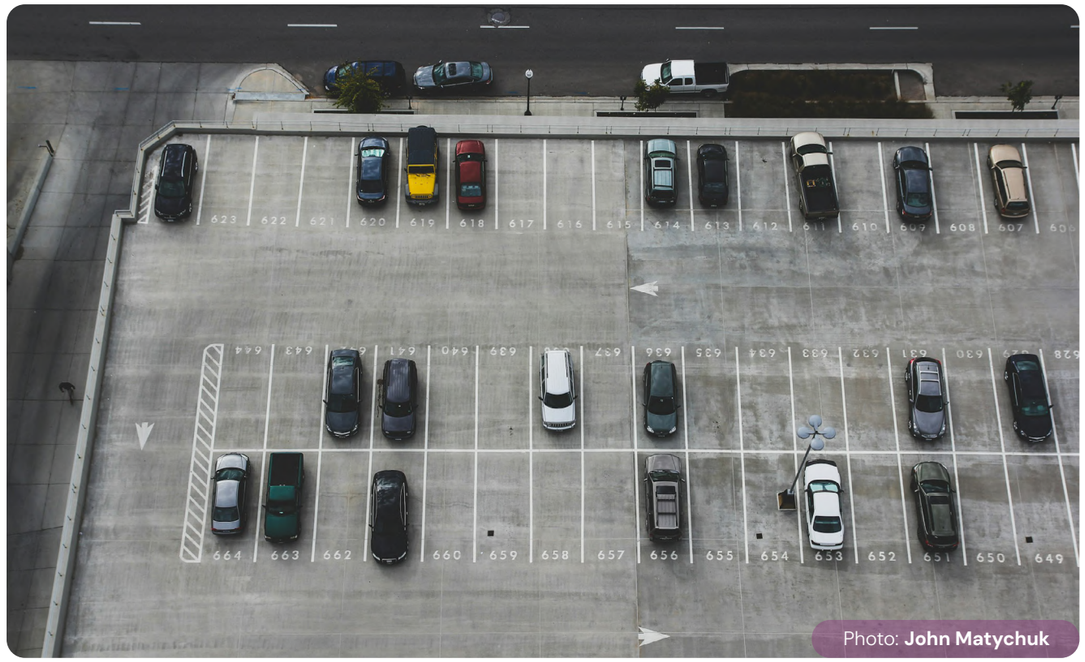


Photo: **John Matychuk**

The measures mentioned here assume that parking spaces are available, either in multi-storey car parks or on the street, which is not always the case in cities of the Global South, where street parking is often poorly managed. One of the first measures to be put in place can be to construct a minimum number of city centre car parks and to organise paid street parking to free up public space while limiting road traffic. To improve traffic flow, this policy should be supported by parking regulations to restrict road traffic.

Income from parking fines: a specific resource

Many cities are seeking to decriminalise parking fines to self-manage enforcement and retain the resulting revenues. In most countries, tax authorities are responsible for collecting and managing parking fines, while appeals are handled through the courts, since parking violations are considered legal infractions. As a result, fines revenue is often not allocated to local authorities, limiting their ability to reinvest it in local mobility improvements.

The example of San Francisco illustrates the significance of these revenues: 46% of the city's total parking income comes from fine payments. By decriminalising parking fines, the management authority would be transferred to local governments, allowing them to directly allocate revenues to urban public transport improvements and other sustainable mobility initiatives.

In France, part of the revenue from parking fines is currently redistributed by the State to local authorities, urban communities, and to the Île-de-France region, including the Île-de-France Transport Authority. However, recognising the need for more effective regional management, a law adopted at the end of 2013 authorised the decriminalisation of parking offences and established parking as a decentralised public service, following a model similar to that in Great Britain (see box on next page).

Box 15

Britain's experience of decriminalising parking fines

In 1991, the Road Traffic Act 1991 transferred power to the local councils to manage and collect parking fines. Outside London, councils were not under the obligation to introduce the civil system, but since 2000, many have chosen to adopt it. In 2010, 237 councils, including London, had adopted the system, accounting for 60% of all borough councils in England and Wales.

They had to establish a "civil system", including the implementation of Special Parking Areas (SPAs). The councils or their delegates employ civil enforcement officers who issue parking fines. Parking fines are paid to the local councils, and the profits must be invested in public transport projects. And since the Traffic Management Act of 2004, profits can also be allocated to environmental projects.
In London, the system has worked well, resulting in more motorists using car parks, less congestion caused by motorists looking for parking spaces, and widespread acceptance among the capital's population. However, this is not the case in all towns. The civil system is sometimes seen as a money-spinner because it has been poorly publicised, lacks transparency and makes it difficult to appeal against unfair parking tickets. Nonetheless, research shows that residents are not opposed to the system per se, but they wish for greater transparency, especially regarding the use of net profits, which the majority would like to see allocated to urban public transport.

The law requires that local authorities publish an annual parking report. Taking the example of the city of Southampton, which has 1,600 parking spaces, total revenue for 2011-2012 was £3.60 million (€4.4 million), and net profit was £1.04 million (€1.25 million), with fines accounting for 20% of overall street parking revenue.

Photo: **John Matychuk**

1.4. Employer contributions

Another possible source of financing for urban mobility is employer contributions. In fact, urban mobility systems support regional economic activity and play a key role in encouraging business development by providing employees with daily access to their workplaces, enabling clients to reach sales outlets, and facilitating the delivery of goods.

A high-performing public transport system helps foster employee efficiency by ensuring they can arrive at work affordably. Furthermore, the more employees are encouraged to use public transport, the fewer cars are on the roads, and the quicker commutes become than private car trips. The contribution of companies and business activities to financing public transport is therefore justified. The following subsections provide an overview of possible mechanisms that decision-makers could explore.

Photo: **Carlos Felipe Pardo**

1.4.1. Voluntary involvement of employers

Organising their own networks

Employers may have to organise their employees' transport:

- When the public transport service is insufficient or irregular;
- When company premises are situated far from transport corridors, as is often the case at the periphery of towns and/or in business parks;
- When the company's employees work outside regular public transport operating hours or during reduced operating hours;
- When the company has a large number of employees at a single site (industry, government agencies)

This type of service, common in countries such as Algeria, Morocco and India, is initiated by the company or public administration and thus improves access to the site and reduces car dependency. Employers can either organise the transport themselves or outsource the task to a private coach company. As the cost can be significant, companies tend to group to provide the service.

Once the urban public transport service is satisfactory, companies often abandon their own transport arrangements for employees, as these can become quite burdensome. However, the very existence of employer-managed transport can sometimes delay the development of public transport systems. As employees' transport needs are already met, building transport corridors becomes less of a priority.

Encouraging use of public transportation systems

Transit authorities are keen to involve employers in organising their employees' mobility and, more generally, the accessibility of their sites. The details and the state of progress of the projects vary widely by country, but all these initiatives share a common aim:

- To encourage employers to think about and take responsibility for their employees' transport.
- To reduce traffic congestion and its impact on the environment by encouraging carpooling and car-sharing, and by promoting sustainable means of transport (such as public transport, bicycles, walking) and multimodality.

Since July 2004, Belgian companies in the Brussels region with over 200 employees have been required to establish a Company Mobility Plan (CMP). In France, Company Mobility Plans (and Public Administration Mobility Plans) have become compulsory for all companies of more than 100 employees since 2018. Similar initiatives, known as Travel Plans, have been implemented in the United States, England, New Zealand and Canada as part of their Transport Demand Management (TDM) policies. For specific development projects, a travel plan is mandatory.

Box 16

Employer contributions to encourage sustainable transportation choices

Since 1993, American employers have been able to voluntarily offer their employees refunds for part of their transport costs. Exempt from federal taxes (and from local taxes in certain states) for both the employer and the employee, this aid covers public transport, vanpooling (at least six passengers, including three employees), parking (park-and-ride or employer parking lots), or bicycles, within the given thresholds.

In 2013, the exemption thresholds were $20/month for bikes and $245/month for parking and carpooling. Studies show that 18% of the beneficiaries of this aid (2.7 million people in 2008) switched from using their cars solely for personal travel to using public transit for their home-to-work commute. Furthermore, this measure saved 1.8 million metric tonnes of carbon dioxide equivalent in 2010.

In California, authorities established the Parking Cash-Out Program (1992) to encourage the use of public transport for commuting to and from work. This programme targets companies with over 50 employees, located in areas where air quality does not meet the standard thresholds, and that subsidise their employees' parking costs. The employees of these companies can choose to either receive the cost of their parking space in their salary (taxable) or convert this amount into public transit passes (tax-exempt).

In Belgium since 1997, employers have paid a kilometre allowance to personnel who cycle to and from work, at least part of the way. The amount of the cycling allowance is left to the employer's discretion, but since 1999 it has been tax-exempt up to €0.22 per kilometre (in 2013). This allowance is not compulsory, but it has become routine in the public sector. For short distances, the company can pay a lump-sum allowance of €350/year. If employees cycle and take the train during their commutes, their employers can pay for their rail passes (this has been set at 75% since January 2013).

Photos: **Carlos Felipe Pardo**

1.4.2. Mandatory financing of the transport system by companies and business activities

Businesses contribute to financing urban mobility through general taxes. However, in some countries, a direct tax is levied on companies, as authorities consider them indirect beneficiaries of the public transport system. These mandatory taxes are applied in two ways: a tax is charged on a company's total payroll costs and directly attributed to the public transport sector, and subsidies are granted to employees who use public transport.

Tax based on payroll

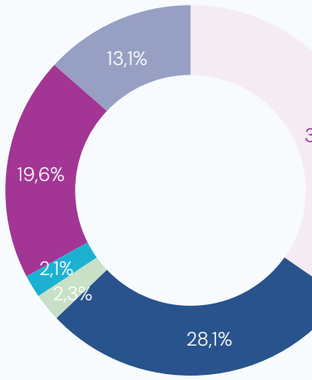
The most widely known and applied transport tax is the French "Versement Transport" (VT). It was introduced in 1971 for public and private companies with more than nine salaried employees in the Ile-de-France region. Its purpose was to provide the necessary funding to extend and improve public transport services in the Paris area, which at the time was experiencing rapid economic growth. It was then gradually extended to all metropolitan areas with a transport authority.

Since its inception, VT has provided a sustainable source of financing and has significantly improved the public transport system. Initially designed to finance investment in transport infrastructure, VT funds have since been used to cover operational costs, thereby reducing the leverage effect on investment.

Owing to a rise in both the number of employees and their wages, payroll is increasing. Payroll-based tax is particularly dynamic during periods of economic growth.

Since 2021, this tax has been replaced by "Versement Mobilité".

Figure 5: **Lyon Transport Authority (SYTRAL)'s income: 761,1 M€ (2013)**



- Transport tax 265,1 M€
- Network customers 213,8 M€
- Sundry revenues 17,8 M€
- Subventions 15,8 M€
- Contribution from local authorities 148,9 M€
- Loans 100,1 M€

Source: SYTRAL

Direct financial support for employees

Direct financial support for employees is an indirect form of financial aid for the public transport service, as the funds aim to support demand by encouraging employees to use public transport rather than increasing supply. This type of financing offers greater transparency concerning the cost of transport, as the ticket price is paid in full.

A variety of methods have been employed in different countries, with some based on voluntary participation, as in the United States, where companies can take advantage of tax exemptions on the amount they allocate to employees to buy a transit pass. The most effective methods, however, are those in which the company is legally bound to comply, such as in Brazil and France.

Box 17

Employer contributions as a significant source of revenue

VT represents a percentage rate of the payroll, which is determined at the discretion of the local authorities, with a ceiling imposed by law:

- In the Paris region, since 2013, the percentage rate has been capped at 2.7% in the county of Hauts-de-Seine (where the La Défense business district is located), 1.8% in the surrounding urban areas, and 1.5% in the other parts of the Île-de-France area.
- In the other regions of France, 2% for towns with more than 100,000 inhabitants that have dedicated public transport corridors, 1.1% for cities with more than 100,000 inhabitants, and 0.80% for cities with fewer than 100,000 inhabitants.

Revenues from VT amounted to approximately €6.5 billion in 2011, roughly evenly split between Île-de-France and the rest of France. However, there was a slight increase in revenue from towns outside the capital that have invested in VT-funded projects.

In Île-de-France, where VT accounts for 37% of the resources of the Île-de-France transport authority, VT yields approximately €263 per inhabitant per year. Outside of Ile-de-France, in the 12 largest urban areas, VT revenues account for 45% of the transport budget and average more than €190 per inhabitant per year. It is estimated that government agencies account for up to one-third of total transport tax revenues.

Introduced in the 1980s, reimbursement of 50% of transit pass costs was initially intended only for users in the Île-de-France region. Employers were required to pay transport subsidies alongside salaries, and this applied to all employees, regardless of status or salary, from the CEO to the caretaker.

The aim was to provide employees with an incentive to use public transport, and the scheme's limited scope to the Paris region was justified because commutes in this region were longer and therefore more costly than those in other towns and cities in France.

Since January 2009, this compulsory scheme has been extended to all urban areas with a public transport service. The 50% reimbursement of transit pass costs has also been expanded to include bike rental services. It is paid at the end of each month, and appears as a separate entry on the payslip when the employee has provided proof of purchase of the transit pass.

Photo: **Davelevy**

Summary

By implementing compulsory contributions from companies and government agencies, such as the VT tax and public transport subsidies for employees, sustainable financing mechanisms are created that help cover both investment and operating costs.
VT is used to top up transit authorities' budgets and to contribute to the system as a whole.
Subsidies for employees are designed to encourage the use of public transport and to play a social role, as in Brazil's Vale Transporte scheme.
However, specific prerequisites are necessary to implement such schemes:

- A political consensus arises from the need for a regulatory or legal mechanism.
- Acceptance by employers, or at least a majority of employers. For them to fully participate, they must reap the benefits: improved transport conditions for their employees, more reliable schedules, and a service extended to cover their place of work.
- The presence of a transport authority to manage capital flow and allocate funds to projects

1.5. Other potential revenue sources

Another possible source of financing for urban mobility is employer contributions.
In fact, urban mobility systems support regional economic activity and play a key role in encouraging business development by providing employees with daily access to their workplaces, enabling clients to reach sales outlets, and facilitating the delivery of goods.

A high-performing public transport system helps foster employee efficiency by ensuring they can arrive at work affordably. Furthermore, the more employees are encouraged to use public transport, the fewer cars are on the roads, and the quicker commutes become than private car trips. The contribution of companies and business activities to financing public transport is therefore justified.
The following subsections provide an overview of possible mechanisms that decision-makers could explore.

1.5.1. Land value capture in areas served by public transport

The development of transport infrastructure gives rise to both positive impacts (improved accessibility for local inhabitants, increased attractiveness of the local area) and negative impacts (pollution, noise, neighbourhood transformation) that affect the value of the land and the buildings served.

Suppose the contracting authority minimises the adverse effects of these new investments (certain studies have shown a negative impact on buildings situated within a 200-metre corridor along the line). In that case, the investment can increase the value of the surrounding land, particularly the buildings.
A win-win situation is thus created between transport and town planning: the attraction of a newly developed area brings in customers for the transport line. This is why the majority of projects which seek to capture land value gains also involve redevelopment to improve the connection between town planning and transport. Capturing land value helps improve the use of space near transport infrastructure and leads to new urban developments or new land uses.

In light of this, public institutions seek to capture some of the added value generated by public investment, from which property developers, real estate owners, companies, shops, and others benefit indirectly. Land and property value capture policies have been implemented in New York and Paris since the 19th century. Currently, many urban areas use various land-value capture mechanisms to fund transport infrastructure.

How can land value capture be used?

Prospects for capturing land value gains

Depending on the circumstances, land value uplift can directly contribute to an urban transport project's budget or fund new infrastructure. Several methods have already been tested, and they can be divided into three distinct categories:

- Developer contributions and betterment charges;
- The anticipated purchase of land to sell it at a profit, or to develop business activities on it;
- Development projects based on mixed semi-public enterprises, or the internalisation of real estate promotion activities.

None of these options is self-contained. In fact, a partnership with a property development company can be established before introducing a tax to capture land value gains. In general, financing that involves capturing property value gains should not rely on a single mechanism. Instead, it should be viewed as a part of a range of complementary methods.

Difficulties and risks associated with land value capture

Certain studies have shown that landowners or property owners achieve significant gains following public investment in transport infrastructure. However, other studies are much more cautious about the reality of the value uplift, and even more so about the public authority's ability to capture it.

The choice of land value capture mechanism depends on the objectives of the public policy and must be coherent with the city's socio-economic, financial and urban policies. Developers and the community at large must clearly understand mechanisms for capturing land value uplift. They must be easy to implement without creating an additional economic expense, which would hinder employment and economic growth.

In any event, it is essential to be well aware of the risks and the precautions to be taken when funding infrastructure through land value capture. These include the following:

- Land value uplift is not always guaranteed. Certain studies show that there is no land value uplift for the construction of certain types of public transport infrastructure. Others show that it is challenging to evaluate where the value gain comes from and to guarantee fair taxation (cf. box below). Real estate markets can take on a momentum of their own. Although infrastructure development can raise prices, a property market crisis can dash any hope of value gains for the community.

- Beware of the temptation to maximise profits. Counting too heavily on profits derived from property transactions can lead local governments to seek to maximise profits, when in fact this type of behaviour is contrary to their duty to serve the public interest. Indeed, in some countries, expropriation is misused to acquire land for a very low price and resell it for a very high price.

- Avoid artificial scarcity. In some instances, urban planning rules can create significant distortions in the real estate market by setting unsuitable boundaries. For example, by proposing development rights within an overly restrictive area around train stations, public authorities can impose disproportionate taxation.

- Maintain high transparency standards. Property markets are never completely transparent, anywhere. The sheer amount of money at stake can lead to corruption or to an institution hoarding profits from real estate transactions, to the detriment of the public interest. Laws that encourage the sale of land at public auction prevent this type of dysfunction.

Box 18

The difficulty of evaluating land value uplift

The value gained from the construction of the metro in Helsinki is estimated at 5%-10% for residential properties and 10%-30% for commercial properties, according to various case studies. The price increase of apartments was inversely proportional to distance from the metro station within a 750-metre radius, with an exceptionally high level between 250 and 500 metres. The value uplift of the 81,000 buildings within a kilometre was estimated at between $550 million and $670 million. However, areas not served by public transport have declined in value. This loss in value has been estimated at between $90 million and $150 million across the metropolitan area.

An independent study commissioned by Transport for London on the extension of the Jubilee Line estimated that between 1992 and 2002, the value of the land surrounding two of its 11 new stations (Southwark and Canary Wharf) had increased by €3.6 billion, while the cost of building the line amounted to €4.5 billion. According to certain studies, the British government could have built the extension of the Jubilee Line at no cost to the exchequer if it had chosen to capture barely a third of the land value increase generated by the project. However, other independent studies show that accurately assessing the actual increase in value is challenging, and capturing it is even trickier.

The T3 tramway line in Paris. The Urban Planning Institute of the Île-de-France Region and the IFSTTAR (French Institute of Science and Technology for Transport) conducted a study to assess the impact of the development of a tramway line on the Boulevard des Maréchaux, a central ring road around the centre of Paris that was redeveloped to make room for a tramway line. This study, in line with others conducted in the French capital, shows that there were no significant gains for landowners and property owners within two years of the line opening.

Photo: **Oli Heinola**

Land value capture and the contribution of property developers

A betterment tax

A betterment tax is not the same as a property tax, because the increase in property value is not due to the owner's actions (as with renovations and improvements), but to community action, which justifies the public authorities' imposition of such a tax.
This tax must be levied on all areas that benefit from the new transport infrastructure. The land is valued each year based on the optimal use of each site, without accounting for the existing facilities. A tax based on land value is levied to generate funds for the public sector. Thus, if the value of the land increases, the tax collected also increases.

This means that a vacant plot of land in the city centre, earmarked for an office complex, will pay the same tax as an identical site nearby where a similar office complex has already been developed.

Unlike construction taxes, there is no tax reduction available to landowners who leave the site empty. Likewise, taxes are not increased if the site is built upon. Landowners will therefore seek to capitalise on the use of their land.

However, it is challenging to implement because realistically assessing land value uplift is difficult. This no doubt explains why this financing mechanism is still underused.
Assessment of the land value uplift is based on the notoriously unpredictable property market. Value can increase even before the project is carried out, and may be over- or under-estimated depending on market ups and downs. Infrastructure projects can also cause land values to decline. Should compensation be paid?

A periodic valuation can be based on the land's market value, and the tax may be calculated accordingly. Although this method offers transparency, it is likely to force landowners to sell their land because improvements to their estate will not generate new income, and the new tax may place them in financial difficulty. There is a risk that the middle and working classes will be pushed out of areas that have increased in value due to new infrastructure. This can be overcome by setting tax levels based on income.

Another option would be to introduce a tax on the sale price. However, this method fails to recognise that the property may increase in value for reasons other than the new infrastructure. It also risks freezing the market, as owners are increasingly reluctant to sell their property. Besides, it would be unfair to tax only the sellers.

Introducing a new tax is always an unpopular measure, especially for the local population who do not use the transport infrastructure. Difficulty in gaining social acceptance often deters politicians from voting for such measures, which require a consensus.
The example of London presented in the box below shows that it was possible to impose betterment taxes on large companies, which were then partially used to finance a major rail project in the city.

Box 19

The Business Rate Supplement in London (United Kingdom): major corporations get involved

Crossrail is a major express rail project (118 km of lines, 37 stations) that, from late 2018, will cross London from east to west and facilitate connections between Heathrow Airport and the City of London financial district. At a colossal cost of £15.9 billion (€17 billion), the line will cross the centre of London, underground (21 km) and offer multiple connections with the existing train and Tube system (creation of 9 stations and renovation of 28 stations). It should increase London's rail capacity by 10% and carry 200 million passengers a year. Cross London Rail Links Ltd, half-owned by Transport for London (TfL) and half by the State through the Department for Transport (DfT), is the entity responsible for the CrossRail project.

The London authorities plan to fund the project with corporate support. Businesses will have to contribute 36%, while the Government and users will each contribute 32%. In a 2007 study, the Greater London Authority and TfL estimated the economic impact of the Crossrail project at £36 billion (€43.2 billion).

A surtax, the Business Rate Supplement (BRS), has been applied since April 2010. It is based on the business premises' rateable value.
It should result in the collection of £4.1 billion (€4.9 billion).

Only businesses that have premises with a rateable value over £55,000 (€66,000) pay this surtax. This means that more than 80% of properties are exempt. Major corporations with real estate representing a taxable value of more than £1 million are liable to contribute more than one-third of the total amount of the BRS. 70% of the taxable companies are located in the districts served by Crossrail.
Among other things, this supplementary tax will repay the £3.5 billion (€4.2 billion) loan taken out by the Greater London Authority. Moreover, certain companies and property developers have agreed to contribute directly to the project, for a total amount of £1.1 billion (€1.3 billion):

- Heathrow Airport for £230 million;
- Canary Wharf, which owns a substantial part of the district of the same name, will finance a station in this area for £150 million.
- The corporation of the City of London, which should provide £250 million.

Photo: **Seb Doe**

Making property developers pay in the event of area improvements

→ Impact fees

Unlike betterment taxes, impact fees raise the issue of funding based on costs. Regarding the infrastructure within the area under development, property developers are required either to build it at their own expense or to fund the infrastructure supplied by public authorities. Concerning external facilities, they are partially funded by "impact fees".
The idea is for urban growth to fund itself without relying too much on public resources. This funding model, which is well developed in the United States for utilities and infrastructure, i.e., drinking water, sewer systems, and roadways, is suitable for urban areas under development. The example of impact fees in San Francisco (USA) is presented in the box on the right.

→ Encourage construction to increase revenues through value capture

This concept is common in Australia (known as "Value Increment Financing" or VIF) and in the United States, where it is known as "Tax Increment Financing" (TIF) or "Transit-Oriented Development" (TOD). Optimal use of urban space near transport infrastructure is promoted to capitalise on the tax income generated by the land.

The State lends landowners the equivalent of the estimated uplift in land value created by the new infrastructure, at a low interest rate for over 10 years. New construction generates new tax revenues for transport, and higher population density leads to more public transport users. This model is socially acceptable because it isn't viewed as an additional tax.

In several American cities, including St. Louis, San Francisco, Portland, San Diego and Denver, the TOD approach has succeeded in increasing population density in the vicinity of extensive underground and railway stations by attracting residential, commercial and service-oriented investments, thereby decreasing car use without banning them.

Photo: **Carlos Felipe Pardo**

Box 20

Impact fees in San Francisco (USA): A funding mechanism in transition

A well-known example of an impact fee is the Transit Impact Development Fee (TIDF), implemented by the city of San Francisco in April 1981. The tax was imposed on new office buildings in the city centre to finance:

→ Public transport investments;

→ Additional operating costs generated by the project. The Supreme Court of California confirmed the lawfulness of the latter objective.

Since 2004, the TIDF has been extended to the whole of the city for all types of non-residential development larger than 280 square metres (excluding the Mission Bay neighbourhood, which is undergoing urban restoration and developments linked to public service or government structures). Since December 2012, all non-residential development projects larger than 74 square metres have been subject to levies. The level of taxation applied per square metre depends on the business activity. Payment of the TIDF is a prerequisite for obtaining a declaration of conformity for a new building.

Soon, the TIDF should be replaced by the Transportation Sustainability Fee (TSF) to harmonise the California Environmental Quality Act (CEQA) with impact fee calculations. This plan will include all types of development (residential in particular) in the tax system.

The TSF will be based on a new calculation method that prevents cumulative impacts from multiple projects. It will also feature a system of partial exemption credits for projects with a strong social dimension, such as social housing and retail shops, or a strong environmental aspect, such as the construction of parking zones below the authorised threshold.

Over 20 years, the TSF will fund an investment programme of $1.4 billion (€1.25 billion), aiming to improve the performance of the transportation system.

Photo: **Carlos Felipe Pardo**

Reselling land or rights to build

Selling off public land for development (land reserves)

In many countries, public authorities own land in suburban areas or city centres, particularly around transport infrastructure.

They can also acquire land in advance, before announcing the development of new infrastructure or revealing its planned route, to benefit from lower prices. Once the land is secured, several options are available:

- Direct sale to private developers, incorporating the anticipated increase in land value into the sale price, as was done in Águas Claras, on the outskirts of Brasília;
- Development as part of an urban renewal project, followed by sale at market value, as practised in Copenhagen and Japan, where railway companies were among the first to use this method to finance their operations.

In addition to leveraging land reserves, public authorities can also optimise land use in areas surrounding stations or along major transport corridors. In some cases, even the value of the land occupied by the infrastructure itself may increase due to improved accessibility and urban development.

Box 21

Urban transport in Mumbai (India): the leverage of land value capture

The Mumbai Metropolitan Region Development Authority (MMRDA) launched an ambitious programme, the Mumbai Urban Transport Project (MUTP), in 2007 to improve rail and road travel conditions for the 22 million residents of the metropolitan area. Partially financed by the World Bank, the programme comprises three phases, with the first two valued at approximately USD 1.9 billion.
To finance the project, MMRDA, the Government of Maharashtra, and the state-owned Indian Railways leveraged the land development potential of the Bandra area, located on the western edge of Mumbai.
MMRDA began developing the Bandra-Kurla commercial complex in the late 1980s and, in 2006 and 2007, auctioned 13 hectares of land to private developers, subject to land-use restrictions. These two sales generated EUR 889 million, an amount 3.5 times greater than the total value of all local government bonds issued across India over the preceding decade.
MMRDA proposed allocating part of these revenues to finance the MUTP.
For Phase 2 of the MUTP, EUR 350 million, representing 44% of the total phase cost, will come from the commercial development of 45,000 square metres of land in East Bandra, owned by Indian Railways. The state-owned company entrusted the management of this land to its subsidiary, the Rail Land Development Authority (RLDA). Established in 2006, the RLDA is responsible for identifying and monetising underutilised land assets owned by Indian Railways to finance the modernisation and rehabilitation of the national railway network.

Photo: **Carlos Felipe Pardo**

Success factors of such mechanisms

For the land value capture mechanisms mentioned above to succeed, decision-makers must ensure that certain conditions are met. They are summarised below:

The land was located in an area with low value due to a lack of mobility infrastructure. Building an underground railway or a tramway didn't just create accessibility; it created high-quality accessibility.

- Public authorities were in a position to buy the land or already owned it. In certain countries, such as France, public real estate entities can acquire land and retain ownership until the project is completed. This discourages speculation.
- The property market was prospering. In Brasilia, as the building is subject to strict regulations by the Pilot Plan, the urban transport system was extended to satellite cities. In Copenhagen, the risk taken on property was successful because the market picked up at the right time. Conversely, the Docklands Light Railway in London, running from the Docklands to Beckton, was supposed to be funded by selling land, but the contract was signed in 1989, and the property market remained sluggish for another 10 years. The land was sold, and the private sector captured the land value uplift. The public authorities ultimately financed the line. The same scenario occurred for the La Parla tramway in Madrid.
- Building the underground line and developing and reselling the surrounding land are jointly managed projects. Even though this situation allows for immediate retrocession of the funds collected, it can nevertheless force underground railway companies to shoulder financial risk by assigning them the task of land development, which is not their field of expertise. An independent company will run the land development project around the extension of Copenhagen's underground railway to avoid these disadvantages.
- Underground railway companies benefit financially both through investment and operations. Because the area is highly accessible, residents of the new area rely heavily on the service, thereby contributing to its operating balance.

The sale of additional construction rights: The example of CEPACs (Certificados de Potencial Adicional de Construção) in Brazil

"Certificates of Potential Additional Construction" (CEPACs) were introduced under the 2001 City Statute, which granted municipalities the ability to modify land-use regulations and sell additional construction rights, beyond existing land occupancy coefficients, in designated areas to finance the physical and social infrastructure required for urban development projects.

This mechanism can only be applied under strict conditions:

- The existence of a comprehensive urban development plan for the city.
- The creation, by municipal decree, of a Joint Urban Operation (JUO) and its corresponding implementation mechanisms. A JUO constitutes a coordinated set of measures led by municipal authorities, with the participation of landowners, residents, users, and private investors, aimed at achieving structural urban transformations and social and environmental improvements. Within the defined area, changes may be made to land parcels, land use, and construction standards, while considering environmental impacts.
- The adoption of a municipal decree regulating the volume and use of CEPACs in connection with the relevant urban project.

The number of CEPACs issued is limited and tied to specific areas targeted for increased population density. CEPACs may be auctioned or used directly to finance works or expropriations, and the revenues generated are exclusively dedicated to the Joint Urban Operation. Urban transport infrastructure that forms part of a JUO can also be financed through this mechanism.

CEPACs are exchanged for the right to build additional square metres, calculated according to location and land use. Although each CEPAC carries the same nominal value, more certificates are required to make in higher-value areas, such as those near major public transport stations. Once the maximum quota of construction rights in a specific area is reached, the CEPAC holder must redeploy them in another eligible project.

Thus, CEPACs function both as urban policy instruments and as financial securities, formally recognised by the Securities Commission in 2004, which oversees their issuance and auctioning. These certificates can be traded on the secondary market by any individual or legal entity until they are applied to a specific parcel of land within a JUO.

For public authorities, this procedure offers several significant advantages:

- It allows them to mobilise financial resources before project implementation, avoiding the need to borrow or increase public debt.
- It ensures transparency in the sale of additional construction rights, as they can be purchased only with CEPACs and not in any other form of payment.
- It enables the capture of future land value increases resulting from public investments by integrating these expected gains into the selling price. However, this value capture is partial, as once auctioned, CEPACs may continue to appreciate on the secondary market.

Which institutional set-up to implement land value capture mechanisms? Examples of transport and urban development activities combined in a single entity

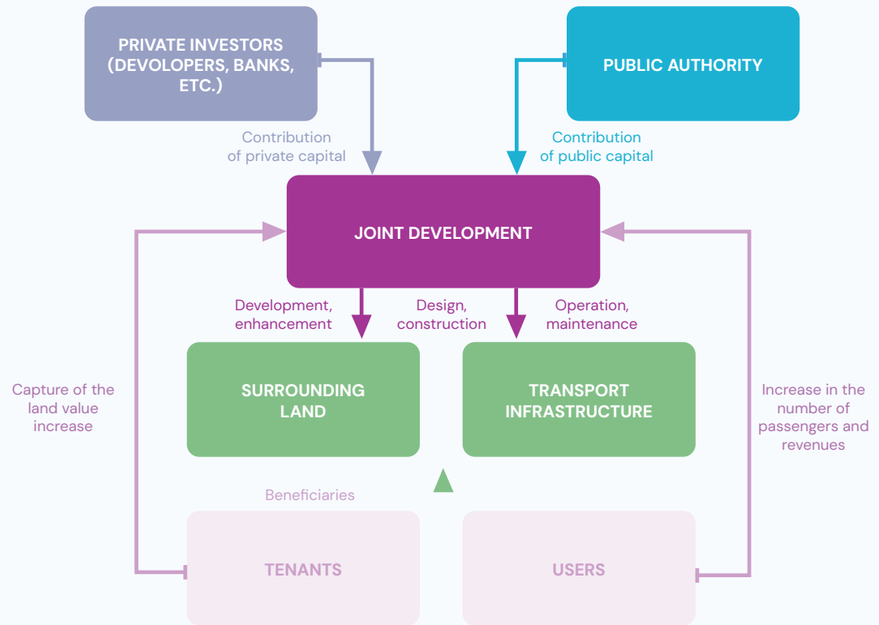
Development projects run by mixed semi-public enterprises

Mixed semi-public enterprises are a valuable mechanism for capturing property value gains generated by transport infrastructure. In such an enterprise, a public authority creates a secure environment for the private sector to carry out a new transport infrastructure development project, and the private partner provides industry know-how, funding, and shares in the project's risk.

The partnership between public authorities and private developers generally occurs within a semi-public entity. It enables:

- Public partners:
  - to directly capture money invested by the "developers" to partially finance the construction of transport lines;
  - to benefit from increased use of public transport brought about by urban development, thus increasing operating capital;
  - to promote controlled urban development with private land developers.
- Private partners:
  - to develop an array of activities, such as residential, commercial and leisure activities, on land which they own;
  - to command higher rent and enjoy a higher level of occupancy in their buildings thanks to improved accessibility from the transport services.

Figure 6: **The Principle of Joint Development**



Box 22

MTR in Hong Kong: An ongoing success story

The Mass Transit Railway Corporation (MTRC) was founded in 1975 by the government of Hong Kong to build a high-performance public transit system. The government, which still holds a significant stake in MTR's capital, does not grant the company any subsidies to manage its network. However, the land acquisition procedure is very favourable because the government grants MTR land rather than auctioning it.

Next, MTR receives remuneration through the property transactions carried out, often in partnership with other property developers, in the vicinity of the depots and stations of the public transit system. Between 1979 and 1998, the opening of five metro lines was accompanied by numerous real estate transactions. This strategy, called "Rail+Property", enables MTR to generate significant profits by selling or renting out residential and commercial properties. In 2023, MTR had more than 121,000 housing units and 1,569 station shops covering 70,503 square metres.

Today, the company's revenues primarily derive from its property and commercial businesses. In 2023, EBIT from transport operations was HK$1.1 billion (€130 million) negative. Still, EBIT from the property and commercial businesses was positive by HK$4.0 billion (€480 million) and HK$3.8 billion (€452 million) respectively, enabling MRT to generate positive EBIT of HK$7.1 billion (€840 million). All the players involved in the process have benefited from the integration of urban development and transport planning: the public authorities, the developers, the MTR passengers, the tenants of developments around MTR stations, and their customers.

Photo: **Ryan Chan**

Integrating property and commercial activities within the main transport operating company

In Japan, land value capture involves internalising a wide range of activities.

For example, the landowner finances the entire project, from building infrastructure to increasing its value by setting up shops or housing. In densely populated areas, where it is impossible to manage land at a reasonable cost, bus, underground, and train stations offer a further means of generating cash flow through commercial activities.

Box 23

Examples from Japanese cities

Rail transport has been a major driver of urbanisation in Japan. Train stations and their surrounding areas serve as essential transit hubs for millions of daily commuters and therefore hold significant commercial potential. In many Japanese stations, passengers can shop, complete administrative tasks, dine, and access various services—all while waiting for a train or metro connection.

Given the scarcity and high cost of land, transport infrastructure developers in Japan have long sought innovative ways to integrate commercial and real estate activities within and around stations.

In 2018, JR East (East Japan Railway Company), which operates across the eastern side of Honshu Island and serves the Tokyo metropolitan area, launched its long-term development strategy "Move Up 2027." The plan aims to expand non-transport business activities to offset the declining demand for rail travel, linked to a shrinking population (projected to decrease by 10% between 2015 and 2040 in JR East's service area), changing work habits, the growth of the digital economy, and the emergence of autonomous vehicles.

The company's objective is to increase the share of non-transport revenues from 30% of total operating income in 2015 to 40% by 2027, and eventually to 50% in the long term. These activities include retail and real estate ventures (shopping centres, offices, hotels, etc.) as well as digital and technological services, such as e-money cards, Mobility-as-a-Service (MaaS) platforms, and data-based businesses. Similarly, Keio Corporation, a private operator running suburban rail lines in Tokyo, has adopted an even more integrated commercial model, with sales of goods and services in stations accounting for over one-third of its total revenue.

Photo: **Kenny Kuo**

1.5.2 Advertising revenues

Advertising revenues can provide additional funding for the operation of a public transport service.

Additional revenues

Users of closed public transport systems, such as underground metros, represent an attractive target audience for advertisers, with revenues largely dependent on passenger traffic at stations.

Similarly, installing advertisements on vehicles or street furniture can also serve as a source of revenue, as these placements reach a broader audience of street users. In this case, the amount of advertising income depends on overall traffic volumes and the visibility of the advertising spaces.

Box 24

Advertising: An additional source of funding to improve public transport service

In Antananarivo, Madagascar, advertising was introduced along a pilot public transport line. To ensure the maintenance and durability of the street furniture, a public-private partnership (PPP) was established to service and maintain the new bus shelters and pylon signs. The bus shelters include advertising spaces managed by a private agency, which, in exchange, is responsible for maintaining the street furniture throughout the concession period and for paying an annual fee to the Urban Community of Antananarivo.

The proceeds from this fee, €62,000 in 2013, were used to fund various support measures, such as paying the salaries of bus station managers along the pilot line, renovating side streets, installing additional bus shelters, commissioning a mural on urban mobility, and providing uniforms for staff managing bus traffic at key stops.

In Cairo, a National Taxi Replacement Plan (PNRT) was adopted in 2008 to renew the city's fleet of 85,000 taxis, half of which were over 25 years old. To encourage the adoption of new vehicles powered by Natural Gas for Vehicles (NGV), the government introduced a package of economic incentives—including tax exemptions on vehicle purchases, subsidies for turning in old vehicles for recycling, waivers on taxi licence fees for several years, and low-interest loans. Contracts with advertising companies to place ads on taxi bodies made the scheme even more attractive to drivers, providing an additional source of income and contributing to the programme's success.

Photo: **Faqih Abdul**

Naming rights

In some instances, naming rights can be sold, allowing companies to sponsor a bus, metro, or tram stop in exchange for payment.

Commonly used to fund sports stadiums, the sale of naming rights is now gradually emerging in urban public transport.
The principle is straightforward: a public or private partner contracts with the transport authority to rename specific stations or lines in return for a predefined annual fee. The location, passenger volume, and visibility of each station are key factors in determining the value of the naming rights over a given period.

While this approach can generate additional revenue, its contribution remains relatively limited, typically representing only 2–3% of total public transport operating budgets, even in the most successful cases. It is also essential to consider the reputational implications, public perception, and the need to preserve a sense of public ownership and identity in urban spaces.

For instance, in 2016, the Los Angeles County Metropolitan Transportation Authority (MTA) approved a policy allowing corporate sponsors to purchase the right to rename rail lines, bus lines, stations, or buildings. However, the policy was repealed within three months following concerns about the over-commercialisation of public space.

Box 25

Urban transport in Mumbai (India): the leverage of land value capture

In 2018, the **Riyadh Development Authority (Saudi Arabia)** announced that it had generated over USD 200 million through 10-year naming rights contracts for eight stations of the Riyadh Metro.

In Dubai, the **Roads and Transport Authority (RTA)** launched the "Dubai Metro Naming Rights Project" in 2008, offering naming rights for 23 of the 47 stations on the city's two metro lines (excluding landmark and historic sites). Sponsors were selected through open tenders held before each line began operations (in 2009 and 2011). In the first phase of the project, 11 companies were chosen from 120 bidders, signing 10-year agreements totalling EUR 409 million.

In New York, the **Metropolitan Transportation Authority (MTA)** signed a 20-year agreement in 2009 with Barclays Bank, valued at USD 0.2 million per year (EUR 0.15 million per year), to add the bank's name to the Atlantic Avenue subway station in Brooklyn, located adjacent to the Barclays Centre, a central indoor arena. In July 2013, the MTA decided to extend this naming rights model to all stations, subject to specific criteria such as maintaining a geographical or historical connection between the station and its sponsor.

In Philadelphia, the **Southeastern Pennsylvania Transportation Authority (SEPTA)** signed a five-year, USD 5 million (EUR 3.7 million) agreement in 2010 with telecom operator AT&T to rename Pattison Station, one of the busiest in the entire network.

In Madrid, **Metro de Madrid** signed a three-year agreement in 2013 with telecom operator Vodafone, valued at EUR 3 million, to rename the central Sol Station (serving 65,000 passengers per day) and Line 2 of the metro (serving 122,000 passengers per day). This contract was expected to increase the operator's annual advertising revenues by 10%.

Photo: **Thomas Holbach**

Developing new services through advertising

Finally, the development of new mobility services, such as bike-sharing systems, can be supported through advertising revenues.

In several metropolitan areas, beginning with Lyon and Paris, local governments have successfully financed bike-sharing schemes by leveraging the outdoor advertising market as a complementary funding source.

Box 26

Vélib' in Paris: Success for a bike share system

Launched by the City of Paris in July 2007, in partnership with the street furniture company JCDecuac, the Vélib' bike-sharing programme was an immediate success during its first five years. The system allows users to borrow or return a bicycle at any station in Paris or in 30 neighbouring municipalities, 24 hours a day, in exchange for a subscription fee and possible overtime charges. In 2024, the standard monthly subscription cost is **€9.30.**

Between 2007 and 2017, the Vélib' system was based on two main principles:

- The system was financed by the private operator, which purchased, installed, and maintained the stations and bicycles, using advertising revenues generated from on-street advertising panels. Although **JCDecux** was not initially a transport operator, its strength lay in its extensive experience in urban furniture development, installation, and contracting with local authorities.

→ The revenues from operating the Vélib' service went to the City of Paris, which also received an annual fee from the operator for occupying public space.

The City of Paris covered part of the maintenance costs, particularly those related to vandalised or stolen bicycles, as well as the rental fees for stations located in neighbouring municipalities. The operator was subject to a bonus-and-penalty system based on eight service quality criteria defined in the contract. In 2010, the City spent €12.5 million on service management and generated €16 million in revenue, resulting in a net profit of €3.5 million.

As the Vélib' programme gradually expanded to include municipalities surrounding Paris, it was decided in 2016 to place it under the authority of a mixed syndicate comprising Paris and more than 100 communes in the inner suburbs of the Île-de-France region. In 2017, after the end of the contract with **JCDecuax, a new 15-year contract valued at nearly €500 million,** now decoupled from the advertising market, was awarded to the Franco-Spanish company Smovengo. The new contract also introduced a fleet of electric bicycles.

Since 2007, the Vélib' fleet has grown from 11,000 to 17,300 bicycles, while the number of stations has increased from 750 to 1,480. The service now has more than 400,000 annual subscribers—42% of whom are women—and records an average of over 120,000 rides per day, 43% of which are made on electric bicycles. Although Vélib' accounted for over 44% of bicycle traffic in Paris in 2013, its share has since fallen to 23%, due to the increase in privately owned bicycles and competition from other self-service bike systems.

Photo: **Besopha**

Photo: **Carlos Felipe Pardo**

Chapter 2

Doing more with available funds

Defining the right mix of funding sources described in the previous chapter is critical.

Defining the right mix of funding sources described in the previous chapter is critical. This must start with a comprehensive and robust cost-benefit analysis of any new investments in infrastructure or rolling stock, or in the development of services. Experience shows that skipping this fundamental step leads to overlooking key parameters such as future maintenance costs or overestimating investment levels relative to actual and future demand, which, in both cases, will result in increased reliance on public funding.

This chapter provides an overview of the levers available to public authorities to do more with a given amount of funds. The section is divided into the following three sub-sections: Improving the financial performance of urban systems. This sub-section examines how revenue-to-cost ratios can be optimised using key operational indicators from the public transport industry. This section focuses on formal public transport.

- **Leveraging private financing:** This sub-section explores how public authorities can reduce the level of subsidies or funding support they must provide by spreading expenditure over longer periods or by establishing public-private partnerships, primarily through Public-Private Partnerships.

- **Finding new financing sources:** This sub-section details investment mechanisms that optimise financing costs, such as climate-related investments.

2.1. Improving financial performance

The financial performance of a public transport network is mainly dependent on its operational performance. To evaluate operational performance, three key questions can be used: three questions can be asked:

1. **Is the system cost-efficient?** In other words, is the total cost per operated vehicle-kilometre optimised?

2. **Is the system commercially efficient?** In other words, is the number of passengers transported per operated vehicle-kilometre optimised?

3. **Is the average effective tariff optimised?** In other words, is the revenue collected per transported passenger maximised?

These indicators are linked through the following formula:

$$\frac{R}{C} = \frac{\frac{R}{P} \cdot \frac{P}{K}}{\frac{C}{K}}$$

Where[1]:

- **R** is the total system revenues (excluding subsidies and any fiscal or parafiscal resources),

- **C** is the total cost of the service (including costs of the rolling stock),

- **P** is the number of transported passengers, and

- **K** is the number of produced bus-kilometres.

And:

- **R/C is the "Financial performance"** of the network
- **R/P is the "Average Effective Tariff"** of the network
- **P/K is the "Commercial Efficiency"** of the network
- **C/K is the "Cost-efficiency"** of the network

Formula (1) translates then to the following: Financial performance « Average effective tariff x Commercial efficiencyCost-efficiency

$$\textit{Financial performance} \;\text{«}\; \frac{\textit{Average effective tariff x Commercial efficiency}}{\textit{Cost-efficiency}}$$

The "**average effective tariff**", "**Commercial efficiency**", and "**Cost-efficiency**" are relatively independent indicators, each reflecting a distinct urban transport policy dimension.

This formula shows that, in addition to the increase in service revenues or additional subsidies, the financial performance of the system can also be improved through two complementary action areas:

- Increasing cost-efficiency by reducing operating expenditures per operated kilometre (C/K); or

- Increasing commercial efficiency through an increased number of transported passengers per operated kilometre (P/K).

A benchmarking exercise comparing these indicators across other cities to draw meaningful insights on the possible and most relevant levers for a given network (see Box 27). However, it is essential to note that the ability of a public authority to optimise the financial performance of a system and, hence, reduce the required public financial support is closely linked to the contractual framework in place. For example:

- In a pure Gross Cost Contract (GCC)[2], by definition, reductions in the operating costs of the system do not translate into reduced payments to operators. Increases in revenue per transported passenger (average effective tariff) are, however, most easily captured in this scheme.

- In contrast, under a pure Net Cost Contract (NCC)[3] public authorities cannot capture any improvements in the system's financial performance; costs and revenues are captured and managed by the operator.

Therefore, depending on the specific context of each city, it is essential to combine efforts to optimise financial performance and the contractual framework, allowing public authorities to benefit from efficiency gains while reducing the levels of public funding required to support the system.

The sections below describe in more detail how to optimise each of the three operational performance indicators mentioned above.

1. In French, these indicators are translated as follows: R Revenue du système, D Coût total du service (y compris le coût du matériel roulant), K le nombre de véhicules.kilomètres produits, et V le nombre de voyageurs transportés.
2. In Gross Cost Contracts, the operator is paid by the contracting authority based on service production indicators (e.g. bus.km).
3. In Net Cost Contracts the operator is paid by user revenues.

2.1.1. Cost-efficiency

- Increased cost efficiency translates to a lower cost per vehicle-kilometre operated. The costs per vehicle-kilometre operated depend on the following parameters:
- Transport mode: articulated or standard buses, midi-buses, or minibuses,
- Characteristics of the fleet: electric or diesel buses,
- Local macroeconomic characteristics, such as income levels and fuel prices,
- Commercial speed,
- Operator's expertise management performance,
- The network's structure and the number of vehicle-kilometres operated.

Therefore, for a given network with predefined characteristics of vehicle size and technology, increased cost-efficiency can be achieved by:

- Enhancing commercial speed through, for example, dedicated bus lanes and better traffic management (e.g., priority at intersections).
- Improving the efficiency of the operators' costs and the network's structure.

2.1.2. Commercial efficiency

Another way to enhance the financial performance of public transport, and thereby reduce its financing needs, is to increase commercial efficiency, that is, by optimising the number of passengers transported per kilometre operated (P/K).

Commercial efficiency (P/K) depends on several factors, including the capacity of the transport modes(e.g. articulated or standard buses, midi-buses, or minibuses), as well as the characteristics of the city and its transport network, such as service frequencies, urban density, and network redesign.

In formal public transport systems, where vehicle size and capacity, commercial efficiency could be improved through more efficient service plans. While operators are usually the most qualified to develop efficient service plans due to their operational expertise, public authorities must ensure that contracts include minimum requirements for service coverage. However, the latter must be reasonable, coherent with population density, and grounded in a careful analysis of demand distribution.

2.1.3. The average effective tariff

Increasing the average effective tariff increases the system's total revenues. These include fare revenues and other revenues, such as advertisements on buses, at bus stops and stations, and other commercial revenues (such as leasing spaces in stations).

However, increasing fare revenue can be challenging in cities of the Global South. The majority of the population is low-income and therefore exhibits high price elasticity of demand. In other words, even small fare increases can significantly reduce ridership.

Well-designed fare policies are therefore crucial in setting the average effective tariff while maintaining affordable fares (see Volume 1)

Box 27

Examples of analyses of the financial performance of networks using the key operational ratios

1.) In Nagpur, India, various solutions were explored to enhance the financial performance of the urban transport network, measured by the revenue-to-cost (R/C) or revenue-to-distance (R/D) ratios, and to reduce the level of required subsidies, particularly following the transition to electric buses. Three key levers were examined: Improving cost-efficiency (C/K or D/K): This lever focuses on lowering the cost per operated bus-kilometre.

In Nagpur's context, where operators are recruited through Gross Cost Contracts, this translates to optimising the operators' operating expenditure per kilometre (km charge). However, the analysis revealed that the existing contractual framework offers limited flexibility to influence the quoted km charge by operators once the contract is defined and the operator is recruited. After the operator is recruited, there is no mechanism to optimise the km charge further.

2.) Improving commercial efficiency (P/K or V/K): This involves optimising the number of passengers transported per operated kilometre. Compared with other cities offering a similar level of service supply, Nagpur's commercial efficiency is relatively low. It could be further improved, for example, by optimising service planning (see the table below).

		NAGPUR BUS SERVICES (2019)	CASABLANCA BUS SERVICES (2017)	RABAT BUS SERVICES (2017)
P/K	PASSENGER/BUS KM (PAX/BUS.KM)	2,30	3,00	3,80
SUPPLY LEVELS (BUS KM/INHABITANT)		8,59	9,91	14,74

3) Increasing farebox revenues by adjusting tariffs: The average effective tariff in Nagpur is relatively low compared to that of other comparable cities. A moderate and well-calibrated fare adjustment could therefore help enhance total system revenues, provided affordability for low-income users is ensured through complementary fare policy measures.

		NAGPUR BUS SERVICES (2019)	FRENCH CITIES (+250 000 INHABITANTS-ONLY BUS SERVICES)	CASABLANCA BUS SERVICES	RABAT BUS SERVICES
R/P	REVENUES/ PASSENGER (INR/PAX)	11,08	37,20	32,32	13,08
AVERAGE DAILY INCOME (INR)		521,3	5830,7	458,8	451,6
R/P PER DAILY INCOME		0,02	0,01	0,07	0,03

The results show that, excluding French cities, where public transport policies rely on high subsidies and low tariffs, the average tariff in Nagpur (when adjusted for daily local income to account for differences in the standard of living across cities) remains low compared to Moroccan towns.

In 2017, similar indicators were used in Moroccan cities to formulate recommendations on funding levels for the urban transport sector. The revenue-to-cost ratio in Moroccan cities is significantly higher than in French towns, reflecting the substantial public subsidies available for public transport in France. In contrast, in Morocco, fare revenues cover a large share of service costs, which illustrates the high priority Moroccan authorities give to limiting the burden on public finances.

PROFILE	FRENCH CITIES (> 250,000 RESIDENTS)	GRAND CASABLANCA	RABAT
P/K	4,4	3,6	4,7
R/P	5,5	4,5	2,2
C/K	4,4	19	14,7
R/C	4,4	85,3%	70,3%

The revenue per passenger (R/P) is also higher in Moroccan cities than in French ones, even after accounting for differences in living standards between the two countries. However, the already high fare levels make it challenging for users to spend more on transport. Moreover, the kilometric cost of service (C/K) in Morocco is higher, even though the quality of service provided remains lower.

Sources: Authors

2.2. Optimising the use of public funds: how to leverage Public-Private Partnerships (PPP)?

2.2.1. Rationale for using a PPP

Public-private partnerships (PPP) are more than a financing mechanism. They are a way to mobilise private-sector expertise in both operations and investment, as well as private capital. PPPs can also enhance accountability, as private operators are contractually committed to achieving higher levels of service quality and performance than may be attainable under conventional public procurement frameworks.

In the urban mobility sector, operating costs typically represent a larger share of total lifecycle costs than investment costs. Consequently, the rationale for using a PPP often lies less in its financial advantages and more in the value of private expertise in managing and operating complex transport systems.

PPPs can also facilitate the use of commercial revenues to service private debt, thereby reducing pressure on public budgets and allowing for a faster pace of investment. However, in greenfield projects —those involving the creation of entirely new infrastructure or services —or in major expansions of existing systems, private partners are generally reluctant to assume significant commercial risk. They often demand guarantees of expected ridership levels, effectively creating contingent liabilities for the public partner, akin to public debt.

Moreover, PPPs in urban mobility typically have a limited impact on a project's underlying economics. Key factors such as route alignment, fare levels, mobility demand, and competition regulation remain, and should remain, under public control. Private capital does not automatically generate higher revenues; instead, it provides a mechanism to finance immediate investment through future income streams. In many cases, the efficiency gains from private operation may not fully offset the higher cost of private financing, including returns to shareholders and commercial interest rates.

Therefore, PPPs in urban mobility should not be pursued for purely financial reasons. Their actual value often lies in the additional capabilities that the private sector brings to infrastructure delivery and service provision, including:

- **Specialised technical know-how:** Urban transport projects require advanced industrial and operational expertise, which is often concentrated in specialised private firms.
- **Enhanced project management capacity:** The construction and operation of major transport infrastructure are complex undertakings requiring robust management and technical skills, which may be limited within public administrations. Collaboration with private partners, under strong public oversight, can accelerate and optimise project delivery.
- **Integration of investment, operation, and long-term sustainability:** A long-term service commitment by the private partner helps ensure that investment and operational decisions are aligned. By tying payment to long-term service quality, the public authority indirectly ensures the adequate maintenance and operation of infrastructure throughout its lifecycle.
- **Improved human resource management:** Transferring operations to a private partner shifts responsibility for staff recruitment and management, potentially reducing administrative costs and increasing operational flexibility.
- **More substantial efficiency incentives:** When properly designed, PPP contracts can promote efficiency by linking the operator's remuneration to clear, balanced performance indicators defined during the competitive bidding process.

2.2.2. Prerequisites for a successful PPP

Implementing a PPP requires meeting several critical prerequisites. The private partner must be provided with explicit contractual protections and a predictable environment, while the public partner must retain sufficient capacity to monitor, regulate, and enforce service delivery effectively.

Key prerequisites include:

- A well-structured institutional framework: The public authority's experience and capacity in developing and managing transport projects are crucial. A successful PPP requires that the authority either already possess, or actively build, the institutional and technical capacity for long-term oversight and contract management.
- Strong legal protection: Effective legal safeguards are indispensable throughout the project's duration. The PPP contract must clearly define the rights, obligations, and responsibilities of both parties and include transparent, equitable enforcement mechanisms—such as mediation and judicial procedures—to protect all stakeholders, particularly when the private partner is foreign.
- An enabling environment for project viability: The project must reflect users' ability to pay and be integrated within a broader urban transport and development master plan. The industrial and commercial risks transferred to the private partner must be realistic, taking into account related factors such as traffic management, public space allocation, parking policy, and competition from other modes (e.g. taxis), all of which influence financial viability.
- A realistic financial assessment: In urban transport, adequate public subsidies are often necessary to achieve financial equilibrium. Even when a medium-term balance is achievable, a ramp-up period is usually required for demand and revenues to stabilise.
- Balanced allocation of roles and risks: Each risk should be borne by the party best equipped to manage it. This principle determines both the level of private-sector involvement and the contract structure. The main categories of risk include:
  - Design risks: technical errors or inaccurate demand forecasts, reducing performance.
  - Construction risks: higher-than-expected costs or project delays.
  - Industrial (operational) risks: related to operating and maintenance costs, competition, or system reliability.
  - Commercial risks: linked to demand, fare setting, and marketing.
  - Financial risks: associated with interest rate fluctuations, inflation, or currency devaluation.

2.2.3. PPP for the operation of public transport

When public authorities entrust private operators with the operation of transport services, they transfer to them a varying share of the financial risks associated with providing those services. These risks generally fall into two categories:

- Commercial risk – related to trends in passenger revenue.
- Industrial risk – related to operating and maintenance expenses.

Depending on how these risks are distributed between the public and private partners, three main contractual models can be identified, often combined in practice:

- Management contracts: Under this arrangement, the public authority assumes both the commercial and industrial risks. The private partner is responsible for day-to-day management of operations and is remunerated based on the actual cost of delivering transport services, supplemented by a system of bonuses and penalties tied to specific performance indicators.
- Gross-cost contracts: In this model, the private operator assumes only the industrial risk. The public authority pays the operator according to a pre-determined remuneration formula, typically based on estimated operating costs plus a margin, regardless of actual expenses or farebox revenue. Remuneration may take the form of a lump sum for a fixed annual number of kilometres, a unit price per kilometre, or a composite formula linked to several performance parameters. These contracts often include mechanisms to adjust remuneration for inflation (labour, energy, and general price indices).
- The operator may also generate supplementary income from advertising or fare-evasion fines. When the investment risk is not borne by the private operator, a gross-cost contract is essentiall a service contract.
- Net-cost contracts: In a net-cost contract, the private operator assumes both industrial and commercial risks. The operator collects and retains fare revenues, while the public authority compensates it for public service obligations (e.g. fare caps, service coverage requirements) through a fixed balancing subsidy.

Figure 7: **Types of contracts and risk sharing**

CONTRACTS	NET-COST CONTRACTS		GROSS-COST CONTRACTS		MANAGEMENT CONTRACTS	
RISK CARRIER	PUBLIC	PRIVATE	PUBLIC	PRIVATE	PUBLIC	PRIVATE
INDUSTRIAL RISK-TAKING (STAKES: COST CONTROL)		X (*)		X (*)	X	
COMMERCIAL RISK-TAKING (STAKES: REVENUE)		X (*)	X		X	
INVESTMENT RISK (STAKES: SIZING AND FINANCING THE INVESTMENT)	CAN BE BORNE BY EITHER OR BOTH		CAN BE BORNE BY EITHER OR BOTH		X	

(*) : However, the risks can sometimes be shared for specifically identified items (industrial risk) or with a %, tunnel or band formula (commercial risk)

2.2.4. PPP as an infrastructure financing mechanism

PPPs can also serve as financing mechanisms for new infrastructure projects (greenfield) or for the rehabilitation of existing assets (brownfield), with the same private partner responsible for both mobilising financing and implementing the project. Although the private partner contributes equity and raises loans, these funds must eventually be reimbursed. Project funding ultimately depends on either users (through fare revenues) or public budgets (through payments based on the quantity and quality of transport services provided).

In this type of PPP, the most common model is the concession contract, under which the public authority delegates to a private company (the concessionaire) the responsibility for designing, building, financing, and operating a public transport project. The concessionaire is authorised to operate the system for a period sufficient to amortise its investment—typically 20 to 30 years for large-scale transit infrastructure built in recent decades. At the end of the concession period, the private partner returns the infrastructure and equipment to the public authority free of charge and in good working condition.

In most public transport concessions, depending on users' ability to pay—and therefore on the combination of ridership levels and fare structures—the public authority generally needs to co-finance a portion or even the entirety of the infrastructure to ensure the project's overall viability. Fare revenues from mass transit systems often cover the cost of rolling stock, or part of it, but rarely the cost of fixed infrastructure such as tracks, depots, or stations. In some cases, even operational costs cannot be fully recovered from fares alone.

As a project financing mechanism, a PPP allows the public partner to:

- Spread public expenditure over time. The private partner advances the initial capital required for construction and is reimbursed gradually over the life of the contract.

- Reduce the immediate use of public investment and debt. By requiring the private sector to provide capital and/or borrow funds, the public authority preserves its limited borrowing capacity for other priority sectors such as health, education, or culture.

- Facilitate access to additional financing sources. Since professional operators bear part of the project risks, PPPs can reassure lenders, including international financial institutions (IFIs), thereby improving access to credit and potentially accelerating project implementation.

Nevertheless, using PPPs solely for financial purposes should be approached with great caution. Public authorities are often in a better position than private entities to secure loans at favourable rates, whether from IFIs in developing countries or from commercial banks in advanced economies. The experience of SYTRAL in Lyon (France) illustrates that well-managed public borrowing, combined with strong institutional and technical capacity, can in some cases be more advantageous than private financing.

In summary, PPP can be a valuable instrument for delivering and operating urban transport infrastructure, but they are not a universal solution. Their effectiveness depends on sound project preparation, transparent risk allocation, and strong institutional capacity within the public authority. When appropriately structured, PPPs can bring technical expertise, operational efficiency, and long-term management discipline to complex transport systems. However, they should be viewed primarily as a means of improving performance and delivery, rather than as an easy way to secure financing. Ultimately, the success of a PPP relies on the public sector's ability to maintain strategic control, ensure value for money, and align private incentives with public mobility objectives.

Box 28

Line 9 of the Seoul Metro (South Korea): PPP Financing

Until 2009, the Seoul Metropolitan Subway network consisted of eight lines, all operated by two public companies that were struggling with chronic operating deficits. In response, the City of Seoul decided to entrust the development and operation of Line 9 to a private partner through a PPP, to introduce competition and incentivise performance improvements among public operators.

A 30-year concession contract was signed with the private consortium Seoul Metro Line 9 (SML9), which was tasked with financing, designing, constructing, and operating the new line. The operating company, Southlink 9 Company Limited, is owned 80% by Veolia Transport RATP Asia (VTRA) and 20% by Hyundai-Rotem. Under the terms of the contract, the municipality guarantees a minimum revenue level for 15 years and provides for a termination payment in case of early cancellation. Although the agreement allowed for a differentiated fare for Line 9, the operator chose to maintain the same fare level as on other metro lines to ensure system-wide fare integration.

The key operational innovation introduced by the private operator was the implementation of express and local services running on the same track, with express trains stopping only at major stations. Early involvement of the operator in the project contributed to an optimised construction process, which was completed in just three years, and led to several operational and maintenance innovations.

The 25.5 km line, serving the southern half of Seoul, opened in July 2009 and was subsequently extended eastward in two phases, in 2015 and 2018. From the very first months of operation, ridership exceeded expectations, quickly surpassing the system's designed capacity. By 2015, the crowding rate had reached 238%, compared to an average of 158% across the rest of the network. Despite various measures to increase capacity, the line remained heavily used, with crowding still around 200% in 2023—a clear indication of its success and high public demand.

Photo: **Carlos Felipe Pardo**

Box 29

Metro line 5 of São Paulo (Brazil): An example for the future?

The public transport system of the São Paulo metropolitan region (20 million inhabitants) currently includes five metro lines as well as numerous bus and suburban train lines.
The construction of the new Line 4 (the Yellow Line) will fully interconnect the metro and rail networks, which together cover the vast majority of the São Paulo Metropolitan Region (SPMR).

The transport authority of the metropolitan region, the Secretary of Metropolitan Transport of the State of São Paulo, selected a new type of PPP for Brazil and Latin America. Under this model, Metrô, the public company operating the first four lines, remains the owner of the infrastructure, while the operator is a consortium of private companies.

- Structure of the PPP
  - In this arrangement, the State of São Paulo entirely financed the infrastructure using its own funds and loans from the World Bank and the JBIC (Japanese Bank for International Cooperation).
  - A concession company was established to operate the system: "Concessionária da linha four do Metrô de São Paulo SA", doing business as ViaQuatro, in which Metrô has a capital holding of $174 million, and a consortium of investors contributed $183 million. The rolling stock and systems are acquired by Concessionária da Linha 4. For a total cost of approximately $1.2 billion, the transport authority will finance 80% of the project (infrastructure and part of the rolling stock), and the private partners will finance 20%. The construction contract was signed in 2003, and the concession contract in 2006.
- Scope of the concession contract
  - The scope of the contract includes operating São Paulo's metro line 4, running from Luz to Taboão da Serra, as well as the investment and installation for rolling stock, signs, track connections and data transmission with the train networks.
  - The contract was signed for 32 years, with a possible extension to 35 years, to ensure the economic viability of the operation.
    The operation of line 4 itself will last only 30 years, since it is scheduled to open two years after the start of the concession contract.
- The contract consists of three phases
  - Phase 1: Operation of Line 4 with six stations and a maintenance centre in Vila Sônia. The concessionaire provides 14 trains in this phase.
  - Phase 2: Operation of Line 4 with all planned stations and the creation of a bus line between Vila Sônia and Taboão da Serra.
  - Phase 3: The Vila Sônia–Taboão da Serra connection, to be defined at a later stage.
- The concession holder receives three types of revenues
  - Compensation calculated in two stages (phase 1 and phase 2) to remunerate the concession holder before operations of the corresponding phase begin, and which lasts 24 months for each phase;
  - Revenue from ticket sales, with a possible adjustment depending on the number of passengers using line 4 alone or in conjunction with the bus line feeding to line 4;
  - Other revenues from sources such as advertising and commercial space.
- Sharing risks
  - Metrô fully covers construction delays, as the contract with the construction companies falls under its responsibility. In a March 2021 decision, a new agreement between the government and the concessionaire required the State to pay over R$1 billion to address economic and financial imbalances caused by construction delays.
    As a result, these delays led to significant additional costs for the State. In addition to completing the construction of the line and stations, the government must also compensate the concessionaire for the non-operational period.
- Demand forecasts
  - Ridership was forecast at 700,000 passengers per day eight years after opening. Remarkably, one year later, though not all stations were open, this target had already been reached. The contract's compensation provision favours the concession grantor: once passenger numbers exceed the forecast by more than 15%, the grantor receives 60% of the difference between the actual and estimated figures. Had ridership fallen below projections, the opposite would have applied. Six years after the start of commercial operation of Phase 2, however, the concessionaire assumes full demand risk and can no longer claim financial compensation from the public authority.
- Exchange risk:
  - Exchange rate exposure is a significant issue, as a large portion of the loans is denominated in foreign currencies. To mitigate this, fare revenue calculations incorporate an exchange rate adjustment, and the transport authority covers the residual risk.
  - The advantage of the PPP structure for Line 4 is that each partner contributes in its area of expertise. The transport authority covers the construction phase, which is the most difficult to finance and depends on public funds and international loans backed by government guarantees.
    The concessionaire finances all operational components, including rolling stock and systems, for which it can secure favourable credit terms, and is then fully responsible for their proper functioning. Metrô's equity stake in the concession company ensures both technical competency and system-wide coherence within the metro network.

Photos: **Matheus Farias**

2.3. Finding new sources of financing: climate-related funds and mechanisms

Climate-related financing mechanisms can be highly effective in optimising investment financing costs when investments are climate-friendly. These sources generally provide favourable financing terms and conditions to promote such investments.

Climate funds have, to this day, been used only rarely to promote public transportation. However, as donors are increasingly focusing on climate-friendly investments, such as green mobility, there appears to be growing interest in mobilising climate funds for urban mobility investments, which could broaden the range of available concessional resources for the sector. The following sections present an overview of the significant climate funds and mechanisms that could be mobilised for urban mobility projects.

2.3.1. The significant "climate" funds

The Global Environment Facility (GEF) was created in 1991 to protect the global environment and promote sustainable development. It now brings together 183 countries in partnership with international institutions, nongovernmental organisations, and the private sector. It is the longest-standing dedicated public climate change fund and is currently undergoing its 7th replenishment. As an independent financial organisation, the GEF helps developing and transitioning countries, through subsidies, to protect biodiversity, fight climate change and manage natural resources.

Since its creation, the GEF has supported numerous urban mobility projects, with an increasing focus on integrated mobility systems and sustainable city approaches. Although initially the GEF primarily supported projects focused on technological solutions, the scope has broadened since 2007, leaving room for non-technological solutions, modal shift, and good management of public transport systems and planning. The GEF supports projects that promote low-carbon modes of transport. This concerns both public transport and non-motorised modes of transportation. However, priority is given to countries with small and medium-sized cities experiencing rapid growth.

The candidate for a GEF funding may be a public administration, a transport operator, a bilateral partnership between development agencies or an NGO. Right from the start, it is essential to contact the GEF's national office, which approves the initial project. In most countries, the office is set up within the Ministry of the Environment or the national environmental agency. Accredited agencies then implement projects, most of which are UN Agencies. Projects applying for GEF funding must fulfil the following criteria:

- National priority: the project must be driven by the country and be consistent with national priorities that support sustainable development;
- GEF priorities: the project has to address one or more GEF focal areas (e.g. biodiversity, international waters, land degradation, chemicals and waste, and climate change);
- Financing: the project must seek GEF financing only for the agreed incremental costs of measures to achieve global environmental benefits;
- Participation: the project must involve the public in its design and implementation, in accordance with the Policy on Public Involvement in GEF-Financed Projects and the respective guidelines.

The French Global Environment Facility (FFEM, for its French acronym) is a bilateral counterpart to the GEF. The FFEM was created in 1994 to partially subsidise global environmental protection projects in developing countries, in connection with the multilateral ecological agreements signed by France. Sustainable urban areas are one of the five priority sectors of the FFEM's activities.

Regarding urban transport systems, the FFEM has supported projects to build underground systems in Cairo and Hanoi.

The Clean Technology Fund (CTF) was created in 2008 and, together with the Strategic Climate Fund (SCF), forms the Climate Investment Funds (CIFs). The role of the CTF is to help middle-income countries combat climate change by funding projects across sectors. Nine countries contributed to the fund, and its resources amount to USD 5.6 billion, as presented in the figure below.

CTF funding is only accessible through Multilateral Development Banks (the World Bank Group, the Inter-American Development Bank, the African Development Bank, the European Bank for Reconstruction and Development, and the Asian Development Bank), acting as implementing partners. CTF supports projects and programmes in the following sectors: (i) Power Sector: renewable energy and highly efficient technologies to reduce carbon intensity; Transport Sector: efficiency and modal shifts; and (iii) Energy Efficiency: buildings, industry, and agriculture.

CTF provides various financial instruments, including grants, contingent grants, concessional loans, equity, and guarantees, to promote investment in local carbon technologies by both the public and private sectors.

A CTF parallel fund (CTPFF) was created in 2022 and is parallel to and associated with the CTF. The same structures also govern it and support the same objectives. The CTF Parallel Fund is used to accept new loan contributions in support of the CTF activities in accordance with allocations made by the CTF Trust Fund Committee.[4]

The CTF and CTPFF current balance (as of March 9, 2023) is estimated at around USD 2,962.38 million.[5]

The Green Climate Fund (GCF) was created by the Cancun Climate Conference in 2010. Its objective is to trigger a paradigm shift toward sustainable development, the mitigation of greenhouse gas emissions and the adaptation of communities to climate change.
The transport sector is one of its targeted result areas.

The GCF provides beneficiaries with various financing tools, including grants, loans, and guarantees. It is always involved as a co-financer and aims at leveraging additional funding.

National entities such as public institutions and government, private companies, and multilateral development banks can all benefit from the GCF fund. Each candidate for GCF funding must complete an accreditation process.
In 2018, the GCF financed a BRT project in Karashi. The funding agreement has been in effect since March 2020, and the project is currently under implementation.

Other "climate" funding agencies exist that finance urban transport to a lesser degree: the Clean Energy Financing Partnership Facility (Asian Development Bank), Fast Start Finance (Japan), and the International Climate Initiative (Germany).

4. Source: https://fiftrustee.worldbank.org/en/about/unit/dfi/fiftrustee/fund-detail/ctf
5. IBID.

Box 30

Mobilisation of "climate" funds in Hanoi (Vietnam) for sustainable transport

The city of Hanoi, which is particularly exposed to the effects of climate change, has initiated an ambitious programme to develop mass transit by 2020: four metro lines (53.5 km) and one BRT line (13 km). For this purpose, the city has received financial support from several international "climate" funds: GEF ($9.8 million in 2007), FGEF (€1.27 million in 2008) and the Clean Technology Fund ($1 million in 2011 and $50 million currently under consideration).

This funding, in the form of subsidies or (heavily) subsidised loans, has mainly targeted bus upgrades, the urban and environmental integration of BRT stations and of line 3 of the metro, as well as the promotion of active modes of transport, such as walking and cycling. These initiatives also promote exchanges among the various actors in the sector and the multimodal integration of the transport system.

2.3.2. The Article 6.4 Mechanism: a successor to the Clean Development Mechanism (CDM)

The Clean Development Mechanism was a flexibility mechanism defined in the UN Kyoto Protocol (Article 12) and based on projects that reduce greenhouse gas (GHG) emissions. It was created to allow for projects that reduce GHG in developing countries (known as non-Annexe I countries) to create co-benefits in the form of carbon credits, which can be sold to companies or states in developed countries (known as Annexe I countries) that have signed reduction commitments in the framework of the Kyoto Protocol.

However, as part of the 2015 Paris Agreement, which determined that more decisive actions are needed to limit global warming, a new mechanism was created to increase the flexibility and potential impact of international cooperation to reduce emissions. This agreement's Article 6.4 sets a goal of establishing a system that allows countries to transfer their emissions reductions through a broader range of approaches beyond the CDM's individual project-specific offsetting.
Many aspects of how exactly the Article 6.4 Mechanism will actually work remain to be defined. Still, in essence, the system is based on the transfer of Internationally Transferred Mitigation Outcomes (ITMOs) from countries that have exceeded their Nationally Determined Contributions (NDCs). How exactly these ITMOs will effectively be traded, verified, and accounted for remains to be determined, but at this stage, some individual countries are establishing frameworks for cooperation. Critical, and one major criticism of the CDM model, is the need to ensure transparency and environmental credibility in the transfer of credits between countries.

Even though the CDM model is quite different, it is essential to note that projects for which the crediting period was active on 1 January 2021 and ends before 31 December 2025 can be transitioned to the Article 6.4 Mechanism

Principles of the mechanism as defined by the Paris Agreement

The project must be consistent with the Nationally Determined Contributions (NDCs) of the host country and be part of a partnership between a developed country (Annexe 1 country) and a developing country (non-Annexe 1 country). A significant difference from the Kyoto Protocol, in which developing countries did not necessarily have emissions targets, under Article 6.4, alignment with NDCs is necessary.

As in CDM, projects must be "additional": they must result in measurable, long-term reductions in emissions that would not have occurred without the project. These reductions must be achieved exclusively through the implementation of the relevant project. For this purpose, a comparison is made between GHG emissions under the business-as-usual scenario and those generated when the project is set up. The project's emissions must be lower than the baseline emissions without the project. The main challenge lies in determining the business-as-usual emissions, especially for an urban transport project.

Need for transparency, equity, and the avoidance of "double counting": Based on difficulties encountered previously in the CDM, Article 6.4 places greater emphasis on ensuring the validity/actual impact of transfers. Essential in the Article 6.4 Mechanism is the need to ensure that figures are trustworthy (ensuring both greater support for this effort and lowered overall emission), that support is provided for the sustainable development and emissions mitigations in the developing countries involved, and that emissions reductions are only counted once, either by the originator of the reduction or the country which is transferred the credit.

Who participates in Article 6.4/CDM projects?

At this point, the Article 6.4 Mechanism remains to be finalised. The parties to the Paris Agreement have agreed on the basic elements. Still, negotiations continue on the environmental criteria that credits must satisfy, credit-generating activities, applicable methodologies, the administrative infrastructure for this system, and safeguards to apply.

While Article 6.4 has yet to produce precise projects/figures, some information is available for its predecessor, CDM. As of 2023, more than 7,840 projects had been registered, totalling over $300 billion in investment. Fifteen sectors of activity were eligible for CDM, including transportation, although this sector accounted for only a tiny minority. All registration categories included, 70% of CDM projects concern renewable energy, and 16% concern solid waste management, primarily methane recovery projects.[6]

Registered CDM projects have reduced over 2 billion tonnes of Carbon Dioxide Equivalent (CO_2e). An example of an urban mobility project supported by CDM is the famous Transmilenio project. It registered with the CDM in 2006 and used money from the sale of CERs to fund improvements to the network and its infrastructure. By 2012, Transmilenio had avoided an estimated 2.4 million tonnes of CO_2 equivalent.[7]

6. Source: Clean Development Mechanism (2023) – accessible online: **https://cdm.unfccc.int/**
7. Source: Achievements of the Clean Development mechanism: Harnessing Incentive for Climate Action (2001-2018) – accessible online: **https://unfccc.int/sites/default/files/resource/UNFCCC_CDM_report_2018.pdf**

Photo: **Mika Baumeister**

How much money can be made from a "transport CDM" project?

While there are no examples yet for Article 6.4 Mechanism projects, according to project developers, proceeds from the sale of CERUs generated by transport CDM projects rarely exceed 10% of the capital invested. The recent decline in the value of carbon credits on the international market also sharply reduces prospects for significant short-term returns. However, as the price of carbon credits is expected to rise in the medium and long term, returns are likely to become more critical. Nevertheless, the impacts of transport projects on carbon emissions are challenging to estimate and generally yield significantly lower reductions in spending than, for instance, energy projects. There are profound uncertainties regarding the financial benefits a project developer can expect from reselling credits, both in demonstrating the volume of credits actually generated by the project and in the value of a ton of carbon on the international market.[8]

2.3.3. The Mitigation Action Facility (formerly Nationally Appropriate Mitigation Actions -NAMA- Facility)

The concept of Nationally Appropriate Mitigation Actions, or NAMA, came about in December 2007 during the 13th session of the Conference of the Parties in Bali (COP 13) and was clarified in the Cancun Agreements in 2010. NAMAs align with the logic of low-carbon development strategies and comply with the principle of common but differentiated responsibility under the United Nations Framework Convention on Climate Change (UNFCCC).

Since 2012, the programme has funded 47 climate action projects in 33 countries, amounting to EUR 668 million (as of February 2023). In 2023, the NAMA (Nationally Appropriate Mitigation Actions) Facility changed its name to the Mitigation Action Facility and identified energy, industry, and transport as priority areas. The objective of MAF is to accelerate the reduction of carbon dioxide emissions and put partner countries on a path to carbon neutrality.

GIZ currently runs the Technical Support Unit (TCU) of MAF. Competitive calls for partner countries or organisations to apply for funding are launched every year. The selected mitigation projects receive grant funding from MAF to develop financial mechanisms for investing in technologies and methods to reduce greenhouse gas emissions.

Support area of MAF combines financial and technical aid to: (i) Provide technical assistance and ensure that investments are effective; (ii) Improve the expertise of actors in the countries and bring about positive changes in behaviour; and (iii) Create sector-wide shifts that improve livelihoods and bring additional environmental, social and economic benefits.

8. In 2021, notably, emissions trading revenues surpassed carbon tax revenues for the first time, representing a potentially very large market in coming decades. While prices have been quite volatile to this point, the High-Level Commission on Carbon Prices concluded in 2017 that carbon prices needed to reach from USD 40 to 80 per metric ton of carbon dioxide (tCO2) in 2020, and from USD 50 to 100/tCO2 by 2030 to be on track to keep temperature rise below 2 degrees. Source: State and Trends of Carbon Pricing 2023 (2023) – accessible online: **https://openknowledge.worldbank.org/entities/publication/58f2a409-9bb7-4ee6-899d-be47835c838f**

Mobilise Your City

Volume 2: Increasing Resources and Optimising Financial Needs

Cities of the Global South face rapidly expanding mobility needs and the imperative to develop sustainable, efficient urban mobility systems that underpin access to essential services, economic opportunities, and broader development goals. However, financing these systems presents significant difficulties. Decision-makers must navigate diverse city contexts, institutional settings, mobility visions, public funding capacities, and a wide spectrum of potential funding and financing mechanisms.

This second volume focuses on approaches to increase resources and optimise financial needs for urban mobility. It provides a structured framework and key considerations to support decision-makers in strengthening the financial foundations of their mobility policies, without proposing ready-made answers or prescriptive models. Building on the MEDDE and CODATU handbook *Who Pays What for Urban Transport*, developed for AFD, this volume complements the first by guiding practitioners in mobilising and managing the resources required for sustainable urban mobility.