




WHO PAYS WHAT FOR URBAN TRANSPORT?

Handbook of good practices

Édition 2014





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The bibliographical references used in this work are given at the end of the document.

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_Foreword

Across the world, urban sprawl and traffic congestion in cities have generated an ever-growing need for urban transportation which, in turn, creates demand for public transportation systems that are both energy-saving and low in greenhouse gas emissions, whilst being widely accessible and occupying little space.

The financing of these systems (operating and investment costs) cannot be covered by the income from fares and subsidies alone. Other sources are necessary, sources that cities and countries endeavour to find and implement as best they can, often with success but always with difficulty.

In a wide range of local and national contexts, many original mechanisms have been developed: betterment taxes to capture land value increases in areas served by public transport systems, taxes on employers, and contributions of private vehicle users through charges on road infrastructure and parking. Depending on the context, these mechanisms associate different levels of public institutions, sometimes the urban transport authorities, but also private actors, especially in the context of public-private partnerships. Their goal remains the same: the continual and efficient development of urban transportation and its sustainable adaptation to the city's growth.

This Handbook of Good Practices in Funding Urban Transport is the product of a joint initiative between the French Ministry of Ecology, Sustainable Development and Energy (MEDDE) and the *Agence Française de Développement* (AFD). It was written by the association “Cooperation for Urban Mobility in the Developing World” (CODATU), and draws from subject-based analyses and case studies, with input from CEREMA (Centre for Studies on Risks, Environment, Mobility and Land Planning).

The guide is by no means exhaustive but aims to highlight key examples of funding solutions which can be mobilised in the public transport sector. The idea is to present a frame of reference for decision-makers, in both the North and South, who would be brought to think about the organisation and financial structure of the urban transportation system which offers the best fit with their city's requirements and particularities.

Within the framework of their respective areas of expertise, the MEDDE and the AFD are available to discuss funding possibilities with these decision-makers.

_Introduction **The challenges of financing urban transport**

According to the United Nations, the proportion of urban citizens among the world's total population was estimated at 3.36 billion inhabitants in 2011, and is set to reach 6.3 billion by 2050. This urban growth will be concentrated in the cities of the developing world over the coming decades. In 2020, 50% of the Asian population will be living in urban areas. In Africa, the same figures will be reached in 2035. As a result, urban mobility will grow very rapidly, accelerated by improvements in living standards.

Transit within urban areas is provided by a combination of modes of transport which can vary greatly. These modes of transport constitute a system and it is this system as a whole which has to be considered when defining effective mobility policies.

Within the systems, the international community is giving greater emphasis to sustainable solutions in which public forms of transport and non-motorised transport are set to play a major role, while the car plays a complementary role. Nonetheless, findings in various parts of the world show that there has not been a sufficient amount of attention or effort given to these public modes of transport and other “active” modes to sufficiently meet mobility needs under acceptable conditions. Public officials are therefore faced with three challenges in the years to come:

- the challenge posed by current qualitative and quantitative shortcomings of public transport in its various forms;
- the challenge of urban growth which creates new needs that have to be met due to the increase in the size of the population and longer travelling distances;
- the challenge posed by environmental issues (energy and climate change) which requires finding a new balance between private and public modes of transport both in the developed and the developing world.

These three challenges imply that public and non-motorised forms of transport have to be strengthened through the mobilisation of significant amounts of funding both for operating and upgrading current systems and for the necessary investment in mass transport to meet future needs.

The decision-makers in the cities of developing countries and in funding agencies must know who can pay and who must pay for urban transport: users, public bodies, employers, businesses? How should the various sources of financing be distributed

and allocated to the various modes of transport? What funding sources are the most favourable for the sector's sustainable development? How should they be mobilised?

The purpose of this document is to provide insight into potential solutions to meet funding needs. The focus is on the funding of public transport, drawing on the innovative experience of emerging and developed countries. Developing countries will be able to benefit from the lessons contained in this handbook. However, implementing some of the measures put forward may be difficult or even impossible in the current context of certain countries. Throughout the handbook, reference will be made to various experiences in different socio-economic, institutional and geographic contexts. The reader must therefore be aware that the solutions are never transposable "as-is" but we can see that major innovations are possible, given a sound understanding and appropriate adjustment of other experiences. The handbook is organised around the six sources of funding which have been identified and analysed with examples taken throughout the world so as to understand the conditions in which they are implemented and to draw lessons for potential adaptations:

- Funding by users of public transport;
- Funding by users of private motorized transport;
- Employer and commercial activity contributions;
- Land value capture in areas served by public transport;
- Public-private partnerships.
- Climate funding

0.1 Challenges of urban mobility

Cities with several million inhabitants are often cited when talking about urban growth in developing countries. However, it is cities with under a million inhabitants, representing two thirds of the global urban population, which will remain dominant. In 2025, more than half of urban citizens will live in cities of this size. Cities with between 1 and 5 million inhabitants will experience the strongest demographic growth in the coming 15 years. However, these cities in developing countries often have the worst urban public transport systems and are those which will need a high level of funding.

Economic growth is driving the growth in mobility demand in developing cities. Indeed, there is a strong link between mobility and income. The creation of wealth requires that earners be able to move about quickly and easily. The relationship between the number of trips made per day and per capita income is very significant: despite a number of counterexamples which are informative but in a minority, those countries with the greatest mobility also have the highest levels of GDP per capita.

Nevertheless, despite the strong relationship between mobility and growth, it does not imply an endless extension of modes of transport and especially not individual modes of transport, which is the basis of growth in developed countries. The development model which generates urban sprawl, spatial specialization and the

inevitable increase in travel time, results in additional costs and negative externalities (congestion, pollution-related health problems, stress, major environmental impact) whose effects translate into a financial, social or human cost which somebody ends up paying: citizens, companies, employees or the local authority.

This situation means that we must come up with a different sustainable city model which involves a change in urban choices favouring the predominant use of public transport. It is thus in high-growth emerging countries where such choices are going to have a significant impact and where investment needs will be highest. The failure to invest in urban transport today will have medium- and long-term consequences on the creation of wealth in the cities concerned and could undermine policies to reduce poverty.

For long distances, the poorest of people have no alternative but public transport to access jobs, healthcare, education and culture. Mobility plays an important role in social inclusion; a lack of transport can worsen social exclusion.

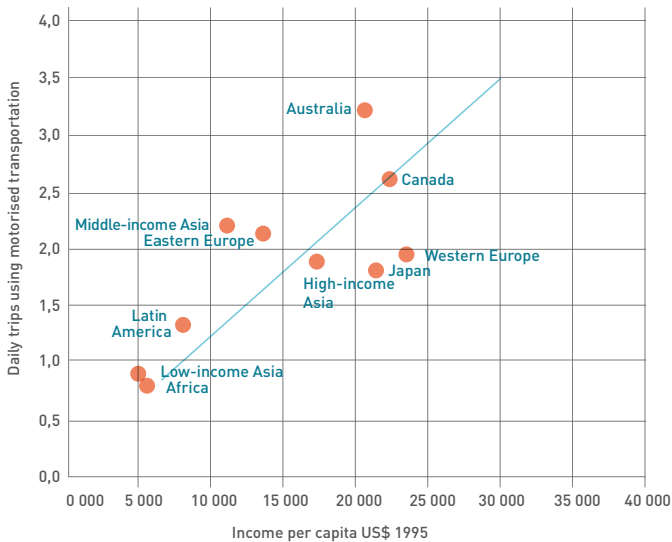


Figure 1 : Relationship between income and mobility¹

0.2 Which modes of transport should be favoured?

In a large majority of cities in the developing world there has been a constant rise - even a very rapid rise - in the use of private cars; this is also the case in cities that have a relatively well-developed transport system and which continue to invest in improvements.

1. According to Cox, W. (2007) Urban Transport & Economic Growth, Seminario de Transporte Urbano : BID/CODATU – Santiago de Chile – 8 Octobr 2007

Aspiring to use a motorbike or private car for urban travel seems to be a global phenomenon and has been made possible by the fall in vehicle prices, a rise in earnings and people's desire to have their own car in order to avoid uncomfortable public modes of transport. This rise of motorised vehicle ownership has also been fuelled by the greater accessibility it offers new users. This accessibility is certainly an advantage from an economic point of view. However, the increase in the number of private vehicles brings with it a number of dysfunctional aspects and significant costs for public authorities (lower economic efficiency and attractiveness of the urban area, air pollution and worsening of climate change, etc.).

Urban planners and decision-makers in developing cities are therefore faced with transport policy choices, forcing a decision between:

- the development of road networks to respond to the growth in road traffic and particularly the demands of new car drivers, while trying to remedy growing congestion which finally leads to an increased use of private vehicles, congestion and pollution;
- the development of public and active modes in order to reduce the dysfunctions and costs to the local authority whilst offering a high level of accessibility to populations;

FOCUS 1

Some key definitions

Urban transportation can be divided into three main families: “Public”, “private” and “active.”

“Public transport,” in this document, indicates any transport which is considered a “public service,” i.e. accessible to the public by means of a predetermined fare. Public transport can be of a collective type (trains, metro, buses, etc.) or individual (taxi, rickshaw, etc.). It can be operated by a public, private or mixed company, of a corporate or independent nature. People are free to choose between all public modes of transport according to their needs, using a mix where appropriate. In all cases, public transport is the transportation of people.

“Private transport” is conditioned by factors such as owning a vehicle or belonging to a group of rights-holders. It includes individual modes (private car, motorbike, etc.) as well as collective modes (school bus, company coach, etc.). It is not limited to transportation of people but also includes the transportation of goods (by minivan, trucks, etc.).

“Active modes” relates to personal modes of transport such as walking, but also bicycles, roller-skates, etc. These are all non-motorised modes of transport but can make use of electrical assistance. They can be combined with public or private modes, especially in the case of the last-mile segment of the journey, but they can also be used alone for a whole journey: this is typical of very poor citizens or those who wish to combine mobility with physical activity.

The organisation of urban transport must not only take into account the public transportation of people. It must also integrate private modes – whether transportation of people or goods – as well as “active” modes.

These two objectives, which can sometimes be contradictory, will lead the city towards long-term development which is largely manageable for the institutions concerned. In fact, transport infrastructure plays a structural role for all urban activities and the organisation of the urban transport system will have significant economic, social and environmental benefits. The international experience shows different models of urban development and associated transport systems. The sustainability of these models is often questioned and, generally speaking, it can be noted that the development of a multimodal system is necessary;

This is why urban mobility development must lead authorities to think in terms of an urban transport system that combines all uses of public areas and all modes of transport: public, private and active.

The sharing of public areas will constitute one of the challenges faced by urban policy makers over the next 20 years. Will public authorities be able to respond to this challenge? This question is particularly relevant when considering the institutional organisations of different cities and metropolitan areas which a single body is rarely responsible for transport and in which institutional coordination is not always effective. The fragmentation of authority in matters transport does not favour a rational use of funds nor the seamless organisation of the various modes of transport. However, all institutional changes require time and the chance to mature; successive steps will certainly allow a better form of organisation to take shape. Nevertheless, in developing cities which are experiencing high growth, much has to be done in a very short period of time. But it is important to understand that these short-term actions do define long-term directions.

FOCUS 2

How much does a transport system cost?

On the basis of international comparisons of cities in developing countries, the funding of a metropolitan area's urban modes of transport requires annually between 1% and 2% of its GDP to cover spending on urban road investments, public transport investments and operating needs. Example:

- in Belgrade, public transport investment stood at around 1.04% of the metropolitan area's GDP for 1997 to 2001.
- Teheran's transport plan (2005/2006) recommends 1.2% of the municipality's GDP to be invested in public transport between 2005 and 2016.
- in Greater Cairo, the Master Plan for Transport puts forward a public transport investment of 1.7% of GDP for the period between 2002 and 2022.

0.3 How can the cost of a public transport system be evaluated?

In the development of a multimodal transport system, public transport networks play an essential role, especially mass public transport modes which allow:

- a concentration of flows along major axes and thus a reduction on other roads which can help free up space for non-motorised modes (bicycles, pedestrians, etc.);
- a structuring of the public transport system and even private transport around major high-capacity axes;
- urban development along transport corridors which encourage interdependence between the city and the transport system;
- consideration for pedestrians around stations because a large majority of journeys start and end on foot.

The choice of mass public transport system is the subject of much debate in all cities. Again, the characteristics of the systems (capacity, flexibility, comfort, urban integration, cost, environmental impact, development potential, etc.) are different and each one is relevant in its own way.

Whatever the choices made, long-term funding conditions must be considered as well as investment in infrastructure and rolling stock and the daily operation of each different mode of transport (operations, maintenance) with regard to the specificities of each city. It is also important to fully assess external costs (accidents, climate change, air pollution, noise, traffic congestion, etc.).

All costs must be taken into consideration when making strategic choices so that the level of service meets expectations in the long term.

In terms of mass public transport, operating costs represent a significant financial constraint which must be taken into account for the longevity of the system. One often sees degradation of a public transport system over the years due to insufficient renewal of equipment because of lack of funding. The result is lower user numbers and a rise in private individual transport options or a lower number of journeys. This hampers economic development efforts and leads operating companies to ask for help from public authorities in order to maintain the service.

For mass public transport, figures 2 and 3 show a comparison of some of the parameters used for decision-making in public transport. Investment costs are influenced by GDP, given that the costs of labour and raw materials are higher.

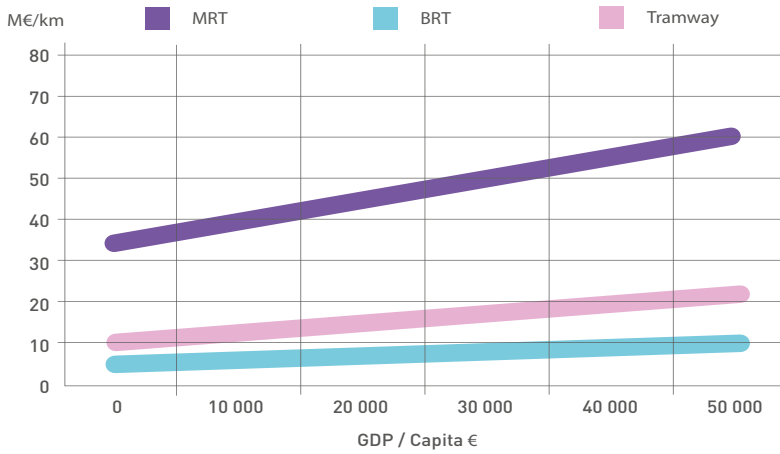


Figure 2 : Average investment costs based on transport modes and GDP per capita²

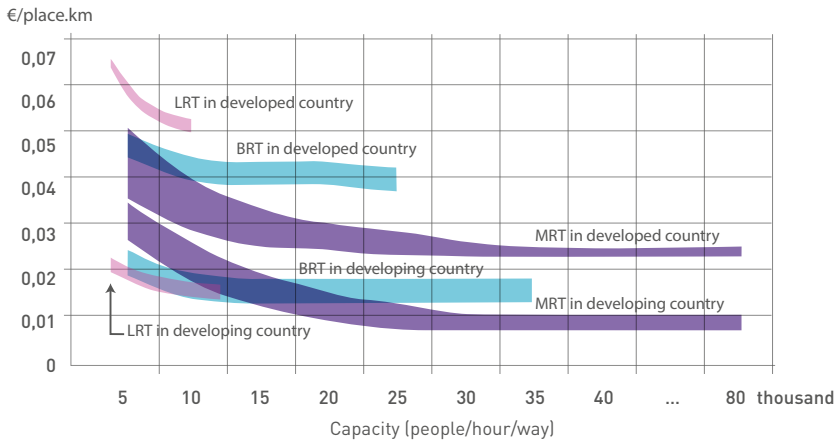


Figure 3 : Operating costs with depreciation measured against GDP (in € and per kilometre)³

2. Source: Systra (2009)

3. Source: Systra (2009)

0.4 Sources of funding for urban transport

One of the particularities of the urban transport sector is that it depends on funding from several sources and involves various partners, both public and private, individual and collective.

In each city, we find a funding framework in which the players generally belong to three large categories; the role of these players varies and they participate in a specific manner.

■ Public authorities

Public authorities are one of the main players involved in the funding of urban modes of transport whether in the area of infrastructure (most commonly) or – often, but not systematically – in the operating of the system through the payment of subsidies or in the running of systems by municipal corporations. The types of roles vary and are closely linked to the institutional history of the cities and countries.

The sources of public funding we find for transport budgets are diverse and sometimes very specific. They might come from the general budgets funded through taxation or be allocated directly to urban transport.

Different levels of public authority (central, regional and local) may play a role in the field of urban transport, ranging from regulations to funding and planning. Very often, all institutional levels intervene simultaneously in a given territorial area, whether in a coordinated manner or not: it can be noted that rail networks are often managed at State level whilst buses come under municipal control.

This means that funding may be channelled to targeted modes of transport rather than to an overall transport system providing mobility in a given territory; this is due to a lack of coordination between the various public authorities. When a transport authority exists, public funds can be more easily channelled to a transport system which has been designed as a comprehensive whole.

■ Direct beneficiaries

This category concerns users who benefit directly from the multimodal transport system:

- public transport users who contribute to the system's funding by purchasing a ticket;
- users of individual motorised vehicles who may be subject to tolls for the use of infrastructure such as bridges or urban motorways, congestion charging to access areas such as a city centre, parking charges, taxes on fuels, fines, other charges related to automobile ownership, etc;
- users of active modes of transport, such as walking and cycling, who may pay rental charges when using self-service systems or secure lock-ups.

In the case of public transport, the revenue collected goes directly to operating the mode of transport, even when the revenue is redistributed by a body responsible for

equalizing the revenue. In the case of revenue from tolls and taxes levied on private vehicle users, this may be earmarked to finance public transport but it is not always the case since the legislation of many countries does not permit the pre-allocation of resources. It is therefore more difficult to accurately establish whether the funds are allocated to urban modes of transport or not and to which form of transport in particular.

■ Indirect beneficiaries

This term refers to those people or bodies which will benefit from the presence of a transport system and the accessibility that it provides without necessarily being direct users:

- companies which, thanks to the transport system, benefit from a wider pool of labour, with greater ease of mobility and facilitated delivery of goods, and without the costly problem of long and unreliable travel times;
- business activities, which also benefit indirectly from infrastructure and the transport systems whether in terms of the transportation of merchandise or transportation of customers to city centres and shopping centres;
- property owners who see the value of their land, homes and business assets increase with the arrival of a transport system.

In some countries, particularly in Africa, residents of an area can also be approached to finance work on public roads or to make personal contributions to the maintenance of infrastructure.

In each city, these different categories of players may play a distinct role, and to varying degrees, depending on the institutions and the social and political conditions. The system is eventually balanced out, but the share of each player differs according to the planning decided upon by institutions. The funding mix can be very different in cities which have a very developed urban transport system.

Users may be the focus of specific policies so as to increase their contribution to the transport system as a whole. Indirect beneficiaries are more difficult to implicate and public resources are more or less in demand depending on the level of mobilization of other contributors.

Before giving a list of potential sources of funding it is important to specify that public decision-makers must pay attention to the economic efficiency of the urban transport system as well as to its social and environmental efficiency. The development of a successful transport system must be based on these three criteria and local authorities must manage to minimise the costs whilst satisfying as far as possible the current and future needs of the population and limiting the impact on the local and global environment.

The organisation of modes of transport requires large investment from a number of public and private actors. They must cater for differing needs through varied technical solutions whilst taking into account the quality of urban life. These many challenges have often led to increased interventions from public and private organisations without any real coherence between their actions.

The creation of a transport authority ensures greater coherency since the contributions of all players can be coordinated. When there are several operators and/or the system comprises several modes of transport, the transport authority coordinates the various players and ensures that there is financial equalization so as to implement an integrated ticketing system. Regardless of the transport authority's legal status, to fulfil its role completely, it must possess recognised and stable powers of organisation, planning and control.

1.1 The growing role of local authorities

Over the past 20 years, decentralisation has become a global trend which has allowed local authorities to become key players in the transport sector.

Urban transport is a metropolitan service, implying local management which is closely linked to the needs of inhabitants and the economic and social activity of a region. However, to what extent local authorities are involved remains highly variable from country to country and even from one city to another within the same country. For example, State governments often keep control over certain modes of transport, particularly rail networks.

Whilst decentralisation of responsibilities is generally defined by law, this is not always effective. Often, the process of decentralisation has not allowed institutions to develop in a way that is adapted to the needs of urban governance. In many countries, local authorities do not have sufficient human resources and/or funding in order to carry out the duties assigned to them. Sometimes, administrative boundaries do not correspond to the journey catchment area and there is a lack of coordination between different local authorities.

Public authorities in urban transport

1.2 Central government retains a key role

States, regardless of the political and administrative organisation of the country, remain key actors which act directly or through financial institutions with which they are involved. They channel funds into the budgets of local authorities in various ways: global allocations, equipment subsidies, channelling of proceeds from certain taxes such as the federal tax on oil products in the United States, etc.

States also contribute directly to the funding of certain projects, in partnership with other public stakeholders (PTAs, town halls, regional authorities, etc.) either as part of a global urban transport policy, or a specific project. They might be involved in a public-private partnership project or a project funded by an international investment fund. Thus, in many countries, rail transport is managed and funded by the central government.

State intervention always takes the form of an annual budget, the value of which depends on the demands made by the various ministries. Funding may be made on a case-by-case basis or it may form part of special programmes aimed at developing urban modes of transport which constitute funding streams that are managed by ministries or financial institutions.

In many European cities and in Japan, with the Tokyo metro, for example, railway transport remains under State control. The significant presence of governments in the railway segment is based on a past need for highly qualified personnel to implement large-scale investments and to run the network; in general, towns did not have such personnel.

Governments very often retain a degree of authority over their main cities either because of their special status, such as the federal districts, or because they are at the heart of the country's economic activity and are often megalopolises; they thereby require particularly large strategic investments.

For the direct funding of projects and also the introduction of new sources of funding which may require changes to regulations or the passing of new laws, the government therefore remains a key player. Governments also play an important

role in obtaining loans, particularly from international funding agencies as their underwriting of the loan is an essential requirement and because they manage external debt.

FOCUS 3

The State's role in urban transport: different situations

In Brazil, the law of 3 January 2012 has strengthened the priority of policies for urban mobility and the role of the central government in its funding.

Following decentralisation law in 1992 which included no additional funding for states and local authorities, the central government started funding public transport again in 2004, making urban mobility a political priority and putting in place three specific programmes:

- the “Urban Mobility Programme” supplements funding from municipalities and the federated states. The programme receives government funding and aims to promote the coordination of transport, traffic and accessibility policies. It prioritises public transport systems, non-motorised forms of transport and accessibility;
- pró-Transporte with funds from the “workers retirement fund”) is particularly targeted at cities situated in the country’s poorest regions. It funds engineering studies, public transport investments and developments for pedestrians and cyclists in cities which have established or are in the process of establishing a transport master plan;
- PRÓ-MOB (Programme for the funding of infrastructure for urban mobility), which is managed by the national bank for economic and social development, is open to municipalities and promotes work which favours the introduction of transport projects to depressed urban areas.

In 2007, President Luiz Inácio Lula da Silva put in place the Accelerated Growth Programme (PAC), which relates to the planning and implementation of large social, urban, logistics and energy infrastructure projects in the country. Urban mobility is one of the priorities but this policy of large-scale investment, continued by Dilma Rousseff, doesn’t satisfy the huge needs of the cities:

- PAC 1 (2007-2010) : 5,6 billion reals (€1.7 billion);
- PAC 2 World Cup (2009-2014): 12 billion reals (€3.6 billion);
- PAC 2 (2011-2014): 32.7 billion reals (€9.8 billion).

In Morocco, the 2015 finance law amended the Fund for Urban and Interurban Transport Reform in order to allow it to finance collective transport infrastructure projects with dedicated transit lanes managed by local authorities. The funds will allow them to:

- clarify investment funding mechanisms in public transport infrastructure;
- anticipate funding needs that local authorities will have to deal with;
- raise extra funds from investors.

Local authorities must present their project to the ministries concerned and fulfil the designated criteria in order to obtain State funding.

In France, the State, having withdrawn from funding of public transport outside the Ile-de-France (Paris) region, has resumed some funding following the introduction of a number of environmental reforms (Grenelle de l'environnement), through calls for project proposals favouring investments in Public Transport with dedicated transit lanes (TCSP) and developments to facilitate active modes such as cycling and walking.

- 1st call (April 2009): €810 million contributing to the funding of 50 selected projects;
- 2nd call (May 2010): €590 million contributing to the funding of 78 projects;
- 3rd call (May 2013): €450 million in funding.

1.3 Institutional integration through a transport authority

It is generally advised to group together within the same authority the planning and operational expertise needed in relation to public transport policies, traffic and parking management, non-motorised modes, etc. A metropolitan entity which integrates a large number of competencies needed in the field of urban mobility is commonly called a «metropolitan transport authority» (MTA). The effectiveness of a MTA depends on certain parameters listed below:

■ **A legal basis.** MTAs can have different legal statuses. The institution can be created by the legal system or by an agreement between local authorities. It can have a public status but also be governed by private law. It could also be a department of a municipality or State administration. Given the time it can take to set up, a more informal structure might precede the creation of the MTA.

■ **The scope of a MTA.** Often the geographic area concerned in terms of movement of people and goods covers part of several municipalities and it is important to establish the scope of action by conducting surveys to find out where people travel from/to but also the flows linked to economic activity. This perimeter could also evolve over time.

■ **The division of competencies.** The powers given to authorities in charge of transport can be limited to the organisation of public transport (all modes) but can also include management of traffic and parking and non-motorised modes, etc. In a highly-integrated MTA, the institution can also take on an urban planning and development role. The political conditions do not always allow for giving a MTA all these functions and it can often be a gradual process. The integration of competencies can therefore be carried out in stages before finding the organisation which best fits the institutional history and culture of each country and each city.

■ **Financial resources.** The MTA needs stable financial resources and guarantees in order to put into operation the mobility policies it develops. The transport authority can either benefit from State or Local Authority funds, or be responsible for its own budget. In order to ensure coherent long-term policy, it is essential that a MTA have a long-term view of its funding.

■ **The need for coordination.** In the absence of such a MTA, it is important to have coordination between the different institutions involved in urban transport in order to ensure coherence in the general organisation of a transport system. Thus, provinces, regions or federated states according to the administrative and political organisation, are often tasked with an urban planning role and can get involved in the organisation and funding of public transport.

FOCUS 4

Metropolitan Transport Authorities : some examples

Lagos Metropolitan Area Transport Authority (LAMATA), in Lagos (Nigeria) is a semi-autonomous agency reporting to the government of Lagos State established in January 2002 as part of the Lagos Urban Transport Project (LUTP) with the technical and financial support of the World Bank and after a long process which began in the early 1990s. Its very wide remit covers urban modes of transport in their entirety, including both public transport and the road network:

- planning, development, coordination of transport policies in Lagos;
- building and maintenance of the main roads and development of road junctions;
- building and maintenance of the main roads and development of road junctions;
- collection of taxes paid by road users which are allocated to funding the transport budget.

For infrastructure work under its responsibility, LAMATA uses various forms of contracts with operating companies: for the BRT of Lagos, inaugurated in March 2008, it is the BRT Cooperative, a function of the powerful transport union which is the operator; for the red line of the metro, meant to carry more than one million passengers per day, and therefore be “profitable,” a concession holder finances the construction and operation; for the blue line of the metro, the State finances the infrastructures and the concession holder the rolling stock and operation.

In Cairo, The difficulty over the past decade in establishing an urban transport authority reflects the underlying political challenges and power struggle between the State, the Greater Cairo governance and the urban planning agency of the newly developed towns on the urban periphery. But this lack of a MTA actually distorts investments in favour of metro projects led by the NAT (National Authority for Tunnels), a national agency, to the detriment of BRT projects which are needed to connect the new towns to the centre of Cairo, but which are “orphans” in terms of ownership.

The Urban Municipality of Izmir (MMIz), in Turkey, directly or indirectly controls all operators of the Izmir public transport system: the local bus network, through the municipal bus operator ESHOT and its subsidiary Izulas; the commuter train network through Izban, a company in which it has half the shares with the rest being held by the Turkish national rail company; maritime public transport through its subsidiary Izdeniz; the metro, and soon the tram network through Metro AS, a limited company of which it has indirect ownership. Also responsible for the road network, traffic and parking, MMIz has all the means at its disposal for a coordinated urban transport policy and obtains excellent results in terms of integrating the different modes of transport.

MMIz is thus fully responsible, across the urban territory of the region of Izmir, for the planning and ownership functions of a MTA, though it is not formally labelled as such.

In France, the framework law for national transport of the 30 December 1982 (LOTI) decentralised urban transport policy. The "Urban Mobility Authorities" is tasked with defining transport policy within its administrative boundaries. It must therefore:

- develop and implement an Urban Mobility Plan (PDU) – since 1996;
- establish the mode of organisation of public transport (choice of operator and mode of operations);
- define the transport offer (areas to be served, timetables, operating hours, fares, passenger information);
- construct and manage infrastructure and equipment and acquire rolling stock.

It is responsible for funding, which comes from ticket revenues, taxation, the Transport Tax and contributions from local authorities.

At the end of 2013, the integration of all competencies for Urban Transport Authority across France was voted by Parliament, renaming them "Urban Mobility Authorities." This legislative modification is part of a trend towards widening competency scopes. Thus UMAs must plan and regulate the use of bicycles, car-share schemes (carpooling and car-share schemes) and define policy for parking and goods delivery.

The Land Transport Authority of Singapore (LTA) in Singapore is probably one of the most integrated examples of a Metropolitan Transport Authority. LTA is tasked with formulating land transport policy and works very closely on this with the authority in charge of urban development. They plan and implement projects for high-capacity passenger transport, road infrastructure and pedestrian pathways. They also regulate vehicle ownership, traffic management and maintenance of road infrastructure. Whilst they do not directly define the fares for public transport, they assist the public transport board in doing so. They do however regulate the service offer and the maintenance of public transport infrastructure.

1.4 The financial advantage of having a Metropolitan Transport Authority

When no authority has the task of managing urban modes of transport at the level of a metropolitan area, which is most often the case, public funding tends to be focused on certain types of investment and/or modes of transport:

- road infrastructure and public transport systems for towns. If each town manages its own territory this can lead to a lack of continuity in the system, insufficient capacity and a high cost for users, as is the case in many Latin American cities;
- “Metropolitan” infrastructures, i.e. involving several towns in the same metropolitan area. Such infrastructures often consist of bus rapid transit (BRT) systems, tram, train and metro lines which are funded by the regions, federated states or central government.

When a transport authority has the task of defining mobility policy, managing the modes of transport and planning investments, public funding will form part of a global and planned project which may turn to other partners, particularly those in the private sector. In such a situation, the various levels of public stakeholders can contribute in a coordinated manner and fulfil their roles but as part of a joint project. The risk of seeing the various modes of transport overlapping, contradicting one another or even competing with one another is thereby reduced.

Therefore, the presence of a transport authority in an area will allow:

■ **The implementation of an integrated public transport offering.** A form of organisation which is balanced between the various modes of transport and designed to favour connectivity and avoid any overlapping, and even competition between the modes of transport, results in a more rational use of financial resources. As the various forms of transport complement one another those lines which make a profit can fund other lines which are making a loss.

■ **Coherence between mobility needs and investments.** Medium- and long-term forecasts of transit needs allow the future resource requirements to be assessed and all of the financial backers to be involved in a global project. For example, if the government can only fund railway projects or an international financial backer only wants to get involved in bus lines, as the transport authority has an overview of forthcoming projects it will be able to use the various sources of funding for its entire project.

■ **A re-alignment between the centre and the periphery of the urban area.** In a metropolitan area, the city centre is the most attractive because it offers a concentration of many services which can be used by people who live outside of the town. It must therefore organise sufficient modes of transport for the benefit of external users or firms who pay their taxes in other towns. To share costs and make all of the towns contribute to the funding of the public modes of transport, an inter-municipal transport authority must be established.

■ **Dedicated financial resources.** If additional resources were to be allocated to the urban transport sector from, for example, betterment taxation or the allocation of toll or parking revenue to public transport, the existence of a transport authority would mean these resources would be used directly for urban transport. Without a transport authority, there is a risk that these new resources could go into the general budget.

Summary

The development of an urban transport system is a highly complex challenge involving a number of different actors. With the trend towards decentralisation, local authorities are the most affected because they are in direct contact with residents but the State and regional authorities also play a major role in the development of urban transport policy.

The coordination between the different actors can be greatly simplified by the creation of a Metropolitan Transport Authority (MTA). There are many different forms a MTA may take, with a narrow or broad scope of competencies and varying geographical boundaries.

Concerning competencies, some MTAs are only responsible for collective public transport, while others regulate all forms of public transport, and still others are also responsible for the road system and private transport as well.

In terms of geographical boundaries, it is important that these correspond to journey catchment areas. It is then well worth analysing what happens outside those boundaries as well, in order to plan for the challenges generated by rapid urbanisation of outlying areas.

Urban transport budget contributors

As public budgets have to respond to numerous public service needs, it is worth identifying their various sources which allow the urban transport sector to be funded. In this document we have identified three main sources of funding for public transport: direct beneficiaries, indirect beneficiaries and public funds.

Across all continents, public authorities represent one of the key contributors to the funding of urban transport, both in terms of investment and operating costs. Public service obligations, generally linked to the provision of public transport for the entire population, justify this mode of funding.

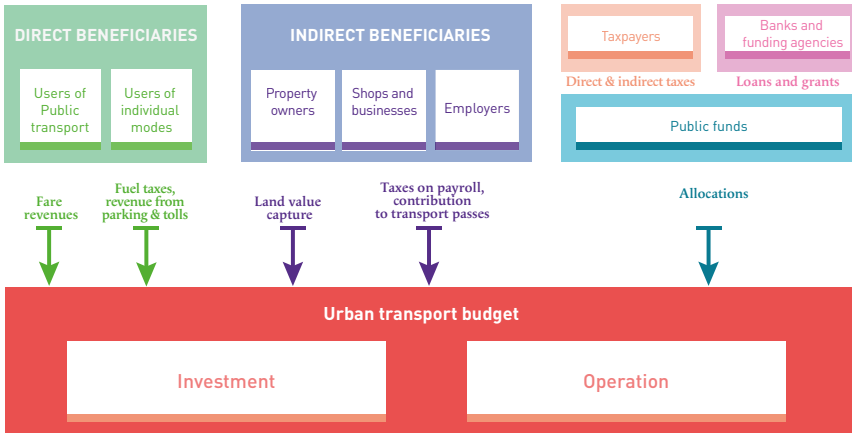


Figure 4 : Funding for public transport

The next source of funding is the general budget of local authorities and the State as funded by taxpayers through direct and indirect taxes. No resources are directly destined for urban transport; it is a political and budgetary choice as to how much should be granted. As public budgets are annual in nature and urban transport projects are long-term, only tax revenues which are allocated to urban transport can ensure the long-term funding which is needed for its development.

2.1 Funding for investments

Investments generally relate to road infrastructure and construction projects, car parks, traffic management tools, public transport infrastructure, rolling stock, ticketing systems, road works linked to public transport development or non-motorised modes of transport.

With the trend towards decentralization policies giving rise to new actors on a regional and local level, public funding is taking different forms with the involvement of an increasing number of local authorities and national development banks. Such a wide range of sources may increase the amount of funds allocated to transport but it can also constitute a risk to the coherency and effectiveness of investment. The creation of a transport authority means all resources can be channelled towards medium- and long-term goals. By offering the guarantee of a stable structure, it is also a way to access bank loans and funding from international agencies.

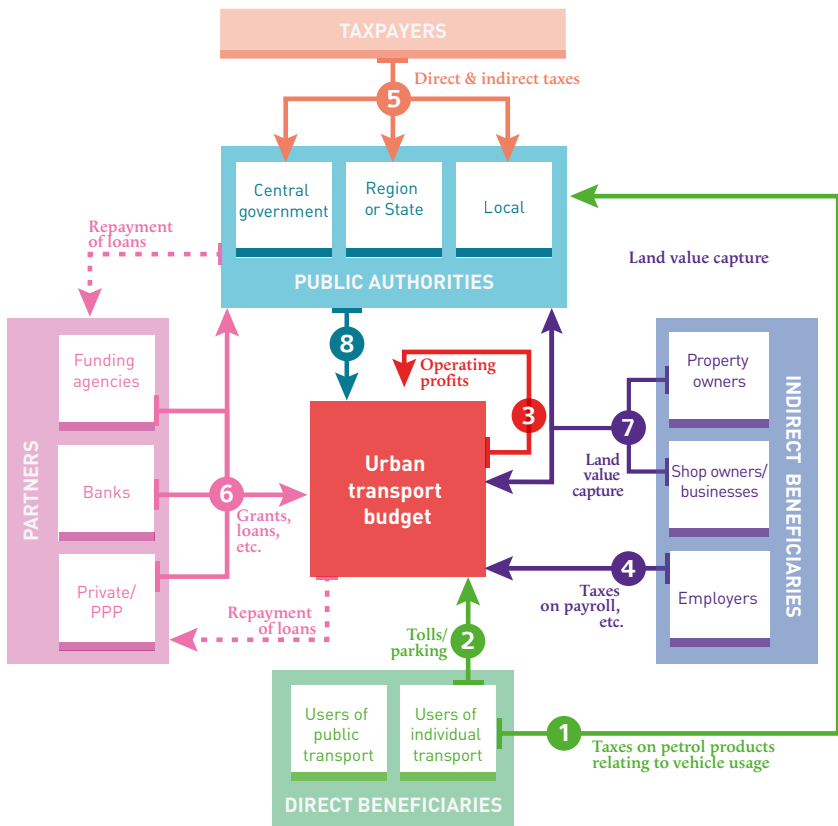


Figure 5 : Who pays what for investments?

Some possible mechanisms for public funding of investment:

- 1 Road users, private cars, trucks and bus transport operators (with certain exemptions) pay taxes on petroleum products which are allocated to national or local budgets. All or part of these taxes can be allocated to urban transport.
- 2 The same users may also have to pay for congestion charging, infrastructure tolls and parking which are allocated to the transport authority.
- 3 Operating income of the system is directly re-invested.
- 4 Employers pay a tax on payroll, or an increased business tax which is allocated to the transport authority.
- 5 Taxpayers pay direct and indirect taxes to the national, regional and local budget. The public authorities may borrow money from national and international institutions.
- 6 Public authorities may have recourse to loans through national or international institutions. In the framework of PPP, the private partner contributes funds either to the public authorities (in the case of a public-private company) or to the transport authority, or to the transport system in general, in the case of a fully delegated service.
- 7 Building owners, land owners, developers, residents and retailers, through various modalities, pay a portion of the property value gains generated by the construction of a transport infrastructure in their vicinity.
- 8 The public authorities, at the State and local levels, contribute to public transport funding from their own budget, based on contributions from direct and indirect beneficiaries, taxpayers and financial backers.

2.2 Funding for operations

Balancing operating costs (operations and maintenance), even if this is achieved in some significant cases, is not the general rule for transport systems where operating companies, whether public or private, often call on public authorities to make up their deficit.

At first glance it is often assumed that developed countries finance more of the operating costs of their public transport systems compared with developing countries. But international comparisons are difficult because the same items are not always counted when calculating revenue and expenses and also very variable levels of service from one continent to another make comparisons complicated. Moreover, certain transport lines can break even or even make a profit but must always be considered in the context of overall funding within a transport network.

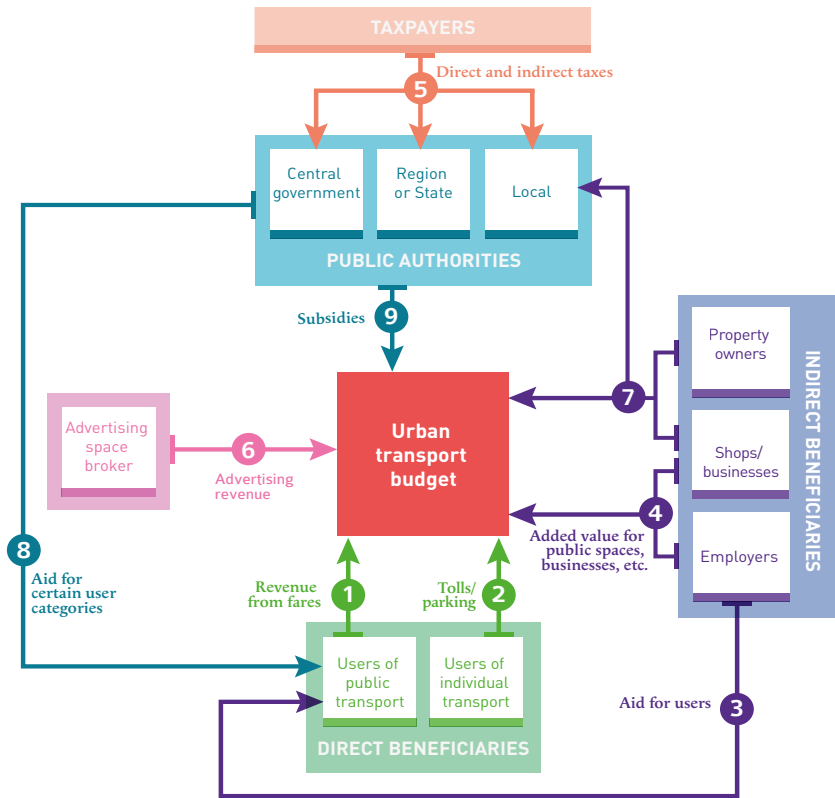


Figure 6 : Who pays what for operations?

Experience shows that fares are a compromise between the need to fund public transport and the users' capacity to pay. It is often noted that fares are kept low to meet the needs of those on low incomes. Fares are set by the public authorities and do not always reflect the real costs, which vary greatly, based on the quality of the service provided.

The public authorities may make their contribution in several ways:

- compensation for the allocation of special fares to certain user categories;
- compensation of losses at the end of the year. In this traditional subsidy practice, companies have no incentive to improve their level of profitability or their service;
- payment of an amount per trip (or per kilometre travelled) based on the operating costs declared by the companies or estimated by the public authorities. When the operating cost is set or negotiated by the public authorities, the carriers may be encouraged⁴ to improve their levels

4. See typologies of contracts in Table 4, Chapter 6, on public-private partnerships.

of performance and cut their operating costs through preventative maintenance and staff training measures (particularly drivers), etc.

In some cases, public authorities may also tie the payment of compensation or subsidies to obligations in terms of productivity, the fight against fraud and improvements in the quality of service by introducing a bonus/penalty type system. In all cases and regardless of the method chosen, it is in the interest of the authorities to introduce a service agreement which lays down the rights and obligations of operators, whether they are public or private.

Some possible mechanisms for public funding of operating costs:

- 1 Users of private transport modes contribute to the financing of operations by paying tolls (congestion charging, parking charges, infrastructure tolls) if this revenue is allocated to the transport authority.
- 2 Users of public transportation contribute to the operating budget by way of ticket and pass purchases.
- 3 Employers contribute to the purchase of transit passes by way of direct aid to their employees.
- 4 Employers contribute by different local tax systems (payroll tax, etc.). Business owners contribute through the payment of rent, etc.
- 5 Taxpayers pay state, regional and local taxes, direct and indirect charges.
- 6 Advertising companies pay part of the advertising revenue to the transport authority or to the operators of the transport system.
- 7 Building owners, land owners and developers, residents and retailers pay taxes on property value gains which can be allocated to the transport sector.
- 8 Public authorities can contribute directly to certain categories of users (low income households, unemployed, young people, the elderly, etc.).
- 9 Public authorities pay subsidies to balance the accounts of deficit-making transport companies.

2.3 Contributions from national and international funding partners

■ Grants, loans and bonds

■ **On an international scale**, multilateral banks and bilateral public aid help to fund investments in transport systems but not in the operating of the systems. Their actions can take several forms:

- **Grants** which are very often aimed at studies or to support institutions to improve the design and management of transport systems (study of a master plan, creation of an organising authority, training of operators, etc.).

- **Soft loans**, namely, loans with conditions which may be more favourable than bank loans in terms of:
 - duration: very long-term loans of 15, 20 and even 30 years;
 - interest rates - bonus rates which are smaller than those on the banking market;
 - grace periods given before the first instalment. In all cases, these loans are no more than a form of re-financing because they must be reimbursed, either through operating revenue or through taxes.
 The conditions of these loans vary in line with the situation in the country, the most favourable treatment is given to the least developed countries.
- **Tied and untied loans**. As part of Bilateral Official Development Assistance, an agreement was reached by donor states to stop this aid from causing distortions in competition between countries. The loans and grants may be accompanied by terms and conditions regarding the use of the funds.

Some countries, cities or operators also have the option of issuing bonds to obtain funding on international markets. The Canadian province of Ontario, for example, decided to issue “green bonds” to contribute to funding public transport in the greater Toronto-Hamilton region. They will benefit the province by allowing it to obtain funding with low interest rates.

■ Loans: successful negotiation strategies

30

As borrowing can prove very costly, it must be managed as closely as possible and renegotiated insofar as possible in line with interest rate changes. Large savings can be made on the amounts in question. However, some local authorities who borrow money do not bear this in mind and lack the qualified staff to deal with it.

To actively manage debt, a municipality must know how to adapt and alter its borrowing to minimise, at all times, its financial costs. This is mainly based on a detailed analysis of the financial market so as to draw up various strategies to cut costs and risks, particularly interest rate and exchange risks.

■ Active management revolves around three main points:

- list the main indicators (weighted average rate, duration, average lifetime, etc.);
- monitor the indicators for debt and structured products;
- identify potential room for manoeuvre.

■ Making use of opportunities on the current debt:

- be responsive to market opportunities to make relevant decisions;
- assess the benefits of renegotiation options: simulate penalty fees, clearing rates, prepayment penalties, rollover rates.

■ Minimising future debt:

- choose between intermediated or dis-intermediated funding;
- define the selection criteria and prepare the consultation process;
- compare bank offers on the basis of the discounting principle;

- ▶ understand structured products.

It follows that real-time information is essential to track the continuous changes in markets, bank offers, the financial situation of your organisation and legal and regulatory changes.

FOCUS 5

Actively managing debt: the example of SYTRAL in Lyon (France)

SYTRAL, the Metropolitan transport authority for the city of Lyon, had a budget of €761 million in 2013. SYTRAL borrows money in order to fund investment. The repayment of its loans represented 19.3% of its expenses in 2013. Despite the age of its debt, SYTRAL's active management allowed it to achieve an average interest rate in 2013 that was below the market rate (3.29% instead of 4.26%).

Thus, as of 30 October 2013, all of the various debt management operations engaged earlier or during the year, allowed SYTRAL to save more than €10 million, i.e. a 20% reduction in its financial costs for the year. This approach also contributed to a reduction in its overall level of debt.

■ Guarantees

All lenders require guarantees and a minimum level of legal protection.

■ **Funding agencies** demand guarantees from central governments to lend to cities which do not enjoy complete autonomy in these decisions. A notable exception is the *Agence Française de Développement* (AFD) and the International Finance Corporation (IFC) which are prepared to risk dealing with cities directly without any state guarantees.

■ **National development banks** may act as guarantors for loans from financial institutions.

■ **Financing packages** can be structured to set aside a share of sales revenue to create a guarantee fund.

In addition to direct financial aid, the involvement of an international funding agency gives credibility to a project and can thereby attract other financial backers, especially private sources. Equity financing, alongside public institutions can also lead to a project in the form of a public-private partnership.

French Development Agency direct loans to local authorities

AFD works in more than 90 countries and French overseas territories, with nearly €7.8 billion in financial commitments in 2013. A few years ago, AFD decided to opt for decentralisation: local authorities represented 18% of beneficiaries of AFD funding in 2007, compared to 10% in 1997.

AFD helps local authorities to get loans:

Through direct loans to the local authority in order to fund specific investment projects or as part of global funding of its investment budget;
Via a financial intermediary: AFD funds a specialist financial institution which distributes appropriate funding to local authorities in the country concerned;

By putting in place measures to encourage local authorities to access financial markets directly, through guarantee or raising credit, for instance.

In 2006 the AFD granted a direct loan of €120 million to the Municipality of Istanbul for the municipal public transport programme and, in 2010, a direct loan of \$166 million USD (€123) million to the Municipality of Amman for its BRT network and \$250 million USD (€185 million) to the municipality of Medellin for an urban project including a rubber-tyre tramway line and two cabled transport lines.

Summary

Across all continents, public authorities represent one of the key contributors to the funding of urban transport, both in terms of investment and sometimes to finance operating costs.

The rising need for mobility resulting from demographic growth and the territorial expansion of local authorities has meant ever-increasing demand for public funding to meet investment needs and shortfalls in operating budgets.

With public funding capabilities not able to keep up with demand, it is essential identify other potential sources of funding.

As public budgets are annual in nature and urban transport projects are long-term, tax revenues which are allocated to urban transport can ensure the longer-term funding which is needed to develop the system.

Through the fare paid to the carrier, users are the primary source of funding for public transport on an operational level. However, setting fare prices requires choosing between subsidizing public transport or having users bear the real cost of the service.

This challenge must be placed in the context of a transport system as a whole and considered in light of both public funding capacities and the quality of the service provided.

3.1 What kind of fare policy?

■ Economic efficiency

It is customary to establish a ratio between business revenue (fare and complementary revenue such as advertising revenue, rent, etc.) and operational expenditure (staff, fuel and electricity costs, day-to-day maintenance, etc.). If this revenue-to-spending ratio is at least equal to 1, this would mean that operating costs are covered, offering short-term equilibrium.

But in order to cover more than just operating costs, i.e. to also ensure the replacement and upgrading of equipment, then investment amortization must be taken into consideration (by differentiating between rolling stock and infrastructure) via another ratio which shows to what extent the total operating and investment costs are covered by fares (and other business revenues): this would mean that operating and investments costs are covered, offering long-term equilibrium.

Depending on the modes of transport and the manner in which these modes of transport are organised, the fare may or may not cover all of the operating costs (operations and amortization for equipment). However, it does not cover new investment spending which is generally borne by the municipality.

However, international comparisons are difficult to make due to the lack of information on the elements entering into the cost calculations. Certain technological innovations can allow operating costs to be reduced. Furthermore, entire systems - and not simply some modes or lines - are being compared. It is obvious that a central line fed by feeder lines will have a higher revenue/expenditure rate and may even make a profit, as is the case with the metro lines in São Paulo, Santiago and Istanbul and tram line 1 in Montpellier. However, without the feeder lines, ridership would be lower and the ratio not as good.

Operating income: diverse situations

In Ho Chi Minh City, public subsidies cover around 45% of the system's operating costs (all public, private and cooperative bus companies).

In Tshwane, public minibuses/taxis (32% of motorised travel) do not receive any operating subsidies. The rail company and bus companies (15% of motorised travel) receive subsidies which cover more than 50% of their operating costs.

In France, in the past 20 years, public transport systems have considerably improved their offering. However, the growth in ridership has been more moderate. At the same time, prices of main fares have consistently fallen in constant Euros. The result of these simultaneous changes is that the ratio between commercial revenue and operating costs has worsened across urban transport systems in France, thus compromising their financial equilibrium. In 2012, the figure was about 33%. The contribution rate varies according to the size of the systems: from 17% in systems with fewer than 100,000 inhabitants to 33%⁵ in those with over 300,000 inhabitants.

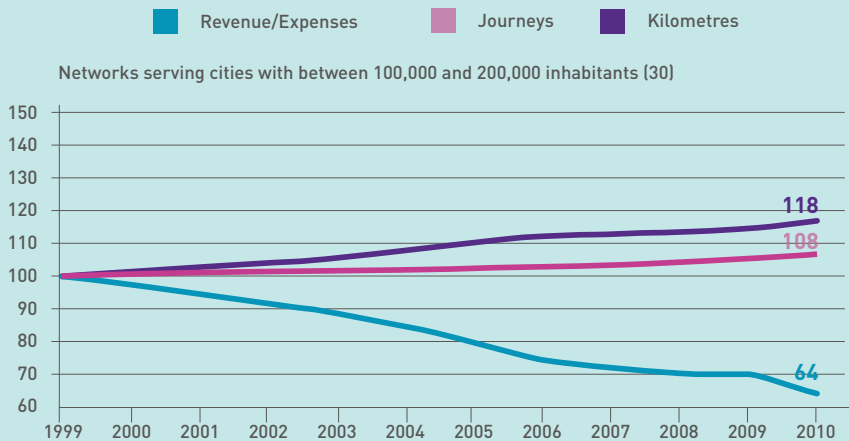


Figure 7 : Evolution of ratios in French transport systems (1999-2010)

To control constantly rising operating deficits, transit authorities are moving towards rationalisation of their offering and a rise in fares whilst also trying to discourage the use of private vehicles.

5. Source: GART/UTP from annual surveys on urban transport (DGITM/CERTU – GART – UTP).

■ Social efficiency

Various studies undertaken by the World Bank show that the cost of public transport becomes prohibitive if it takes up more than 15% of a household's income. An acceptable fare can then be examined on the basis of indices of what the poorest groups of people can pay by comparing the cost of a daily return trip with the minimum household income.

It is therefore important, for a strategic approach to funding, to consider the elasticity of demand in an economic and sociological context. The use of public transport by the middle classes is generally less affected by a rise or fall in the fare than use by lower social classes. A high fare could therefore constitute a factor of social exclusion as it would not allow the poorest in society to easily access the job market or public services which are usually located in city centres, while those with the least financial resources tend to live on the outskirts where accommodation is cheaper.

Political commitment to enabling certain categories of the population to have access to transport services often leads to subsidizing the whole system. This may create a windfall effect for passengers who already have the means to contribute, but who will further benefit from the subsidies. But should the poorest in society be helped by subsidizing ticket prices or helping users directly? This is a debate on the objectives of urban transport policy and the populations targeted as a priority.

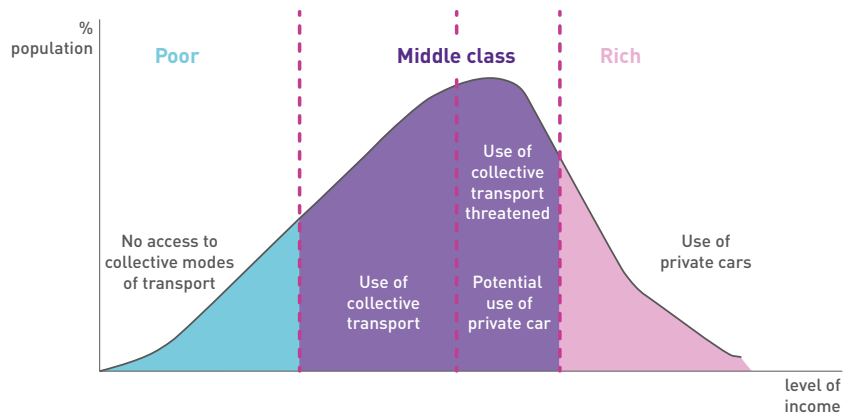


Figure 8 : Use of modes of transport and distribution of revenues ⁶

6. Source: Mitric S. (2008)

The diagram indicates that public transport can concern several social groups, the extremes of which may be targeted by different offers and fares:

- potential private vehicle users who want a high quality of service and are prepared to pay a high fare, but this level of quality creates costs for the operator;
- poor people who do not have the resources to use public transport regularly and for whom the offer must be adapted to ensure an affordable price. This is an issue of policy, the terms of which vary from one city to another.

The challenge is thus to find the right mix (level of service; price) ad hoc and then establish targeted subsidies.

FOCUS 8

The end of multimodal management of public transport without subsidies in Curitiba (Brazil)

In Curitiba, up until May 2013, fares covered all of the operating and maintenance costs of the Integrated Transport Network (Rede Integrada de Transporte, RIT). This comprises both standard and rapid buses (BRT), with 28 private operators and serving 13 of the 26 towns that constitute the Metropolitan Region of Curitiba. Their activity is coordinated by a transport authority (URBS 15), which is a function of the Curitiba municipality. This authority approves lines, collects the revenue and redistributes it among the operators according to the type of vehicle and the number of kilometres covered, as opposed to the number of passengers transported, which makes management easier and prevents rivalry between operators.

Until 2013, the discount or concessionary fares given to the elderly and students were not offset by public funding. The cost of these concessionary fares is spread over all of the users who pay the full fare which, according to the Curitiba Association of Transport Enterprises, increases the cost of a single, full-price fare by 16%. This policy was revised after large-scale user protests following ticket price rises in April 2013. The city took the decision to reduce the ticket price from 2.85 reals to 2.70 reals (from €0.85 to €0.81), with the Treasury paying the difference of about 30 million reals (€9 million). One of the founding elements of the Curitiba fare pricing policy was therefore challenged through pressure from users.

■ Environmental efficiency

The decision to set fare prices below the actual cost of the urban transport service can also come from the desire to steer the modal transfer towards more environmentally-friendly options. Lower transport costs allow the poorest citizens to get around whilst also discouraging users of private motorised transport by sending a strong economic argument to move over to using the public transport system.

A policy of low ticket prices for greater environmental efficiency will clearly have a direct effect in terms of the commercial revenue and financial equilibrium of an urban transport system. This type of policy aims to encourage modes of transport which are more respectful of the environment and thus to reduce the negative externalities (i.e. congestion, pollution, etc.) of private motorised forms of transport. However, their efficiency remains to be proved. It may be preferable to levy taxes differentiated per mode of transport on a prorata basis according to the negative externalities of each, rather than subsidising the mode which generates the least negative impact.

FOCUS 9

A radical choice free public transport in Tallinn (Estonia)

Until 2013, examples of free public transport could only be found amongst smaller transport systems with low revenue which often barely covered the collection of ticket fares. This changed when elected representatives in Tallinn decided to make the whole public transport system free as of 1 January 2013.

The capital city of Estonia, Tallinn, has 420,000 inhabitants and no transport system of its size had ever offered a free service until that point. As with smaller-scale examples, the decision to make public transport free seems to have been motivated partly by low coverage of the system's operating costs through ticket revenue (about 30%) but the main reason given by the elected representatives was the desire to discourage the use of cars in the city. The first measures introduced after changing over to the free system seem to show success in this direction, since automobile traffic in the city fell immediately by 10%. It remains to be seen whether this trend will continue in the future.

In the meantime, all citizens of Tallinn can use public transport for free if they buy a special green card for two Euros. Non-residents must still buy tickets from the driver if they use the bus or tram. Public transport is also free in Tallinn for all Estonian students up to the age of 19 and for everyone over the age of 65. The shortfall in revenue after the introduction of free public transport was made up by a local tax rise worth €17.5 million per year.

3.2 How can a fare policy be established?

■ A range of fares for different target groups

■ Social fares & solidarity fares

The need to fund public transport at a cost deemed acceptable for citizens and not too high for the lowest earners, generally leads to establishing special fares that are very often targeted at certain customer groups: pupils, students, the unemployed, senior citizens, etc., for whom there is a political will not to make them bear the cost of transport. However, for the past few years there has been a desire to move away from this system based on social category in favour of a solidarity fare system based on income.

Furthermore, the question remains whether this solidarity should take the form of direct contributions to low-income users, via the budget for social action, or via the transport budget of the local authorities.

■ Frequent & occasional users

Through different kinds of weekly and monthly passes, a discount is often given to frequent users compared to those users who purchase occasional single tickets. Such passes build the loyalty of users and increase occupancy rates. However, they can also lead to a drop in revenues as the unit price of the trip drops.

In some systems, though pass holders tend to represent the majority of customers, their contribution to revenues is small and compensated to a large extent by occasional users who pay a full fare. However, the paradox resides in the fact that many of these full fare users do not have the means to buy a pass: the poorest people therefore pay the most.

■ Fares by journey type

■ **A flat fare**, that is to say, a fare which is the same throughout the area covered by the modes of urban transport regardless of the distance travelled, is appealing and catches the attention of users who travel long distances; it also facilitates the management of the fare system. It may be offered just for a set time period. However, it tends to be unfavourable to operators with regard to revenue levels and it favours urban sprawl in particular: it penalises short trips and favours longer trips.

■ **A kilometre-based fare**, that is to say, a fare based on the distance travelled, as is the case for example in Washington (USA) and Tokyo (Japan). This ensures that revenue is proportional to cost. However, it is potentially complex to implement and could dissuade inhabitants on the outskirts of cities who are often the poorest people and rely heavily on public transport.

■ **A progressive fare** is often a compromise between operating needs and urban policy choices. It is based on two kinds of approaches to geographic zones:

- **concentric rings:** based on the distance of the zones travelled from the central zone (generally for extensive metropolitan areas);
- **zone-to-zone** pricing according to the number of zones crossed (generally for polycentric metropolitan areas).

The success of Strasbourg's solidarity fare policy (France)

Until 1 July 2010, fares for users of Strasbourg's public transport system were set according to their social category without taking their actual income into account. The result was an unfair and unequal system: some users with lower income were paying more than others and situations such as those experienced by one-parent families, young people or those without secure employment were not taken into account. After a wide public consultation process, the city and local authorities decided to put a new fare system in place in order to guarantee more fairness and solidarity in terms of public mobility. Since then, public transport fares have been set according to family composition and actual income, measured by the Family Quotient as applied by the *Caisse Nationale des Allocations Familiales* (Family allowance office).

There are now only six fare categories, which are divided into two complementary levels:

- A basic fare calculated according to age: in 2013, the full monthly fare was €46.40. A half-fare (€23.30) is applied for young people aged between 4 and 25 and elderly people over the age of 65;
- A potential progressive reduction calculated via the Family Quotient: -90% for an FQ of below €350, -75% for a FQ of between €351 and €550 and -50% for an FQ of more than €750;
- At the end of 2011, i.e. 18 months after the introduction of the new fare system, the feedback has been very positive, with:
 - 16,000 new pass holders (all pass types);
 - An extra €2 million in commercial revenue (approx. €40 million per year);
 - 68,500 people benefit from the new solidarity fare (58.2% of all pass holders).

The cities of Dunkirk (1994), Brest (2006) and Grenoble (2009) had already introduced similar fare plans before Strasbourg.

Progressive fares on Jakarta's suburban train network

A new fare system was put in place on the KRL Jabodetabek line in Jakarta's suburban train network at the same time as a ticketing system called COMMET (*Commuter Electronic Ticketing*) allowing the purchase of monthly passes.

The fares are now progressive: for the first five stations, the fare is set at 3000 IDR (€0.21), which rises by 100 IDR (€0.07) every three stations. Before, the fare was set at 8000 IDR for all journeys. For many users, this new system has led to cheaper transport costs. The transport company believes that the reform will not mean lower revenue. On the one hand, the new system should reduce levels of fraud and on the other hand a rise in passenger numbers is expected, particularly for journeys of less than five stations.

■ Fares by time of day?

It can be advantageous to offer variable fares depending on the time of day. In order to avoid having to invest more in transport at peak travel times, it is also possible to encourage people who do not have to travel at peak times to travel at less busy times of the day.

Percentage of users entering every 30 minutes (from Monday to Friday in 2011)

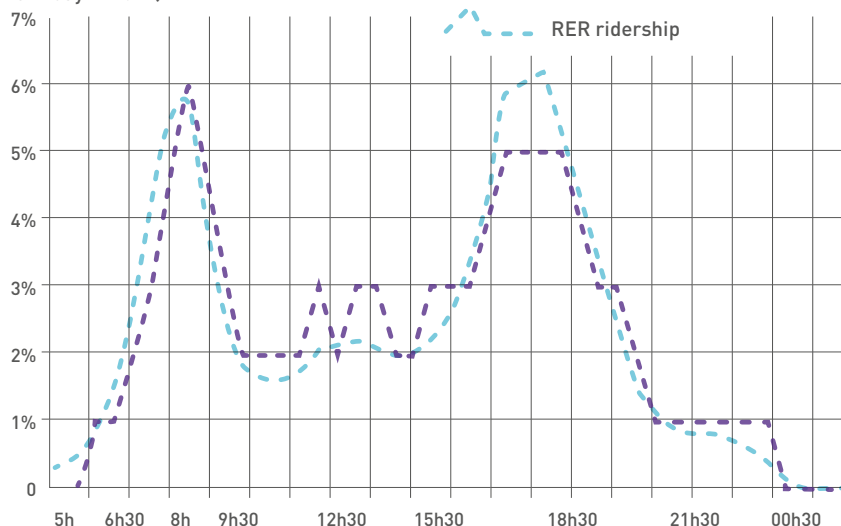


Figure 9 : Hourly traffic distribution in Metro and RER systems
in Ile-de-France Region⁷

7. Source : RATP

Variable fares to counterbalance peak journey times

In Santiago, Chile, there are three types of fares: standard (€0.90), peak (9% higher, from 7 am to 9 am and 6 pm to 8 pm) and off-peak fares (8% reduction, from 6 am to 6.30 and 8.45 to 11 pm). On Saturdays, Sundays and public holidays all fares are charged at the standard rate. A survey showed that a modal transfer of 4% had been achieved.

Public Transport Fares in Santiago			
	Peak times	median hours	Off-peak times
from monday to friday	07:00 - 08:59 18:00 - 19:59	06:30 - 06:59 09:00 - 18:00 20:00 - 20:44	06:00 - 06:29 20:45 - 23:00
Metro	\$ 680	\$ 620	\$ 570
Metro + Bus	\$ 680	\$ 620	\$ 600
Students	\$ 200	\$ 200	\$ 200
Senior	No special fare	\$ 200	\$ 200

Saturday, Sunday and during bank holidays users pay «median hours» fares

* 100 Chileans pesos = 0,14 €

In Curitiba, a special fare has been introduced on Sundays, costing one real (€0.38) instead of 2.2 reals on work days to encourage leisure travel amongst the poorest groups who do not receive any assistance from employers on Sundays.

In Rennes, Ganéo is a system which favours occasional travellers who decide to use the service at off-peak times: it gives a 10% reduction during the week and 20% on Sundays and official holidays.

In Washington D.C. there are off-peak fares on Metrorail (between \$1.35 (€0.95) and \$2.35 (€1.66) depending on the distance travelled). Metrobus gives reductions to those with SmarTrip cards. These cards let users obtain an additional discount if they use both systems as there is no fare integration. Because the reduction system is quite complex it encourages users to buy a SmarTrip card.

SmarTrip fare in Washington by journey period		
US\$	Peak times	Off-peak times
Minimum	2,1	1,7
Maximum	5,75	3,5

For each journey, those who use a paper ticket must pay an extra \$1 USD. In addition, Metrobus gives reductions of \$0.50 for holders of SmarTrip cards for an intermodal bus+rail journey as there is no integrated fare system.

3.3 How can new customers be won?

Healthy management of public transport systems consists of reducing operating costs per km and increasing revenues per km. First of all, this involves avoiding commercial losses: the fight against fraud (which can sometimes concern a significant share – between 10 and 20% - of users) is essential to optimise revenue. Another line of action consists of seeking to increase the occupancy rate of vehicles for the sectors where they are under-occupied: this requires attracting new customers whilst offering the same level of service.

■ By integrating the different networks

Several modes of transport often cohabit within the same metropolitan area; there may even be several networks managed by different operators. It is essential to have an integrated ticketing system allowing passengers to easily use all these modes of transport and networks and in a complementary manner, at no excessive cost so that the entire transport system is coherent and so that connectivity (namely, the ease with which several modes of transport are used on the same trip) can be developed.

The underlying principle behind fare integration is that one ticket provides access to all modes of transport even when managed by different companies. In general, the fare is less than the sum total of the fares of each system, which is favourable to users but unfavourable for constant traffic revenues. Nevertheless, the integration of fares makes the offer more appealing and can lead to higher traffic volumes which may partially compensate for the rate reductions made.

FOCUS 13

The “single ticket” in the São Paulo urban area (Brazil)

In this megalopolis of 20 million inhabitants the transport authority which is responsible for interurban transport within the metropolitan area is STM (São Paulo State Secretariat for Metropolitan Transportation). The networks (metro, rail lines and rapid buses) are managed under the aegis of STM. The city of São Paulo and the neighbouring towns have established a transport authority for all of the urban modes of transport on their territory (generally buses). Each system had its own fares and its own ticketing; the sum of the separate costs discouraged users from taking several modes of transport.

In May 2004, STM decided to integrate fares among its three operators and negotiated with SPTrans (the transport authority for the city of São Paulo) a “single fare” which allows passengers to make up to four journeys over a time period of three hours. The success of this operation was so apparent that the partners went even further by introducing in 2013 the “single monthly ticket” which, for 140 reais per month, allows unlimited travel on partner networks.

However, fare integration requires the use of high performance electronic ticketing system and management tools, formal agreements and the development of revenue distribution methods among the various operators. The system adopted must also be scalable and allow operators to enter and leave the system.

In developing cities where there are many owner-drivers, the issue at hand concerns their integration into the system. Here, the example of Bogota is worth considering.

FOCUS 14

Integrating independent transport services into the transport system in Bogotá (Colombia)

Under TransMilenio's management, certain feeder lines towards BRT lines have been awarded to private operators paid by the Fiduciary Trust, which deals with dividing revenue between the different operators in the system. Up to 20% of available funds have therefore been allocated to small independent operators. Since this experience was a success, the Secretary for Mobility decided, in 2010, to put in place a new plan: the Integrated Public Transport System (SITP), the operation of which was entrusted to the Transmilenio SA public company. The city was divided into 13 zones, each awarded through a call for tender system to companies which had integrated small independent transport operators.

The capital contribution of these independent operators to the companies into which they have integrated is represented by the value of the vehicle(s) they own – this capital gives them a fixed monthly income and they are offered the opportunity to work as company drivers. If the independent operator doesn't want to take part in the process, his vehicle(s) will be bought. In this way, over the course of three years, the municipality has been able to bring considerable improvement to the private bus transport system, reducing the number of buses from 16,000 to 12,000, getting rid of the oldest vehicles or repairing some, stopping the competition between buses on the most popular routes and ensuring a service is provided on less popular routes, bringing down the cost of journeys by fare integration with BRT services and, finally, giving an official status and salary along with access to welfare systems to independent drivers.

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■ By improving the quality of the service

Facilitating information in real time on frequencies and connections with other lines can be a determining factor in encouraging ridership over a multimodal urban transport network. Targeted advertising campaigns can enable authorities to inform the public about the service on offer.

An advertising campaign in Toronto (Canada): “Ride Viva now”

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 used private forms of transport, and to encourage users aged between 15 and 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 rates, 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.

■ By offering adapted services and attractive fares

In order to facilitate combining public transport with other modes of urban mobility in a multimodal urban transport system, services must be adapted and fares attractive: Park & Ride facilities where drivers can park their car and finish their journey by taking public transport, secure bicycle parking, etc. can be offered.

– 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 put in place 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 very attractive fare in the case of 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.

■ By taking a smart approach to ticketing

Ticketing is a tool at the service of a fare policy. By replacing paper tickets with advanced technological options (cards with memory chips or magnetic cards) different fare grids can be put in place. It also facilitates citizens’ access to the transport system, as in the case of Belfort, and allows the operator or transport authority to monitor transport system use more easily.

The challenge now is to implement interoperable ticketing systems so that users can make connections without difficulty from one mode to another.

30 years of fare policy in France

In France, fare policies applied in urban transport systems over the past 30 years have evolved significantly with five main trends which can sometimes be contradictory.

With the aim of simplifying fares, the single fare policy introduced in the 1970s was applied across urban systems during the 1980s, almost completely replacing fares calculated by distance. In 2011, only six urban systems in France were still using distance-based fares.

At the same time, the desire to improve user loyalty led PTAs to encourage the introduction of passes. The most common is still the monthly pass offered by 96% of transport systems). The annual pass became much more common from 2000, with more than 67% of cities offering this option in 2011, compared to 15% in 1999.

Transport systems have looked to diversify their choice of fares in order to attract new clients and therefore increase ticket revenue. A number of solutions for young people, students and families were created as well as specific options depending on a time period or the kind of journey: “one day” tickets for leisure journeys, events tickets, commuter passes, etc.

With regards to social fares, the most significant change introduced from 2000 is the wider application of income criteria in attributing fare reductions. Following this logic, a concept has been developed known as “solidarity fares” based on family quotients, as in Dunkirk, Grenoble and Strasbourg.

Finally, from the mid-1990s, pricing agreements between transit authorities (PTA) have been growing in order to eliminate administrative borders which are inconvenient for users. However, intermodal journeys as a percentage of daily journeys remains low and fare integration remains difficult due to the differing scopes of PTAs.

Post-payment in Belfort (France)

In 2007, Belfort put in place the Optymo Pass which allows inhabitants of the Belfort metropolitan area to take the bus and pay the following month only for journeys made. This new payment system caps monthly costs for users at €31 for the normal fare and €9 for reduced fares (under 18s, school pupils, university students, unemployed, people receiving benefits, over 65s, etc.).

The introduction of the post-payment system has been accompanied by a simplification of the fare system (reduced from 75 different sorts of fares to less than 10), and a lowering of fares in general (no more fare zones, with the lowest fare now applied across the entire area).

This was part of an overall optimisation of operations on all lines with a complete reorganisation of the system (10 min frequency of services, cancelling school zones or school holiday periods, more reliable travel times by putting in place dedicated bus lanes and priority at traffic lights, etc.).

After one year of operations, almost one million extra passengers were using the network, i.e. an increase of 25%.

In 2013, the Public Transport Authority for Belfort (SMTc) decided to go a step further, by offering an integrated mobility offer with this free card without obligation, which also includes bus, self-service bicycles and cars.

Summary

Commercial revenue can sometimes cover operating costs, and even reduce the need for investment subsidies. Depending on the mode concerned (high or low capacity public transport), it may or may not be necessary to seek other financial resources.

In many situations, the authorities try to optimise commercial revenue, keep fares to a rate considered socially acceptable and limit operating subsidies. Different networks should be complementary and fare integration can contribute to this with the resulting loss of revenue being compensated for by an increase in passenger numbers.

Funding by users of private motorised modes of transport

“Private transport” is not limited to the transport of people and includes the transportation of goods. It is conditioned by factors such as owning a vehicle or belonging to a group of rights-holders.

Users of private motorised modes of transport benefit directly from a multimodal transport system and can be called upon to contribute to its funding, particularly the funding of public transport.

Different modes of taxation on vehicle ownership and usage exist across the world. Toll roads and paid car parking can also contribute to financing, thereby raising the cost of using private motorised modes, with the aim of influencing people’s transport choices.

4.1 Taxes on vehicle ownership and private usage

Taxes are usually linked to 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 borne by a municipality to scrap vehicles and the nuisances caused by pollution. In France, since 2007, a system of bonus-malus has been in place but its aim was to discourage people from buying more polluting vehicles and not to find new means of funding. The system, which was supposed to pay for itself, was so successful that the deficit had to be funded in the end by the State budget.

■ Taxes on vehicle purchase and registration

The purchase of a vehicle often gives rise to the payment of taxes to register the vehicle, depending on its horsepower or the number of axles for heavy vehicles. These taxes are paid by each new owner of the vehicle. For example, in Ottawa, these taxes represented 9% of the transport company’s (STO) operating budget in 2003.

In Japan, there is a vehicle purchase tax. It represents 5% of the price of a private vehicle and 3% for a vehicle destined for professional use. Reductions are possible

when purchasing vehicles with low levels of emissions. The tax is collected by the local authority and is used for maintaining the road network.

Singapore was the first to launch a Vehicle Quota System (VQS) in 1990 in order to control the rise in the ownership of private vehicles. Every semester, the Land Transport Authority (LTA) determines a number of registration certificates (Certificate of Entitlement – COE) to be given out, for each category of vehicle, on the basis of bimonthly auctions. The COE is valid for 10 years and can be renewed by paying the average auction price of the three months preceding the due date. A quota of 19,263 COEs was adopted for the period from February to July 2013.

FOCUS 19

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

The city of Shanghai launched a system similar to that of Singapore in 1994, without making a distinction between different categories of vehicles. Auctions are accessible online monthly, after a registration process. In April 2013, 11,000 licence plates were auctioned for an average price of €10,000. Given the soaring prices seen at auction, the authorities decided to apply limits on auction prices and to make the distinction between private and company vehicles.

Judging this system unfair, the city of Beijing opted for a free monthly lottery system in 2011: the Yaohao. In 2011, the city decided to award 20,000 licence plates per month, which is just 1/3 of those awarded in 2010. This lottery system is open to permanent residents or those having paid taxes in the city for at least five years. Registering for the lottery is easy and valid for three months and three successive attempts. In April 2013, the number of people registered rose to 1.5 million, which represents an award rate of about 1.3%.

Both cities had approximately 2 million private vehicles in 2004. Six years later, a considerable difference was noted: Shanghai had 3.1 million vehicles whilst Beijing had 4.8 million. In both cities social acceptance of the measure is quite limited due to a lack of fairness and transparency in the licence attribution process and in how the money collected is reallocated.

In 2012, the city of Guangzhou (Canton province) put in place a mixed system, in between those used in Beijing and Shanghai, by introducing incentive measures for green vehicles. The authorities decided to attribute 120,000 licence plates in 2012, for a 10-year period. This number, representing half of those granted in 2011, was shared out as follows:

- 10% for “green” vehicles through a free lottery system (small and medium sized vehicles 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 a system of auction with no price limits, on the Shanghai/Singapore models.

■ Taxes on vehicle ownership

In Denmark, ownership and use of vehicles is heavily taxed. In 2012, registration tax for new vehicles rose to 105% of the first €10,600, then 180% on the rest of the price, which nearly doubles the total cost. A tax (ejerafgift) is then collected every six months, at a varying rate according to the vehicle's fuel consumption.

In Chile, there is an annual motor vehicle tax of a minimum of \$30 USD which increases with the value of the vehicle. 35% of this tax goes towards the city budget, with the remaining 65% paid into a Communal Municipal Fund managed by the central government, which redistributes it to towns after evaluating their needs.

■ Taxes on vehicle use

Taxes on vehicle use can take different forms:

- ▶ Annual license tax in Japan; vehicle owners must pay a tax of between 10,000 and 50,000 yen (between €75 and €385). The amount due depends on the power of the vehicle;
- ▶ Right-to-drive certificates valid for a specific period which are sold at auction in Singapore;
- ▶ Purchase of an annual tax disk in Morocco (e.g. For a vehicle with less than 8 CV of engine power, the price in 2013 was €31 for a petrol model and double that for a diesel model);
- ▶ Purchase of an annual motorway pass in Switzerland to drive on all of the country's motorways. The pass, is valid for one year and costs 40 Swiss francs (€33). Almost 9 million passes were sold in 2011 for a revenue of €246 million;
- ▶ Tax on heavy vehicles applied in different European countries (Germany, Slovenia, Austria, Czech Republic) which oblige vehicles of more than 3.5 tonnes to pay for using the road network.

These taxes most often go directly to the national budget and only fund public transport indirectly.

■ Fuel taxes

Fuel can also be heavily taxed in order to encourage modal transfer towards public transport. However, in developed countries, it is primarily a source of finance and sometimes a tool to fund public transport.

It should be noted however, that fuel taxes vary to a great extent from one country to another. Fuel sources can also be heavily subsidised as is the case in Venezuela, Iran and Algeria.

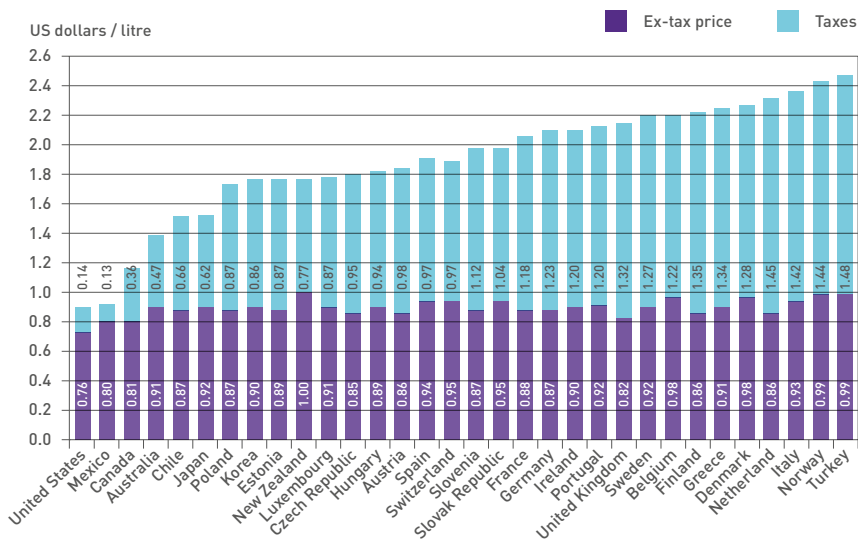


Figure 10 : Unleaded gasoline prices (1st quarter of 2014)

Examples of fuel taxes to fund public transport

The State of California allocates 70% of fuel and heavy vehicle tax revenue (\$6.2 billion in 2012) to the transport sector, 10.4% of which goes to public transport and the remainder to road and motorway maintenance.

In Colombia, drivers pay an additional tax of up to 25% when they fill up their tanks with petrol and up to 8% for diesel. This resource enables local funding and in 2012 brought in almost 552,208 million pesos (€210.8 million) to regional governments and almost a billion pesos (€38.2 million) to local authorities in Colombia. The additional tax on fuel provided 20% of the investment for the first three Transmilenio system lines;

In Germany, the Länder (provinces) receive funds collected through federal fuel taxes. Bavaria uses these funds to subsidise the losses made by suburban rail services (40% of operating costs).

In Lagos, Nigeria, half of the revenue from vehicle registration and licences collected by the Department of Motor Vehicles, one of the services of the Ministry of Transport, has been allocated since 2007 to a special Transport Fund, which the urban transport authority (LAMATA) can use for its running costs and projects. The share of the revenue destined for the Transport Fund has risen since 2007 from \$5 million to \$6 million per year, of which about \$2 million covered LAMATA's running costs, which is quite low with regard to the system's needs.

4.2 Tolls

Urban toll roads can be introduced in order to achieve several different objectives: infrastructure funding, traffic regulation and measures to limit congestion, as well as advertising for public transport and modal transfer.

Fares can be adjusted to favour certain kinds of flows (logistics, etc.), depending on the number of passengers in the vehicle, or the type of vehicles.

Funds raised can potentially be used to finance the public transport sector. This additional means of charging private transport users and funding more sustainable modes is sometimes difficult to implement as it is not fully accepted by society.

■ Tolls for road infrastructures

Charges are levied on urban road infrastructures primarily to generate funds for extending and improving current networks. In some instances, the money is used for building a new road or bridge designed to reduce traffic on existing roads. Only users who are prepared to pay for a gain in time and/or convenience are charged. In other instances, the user has no choice other than to pay the toll, such as in the San Francisco Bay Area, where all eight bridges allowing passengers to cross the bay are subject to tolls.

The amounts of investment necessary for road infrastructure works usually mean that net revenue is absorbed by loan repayments for many years after the new infrastructure comes into use. Once the infrastructure costs have been covered, any surplus net revenues can be invested in public transport, providing certain conditions are met:

- the infrastructure is operated by a transport authority which can transfer the net revenues directly to the public transport sector;
- the infrastructure is operated by an independent public entity which must transfer its operating profits to a transport authority;
- the infrastructure is operated by a Public Private Partnership. In this instance, a portion of the funds are used to pay the operator and the remainder is transferred to the public transport sector in accordance with the terms specified in the contract;
- the infrastructure is operated by a fully privatised subcontractor. In this instance, net profit cannot be used to finance public transport unless it is specifically stated in the conditions of the concession agreement, which can be dissuasive to potential subcontractors.

Bridge tolls in San Francisco (USA)

The Metropolitan Transportation Commission (MTC) is responsible for planning and financing public transport for the nine counties of the San Francisco Bay Area. Its missions are to plan, select projects for financing and, since 1998, to levy taxes on seven of the eight bridges in the Bay Area through BATA (Bay Area Toll Authority), an authority under its supervision.

The Ministry of Transport in California (Caltrans) owns the bridges, and the BATA is responsible for collecting a \$5 toll for cars in one direction only. Motorbikes, cars with low emissions and those used for car-pooling benefit from a half toll from Monday to Friday from 5am to 10am and 3pm to 7pm.

In 2012, BATA collected \$625.9 million (more than twice as much compared with 2002) which was distributed to the governing bodies according to a pre-established rule: 40% is allocated to the MTC for financing bridge maintenance and public transport; 60% is allocated to Caltrans to finance bridge improvements and to reinforce bridge structures against potential earthquakes.

■ Congestion charging

Congestion charging requires users to pay to enter designated zones. This mainly targets private vehicles, but may also concern public transport vehicles, though they usually benefit from a reduced rate.

It can be used to:

■ Reduce congestion in city centres

The main objective of cities such as Singapore, London and Stockholm in implementing entrance charges to certain zones is primarily to control the number of drivers entering city centres and to free up roads for public transport and professional use:

- by encouraging a modal shift towards public transport;
- by discouraging motorists from using their vehicles at certain times, or from taking certain routes.

■ Reduce pollution

Reducing congestion helps reduce pollution and improve the quality of city life by passing onto individual private transport users part of the environmental damage costs incurred.

■ Raise new funds for investing

in road infrastructures or public transport. In Oslo, a toll was introduced in 1990 for a limited period of time in order to raise funds for building new bypasses and tunnels which would relieve traffic congestion in the city centre. The moderate charge was introduced solely to raise funds, not as a measure for reducing traffic.

Depending on the main objective different systems can be implemented depending on the area concerned, level of charges and the period of the day.

We can typically identify cordon charging, area charging and toll roads.


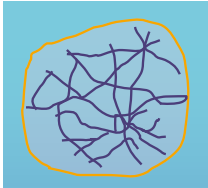
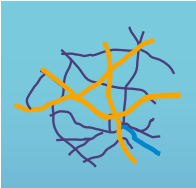
	Cordon charging	Area charging	Toll roads
Designated zone			
Designated time			
Standardized fares	Norway (Trondheim, Oslo, Bergen) Stockholm Project	London, Singapore (before 1998)	
Variable rate fares	Singapour (depuis 1998)		Hot Lanes (San Diego, SR-91), Highway 407
	↓	↓	↓
	Users are charged each time they enter the designated zone. No charges are imposed for journeys within the zone.	Users are charged each time they enter the designated zone and may be charged for internal journeys within it.	The motorist pays for the privilege of using the road; generally a free-of-charge alternative exists.

Figure 11 : Types of congestion charging⁸

■ cordon charging

Users are charged each time they enter the designated zone. The boundary, or cordon, often surrounds the heart of the city centre.

8. According to Certu

Singapore's congestion charge: a pioneering plan

Singapore was the pioneer in introducing congestion charging back in 1975, when it implemented an urban congestion charge designed primarily to tackle traffic congestion in the business district by levying a tax on vehicles with less than four passengers that travelled in the business district during peak hours.

From the 1990s, a very restrictive policy on the use of personal cars was introduced. It included measures such as the obligation to buy a licence when purchasing a new vehicle, an annual tax for road repairs and maintenance, and an urban road toll on city-bound high speed roads at peak hours. Motorists were required to display a tax disc on the windscreen of their vehicles.

In 1995, the Land Transport Authority was created. It was responsible for streamlining all transport policies. In 1998 it implemented urban cordon charging. Thanks to technological developments - *Electronic Road Pricing* - the system includes on-board equipment and pre-paid cards and cameras that automatically detect vehicles at the 60 points of entry into the city.

Each time users enter the zone, they pay a variable price depending on the time of day. This has given rise to a reduction in traffic during peak hours and motorists have learned to better organise their journeys. The tolls are regularly adjusted to allow the express lanes of the zone to maintain a speed of between 45 and 65 km/h and between 20 and 30 km/h on other roads.

In 2006, a new generation of cards was developed to be used for passes on public transport, in car parks, etc. They can even be used in some shops.

Congestion charging has been particularly well accepted by the population of Singapore, who are aware of the issues relating to high population density of the island and who consider congestion zones to be taxes targeted at congestion (during a survey, 75% of people questioned responded that they thought it fair to tax vehicles according to amount of congestion they generate).

In order to guarantee fairness and economic efficiency, there are plans to develop the system by making the charge variable according the distance driven (*Electronic Road Pricing II – second generation*).

In 2008, gross revenue was approximately \$125 million Singapore dollars (€71 million), 10% of which was spent on operating costs. With investments having been paid off (they stood at €93 million in 1998), the LTA receives an annual net revenue of \$100 million Singapore dollars (€57 million) which is paid into the general governmental budget of Singapore. It is therefore difficult to evaluate to what extent this revenue contributes to the public transport system.

Milan's eco-charge: moving towards congestion charging

Milan's congestion charge was introduced in January 2008 to tackle pollution by charging drivers of the worst offending vehicles a variable toll adjusted to reflect how polluting their vehicle is (with reference to European standards). The daily congestion charge applied between 7 am and 6 pm costs between €2 and €10 depending on how polluting a vehicle is and at what time of day the vehicle enters the zone. Monthly passes are charged according to the level of pollution a vehicle emits, costing between €50 and €250.

Two months after the tax was introduced, the number of commercial vehicles entering the zone dropped by 30% and traffic composition was significantly altered. As a result, more and more vehicles were given free access to the zone and the city centre therefore ended up with traffic levels similar to those recorded in 2007.

At the beginning of 2012, a new initiative (known as Area C) was put in place on an 18 month trial basis. The zone covers the city centre, i.e. 8.2 square km². The zone is accessible via 43 entry points covered by surveillance cameras. The daily rate applicable from 7.30 am to 7.30 pm is €5. Residents are allowed 40 free entries and beyond that have to pay €2. City centre access is free for motorbikes and scooters, as well as vehicles with electric, hybrid, LPG engines or those which have biofuel or natural gas engines. On the other hand, vehicles with Euro 0 petrol engines and Diesel Euro 1, 2, and 3 are not allowed access to the city centre. Traffic in 2012 fell by a third in the Area C zone and even traffic outside the zone has fallen as a result of the trial.

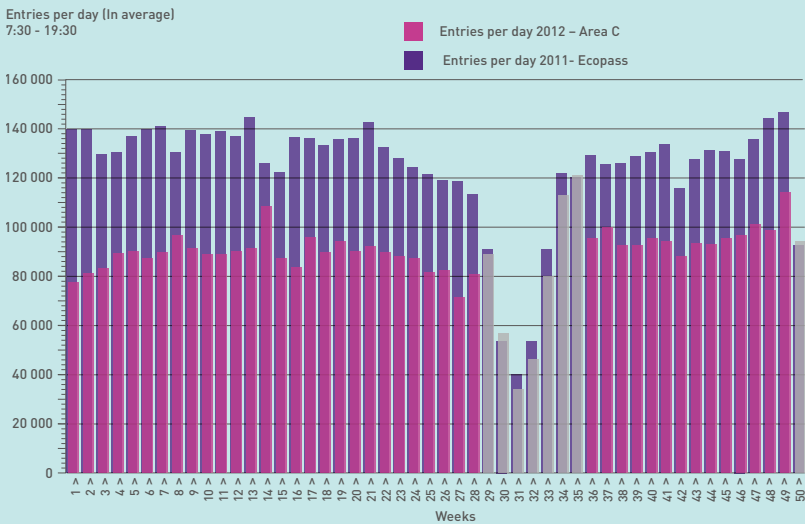


Figure 12 : Traffic entering the zone in 2011 (Ecopass) and 2012 (Area C)

In 2012, the programme brought in €20.3 million which is €13 million net. €10 million were invested in order to develop the metro and bus network services, whilst the remaining €3 million allowed the development of the self-service bicycle system.

■ Area charging

A one-off area charge is imposed on all users for travelling within the zone for a specific period of time (such as a day). It can, however, be varied according to the overall length of the journey (distance-based charging) and/or the time spent within the zone (time charging).

FOCUS 24

London's congestion charge: a successful example which has not been extended to other British cities

Congestion charging was introduced in London by the city's transport authority, Transport for London (TfL), to manage policies covering the entire transport spectrum, from road traffic to public transport. Congestion charging was introduced in two successive stages: in 2003, the zone covered 22 square km (The City business quarter), and in 2007 it was extended to 40 square km (western residential area), only to be reduced back to original City area in 2011 (a very controversial decision).

Cameras record the vehicle number plates, and they are then checked against the list of users who have paid the daily charge of £10, or £9 if you use the auto-pay system (about €12), to travel within the zone. Payment is compulsory from Monday to Friday between 7 am and 6 pm and can be made by text message, on the internet, at points of sale, over the telephone, by post, etc. The zone's residents are entitled to a 90% reduction if they buy a monthly or annual pass. Emergency vehicles, vehicles for disabled persons, vehicles with more than nine seats, motorcycles, electrical or hybrid vehicles with low emissions, motorized three-wheel vehicles, taxis and buses are exempt from congestion charging.

The goals of the congestion charging policy set for 2010 were:

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

In 2011, research carried out by TfL show that these goals had largely been accomplished:

- traffic (excluding motorcycles) has decreased by 21% in the city centre (a larger area than the congestion charging zone) compared with 2000;
- Between 2002 and 2007 congestion decreased by 35% in the zone, which has resulted in a 3km/h increase in traffic speed, from 14 km/h to 17 km/h; This trend has been reversed since 2007 and the level of congestion is now similar to the level before the introduction of congestion charging (average speed of 14 km/h). This can be explained by the gradual reduction of space devoted to automotive traffic (dedicated bus lanes, pedestrian paths, cycles routes) and by the number of road works undertaken in the past few years disrupting the traffic flow;

- increase of 6% in the number of bus passengers during congestion charging hours. Between 2001 and 2011, the number of bus journeys increased by 54% and the number of passenger-km by 67%.

charging hours flow

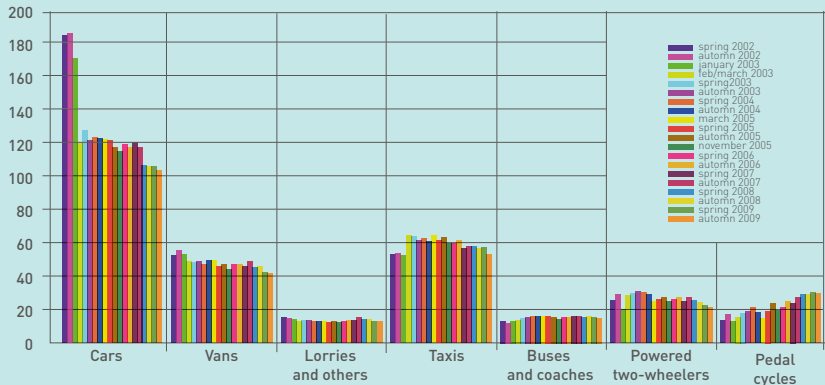


Figure 13 : Traffic in London's central zone subject to congestion charging during peak hours (7am-6pm) from 2002 to 2009

One of the objectives of London's congestion charging scheme was to generate cash flow for public transport by imposing mandatory charging for at least the next 10 years. The objective was to generate €180 million per year. This objective was not reached for two key reasons:

- the cost of operating the scheme turned out to be very high, around 40% of gross revenues in 2011-2012 (compared with 50% in 2007-2008);
- the scheme was a victim of its own success - the modal shift resulted in less congestion charges being collected.

The results, however, are worth noting. For the financial year 2011-2012, gross revenues amounted to approximately €263 million (about 5% of TfL's total gross revenue) and operating costs totalled €104 million. The €159 million additional net revenues that TfL recorded were allocated to improvements in public transport and active modes.

The London experience has of course given ideas to other large cities in the UK, but no others have so far managed to implement a congestion charge. In Manchester, 80% of residents voted against a plan to introduce a congestion charge of £5.78 (€6) during peak hours in a vast 128 square km zone. The transport authority in Edinburgh planned to introduce congestion charging to finance line 3 of the tramway, valued at €380 million for 15 km of tramlines. However when it was put to a referendum, the proposal was decisively rejected. This experience shows that it is not sufficient to allocate financial resources to a good cause, but that the project must also be presented in a favourable light and fully explained in order to positively influence public opinion.

■ High-speed toll roads

This toll generally applies to high speed roads running directly into central urban areas, and aims to provide clear roads to paying traffic, and to alleviate congestion on the toll-free roads.

FOCUS 25

The experience of Seoul (South Korea): the Namsan #1 and #3 toll tunnels

The Namsan #1 et #3 tunnels are two major traffic axes in the city of Seoul, connecting the south to the business quarter. In 1996, the authorities decided to introduce a toll for the use of the two tunnels in order to reduce congestion along both axes and in the city centre and encourage use of public transport. The same year, 90% of traffic using these tunnels was private vehicles, 78% of which were only being used by the driver with no other passengers.

The toll, unchanged since 1996, is set at 2000 won (around €1.37) one-way between 7 am and 9 pm during the week and from 7 am to 3 pm at the weekend. Taxis, buses, vans, low-emission vehicles, emergency service vehicles, diplomatic vehicles, vehicles for disabled persons and vehicles with more than two people on board including the driver are exempt. Participants in the voluntary programme “*Seoul's Weekly No Driving Day Program*” benefit from a reduction of 50%. Payment can be made in an agency, by bank transfer or with a prepaid card.

Public awareness and advertising campaigns have also been used as part of the initiative, particularly aimed at promoting car-pooling. More than 15 years after its introduction, this toll system has shown very positive results:

- Increase in average speed of traffic from 21.6 km/h in 1996 to 46.5 km/h in 2006;
- Control of the traffic flow, which has stayed almost constant: 90,404 vehicles in 1996, 92,950 vehicles in 2006;
- Increase in private vehicle occupancy rates and increase of 88% in the number of buses using the tunnels between 1996 and 2006.

High Occupancy Toll Lanes in the United States

The first lanes reserved for vehicles with a high occupancy rate, “High Occupancy Vehicles Lanes,” were introduced in 1970 in California. Aimed at reducing congestion and encouraging car-pooling, these HOV lanes have since been developed in other American states. In 2008, the federal administration counted 4,800 km of lanes reserved for vehicles with at least two or three people on board.

These lanes have sometimes been criticised due to their low user rate. In order to increase their effectiveness, some have been transformed into “High Occupancy Toll Lanes”. This means that a lone driver in a car can take this lane if they pay a toll.

■ Conditions for implementing congestion charging

In order for congestion charging to work best, the public transport network must offer good performance and be capable of absorbing the higher volume of new users, and of a high enough quality for the modal shift not to be perceived as an act of discrimination. If this is not the case, congestion charging could curb travel within the zone and potentially cause a drop in economic activity, or it could prompt users to travel to other zones where journey costs are less prohibitive.

Social acceptance is essential, and is only gained by explaining to users that congestion carries both social and environmental costs. Congestion charging can be described as a “pay-to-pollute” licence. As in London’s case, the scheme is often better accepted once it is up and running and the residents have had time to appreciate the positive impact it has had on their quality of life. If it is presented in a careless manner, it can provoke a strong public backlash.

In London, for example, the introduction of congestion charging wasn’t met with a strong opposition, despite the extension to the West zone being cancelled in 2011, 4 years after being introduced. This may be attributed to the fact that the scheme was introduced in a limited zone, where less than 15% of passengers travelled in personal cars even before the trials began. Visibly, the introduction of congestion charging has had a positive impact on the property market, as six months after the zone was extended, the cost of rented office space rose more sharply within the zone than in equivalent areas that did not have congestion charging. Congestion charging appears to have been better accepted by Londoners than by the rest of the country. In 2003, over 60% of Londoners considered congestion charging to be a good thing, compared to 43% of people outside the capital.

In order for congestion charging to be successful, traffic policies and public transport policies must be aligned. This is made possible by a transport authority, responsible for managing all transport policies and means of urban transport, and covering every aspect from traffic flow through to public transport. This is the case in London, Singapore and Milan, whose authorities are Transport for London, Land Transport Authority and Azienda Transporti Milanesi respectively; or transport entities

must work in close collaboration, such as in Stockholm, where the Swedish Road Administration has developed and manages congestion charging, and Stockholm's Road Transport Department is responsible for extending public transport services and the Park & Ride scheme.

4.3 Paid parking

Paid parking is a way of getting users to pay for road use and occupation, and all or part of the amounts collected can serve to finance public transportation. Paid parking can also be a tool to encourage modal shift, provided that it is coordinated with all other transport policies.

In reality, parking policies are often a balancing act between the desire to satisfy the needs of users by making public parking available, and the necessity to control the space available and to minimise the negative impact of private motorized vehicles. Such policies can include free or reduced parking spaces in order to encourage certain flows (deliveries, etc.).

■ A means of boosting modal transfer

For many years and in many cities across the world, decision-makers have thought that the development of the use of motorized vehicles should be accompanied by an increase in the number of available parking spaces (in car parks or on the street) and by applying minimal parking space requirements within new constructions, such as office or residential complexes.

This way of thinking has contributed to a rise in road traffic, congestion and urban space being used in a disorganised manner, with conflicts arising between different road users and has had a negative impact on the quality of life in urban settings.

Limiting the supply of parking spaces and regulating the supply according to several criteria (e.g. based on parking time, such as is done in Barcelona) is a way of controlling the demand for using personal vehicles in city centres and encouraging users to use more environmentally friendly options. However, this supposes that the local authority has the means to regulate the parking offer (managing car parks, regulations, prices) and to offer a credible alternative to manage the resulting modal transfer.

Parking in Montpellier (France): part of the Urban Mobility Plan toolkit

The Transports de l'Agglomération de Montpellier (TaM) in Montpellier is a semi-public company that implements transport policies. It has been commissioned to do so by Montpellier's transport authority, the Communauté d'Agglomération de Montpellier (CAM). The TaM is responsible for:

- operating and extending a bus and tram network within Montpellier's urban community;
- developing active modes, for example cycle hire and cycle routes;
- managing 40% of parking in city centres.

In its Urban Transport Plan, Montpellier described parking as a lever of action, and recommends creating more residential parking at lower parking rates, and in parallel reducing parking in areas of work close to tram stops, and implementing park-and-ride facilities at the edge of Montpellier's city centre. The idea is to encourage individuals to leave their car at home or in a park-and-ride site, and to use public transport to enter the city centre.

TaM is responsible for implementing these directives by managing:

- seven park-and-ride car parks at tram stops (three already exist and four are under construction) offering 3,000 parking spaces at very attractive rates: free for TaM pass holders; €3 for a park-and-ride return ticket for the city's civil servants, and €4 for the general public;
- seven public car parks in the city centre with a total of 3,300 spaces. Parking rates are set by the municipality;
- close to 15,000 parking spaces on roads with pay-and-display meters, accounting for 3/4 of city centre parking. The rate is set by the municipality.

TaM aims to strike a balance between offering rates that are high enough to prompt people to use public transport, but low enough to be acceptable to shops and local residents, so as not to drive all business and residential activity out of the city, but to cover costs for construction and maintenance of works. A specific

price scale was chosen for residents, and a parking zone system based on parking time (short-stay, medium-stay and long-stay) for non-residents.

This policy has helped to solve the problem of a shortage of parking spaces in city centres and has reduced congestion caused by motorists looking for a place to park. It also represents healthy financial management.

With a gross profit from parking activities of close to €400,000 in 2007, a margin remained - albeit it smaller than other sources of funds - for investing in improvements to the public transport service, for which TaM is equally responsible.

■ A source of funding for public transport

A well-designed and carefully applied parking policy which generates revenue can, in theory, largely cover operating costs and investment in the system.

In France, for example, the operating cost of one street parking space is evaluated at €350/space/year, including the cost of employees for enforcement. By comparison, the revenues are estimated at €1000/space/year including revenue from fines.

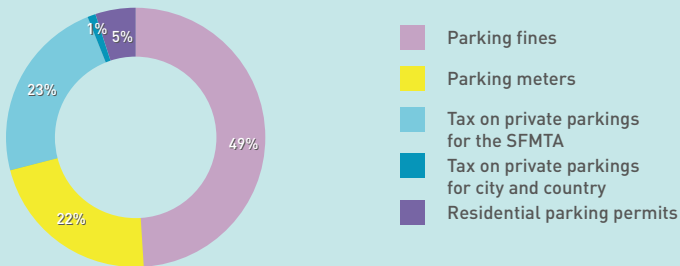
For underground car parks the operating cost per space can be between €800 and €1,600. Above-ground multi-storey car parks tend to cost half as much annually. The cost of street-level parking lot spaces is half as much again (between €200 and €400).

FOCUS 28

Parking management in San Francisco (USA): an important resource for the PTA

The San Francisco Municipal Transportation Agency (SFMTA) comprises MUNI (the municipal transit agency responsible for operating public transport) and the traffic and parking management authorities. It manages all municipal urban transport policies, including 40 city-owned paying car parks and all street parking.

Revenues from parking are composed of user parking permits, resident permits, parking fines and half the 25% tax on private parking income. In 2012, parking revenue rose to \$263 million, which represented a third of SFMTA's budget.



Data 2012

Figure 14 : Breakdown of parking fines in San Francisco

Net revenue from paid parking must be part of the urban transport policy, which is more likely when the transport authority manages all modes of transport as is the case in San Francisco and Nantes.

In Australia, the system is less integrated and only relates to private parking, but all revenues are allocated to the funding of public transport infrastructure.

Parking in Nantes (France): new parking rates

Through its Urban Mobility Plan, the city of Nantes has developed a parking policy that maintains accessibility to the city centre by encouraging modal transfer to public transport and active modes.

On the 1 September 2013, the city of Nantes, which has a population of 590,000, offered:

- 12,000 paid street parking spaces, of which almost all are in the city centre;
- 9,000 off-road parking spaces divided across 13 multi-storey car parks and 14 parking lots;
- 6,700 free spaces in 48 Park & Ride facilities

Between 2008 and 2009, Nantes introduced significant parking price increases in city-centre car parks and parking spaces around the train station.

Parking price rises in Nantes

	City centre			Station		
	Prices 2008	Prices 2013	growth 2008-2013	Prices 2008	Prices 2013	growth 2008-2013
1hr	1,40 €	2,30 €	64,3%	1,40 €	2,30 €	64,3%
3hr	3,10 €	4,90 €	58,1%	3,20 €	6,00 €	87,5%
24hr	10,00 €	14,90 €	49,0%	10,80 €	18,00 €	66,7%
7 days				75,60 €	161,40 €	113,5%

These rises in parking prices have not had a negative impact on their use. On the contrary, car parks situated in city centre saw their use grow by 10%. Long-term parking close to the station has virtually disappeared and the prices have allowed greater rotation which has increased use by 18%.

In 2012, the total operating revenue was €7.6 million for €3.1 million in expenses. The annual profits will fund new car parks with a total capacity of 1,500 spaces. On a city-wide scale, this new pricing system is a real tool for modal transfer whilst ensuring complementary financial resources.

Non-residential parking in Sydney, Perth & Melbourne (Australia) : taxes to finance public transport

Three cities in Australia have a system of taxation on non-residential parking: Sydney (1992), Perth (1999) and Melbourne (2006). These taxes aim to encourage the use of public transport and to finance the development of urban transport infrastructure.

In Sydney, these taxes apply to private, non-residential off-road parking. They are calculated on a *pro rata temporis* basis for occasional parking usage (e.g. car parks next to places of religious worship) and on the basis of a space of 25.5 sq. metres for unmarked spaces (space + access). On 1 July 2013, these taxes per parking space rose to:

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

These taxes represented revenue of €74 million for the 2010-2011 financial year, all of which went towards development and maintenance of public transport infrastructure.

Company car parks in Nottingham (UK): a tax to fund the tramway

In Great Britain, the Transport Act 2000 introduced the concepts of *road user charging scheme*, of which an example is the London congestion charge, and the “workplace levy” (taxes on company car parks), which can be introduced by local authorities across some or all of the area they are responsible for. At the end of 2011, the city of Nottingham decided to institute, for a period of 23 years, a tax on company parking in order to reduce traffic congestion and partly fund the extension of the tramway (*Nottingham Express Transit project - Phase 2*) as well as renovation of the stations.

The tax takes the form of an annual licence which costs £334 (about €400) per space and has been in place since April 2013. It applies to the whole city and to employers with more than 10 parking spaces (about 500 employers and 3000 spaces are affected). Those who are exempt include essential services such as hospitals as well as disabled parking and customer/visitor spaces. Based on the expected annual rises (£363 in 2014 and £380 in 2015), this tax should bring in €9.3 million for the 2012-2013 financial year and €16.3 million on average the following years.

The measures we've mentioned here presume that parking spaces are available, either in multi-storey car parks or as street parking, which is not always the case in developing cities where street parking is often poorly managed. One of the first measures to be put in place can be to construct a minimum of city centre car parks and to organise paid street parking in order to free up space for traffic flow, but this policy should be followed up with parking regulations that can limit road traffic.

■ Income from parking fines: a specific resource

Many towns wish to decriminalise parking fines so that they can self-manage them and reap the financial rewards. In most countries, the tax authorities are responsible for the financial management of parking fines, and appeals are dealt with through the courts as parking fines are considered an infringement of the law.

FOCUS 32

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 plus London had adopted the system, accounting for 60% of all borough councils in England and Wales.

They had to establish a "civil system", including 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; it has resulted in more motorists using car parks, less congestion caused by motorists looking for parking spaces, and it has been widely accepted by 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 against the system per se, but they wish for more 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 the net profit generated was £1.04 million (€1.25 million), with fines representing 20% of overall revenue for street parking.

The example of San Francisco serves to highlight the importance of these budgets. 46% of parking revenues come from fine payments. By decriminalising parking fines, power to manage them would be transferred to local authorities who could then allocate the revenues to improving urban public transport.

In France, the State allocates part of revenues from parking fines to all local authorities and urban communities, to the Ile-de-France region (Paris area) and to the Ile-de-France Transport authority. At the end of 2013 a law was voted to decriminalize parking and make it a decentralized public service, similar to the system that has existed in Britain for a number of years.

Summary



In addition to the financial resources it provides, taxing the ownership or use of motorised vehicles can be a good way of influencing modal choices. In order for this type of measure to be successful, however, it is essential to develop an urban transport system that can accommodate the resulting modal transfer. It is also wise to measure the impact on different types of traffic (transportation of goods, tradesmen, etc.).

It is rare that revenue from taxes is allocated directly to the funding of public transport, with taxes from petrol products generally going towards national budgets. The net revenues generated by tolls and paid parking can also contribute to the funding of public transport under certain conditions.

Congestion charging and parking management must be perfectly harmonised in order to provide a sufficient public transport service to absorb the increased number of users caused by the introduction of congestion charging or paid parking. Users should not feel that they have been discriminated against by being forced to use public transport.

Users have to be prepared through targeted information campaigns before introducing the system in order to gain their acceptance. Positive impacts, such as reduced congestion and less pollution, need to be emphasized. The system can be a victim of its own success: less traffic means less income. This element needs to be taken into account when performing financial assessments.

Urban transport systems benefit the economic activity of a region and play a key role in encouraging business development by providing employees with daily access to their workplace, giving clients access to sales outlets, and facilitating the delivery of goods.

A high-performance public transport system fosters employee efficiency. Employees are less stressed and tired arriving at their workplace when their commute is shorter and more reliable. The contribution of companies and business activities to financing public transport is therefore justified.

5.1 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 normal 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, etc.)

This type of service, which is common in countries such as Algeria, Morocco and India, stems from the initiative of the company or public administration, and it 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 together to provide the service.

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

What contribution(s) do employers make in the United States?

Since 1993, American employers have been able to voluntarily offer their employees refunds for part of their transport costs. Exempted from federal taxes (and also from local taxes in certain states) for the employer and the employee, this aid concerns public transport, carpooling in vans (at least 6 passengers including 3 employees), parking (park-and-ride or employer parking lots) or bicycles, within the limit of the given thresholds.

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

In California, the authorities set up the Parking Cash-Out Program (1992) in order 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 the air quality does not reach the standard thresholds, and which subsidise their employees' parking costs. The employees of these companies can choose between either receiving the value of the cost of their parking space in their salary (taxable) or converting this amount into public transit passes (tax-exempt).

■ Encouraging use of public transportation systems

Transit authorities are keen to involve employers in organising the mobility of their employees, and more generally, the accessibility of their site. 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 access to their workplace, and possibly to improve access via certain developments.
- 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 intermodality.

Since 1 July 2004, Belgian companies with over 200 employees in the region of Brussels are required to set up a Company Mobility Plan (CMP). In France, Company Mobility Plans (and Public Administration Mobility Plans) are not compulsory, but transit authorities actively encourage them. 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 certain development projects, a travel plan is mandatory. As part of TDM, some American states have adopted a "parking cash-out" programme - a scheme in which the employer pays

cash compensation to employees who choose to give up their free parking spaces, with compensation amounting to the equivalent sum paid for a space. This money can thus be used by employees for public transport or for carpooling.

Results of Company and Public Administration Mobility Plans in Grenoble (France)

Since 2001, the Urban Transport Consortium of Grenoble (SMTC) assigned the public-private entity Sémitag (responsible for Transport in the region of Grenoble) the task of implementing Company and Public Administration Mobility Plans within its overall Urban Mobility Plan.

The implementation of these mobility plans raises the awareness of employees who benefit from them, through the employer, in a collective and individual approach. Inter-Company Mobility Plans also make it possible to pool resources in a given business park.

The public transport operator has developed methods for raising awareness of CMP in companies, with the support of the Chambers of Commerce and Industry and of the ADEME (the French Environment and Energy Management Agency) to enable interested companies and government agencies to adopt their own customised Mobility Plans: information days, a dedicated CMP internet service and hotline, route planners and eco-route planners, and more.

Moreover, Sémitag also offers an attractive price scale

- for employee commutes;
- for business trips;
- for renting a fleet of company bicycles and vehicles for car-sharing.

In 2011, more than 300 employers had set up a Company or Public Administration Mobility Plan or participated in an Inter-Company Mobility Plan, concerning more than half of all employees in the urban area of Grenoble. Employee commutes represented 14% of trips in the Grenoble area. 63% of trips were made in cars. A shift has been observed since 2002 to bikes and public transit, in part thanks to the adoption of Mobility Plans. Indeed, before the Mobility Plans were set up, 3 out of 5 employees were using their own cars to get to work, whereas at present, only 2 out of 5 employees do so.

In order to expand this effort, the authorities in the Grenoble urban area are trying to stress the consequences of road accidents for employers. More than 500 accidents resulting in personal injury occur every year. For companies, the consequences can be serious from a financial point of view, on one hand, and for the organisation of its business, on the other hand. In France, half of all workplace fatalities are road accidents, 75% of which occur during the commute to and from work.

Encouraging cycling in Belgium: a kilometre allowance paid by the employer

In Belgium since 1997, a kilometre allowance has been paid by employers to personnel who cycle to and from work, at least part of the way. The amount of the cycling allowance is left up to the employer's discretion, but since 1999, it has been exempted from tax 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, they can have their rail passes paid for by their employers (this has been set at 75% since January 2013).

5.2 Mandatory financing of the transport system by companies and business activities

Businesses contribute to financing public transport through general taxes, although in some countries a direct tax is levied on companies, since the authorities consider them to be 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 salaried employees who use public transport.

■ Tax based on payroll

The most widely known and applied transport tax is the French "Versement Transport," or 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 contributed to improving the public transport system. Originally designed to finance investment, VT funds have since been used to finance operation, thereby reducing the leverage effect on investment.

Owing to a rise in both the number of employees and their wages, payroll is increasing. Tax based on payroll is particularly dynamic in times of economic growth.

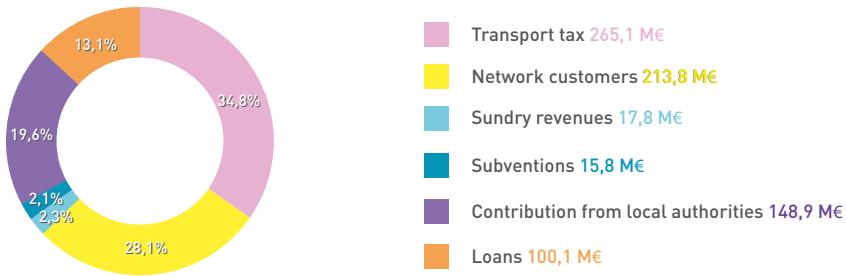


Figure 15 : Lyon Transport Authority (SYTRAL)'s income : 761,1 M€ (2013)⁹

■ Direct financial support for employees

Direct financial support for employees is an indirect financial aid for the public transport service, as the funds are aimed at supporting demand by inciting 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. Moreover, it is a good incentive to use public transport.

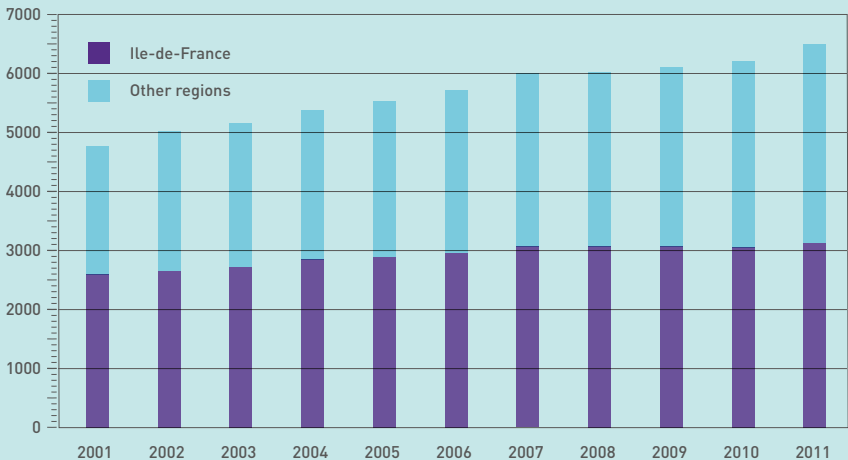
A variety of methods have been employed in different countries, with certain methods based on voluntary participation, like in the United States, where companies can take advantage of tax exemptions on the amount they allocate to employees to buy a transit pass. The most effective methods, however, are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

9. Source Sytral

The transport tax in France: a constantly growing resource

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

- for the Paris region, since 2013, the percentage rate has been capped at 2.7% and 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 towns with more than 100,000 inhabitants; and 0.80% for towns with fewer than 100,000 inhabitants.



**Figure 16 : Growth rate of transport tax revenues from 2001 to 2011
in millions of euros**

Revenues from VT represented approximately €6.5 billion in 2011, roughly evenly divided between Ile-de-France and the rest of France, although there was a slight increase in revenues from towns outside the capital that have invested in projects funded by VT.

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

Vale Transporte in Brazil: covering costs for the poorest employees

This transport voucher system, which was introduced in 1987, is an employer-subsidised public transport scheme. Employers are under obligation to cover the extra cost of an employee's transport if it exceeds 6% of their salary. The employer buys public transport vouchers from the transport authority and tops-up the employee's electronic transit pass. It is a legal obligation that is applicable in all urban centres, and nearly 40% of public transit passengers benefit from it, on average.

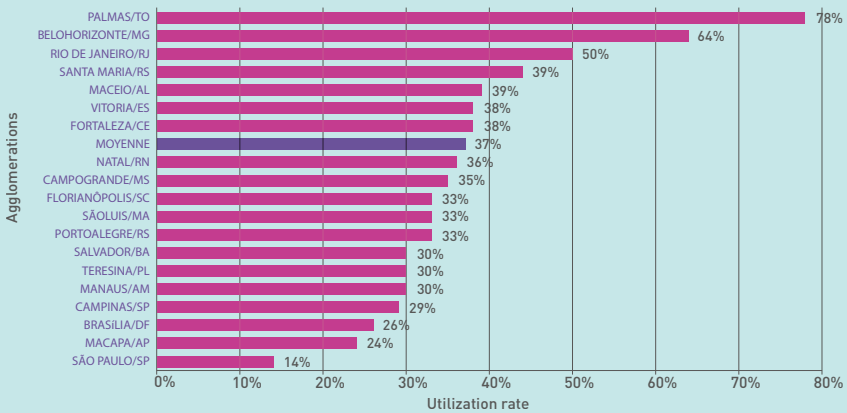


Figure 17 : Percentage of journeys made using the Vale-Transporte scheme in municipal transport systems in 2012

Transport vouchers can be used for urban and interurban public transport services subject to a fare policy decided upon by the transport authority. Other transport is excluded, including small-scale transport operators, which are very common in large Brazilian cities.

Vale Transporte is an essential resource for financing the cost of transport services, and it offers a number of advantages:

- It is used for roughly 4 out of 10 journeys made on the country's public transport system.
- Employees do not feel the pinch of rate increases, as the cost to them is capped at 6% of their salary. The employer covers the extra cost.
- It represents a means of social justice, in that only the poorest are entitled to it, at least for workers in the formal sector of the economy. The *Vale Transporte* system is most widely used in Brasilia, with 68% of users, because this is where public-sector jobs are dominant.

However, as the system has developed, it has on occasion been misused: *Vale Transporte* has become a parallel money traded on the black market, especially for using small-scale transport. Introducing electronic cards has helped to significantly reduce this illegal traffic.

Another drawback is that *Vale Transporte* is only available to formal economy workers. Despite major progress in the employment market, formal employment still only represents 52% of the total workforce in the country's six largest metropolises. Therefore, a large number of users are excluded from the system.

Nonetheless, transit authorities and operating companies are overwhelmingly in favour of this system, because it guarantees user loyalty, and creates an incentive to use public transport.

Who benefits from *Vale Transporte* ?

In Brazil, a transport ticket costs on average 2.7 reais (€0.80). Employees thus spend an average of €35.60 per month on travel costs, i.e. one return ticket for 22 days, if they only use one means of transport. (However, many cities do not offer ticket integration and so, usually, two modes of transport are used per trip).

Without transport vouchers, this cost would represent 20% of the income of an employee earning minimum wage, which is €203. Thanks to the system, all employees earning less than €650 per month are entitled to transport subsidies. This accounts for a very large percentage of the population, since the average monthly salary in Brazil is €403.


The transport bonus in France: reimbursement of half of the cost of transit passes by the employer

Introduced in the 1980s, reimbursement of 50% of the cost of transit passes was at first only intended for users in the Île-de-France region. Employers were required to pay transport subsidies along with salaries, and this held true for all employees, regardless of their status or salary, from the CEO to the caretaker.

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

Since 1 January 2009, this compulsory scheme has been extended to all urban areas with a public transport service. The reimbursement of 50% of the cost of a transit pass has also been extended 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.

Summary



By implementing compulsory contributions from companies and government agencies, such as the VT tax and public transport subsidies for employees, sustainable forms of financing are created which contribute to covering both investment and operating costs.

VT is used for topping up transit authorities' budgets and contributing to the system as a whole. Subsidies for employees are designed to encourage use of public transport, and to play a social role in the case of Brazil's *Vale Transporte* scheme.

However, certain prerequisites are necessary in order to implement such schemes:

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

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 a local area, etc.) and negative impacts (pollution, noise, transformation of the neighbourhood, etc.) that affect the value of the land and of the buildings served.

If the contracting authority minimises the negative effects of these new investments (certain studies have shown a negative impact for buildings situated within a 200-metre corridor along the line), the investment can increase the value of the surrounding land and in particular 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 infrastructures and leads to new urban developments or new types of land usage.

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

6.1 How should land value capture be used?

■ Prospects for capturing land value gains

Depending on the circumstances, this capture of land value gains can contribute directly to the project's budget, fund new infrastructure, etc. A number of methods have already been tested, and they can be divided into three distinct categories:

- developer contributions and betterment charges;
- the anticipated purchase of land in order 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 are self-contained. In fact, a partnership with a property development company can be established prior to introducing a tax to capture land value gains. In general, financing that involves capturing property value gains should not be limited to just one mechanism. Instead, it should be viewed as a part of a range of complementary methods.

■ Difficulties and risks

Certain studies have shown that very large gains are made by landowners or property owners following a public investment in transport infrastructure. However, other studies are much more reserved as to the reality of the value gains, and even more so as to the public authority's ability to capture it.

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

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

■ **Do not assume that the land value gain is guaranteed.** Certain studies show that there is no land value gain for the construction of certain types of public transport infrastructure. Others show that it is very difficult to evaluate where the value gain comes from and to guarantee fair taxation. Real estate markets take on a momentum of their own, and although the development of a piece of infrastructure can raise prices, a crisis on the property market 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 certain cases, urban planning rules can create significant distortions on the real estate market, by setting unsuitable boundaries. By proposing development rights within an overly restrictive geographical area around train stations, the public authorities can create disproportionate taxation.

■ **Maintain a high level of 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 derived 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.

The difficulty of evaluating land value gains

- The value gain generated by **the construction of the metro in Helsinki** is estimated at between 5% and 10% for residential properties, and between 10% and 30% for commercial properties, according to various case studies. The price increase of apartments was inversely proportional to the distance from the metro station within a radius of 750 metres, with a particularly high level between 250 and 500 metres. The value uplift of the 81,000 buildings less than a kilometre away was estimated at between \$550 million and \$670 million. However, areas that are not served by public transport have dropped in value. This loss in value has been estimated at between \$90 million and \$150 million for the whole of 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 it is very difficult to evaluate the actual increase in value, and that capturing it is an even trickier task.
- **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 major 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.

6.2 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 value of property is not due to the action of the owner (such as would be the case with renovations and improvements) but from a community action, thus justifying the public authorities to impose such a tax.

In cases where the site is already built up, it is not easy to implement this tax. Indeed, it is very difficult to assess land value gains generated by transport infrastructure. This no doubt explains why this financing mechanism is still underused.

This tax must be levied on all areas that benefit from the new transport infrastructure. The land is valued each year based on an optimal use of each site, without taking into account the existing facilities. A tax based on the value of the land is then levied in order 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 which has been earmarked for building 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, no tax reduction is 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 difficult to implement because it is difficult to realistically assess land value gains.

Assessment of the land value gains 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 to lose value. Should compensation be paid?

A periodic valuation can be made based on the market value of the land, and the tax may be based on this value. 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 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 property may increase in value for reasons other than the new infrastructure. It also runs the risk of 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 locals who do not use transport infrastructure. Difficulty in gaining social acceptance often deters politicians from voting for such measures, which require a consensus. The example of London (see Focus) shows that it is possible to impose betterment taxes on large companies.

Land value capture: the experience of the Dublin tramway (Ireland)

The tramway in Dublin, opened in 2004, was partially financed by a Development Contribution Scheme. In Ireland, the law requires property developers to pay a standard financial contribution to help fund utilities in the area in which the project is being developed. They must also pay an additional contribution on top of the standard financial contribution based on the increase in land value in the vicinity of the new infrastructure.

Two recent articles in the “Irish Planning and Development Act, 2000” allowed planning authorities to issue authorisations to develop nearby stations on condition that the private developers contribute financially to the work necessary to complete new transport infrastructure. The tax is directly proportional to the land value increment generated by the public transport project.

In the Dublin tramway example:

- in residential areas: contributions totalled €250,000 per hectare
- in commercial areas: contributions totalled €570,000 per hectare.

This scheme helped to finance part of the capital invested and created new areas for urbanisation, thus offering new opportunities to developers willing to pay the supplementary contribution.

Moreover, urban development around stations has generated a new clientele and increased income from fares. This is therefore a win-win situation for both the transport authority and property developers.

Changes in taxation in Bogota (Colombia): from the betterment tax to the equipment tax

Like other Latin American countries, Colombia long ago (1921) introduced the principle of *contribución de valorización*. It corresponded to a contribution by landowners to the funding of public works, primarily roads, equivalent to the increase in the value of their land.

This mechanism represented a large source of revenue for local governments through the 1980's, but it had major disadvantages. The amount of the contributions was not actually set according to increases in land value. Above all else, it depended on the amount of investment required for the infrastructures, in addition to administrative management costs of 30%. As it was no longer meeting its objectives, the system was reformed in 1997. In concrete terms in Bogotá, the *valorización* corresponds to a tax on infrastructure based on the land value, taking account of household income levels and a number of other factors, such as the size of the plots of land and their distance from the infrastructure. It is used for funding the municipal investment budget.

At the end of 2007, the mayor of the Colombian capital announced a vast programme to improve the road system of the entire city, based on this tax resource. He planned to raise \$260 million from the *valorización*, but he also chose to take out loans (for €74 million) and turn to the bond market (€222 million). The *valorización* thus made it possible to accelerate the improvement of the road system of the Colombian capital. This approach has since been copied in other cities of the country.

■ 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. Concerning the infrastructure inside the area under development, property developers are required either to build it at their own cost, or to fund infrastructure supplied by the public authorities. Concerning external facilities, they are partially funded by "impact fees". The idea is for urban growth to fund itself, without tapping into public resources too much. This funding model, which is very developed in the United States for utilities and infrastructure, i.e. drinking water, sewer systems and roadways, is suitable for urban areas under development.

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

A well-known example of impact fees 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 in order 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 are levied. 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) in order to harmonise the California Environmental Quality Act (CEQA) with the calculation of impact fees. This plan will include all types of development (residential in particular) in the tax system.

The TSF will be based on a new method of calculation that will prevent cumulative impacts from various 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 a 20-year period, the TSF will fund an investment programme of \$1.4 billion (€1.25 billion), aiming to improve the performance of the transportation system.

Land-use category	Amount per sq. m. [TDIF]	Amount per sq. m. [TSF]
Residential	-	\$ 5,53
Offices	\$ 12,06	\$ 12,64
Cultural, institutional and educational premises, social centres, health services, leisure, retail shops, etc.	\$ 12,06	\$ 13,30
Museums	\$ 12,06	\$ 11,05
Production, distribution, repairs	\$ 9,65	\$ 6,80
Retail and leisure	\$ 12,60	\$ 13,30
Visitor services	\$ 9,65	\$ 12,64

2012 data

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) which – from late 2018 – will cross London from east to west and facilitate the connection 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 of Transport (DfT), is the entity in charge of the CrossRail project.

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

A surtax called the Business Rate Supplement (BRS) has been applied since April 2010. It is based on the rateable value of the business premises. 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 higher than £1 million or more 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 pay back the loan taken out by the Greater London Authority for £3.5 billion (€4.2 billion). 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.

■ 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 the urban space near transport infrastructures is promoted to capitalise on the tax income generated from the land.

The State lends landowners the equivalent of the estimated land value gain created by the new infrastructure, at a low interest rate and for over 10 years. New constructions generate new tax revenues which are attributed to transport, and the higher population density leads to more users of the public transport infrastructure. 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 large underground stations and railway stations by attracting residential, commercial and service-oriented investments, and has thus decreased car use without having to ban it.

6.3 Reselling land or rights to build

■ Selling off public land for development (land reserves)

In many countries, the public authorities own land in suburban areas or in city centres, and in particular in the vicinity of transport infrastructure.

The public authorities can also acquire land before announcing that the infrastructure will be developed, or before presenting its route, in order to benefit from lower prices. Next, several options are possible:

- directly selling the land to private developers, including the estimated added value in the sale price, such as was done in Aguas Claras on the periphery of Brasilia;
- developing the area as part of an urban renewal project and then selling it at market price, as was done in Copenhagen or in Japan, where rail companies were the first to use this method to finance their operations.

The new city of Aguas Claras (Brazil): urban development funds the metro

Aguas Claras, some 20 kilometres outside Brasilia's city centre, situated in the new city (satellite city) of Taguatinga, was largely unused until the beginning of the 1990s. The land belonged to Terracap, the land agency of the Federal District, also known as the "Federal District Development Agency". In December 1992, the decision was made to develop this area and build the Brasilia—Samambaia underground line, linking the Pilot Plan area to satellite cities that have developed around Brasilia. The land acquired was developed by Terracap and sold off as individual plots to property developers, in order to capture the significant land value gains generated by the investment.

This project - the first of its kind in Brazil - was a complete success, as demand for property in the region is very high. Out of the \$570 million cost to build the underground infrastructure, 85% was generated by selling off plots of land. The cost of developing the land in preparation for selling the plots was valued at €37 million. The same procedure was followed by Metrô DF for the construction of the last station of Aguas Claras, in service since late 2013. Today close to 135,000 residents live in this new city, meaning that the figure forecast for 2020 has already been reached.

As Terracap is already the administrator of the undeveloped land of the Federal District, Metrô DF is planning to use this new procedure to increase the population density of the so-called "Jockey Club" area, which is slated to accommodate the decentralisation of certain government agencies that are overly concentrated in the Pilot Plan, whereas the middle classes live in the satellite cities. Metrô DF plans for 39,000 square metres of commercial development around the Samambaia and Asa Norte stations.

Initial state of development



Current state of development



Figure 18 : Changes in the environment of the Aguas Claras station¹⁰

The new Orestad area provides an underground line to Copenhagen (Denmark)

Born from a necessity to find sources of funding to finance its underground line, Copenhagen's project also combined the development of transport infrastructure with the development of a new local neighbourhood.

Orestad is an area covering 3.1 square kilometres, located on an island 5 kilometres away from the centre of the Danish capital. In the beginning of the 1990s, it had little value because it was largely inaccessible. In 1991, the State and the City of Copenhagen created a development company, the Orestad Development Corporation (ODC), to manage this flagship project for Copenhagen. ODC's assets essentially comprised the land made available for the project (45% State and 55% City of Copenhagen).

ODC had two objectives:

- build and manage the underground system: i.e. two lines that were 20 km long, to serve the Orestad neighbourhood on one side and the airport on the other.
- develop and improve Orestad, in order to bring in university facilities (20,000 students), businesses (80,000 jobs) and housing (20,000 residents) within the span of 20 to 30 years.

The project's organisation was based on the model of new cities in England. It planned for ODC to borrow funds to build the underground inaugurated in 2002, and then for the company to pay back its loan by selling the now-attractive land to property developers. It was estimated that the price of the land would double with the construction of the underground.

However, the project encountered a few difficulties. First of all, the cost of building the underground (€1.5 billion) was two times higher than estimated, and revenue from fares was lower than expected at first. Next, the underground was inaugurated in 2002, during a period of international financial crisis. Furthermore, other projects attracted more investors (renovation of the areas near the port and docks, in the city centre) and the price of the land increased by only 10% to 15%. To pay back its loans, ODC had to lower the price of the most attractive land, and the State encouraged the transfer of public agencies, such as national television and radio, to the area.

At present, the neighbourhood has developed well, and subway ridership levels are higher than projected. In the long term, this funding model enabled Copenhagen to acquire an underground system with this mechanism, which covered 60% of the financing requirement (45% through the sale of land and 15% through the property tax). However, Copenhagen's authorities decided to continue extending the underground network by supporting another land selling project. This time, however, the risk wouldn't be taken by the underground railway company.

In addition to using land reserves, public authorities may also seek to optimise land usage near stations or along main transport lines. Sometimes, the value of the land occupied by the infrastructure itself can increase.

Land consolidation in Japan: using taxes and anticipated acquisitions

Traditionally, Japanese railway companies have used land holdings to finance their own development. Tokyo was largely constructed in this manner, with intermediary companies running new area urbanisation projects from conception to completion, and pre-financing public transport infrastructure before selling off the developed land to recoup their investment (and profits).

But as land to develop has become scarcer, land consolidation has emerged as the most popular method of financing for public and private developers. The principle consists in entirely remodelling parcels of land in specific areas and developing facilities and public infrastructure on site, without the land changing owners.

The landowners participate in financing the developments through a "property tax" of 30% to 50% of the surface of their land within the defined area. The parcels of land are grouped to create a land reserve, to be sold to individuals, private property developers or social services to cover the majority of the cost of construction of the new transport infrastructure, as well as the new roads and public land which have been granted public subsidies.

Architectural innovation in Paris (France): a building-cum-bridge over the train tracks

“Seine Rive Gauche” is the largest development project in the centre of Paris since Haussmann’s renovation of the city. It covers 130 hectares. Within this area, the Austerlitz train station is used by 23 million passengers a year. By 2020, its annual passenger numbers will double, because that year it will begin handling high-speed trains.

As part of this project, the area around the train station will be the stage for a technical and architectural feat: a building-cum-bridge weighing 16,000 metric tons (twice as heavy as the Eiffel Tower) will be built. It will span the 58 metres of tracks with no traditional “supporting” slab. This edifice, made of metal structures mounted on linking bridges, will improve the railroad’s integration into its site, as it previously represented something of an urban rift, dividing a historic part of the city.

The building will include 15,000 square metres of office space and 1,000 square metres of shops, for a cost estimated at €50 million.

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

The Mumbai Metropolitan Region Development Authority (MMRDA) initiated an ambitious programme in 2007 - the Mumbai Urban Transport Project (MUTP) - in order to improve the travelling conditions (rail and road) of the 22 million residents of the metropolitan area. Partially financed by the World Bank, this programme features three phases, the first two of which are valued at \$1.9 billion. To finance the project, MMRDA, the Government of Maharashtra and the state-owned company Indian Railways have relied on the land potential of the city of Bandra, located on the western edge of Mumbai.

MMRDA began developing the commercial complex of Bandra-Kurla at the end of the 1980s, and decided to auction off 13 hectares of land to private developers in 2006 and 2007 (with land-use restrictions). These two sales raised €889 million, which represents 3.5 times the total value of the bonds issued by all of the local Indian governments over the past decade. MMRDA proposed to allocate part of these funds to the MUTP project.

Part of the €350 million in funding for Phase 2 of the MUTP (i.e. 44%) will come from putting to commercial use 45,000 square metres of land in east Bandra, which belongs to Indian Railways. The state-owned company entrusted management of this space to its subsidiary, the Rail Land Development Authority (RLDA). Created in 2006, the RLDA is responsible for identifying land holdings owned by Indian Railways that could be sold or used to fund the renovation of the railway system.

■ Factors for success

The above-mentioned examples respected a certain number of conditions.

■ **The land** was located in an area with low value due to a lack of mobility infrastructures. Building an underground railway or a tramway didn't just create accessibility, but high-quality accessibility.

■ **Public authorities** were in a position to buy the land, or already owned the land. In certain countries, such as in France, public real estate entities can acquire land and retain ownership until completion of the project. This discourages speculation.

■ **The property market** was prospering. In Brasilia, as 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 gains. The public authorities ended up financing the line. The same scenario occurred

for the La Parla tramway in Madrid. In 1998 the “Parla Este” consortium formed by the city of Parla and the Community of Madrid initiated a project to develop the Parla Este area by buying farmland and selling it off for development. In this way, €42 million were allocated to the tramway and an equivalent amount to the urban improvements of the area. But the collapse of the property market in the capital prevented the process from reaching completion, and the missing €80 million, as well as the balancing subsidy paid to the concession holder, had to be financed by the public authorities.

■ **Building the underground line and developing and re-selling surrounding land is a jointly managed project.** Even though this situation allows for immediate retrocession of the funds collected, it can nevertheless force underground railway companies to shoulder a financial risk by assigning them with the task of land developer, which is not their field of expertise. The land development project around the extension of Copenhagen's underground railway will be run by an independent company to avoid these disadvantages.

■ **Underground railway companies** benefit financially both in terms of investment and operation. Because the area boasts high accessibility, the residents of the new area rely heavily on the service, thus contributing to its operating balance.

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

“Certificates of Potential Additional Construction” were introduced by a law in 2001 defining a “City Statute,” which provided municipalities with the possibility of modifying land-use rules and selling construction rights greater than the land occupancy coefficients, in certain areas, in order to finance the physical and social infrastructures needed for urban development projects. This sale is only possible under very specific circumstances:

- The existence of an overall urban development plan for the city;
- The creation by municipal decree of a Joint Urban Operation (JUO) and its application mechanisms. A JUO is the focus of a set of measures coordinated by the municipal authorities, with the participation of the owners, residents, users and private investors. The goal within a given area is to make structural urban modifications and social and environmental improvements. Modifications can be made to parcels of land, land use and construction standards, taking environmental impacts into account;
- A municipal decree regulating the quantity and implementation of the CEPACs in connection with the relevant urban project.

The quantity of CEPACs issued is limited, and they are assigned to specific areas in order to increase the population density in the targeted areas. CEPACs can be auctioned off or used directly to pay for work or expropriations. The financial resources obtained are exclusively used for the Joint Urban Operation. Urban transport infrastructure integrated as part of a JUO plan can thus be funded using this procedure.

CEPACs are then exchanged against the purchase of a given quantity of square metres of additional construction, calculated according to the location and intended use of the building. As each CEPAC has the same value, more have to be provided in order to build in a higher-value area, for example in the vicinity of a public transport station. However, once the maximum quota has been reached in a given area, the CEPAC holder has to try to use them in a different project.

Thus, CEPACs are actually urban policy instruments, as well as securities, approved as such by the Securities Commission in 2004. This commission regulates the issuance and auctioning of securities and their associated rights. Any individual or legal entity can buy and sell them on the secondary market, until they are applied to a plot of land as part of a JUO plan.

Public authorities find several advantages in this procedure:

- They capture the financial resources before the beginning of the project, and thus do not have to borrow or increase their indebtedness to start up a project.
- The supplementary construction rights are sold in a transparent manner, because they can only be paid for with CEPACs and with no other financial means.
- They can set the selling price, including the future increase in value generated by the public urban investments, thereby capturing a large share of the land value gains. However, they only capture these gains partially, because once sold at auction, CEPACs can continue to rise in value on the secondary market.

In this respect, it is useful to compare the procedures used in São Paulo and Rio de Janeiro, which were the first cities to use CEPACs in large-scale projects.

CEPACs in São Paulo (Brazil): pioneering with the Água Espraiada and Faria Lima projects

Água Espraiada is the first Joint Urban Operation approved after the vote of the City Statute in 2001. It concerns the improvement of an area containing several favelas, as well as old residential buildings with one or two stories. The project provides for the construction of new roads, green spaces, the densification of mixed-use neighbourhoods, housing, offices, the construction of 8,500 units of social housing to rehouse families impacted by the construction work, new roads reserved for fast buses and part of the work on line 7 of the metro.

In 2001, all of the urban projects together were estimated at 1.25 billion reais (€375 million) over a 15-year period, with the resources primarily deriving from the sale of 3,750,000 CEPACs, representing the same amount of additional square metres. 350 million reais (€105 million) were allocated to the work on the metro, and 202 million reais (€60.6 million) for the creation of dedicated bus lanes.

The CEPACs were sold in 5 instalments between 2004 and 2012, with each instalment funding a certain number of planned urban projects. Until all of the CEPACs in a given instalment have been sold, another instalment cannot be opened up. In September 2008 the financial objective was met: the sale of 2,030,661 CEPACs had yielded 1.14 billion reais. The 5th instalment, representing the balance of the project, was launched in June 2012. The CEPACs were traded at 1,182 reais/unit, up from a starting price of 460 reais.

The financing operation was thus a success, but the requirement of selling out an instalment completely slowed the initiation of certain projects planned for the last instalments, which otherwise could have started up sooner. However, this way, the city council was guaranteed that all of its projects would be financed, not only the highest-value ones.

The second major operation of Faria Lima covers 650 hectares in the southwest part of São Paulo, a very high-value area. The main goal of the project, which started in 2004, is to reorganise the flows of automobile traffic and public transit by extending Faria Lima Avenue. 650,000 CEPACs were issued, and 1.05 billion reais were generated, for a total project budget of 1.9 billion. 120 million generated by the sale of the CEPACs were allocated to the construction of the metro system.

CEPACs in Rio de Janeiro (Brazil): 5 million square metres to be revitalised in Porto Maravilha

In Rio as in many cities, port operations have moved away from the vicinity of the centre of town, leaving behind thousands of square metres of hangars, silos and housing. The proximity of this area to the historic centre made it an exceptional land holding, but one which required a complete renovation programme. It was with this goal in mind that, through a supplementary law approved in December 2009 (LC 101/2009), the city council of Rio created the institutional and financial measures needed to set in motion a project called “Porto Maravilha”.

- creation of the Porto Maravilha Joint Urban Operation;
- creation of the Urban Development Company of the Port Area of Rio de Janeiro (CDURP), which managed the project for the city council;
- modification of Rio's urban master plan, in order to amend the construction and land-use rules.

For implementation of the project and financing of its public share, the municipality issued 6,436,722 CEPACs for 545 reais apiece, representing a financing potential of 3.5 billion reais (€1.05 billion) which were sold in a single instalment in June 2011 to the public bank, the Federal Savings Bank (CAIXA). This bank then put the CEPACs it had acquired on the secondary market, in successive instalments. By July 2013, nearly a quarter of the CEPACs had been resold on the secondary market to investors, at twice their initial price.

Using this approach, which differed from the one used in São Paulo, the city of Rio de Janeiro was thus able to have 3.5 billion reais at its disposal immediately to allocate to the project, and in particular to fund construction of the 44-km tramway system underway. The Federal Savings Bank recoups the value gains on the secondary market, which it can then allocate to the numerous housing and development projects that it funds throughout the country.

6.4 Transport and urban development activities combined in a single entity

■ Development projects run by mixed semi-public enterprises

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

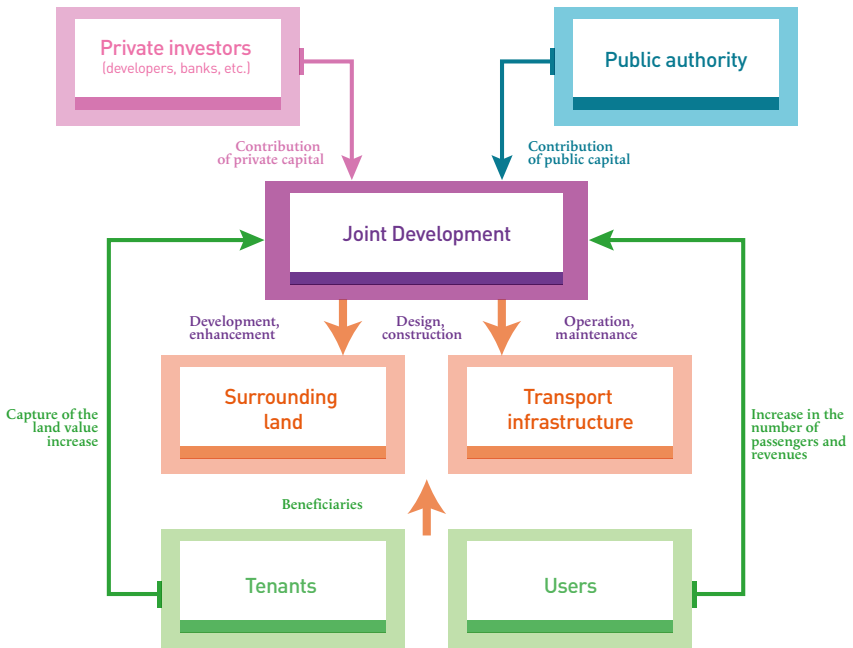


Figure 19 : The Principle of Joint Development

The partnership between public authorities and private developers generally takes place within a semi-public enterprise. It enables:

■ **The public partner:**

- 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.

■ **The 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.

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 large majority stake in MTR's capital, does not grant any subsidies to the company to manage its network. However, the land acquisition procedure is very favourable because the government grants MTR land, instead of auctioning it off.

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 a number of real-estate transactions. This strategy, called "Rail+Property", enables MTR to generate large profits by selling or renting out residential and commercial properties. In 2013, MTR had more than 94,000 housing units and 2 million square metres of commercial space built around 33 tramway stations.

Today, the company's revenues derive predominantly from the management of 13 shopping malls, more than 90,000 housing units and 5 office buildings. But all the players involved in the process have benefited from urban development and transport planning being integrated: the public authorities, the developers, the passengers of MTR, the tenants of the developments around MTR stations and their customers.

The Odysseum project in Montpellier (France): linking urban development to transport, thanks to a semi-public enterprise

The rapid development of the city of Montpellier, in the south of France, has occurred within the context of a strong linkage between urban development projects and the tramway system.

Odysseum is a 50-hectare shopping and leisure complex designed to develop a new focus point in the metropolitan area, connected to the historic centre by a tramway line. It has been under construction since 1998. The entire investment, which includes supermarkets, a movie theatre, a skating rink, a bowling alley, a karting track, hotels, etc. is estimated to amount to more than €300 million.

This project was run by a semi-public company, SERM (Montpellier Area Equipment Company) which had previously acquired a number of parcels of land to increase their value by developing the tramway system, which links the city centre to this shopping complex in 15 minutes.

- Lombed property and commercial activities within the main transport operating company

In Japan, land value capture consists of internalising a large number of activities: 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 reasonable cost, bus, underground and train stations offer a further means of generating cash flow through commercial activities.

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The “Tokyo Station City” project

The JR East company, which serves the eastern side of Honshu Island, and thus the metropolitan area of Tokyo, launched a development plan called “Vision 2020 – i do mu”. Its goal is to develop new business activities and services reflecting the most recent societal developments, and to increase operating revenues other than transport by 10%, thus reaching 40% of all operating revenues.

The “Tokyo-Station-City” project aims to revitalise Tokyo City station’s neighbourhood, which is used by around 380,000 people daily. The revenues generated by these passengers come to an average of ¥260 million per day, or approximately €2 million.

The development project has three major components:

- The construction of twin towers at the Yaesu exit. This development plan is a joint effort with both landlords and leaseholders in the vicinity of the Yaesu exit. Individually owned premises will be combined to build two towers which will be used for offices, shops and administrative services.
- The development of Sapia Tower, a high-rise building at the Nihonbashi exit, which will house a research and education centre.
- Preservation and restoration of the Marunouchi station building. Upon restoration, the building will accommodate station facilities, a hotel and an art gallery.

The area development plan aims to make Tokyo the world's most modern station. More than just a transit point, it will offer various new cultural attractions inspired by its users. The work should be completed before the commemoration of the train station's centennial anniversary in 2014.

The role of railway companies in Japan

Due to a scarcity of land, and the exorbitant price of land for sale, transport infrastructure developers have had to come up with original solutions for developing business activities within train stations and surrounding areas.

Traditionally, railway companies have captured the value of land and commercial activities to guarantee part of their operating revenues. For example, in 2012, the share of land activities represented 25% of operating revenues of the JR East railway company, which operates in the Tokyo and Tohoku areas.

Keio, a private operator that runs suburban train lines in Tokyo, takes an even more integrated approach concerning the sale of merchandise in train stations, which represents more than a third of its sales.

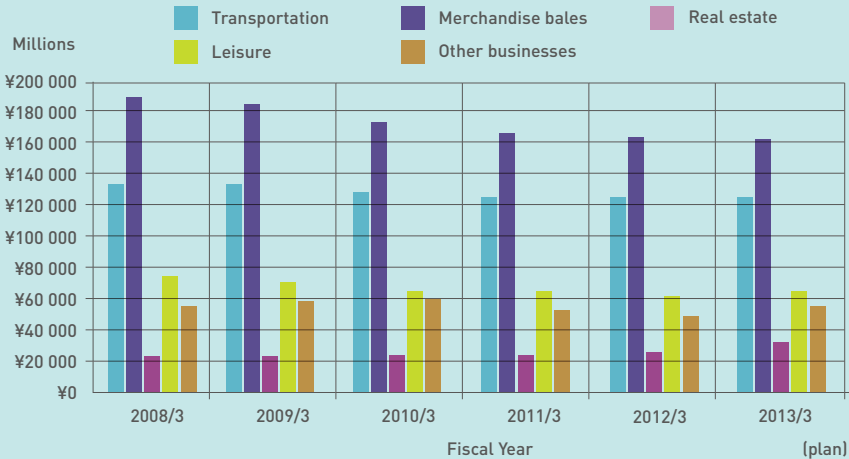


Figure 20 : Operating income of Keio in 2012

Rail transport has driven Japan's urbanisation. Stations and their surrounding areas are obligatory transit points for consumers and thus harbour significant business potential. In Japanese stations, you can go shopping, handle administrative formalities, etc., and catch a train or an underground metro.

Mass transit projects in India: the search for innovative financing mechanisms

Since the 2000s, the Indian government has implemented a proactive national urban transport policy. In order to promote integrated land-use and transport plans, the central government subsidises 50% of the development, provided that the city demonstrates its willingness to act in favour of sustainable urban mobility. All cities are thus encouraged to identify potential development corridors and to set up a mass transit system there, which is consistent with a controlled approach to urbanisation.

To fund these projects, cities are encouraged to levy taxes specifically for the funding of urban transport, in particular aiming to capture the land value gains made along the mass public transit corridors. The commercial use of land provided by transport operators is also recommended to raise additional funding.

In 2012, the central government sent out a circular, indicating the innovative financing mechanisms to be implemented, to the governments of the federated states and the directors of the agencies in charge of urban transportation. This circular made it compulsory to search for resources through land value capture mechanisms (Transit Oriented Development) and made this a prerequisite for the granting of subsidies from the central government for all types of mass transit projects. The different financing methods are:

- new tax revenues in an area of influence around metro lines;
- the densification of these areas with a higher land occupancy coefficient;
- the use of transfers of development rights;
- the annual adjustment of property taxes;
- the creation, at the level of the states, metropolitan regions or municipalities, of public funds into which these tax revenues are deposited and then reinvested in transport projects.

Pimpri Chinchwad, an urban area of 2 million inhabitants located in the State of Maharashtra, has become a reference for other Indian cities. For its project of two BRT lines totalling 40 km (eventually 130 km of network are planned), the municipality developed an innovative financing model: an urban transport fund (UTF) was set up to manage the resources required to build the infrastructure. A public company (PCMC) was created to build, run and maintain the BRT corridors.

In addition to the contribution of international financial institutions, the municipality of Pimpri Chinchwad planned to raise funds in the area of influence of the BRT, i.e. within a 100-metre strip on either side of the BRT corridor. In order to encourage developers to build in this area, the land occupancy coefficient was raised by 80%. Investors must transfer development rights obtained from other parts of the city and pay a surcharge to develop their property project along the BRT. Local taxes are also increased in this area of influence, and the additional revenue is paid into the UTF. In all, the potential revenues in the BRT's area of influence are estimated at roughly 28 billion rupees (€330 million). With this method, the average land

occupancy rate in the metropolitan area is not modified. Instead, there is simply a concentration of construction projects along the BRT corridors, which serves to increase the attractiveness of the public transport system and its self-financing model.



Figure 21 : Metro under construction in Kochi, Kerala State

6.5 Advertising revenues

Advertising revenues can provide additional resources to fund the operation of a public transport service.

■ Additional revenues

The users of a closed public transport system, such as an underground system, can represent a target for advertisers. The revenues depend on passenger traffic in the stations.

Installing advertisements on vehicles or on street furniture can also represent a source of revenue. In this case, the advertisers target all of the users on the street. The amount of advertising revenue depends on traffic volumes.

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Advertising: an additional source of funding to improve public transport services in Africa

In Antananarivo (Madagascar), advertising was introduced along a pilot public transport line. In order to ensure the durability of the street furniture, a public-private partnership was set up for the servicing and maintenance of the new bus shelters and pylon signs. The bus shelters feature advertising space made available to a private agency which, in exchange, is required to provide maintenance of the street furniture for the duration of the concession contract and pay an annual fee to the Urban Community of Antananarivo.

The proceeds from this fee (€62,000 in 2013) go towards funding certain support measures, such as paying the salaries of the bus station managers on the pilot line, renovating a side street, installing a bus shelter at the end of a line, commissioning a mural about urban mobility in Antananarivo and making uniforms for the people who manage bus traffic at a few stops.

In Cairo in 2008, a National Taxi Replacement Plan (PNRT) was adopted to renew the fleet of 85,000 taxis, half of which were more than 25 years old. To encourage the purchase of new vehicles running on Natural Gas for Vehicles (NGV), economic incentives were put in place: tax exemptions on the purchase of the vehicle, subsidies in exchange for turning over old vehicles to recycling centres, exemption from taxi license fees for several years, low interest rate loans, etc. Contracts with advertising firms to put ads on the car bodies made this project even more attractive for taxi drivers.

Commercial and advertising revenues in Hong Kong: a source of funding

In Hong Kong, the private operator MTR (Mass Transit Railway) operates a railway spanning 218 kilometres, made up of an underground system (10 lines), light rail transit and an express line connecting the city centre to the airport.

In 2012, commercial and advertising revenues from the public transport stations represented 16% of MTR's total revenues in Hong Kong, i.e. €356 million. In the same year, the operating cost of these activities amounted to €38 million, resulting in a net income of €318 million. This revenue was derived from four categories:

- Shops in stations: MTR stations featured 1,331 shops which generated €207 million in gross income.
- Advertising: MTR had 44,651 advertising spaces (trains and stations) which generated €97 million in gross income.
- Telecommunications: mobile telephone services generated €38 million in gross income. A vast technological upgrade programme (3G/4G migration) is underway.
- Others: gross income from other sources amounted to €14 million. For example, MTR has had a steady revenue stream since 2002 through a partnership with a free newspaper distributed exclusively in its public transit system.

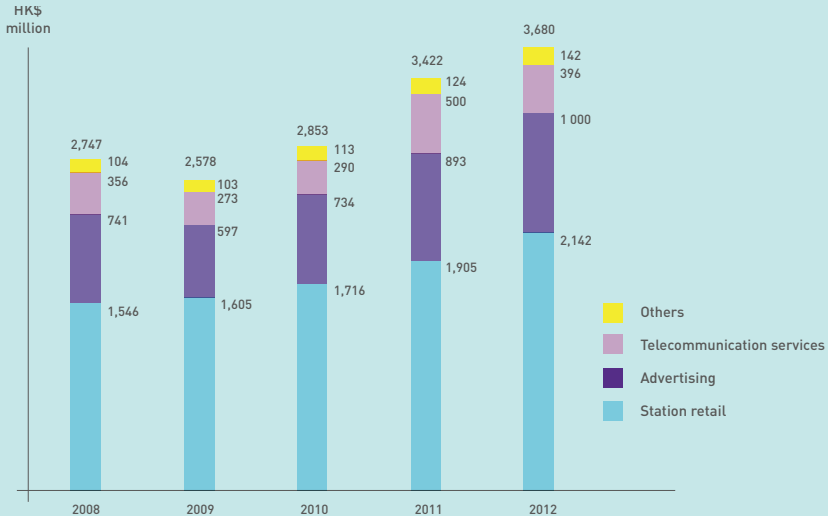


Figure 22 : Revenue from commercial activities in stations

An emblem of the city, Hong Kong Tramways (created in 1904) accounts for between 16% and 18% of all trips made on public transit on the island. Since 2009, the line has been operated by the joint venture Veolia Transport-RATP Asia (VTRA). No subsidies are given by the Hong Kong government to the operator, which tries to maximise its advertising revenues.

■ *namings rights*

In certain cases, naming rights can be sold. This involves naming a bus, underground or tramway stop after a company that pays for this advertising.

Commonly used for funding sports stadiums, the sale of naming rights is developing gradually in the sector of urban public transport. The principle is simple: contracting with a public or private partner to rename certain stations or lines of the transport system in exchange for a predefined annual fee. The location and traffic of the stations are factors that go into setting the value of the naming rights for a given period.

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naming rights : a new source of income?

In Dubai in 2008, the Roads & Transport Authority (RTA) launched the “Dubai Metro Naming Rights Project” to choose the name of 23 of the 47 stations of the two underground lines (excluding landmarks and historic sites). The sponsors were chosen through an open call for tenders held before each line commenced service (in 2009 and 2011). In the first phase of the project, 11 companies were chosen out of 120 to sign agreements for 10 years, for an aggregate amount of €409 million.

In New York in 2009, the Metropolitan Transportation Authority (MTA) signed an agreement for \$0.2 million/year (€0.15 million/year) for 20 years with Barclays Bank to add its name to the Atlantic Avenue subway station, located in Brooklyn next to the Barclays Center (a multi-purpose indoor arena). In July 2013, MTA decided to authorise the extension of this arrangement to all of its stations, subject to certain criteria being met, i.e. a geographic or historic link between the station and its name.

In Philadelphia in 2010, the Southeastern Pennsylvania Transportation Authority (SEPTA) signed a five-year agreement for \$5 million (€3.7 million) with the telecoms operator AT&T to rename the Pattison subway station, one of the busiest of the entire system.

In Madrid in 2013, Metro de Madrid signed a three-year agreement for €3 million with the telecoms operator Vodafone to rename the central Sol station (65,000 passengers a day) as well as Line 2 of the underground (122,000 passengers a day). This contract will increase the operator’s annual advertising revenues by 10%.

■ **Developing new services through advertising**

Finally, the development of new services, such as bike share systems, can be supported by advertising revenues.

In many metropolitan areas, starting with Lyon and Paris, local governments have funded bike share systems by developing the outdoor advertising market.

Vélib' in Paris (France): success for a bike share system

Launched by the City of Paris in July 2007 with the street furniture company JCDecaux, the Vélib bike share programme has been a huge hit for five years. This system enables people to borrow or drop off a bike, 24 hours a day, at any station in Paris and in 30 adjoining towns, in exchange for a subscription to the service and possible overtime costs (the first 30 to 45 minutes are free, and then there is a charge for additional time). Since 2011, the full-price subscription costs €1.7 per day (the price of a metro ticket), €8 per week and €29 or €39 per year based on a time scale and a usage surcharge.


The Vélib system is based on two principles:

- the system was funded by the private operator, which buys and installs the stations and bikes and maintains them using the advertising revenues made from advertising panels (2 square metres and 8 square metres);
- the revenue made by operating the Vélib service goes to the City. Moreover, the operator also pays the City an annual fee for occupying public space.

The City of Paris pays part of the maintenance costs (for vandalised or stolen bikes) as well as rent for the stations in the adjoining towns. The operator either receives bonuses or pays penalties, according to eight service quality criteria defined in the contract. In 2010, the City spent €12.5 million on managing the service and made €16 million in revenues, resulting in a net profit of €3.5 million.

Between 2007 and 2012, the fleet of Vélib bicycles increased from 11,000 to 23,000, and the number of stations went from 750 to 1,700. The service now has more than 245,000 annual subscribers, and enables an average of 110,000 bike rides a day. Vélib now represents 38% of bicycle traffic in Paris. Since it was set up, the number of cyclists has increased by 41%

Summary



There are numerous and promising examples of taxation on new urban developments. Taxing newly urbanised areas to finance the capital invested helps tackle the problem of urban sprawl. Likewise, an increase in population density along public transport lines generates more users and higher operating revenues.

Cities in developing countries are well-suited to implementing this kind of project, because population density is low outside the heart of the city centre, and therefore land value is also low. However, such procedures require keeping a complete land registry, establishing a property tax and having a land management system, as well as development projects which include apportioning land for social housing in order to avoid the impression that low income families are victims of the increase in value of the area. These types of procedures must be well prepared ahead of time, due to the fact that the financing is mobilised just once.

Methods differ by country because of institutional and regulatory practices, but regardless of the method, public authorities should have control over the entire project, from construction of the infrastructure to supervision of urban development, so that they can assure that the funds generated are transferred to the transport sector and do not disappear into the general budget.

Using Public-Private Partnerships

The aim of a public-private partnership is to involve the private sector in the initial investment and/or operation of a project by assigning some of the tasks to the private partners and transferring a share of the risk to them, while guaranteeing a sufficiently profitable set-up (by means of public sector subsidies if need be) to attract investors.

The tasks to be divided up between the public partner and the private partner are as follows:

- Design (D)
- Build (B)
- Finance (F)
- Operate (O)
- Maintain (M)

If the PPP concerns building work, the Transfer (T) is generally added, in order to specify when the public partner becomes the owner of the infrastructure. A “full” PPP could therefore be referred to by the acronym DBFOMT. But in fact, PPPs are usually “limited” to certain tasks.

The BOT (Build, Operate and Transfer) is certainly one of the most common and oft-cited forms of PPP. However, in the public transport sector, a large number of PPPs are limited to the operation and maintenance aspects, or O&M (Operate & Maintain).

7.1 Why use a PPP?

Public-private partnerships do not constitute a new financial resource, as such. In fact, they mobilise the private sector to bear the financial burden temporarily, whether it be for investment or operation purposes.

The general principle is that the private partner gradually recoups his costs, either by being reimbursed for the public authority’s share, or by being paid a fee by the user of the service and/or of the infrastructure.

In any case, the contracting authority of the infrastructure or service pays a price for the PPP. Indeed, the burden of the investment or operation borne temporarily

by the private partner represents an additional cost for the owner. Thus, PPPs are generally not used for purely financial reasons. However, this does not mean that PPPs are not useful. Indeed, the private sector has other advantages, which can be exploited with PPPs:

- **Know-how in a complex industrial and commercial activity:** Conducting an urban transport project requires skills and expertise which are most found in the specialised private sector;
- **Flexibility:** Regulations concerning public management may hinder management of an industrial and commercial project such as the construction and operation of transport infrastructures. A partnership with the private sector, under public control, can help accelerate and optimise project management;
- **Better personnel management:** Given that the operation of the transport infrastructure will be delegated to a private partner, it is not the transport authority but rather the private partner who is responsible for hiring and managing operational staff, which means lower administrative costs for the public partner and, above all, allows greater flexibility;
- **Economies of scale:** These may be achieved by bringing in financial partners, well-established builders and operators, managers of multiple infrastructures;
- **Encouraging efficiency:** This must be organised during the competitive bidding stage, and then by rewarding the private operator based on balanced performance indicators.

7.2 Which contextual aspects should be considered?

Before deciding to use a PPP, a certain number of aspects must be analysed in order to decide whether this solution is truly appropriate, and if so, to design the right one.

- **The nature of the project** may influence which type of partnership is chosen. The public partner must evaluate the total cost of the project, its importance in terms of public need, the time frame, the number of actors involved and the geographic area in question. Does providing this public service require a major infrastructure? Will it require high levels of human and financial resources to provide this service? Before a decision can be made, it is necessary to fully understand the context of the proposed project.
- **The cost of the project** is, of course, a critical factor which will weigh on the choice. Many PPPs concern projects for underground systems, LRT and BRT requiring significant levels of financing which the public authorities would have difficulty assuming alone.
- **A well-structured institutional framework** and the public authority's experience in developing transport projects are also decisive factors. Public transport is an industrial and commercial activity which involves financial risk. Bringing in experienced partners is one way of compensating for a lack of certain skills in this field. This

can sometimes facilitate obtaining a loan, in particular from international funding agencies. However, a public-private partnership must rely on the involvement of the public authority for its long-term success.

■ **The tasks entrusted to the private sector** (financing, design, construction, development, operation, maintenance) will influence the type of contract (see above).

■ **The sharing of roles and risks** will determine the degree of involvement of each partner and the type and clauses of the contract. There are many types of contracts, but it is primarily the sharing of financial risk which will determine the key characteristics:

- Risks related to the project design which may engender low performance due to inappropriate technical choices, errors in assessing potential demand, etc;
- Risks related to the technical and economic aspects of construction may result in higher costs than anticipated and delays in completion, etc;
- Industrial risks related to operating the infrastructure (mainly linked to costs): competition with other modes of transport, operating and maintenance costs, traffic risks, etc;
- Commercial risks (linked to demand): setting fares, marketing etc;
- Financial risks: variable interest rates, risk of inflation, etc.

7.3 What are the prerequisites for a successful PPP?

Implementing a PPP requires a certain number of prerequisites. In order to perform its duties, the private sector requires certain protections, while the public sector needs to monitor the service rendered.

■ **Guaranteeing legal protection.**

This is an absolute necessity for the proper functioning of a PPP for its entire duration. A PPP is governed by a contract which sets out in the most exhaustive detail possible the relations of the two partners. It sets the terms of the partnership, the rights and obligations of both parties. But it should also specify the mediating and judicial bodies which must be able to intervene in an effective manner, in the event of a dispute. It is precisely the institutional environment which will enable – or not – the enforcement of the contract’s clauses.

■ **Providing an environment that fosters the viability of the project.**

The project absolutely must take into account the ability of users to pay, and it must be an integral part of a master plan for urban transport and development. The industrial and commercial risks engendered also depend (sometimes a great deal) on the way in which the other elements of the system are managed (automobile traffic, sharing of public space, parking, taxis, etc.).

■ **Ensuring financial viability.**

A public transport project is not always self-financing, at least in the first years of the project. Thus, the public partner must be able to ensure its financial viability.

This is all the more true if the transport authority chooses a route which does not optimise income but which it deems most appropriate from an urban development perspective or if it chooses a low pricing scale to fulfil the social function of the public transport system.

7.4 Public-Private Partnerships for operation of public transport

Delegated management contracts enable public authorities to entrust private operators with operating transport services, by transferring to the private operators a more or less significant share of the financial risks associated with supplying a given service.







Generally, the risks can be divided into two categories: **commercial risk**, related to trends in revenue, and **industrial risk**, related to the operating and maintenance expenses. Depending on how these risks are distributed between the public and private partners, there are three types of delegated management contracts:

- **Service contracts**, where the public authority assumes both the commercial and industrial risks. The private operator is paid according to the type and volume of services provided; this pay includes a system of bonuses and penalties tied to the quality of the management results.

- **Gross-cost contracts**, where the private operator assumes only the industrial risk. The public authority undertakes to pay the private operator an annual lump sum determined according to an estimate of the operating costs, regardless of their actual amount. These costs can be calculated on the basis of a fixed annual number of kilometres or a price per kilometre, or for an overall volume of activity. Moreover, the operator can receive additional income from advertising revenues, fines for fare violations, etc.

- **Net-cost contracts**, where the private operator assumes the industrial risk (on costs) and the commercial risks (on revenues). The private operator collects revenue from passenger traffic. However, to compensate for the public service obligations that it imposes on its private partner (fare obligation, obligation to operate according to a given set of specifications, etc.), the public authority is generally required to make a supplementary contribution, called the flat-rate financial contribution. This financial contribution can take two forms:

- **a predefined flat rate** that does not reflect trends in the revenue collected by the operator. However, the risk is very high, because once the contribution has been predetermined, the operator's financial health depends exclusively on revenues from traffic;
- **a flat-rate contribution**, but which can be adjusted according to the actual revenues made from traffic. In this case, the public transport authority bears part of the commercial risk.

Contracts	Net-cost contracts		Gross-cost contracts		Service contracts	
Risk carrier	Public partner	Private partner	Public partner	Private partner	Public partner	Private partner
Industrial risk-taking (stakes: cost control)		 (*)				
Commercial risk-taking (stakes: revenue)		 (*)				

(*) : However, the risks can sometimes be shared.

7.5 Public-Private Partnerships as infrastructure financing mechanisms

PPPs can also be a source of funding for a project, in the same way as a loan, but which commits the lender (the private partner) and makes him responsible for the proper implementation of the project. In the long run, the real financing comes from the users and/or the public sector via ticket sales and/or the remuneration of the private partner responsible for repaying the loans.

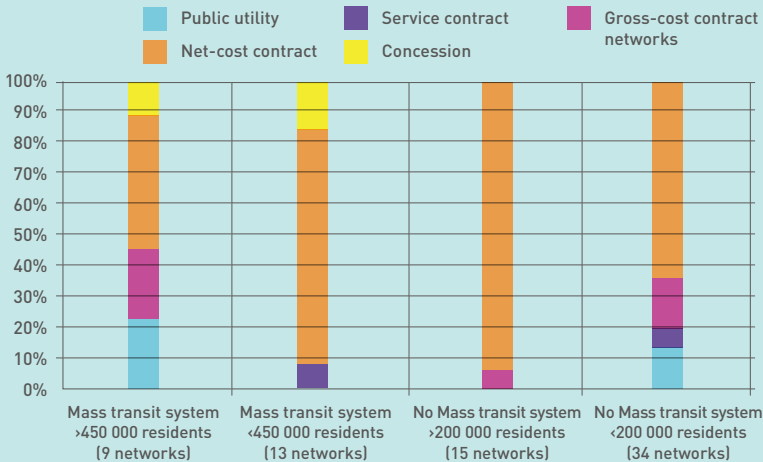
In this category of PPP, the concession is a contract under which the public authority delegates to a private company the responsibility for building a public structure. The concession holder is authorised to operate the structure for the period required to amortize the concession holder's investment (generally 20 to 30 years for dedicated public transport infrastructure built in the past few decades). At the end of the concession contract, the concession holder returns the infrastructure and equipment to the granting authority, free of charge and in good working order.

The concession holder's remuneration is mainly in the form of revenues from traffic, paid directly by the passengers. But in the framework of a concession, depending on users' ability to pay (and therefore on ridership combined with price), the public granting authority will have to finance part of the infrastructures to ensure "viability" of the overall business model. The example of Lagos will be interesting to study over the long term: LAMATA, the PTA, has implemented more or less concession-like mechanisms for two lines of light rail, based on their "profitability".

An overview of delegated management in France

In France, it is the public authorities who define public transport service and public service obligations. Since 1982 and the “LOTI” (framework law on domestic transport), it is the urban transit authorities who decide on the modes of transport and how they are managed. In a great majority of cases, they use exclusively public funding for the infrastructures for which they are responsible.

To this end, they borrow on the financial markets, where they usually enjoy low interest rates. Next, they generally turn to private partners, especially for system operation. The annual survey of transit systems in France gives a clear picture of the different types of management options. Of the 189 systems outside of Île-de-France which responded to the 2011 survey, only 9% were directly managed by the transport authority. The remaining 91% were managed by private operators.



Mass transit system : metro, tramway or Bus with High level of service (BHLS) systems

Figure 23 : Number and type of contracts by size of urban area in France (2011)

The use of private partners for the operation of systems is very common in France, but the degree of delegation is not directly correlated to the size of the system. Most urban public transit authorities opt for Public Service Delegation contracts, which leave the commercial and industrial risk with the private partner: net cost management contracts. The trend since the end of the 1990s has been to move away from management contracts and gross-cost contracts, and towards net-cost management contracts. Certain urban areas, such as Caen and Reims in France, have chosen to use concession holders to build infrastructure and operate public transport systems.

The PPP as a project financing mechanism must enable the public partner to:

■ **Spread public expenditure over a long period.** Essentially, the private partner advances money to the transport authority partner. This amount, spread over a long period, helps the public authorities avoid blocking large amounts of cash during the construction period, for a single project.

■ **Limit the use of public investment and debt.** By asking the private sector to make capital investments and/or undertake loans, the public authorities do not have to set aside large sums for urban transport infrastructures, thereby ensuring that funds will be available for other equally important uses in the public interest (health, education, culture etc.) in a context of limited public resources.

■ **Facilitate access to other types of financing.** Because the risks are borne by professionals, the use of a PPP can reassure lending institutions, in particular the international funding agencies, thereby making it easier to obtain loans.

Dans tous les cas, comme il a été dit plus haut, un recours aux PPP pour des motivations strictement financières est à envisager avec beaucoup de circonspection, les collectivités publiques étant aujourd’hui *a priori* mieux placées que les acteurs privés pour négocier des emprunts à des taux intéressants (voir l’exemple du SYTRAL à Lyon, France).

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Line 9 of the underground in Seoul (South Korea): PPP financing

Until 2009, the underground system of Seoul comprised eight lines, operated by two public companies. These operators had chronic operating deficits. Given this situation, the city decided to have a private partner develop and operate line no. 9, so as to motivate the public companies to improve their performance levels.

The 30-year contract was concluded between the private concession holder Seoul Metro Line (SML9), to whom the city assigned the tasks of financing, designing, building and operating the line, and Southlink 9 Company Limited, an operating company 80% owned by Veolia Transport RATP Asia (VTRA) and 20% owned by the Korean corporation Hyundai-Rotem. Under this contract, the municipality guarantees a minimum level of revenues for 15 years, and provides for a termination payment. This contract also set a separate fare for this line, but the operator decided to keep the price the same as on the other lines.

The key innovation provided by the operator on this line is that it runs trains that stop at each station and express trains that only stop at the main stations, all on the same track. The operator got involved with the project very early on, thereby optimising the construction phase (three years) and providing innovations in terms of operation and maintenance. This 25.5-km line, which commenced service in July 2009, serves the southern half of the capital and will be extended by 12.5 km in 2014.

Metro line 4 of São Paulo (Brazil): an example for the future?

The public transport system of the São Paulo metropolitan region (20 million inhabitants) currently has 5 metro lines and many buses and suburban train lines. Construction of the new line (line 4, or the yellow line) will fully inter-connect the metro-rail networks, which cover the large 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, chose a type of PPP which is new to Brazil and Latin America: the owner is Metrô, the public company operating the first four lines, and the operator is a consortium of private companies.

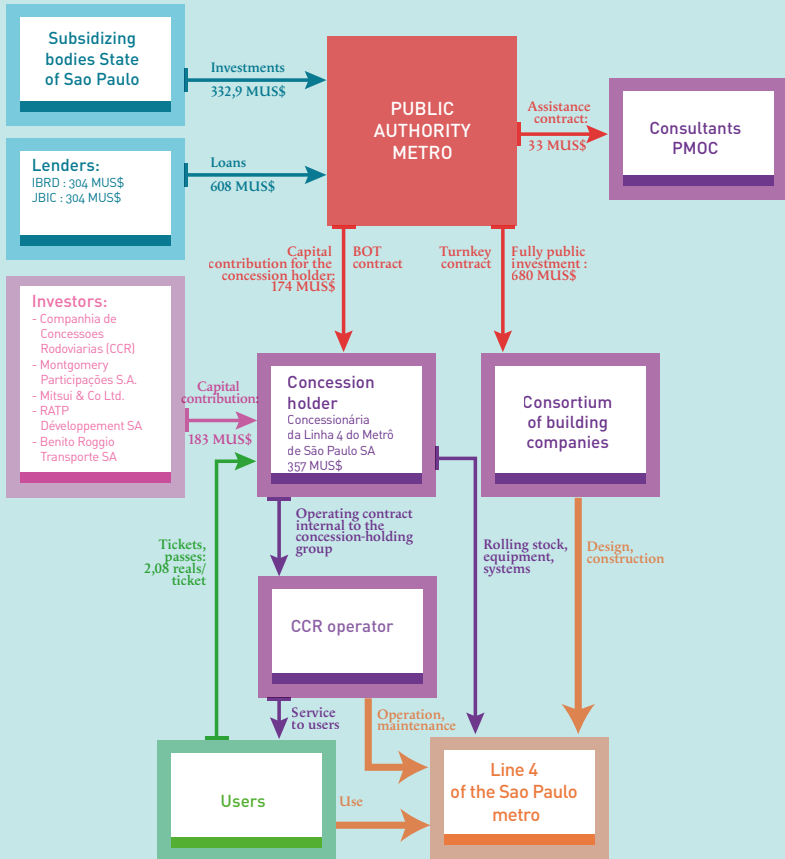


Figure 24 : Structure and financial flow of São Paulo's metro line 4

■ Structure of the PPP

In this set-up, the State of São Paulo entirely finances the infrastructure with 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 4 do Metrô de São Paulo SA” 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 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 a 32-year period, with a possible extension to 35 years, in order 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 concession holder supplies 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: Vila Sônia / Taboão da Serra connection, to be specified at a later time.

■ 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 begins, 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 revenue from sources such as advertising and retail space, etc.

■ Sharing risks

Delays in construction are entirely covered by Metrô, as the contract with the infrastructure builders is its responsibility.

■ Demand forecasts

700,000 passengers a day, eight years after opening. One year later, although not all of the stations are open yet, this target has already been reached. The provision of the contract concerning compensation thus favours the concession grantor, as it receives 60% of the difference between the estimated figure and the actual figure,

as soon as passenger numbers exceed the estimated number by 15%. The provision would have had the opposite effect if the actual passenger numbers had been lower than expected. Regardless of the circumstances, six years after commercial operation of phase 2 began, the concession holder would have solely borne the risk associated with passenger numbers on line 4, with no possibility of claiming financial compensation from the concession granting authority.

■ Exchange risk

This is a significant risk, since a large share of the loans are in foreign currencies. Calculating revenue from ticket sales takes this risk into account and is therefore covered by the transport authority.

The advantage of the PPP for line 4 is that each partner plays a role in its area of expertise. The transport authority is responsible for covering the construction works because this is the most difficult part to finance, requiring both public funds and loans from international funding agencies, obtained thanks to public guarantees. The concession holder finances everything related to operations, including the rolling stock and the systems for which it can obtain credit terms for the purchase and is then fully responsible for its proper functioning. Métro's stake in the company holding the concession is a guarantee of competency and coherence for the entire transit system.

7.6 The key stages of PPP implementation

Whether a PPP is implemented to delegate the operation of a transport service or to finance the construction of infrastructure, the public contracting authority must carefully prepare the following three stages, in order to ensure that the private partner fully meets the needs of the community:

■ Drafting the call for bids

Drafting the terms of the call for bids which will be used to choose the private partner is both a crucial and difficult process. If the call for bids is very restrictive, it gives the winning bidder the explicit technical and financial criteria, but it may exclude potential partners from offering their know-how and experience.

Or, if the call for bids allows for technical and commercial variants, the selection process may prove more difficult and seem less transparent, but it enables the potential partners to put forward proposals.

■ Negotiations¹¹

In any case, negotiations between the two partners should make it possible to find a balance which ensures the workability of the partnership and clearly sets out the provisions of the contract. It is important to be very demanding in terms of the technical expertise of the partner, in order to fully benefit from their experience.

¹¹. For certain contracts, depending on the legal context, the negotiation phase is not always possible.

Furthermore, if the contract is properly defined, it is in the interest of the private partner to provide the best possible technical and commercial management. The negotiation phase is important, requiring close attention and sufficient time. Anything unresolved at this stage will prove costly in one way or another in terms of the outcome of the partnership. A review phase at the mid-way point of the contract is advisable because over time, the context and conditions may have changed.

■ **Contract monitoring**

The private partner generally has qualified staff for the financial, commercial and technical aspects. This is not necessarily the case for the public authority, which, if it hopes to play its role and maintain control, must also have high-level staff in the same areas, either on a permanent basis or as consultants. Contract monitoring is all the more important because, if done well, it will dramatically facilitate the drafting of subsequent calls for bids.

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Building a multimodal terminal in Dhaka (Bangladesh): a promising PPP arrangement

As part of the project to create the first bus rapid transit (BRT) lines, the Bangladesh Communications Ministry is considering funding a multimodal facility located close to Dhaka International Airport, through a public-private partnership (PPP). The method currently under consideration calls for the construction, over existing railway tracks and roads, of a multilevel facility that will house the stations of two future BRT lines, the terminal station of the light rail train that links up the terminals of the airport; a shopping mall, a hotel and car and coach parking.

Bangladesh Railway, which owns the land, would supervise the implementation of the PPP, with Dhaka Bus Rapid Transit Company Ltd. being in charge of the commercial, financial and legal studies and negotiations with the private sector. Private investors would provide the capital needed and would be reimbursed later through the payment of rent by the users of the equipment. A lease financing mechanism would enable Bangladesh Railway to become the owner of the equipment, at the end of the initial management contract.

Bangladesh is still relatively inexperienced in financing public transport infrastructure with the participation of the private sector. Special attention will be paid to this pilot operation, which is essential for the development of mass public transit in Dhaka, one of the most densely populated urban areas in Asia.

Summary



The growing use of PPP around the world in the area of urban transport proves that this mechanism meets the needs of both partners: the transport authority and the private sector. The wide range of types of contracts also shows that the mechanism is flexible and can be adapted to local regulations and institutional cultures, as well as the financial capabilities of the partners. But regardless of the type of contract, some basic rules must be established to govern the PPP:

- a solid public contract allowing appropriate agreements with the private sector;
- a contract which is balanced for both partners with a clear distribution of roles and risks;
- a financially balanced project with, if necessary, financial compensation to be paid by the public partner;
- clauses providing for the revising of contract terms in the event of a major change in the context;
- legal guarantees;
- a well-designed project and proper integration in the urban transit system as a whole;
- an accurate assessment of users' ability to pay;
- technical and financial monitoring by the transport authority, which must avail itself of the necessary technical expertise.

Funding from Climate-related Mechanisms

Launched in 1992 following the Earth Summit in Rio de Janeiro, the United Nations Framework Convention on Climate Change (UNFCCC) designated the Global Environment Facility (GEF) as a financial mechanism of the Convention. In 1997, the Kyoto Protocol – which completes and reinforces the UNFCCC – defined a “Clean Development Mechanism (CDM)” which aims to reduce greenhouse gas emissions and offers a financial mechanism based on carbon credit trading.

Ten years later, the Bali Action Plan outlined the concept of “Nationally Appropriate Mitigation Actions”, or NAMA, and several “climate” facilities were set up by bilateral and multilateral development banks and agencies: the Clean Technology Fund, the Clean Energy Financing Partnership Facility (CEFPF), etc. In the coming years, the Green Climate Fund currently being developed should help channel a large share of international funding for climate measures, expected to reach an annual volume of €100 billion by 2020. This continual development of “climate” financial architecture has cleared the way for the urban transport sector to play an increasingly larger role as it contributes to achieving global targets for reducing greenhouse gas effects.

In June 2012, the “Rio+20” United Nations Conference on Sustainable Development marked a milestone in the recognition of urban transport as a major tool in the fight against climate change. At that summit, eight of the major multilateral development banks promised to commit a total of \$175 billion over the following ten years, to fund sustainable transport projects.

8.1 The major “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.

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 it was created, the GEF has supported 50 urban transport projects, for a total aggregate amount of \$292.5 million. Although initially, the GEF primarily supported projects that focused on technological solutions, the scope has broadened since 2007, leaving room for non-technological solutions, modal shift, 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-size cities experiencing rapid growth.

A very wide variety of projects are fundable by the GEF. Candidates can apply for a subsidy of up to \$25,000, to prepare a project. The candidate may be a public administration, a transport operator, a bilateral partnership between development agencies or an NGO. Right from the start, it is important to contact the national office of the GEF, which approves the initial project. In most countries, the office is set up within the Ministry of the Environment or the national environmental agency.

■ **The French Global Environment Facility (FGEF)** is a bilateral counterpart of the GEF. The FGEF was established in 1994 to partially subsidise global environmental protection projects in developing countries, in connection with the multilateral environmental agreements signed by France. Sustainable urban areas are one of the five priority sectors of activity of the FGEF. Regarding urban transport systems, the FGEF has supported projects to build underground systems in Cairo and Hanoi.

■ **The Clean Technology Fund (CTF)** was created in 2008, and forms with the Strategic Climate Fund (SCF) what are called the Climate Investment Funds (CIFs). The role of the CTF is to help middle-income countries fight climate change, by funding major projects. Fifteen countries are eligible to receive CTF funding: South Africa, Chile, Colombia, Egypt, India, Indonesia, Kazakhstan, Mexico, Morocco, Nigeria, Philippines, Thailand, Turkey, Ukraine and Vietnam. The funding is planned by the countries in agreement with the multilateral development banks which must co-finance the projects. They are presented to the CTF in a regularly updated plan. There are also regional plans for North Africa and the Middle East.

The CTF provides (heavily) subsidised loans, or via subsidies for project preparation, and its funds transit through the five multilateral development banks. The energy efficiency of vehicles, modal shift and mass transit are major areas of focus for the CTF in the urban transport sector. Over 14% of the CTF's funds are currently allocated to urban transport, for a total budget of \$728 million.

■ **The Green Climate Fund (GCF)** was established by the Cancun Climate Conference in 2010. It is a funding mechanism of the United Nations, attached to the UN framework convention on climate change (UNFCCC). This fund, officially launched at the Durban conference in 2011, and which is still in the process of development, could eventually become the main international fund devoted to fighting climate change.

It must of course meet the needs of the developing countries which are seeking a funding instrument to implement policies for mitigating and adapting to climate change. To meet the high demand for funding, developed countries have agreed to mobilise \$100 billion by 2020.

■ **Other “climate” funding agencies** exist, which finance urban transport to a lesser degree: the Clean Energy Financing Partnership Facility (Asian Development Bank), Fast Start Finance (Japan), International Climate Initiative (Germany), etc.

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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 between the different actors of the sector, as well as the multimodal integration of the transport system

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8.2 The Clean Development Mechanism (CDM)

The Clean Development Mechanism is a flexibility mechanism defined in the UN Kyoto Protocol (article 12), based on projects to reduce greenhouse gas emissions (GHG). It allows projects for reducing GHG in developing countries (known as non-Annex 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 Annex I countries) that have signed reduction commitments in the framework of the Kyoto Protocol.

The CDM is above all a mechanism aiming to reduce greenhouse gas emissions, but it can also constitute a source of financing via the Certified Emissions Reductions (CER) made possible by the protocol. However, it should be considered as a marginal complementary contribution, i.e. for pilot projects, which provides funding at least one year after start-up. Carbon credits are in fact generated only after an independent auditor commissioned by the United Nations conducts an ex-post verification of the effective emissions reduction.

■ Principles of the mechanism as defined by the Kyoto Protocol

■ **The project must be consistent with the sustainable-development objectives of the host country** and be part of a partnership between a developed country (Annex 1 country) and a developing country (non-Annex 1 country) which has signed the Kyoto Protocol. The host country must establish a Designated National Authority (DNA), in charge of approving projects and verifying their compliance with the country's objectives for sustainable development.

■ **The CDM project must be “additional”**. This condition of additionality has both environmental and financial aspects. Sometimes a technological component is also included, whereby the CDM has to facilitate the transfer of a clean technology to the host countries:

- **Environmental additionality:** The project must result in measurable and long-term reductions in emissions which would not have been achieved without the project. These reductions must be achieved exclusively through implementation of the relevant project. For this purpose, a comparison is made between the GHG emissions under the business-as-usual scenario and the emissions generated when the project is set up. The emissions generated with the project must be lower than the baseline emissions generated without the project. The main challenge lies in determining the business-as-usual emissions, especially for an urban transport project;
- **Financial additionality:** Implementation of the project must generate investments greater than those that would have been made in the business-as-usual scenario. The investor must therefore demonstrate that it would be impossible to carry out the project without the “carbon added value” brought by the CDM;
- **Technological additionality:** The granting of Certified Emission Reduction Units (CERUs) must enable funding for the deployment of a technology which, in the absence of the CDM, could not otherwise have been implemented in the host country.

■ Who participates in CDM projects?

More than 7,000 projects are currently registered, for a total amount invested of \$215.4 billion in 2012. 15 sectors of activity are eligible for CDM, including transportation, although this sector is a very small minority. All registration categories included, 70% of CDM projects concern renewable energies and 16% concern solid waste management, primarily consisting of projects for methane recovery.

By the end of 2011, registered CDM projects had generated more than 750 million CERUs. The estimated income from sale of these CERUs was between \$9.5 million and \$13.5 million.

Some 70 host countries are currently participating in CDM projects. The main recipient countries are India, China, Brazil, Mexico and Chile. The majority of countries financing CDM projects are located in Europe, with the United Kingdom as the leading financier in Europe and the world.

The urban transport sector is the neglected relative of the Clean Development Mechanism. Urban transport projects involve many players, require complex institutional arrangements, necessitate large investments and are designed for the long term, unlike industrial projects, which produce more short-term effects. There are only 37 registered projects and projects pending validation, or 0.4% of total CDM projects, all registration categories included.

■ How much money can be made from a “transport CDM” project?

According to project developers, proceeds from the sale of the CERUs generated by transport CDM projects rarely exceed 10% of the capital invested. The fall in the value of carbon credits on the international market sharply reduces these prospects. There are serious uncertainties regarding the financial benefits that a CDM project developer can expect to reap from reselling credits, both in terms of the volume of CERUs actually generated by the project in relation to the number specified in the PDD, and in terms of the value of the ton of carbon on the international market. A recent World Bank study on potential CERU prices put forward the following values:

- high scenario: \$15 /ton CO₂e
- middle scenario: \$11 /ton CO₂e
- low scenario: \$5 /ton CO₂e

Table 2: List of principal registered transport CDM projects (representing more than 100,000 metric tons CO₂ equivalent per year).

Project	Host country	Partner countries	Methodology	Estimated annual reduction (in MtCO ₂ e)
BRT in the city of Guatemala	Guatemala		AM0031 ver. 3	536 148
Delhi Metro	India	Switzerland	ACM0016	529 043
Line 1 of MRTS project in Guiyang	China		ACM0016 ver. 3	335 188
BRT Bogota: TransMilenio Phase II to IV	Colombia	Switzerland and Netherlands	AM0031	246 563
MIO Cali	Colombia	Netherlands	AM0031 ver. 3	242 187
BRT lines 1 to 4, Chongqing	China	Switzerland and Germany	AM0031 ver. 3	218 067
BRT Zhengzhou	China	Switzerland and Portugal	AM0031 ver. 3	204 715
Mumbai Metro 1	India	Switzerland	ACM0016 ver. 2	195 547
BRT Lignes 1-5 EDOMEX	Mexico	Switzerland and Portugal	ACM0016	145 863
Mexico City Metro Line 12	Mexico	Switzerland	ACM0016 ver. 2	136 983
BRT Metrobus 2-13	Mexico	Switzerland	ACM0016 ver. 3	134 601
BRT Metroplus Medellin	Colombia	Switzerland	AM0031 ver. 3	123 479
Modal shift of private car passengers to the MRT for the metro of Gurgaon	India	Switzerland	ACM0016 ver. 2	105 863

■ The project registration procedure

To date, 16 methodologies have been approved for measuring GHG reductions in the urban transport sector (5 methodologies for large-scale projects and 11 simplified methodologies for small projects). These methodologies available to project proponents are presented in the following table:

Project scale	Approved methodology	Transport
Large scale	ACM0016	Mass rapid transit projects
	AM0031	Bus rapid transit projects
	AM0090	Modal shift in transportation of cargo from road transportation to water or rail transportation
	AM0101	High-speed passenger rail systems
	AM0110	Modal shift in transportation of liquid fuels
Small scale	AMS-III.C.	Emission reductions by electric or hybrid vehicles
	AMS-III.S.	Introduction of low-emission vehicles/technologies to commercial vehicle fleets
	AMS-III.T.	Plant oil production and use for transport applications
	AMS-III.U.	Cable cars for mass rapid transit systems
	AMS-III.AA.	Transportation energy efficiency activities using retrofit technologies
	AMS-III.AK.	Biodiesel production and use for transport applications
	AMS-III.AP.	Transport energy efficiency activities using post-fit idling stop device
	AMS-III.AQ.	Introduction of Bio-CNG in transportation applications
	AMS-III.AT.	Transportation energy efficiency activities installing digital tachograph systems to commercial freight transport fleets
	AMS-III.AY.	Introduction of LNG buses to existing and new bus routes
	AMS-III.BC.	Emission reductions through improved efficiency of vehicle fleets

8.3 Nationally Appropriate Mitigation Actions (NAMA)

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 fit in with the logic of low-carbon development strategies and comply with the principle of common but differentiated responsibility of the United Nations Framework Convention on Climate Change (UNFCCC).

■ What is a NAMA?

NAMAs are voluntary measures taken by developing countries, registered with the UNFCCC, in order to reduce their GHG emissions. They are not limited to investment activities. They might concern an investment project or programme, or a sectoral or national policy leading to short- or long-term emission reductions. NAMAs must, however:

- Fit into a national sustainable development policy, contribute to reducing CO₂ emissions and present co-benefits to other sectors.
- Make reference to a baseline “business-as-usual” scenario, in order to show the expected emission reductions by using an MRV methodology (Measurement, Reporting and Verification) to quantify the impacts of the measures taken.

Three types of NAMAs have been defined:

- Unilateral NAMAs, entirely funded by the host country
- Supported NAMAs, funded at least partially by developed countries and/or international financing
- Credited NAMAs, i.e. where corresponding carbon credits are issued for all or part of the emission reductions. There is currently no MRV methodology for this type of NAMA.

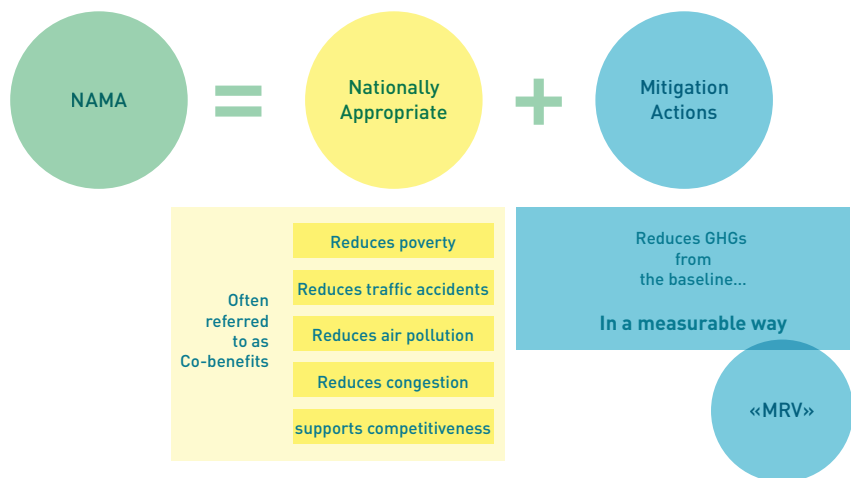


Figure 25 : Illustration of the NAMA concept for the transport sector ¹⁸,

18. Sakamoto, K. (2012)

The Bogota Transmilenio (Colombia): the first urban transport CDM project

The Bus Rapid Transit of Bogota, called the Transmilenio, was the first urban transport project to be registered by the Clean Development Mechanism, introducing the validation of the first methodology applied to urban transport. Transmilenio S.A. and Corporación Andina de Fomento (CAF), the Andean multilateral development bank, initiated the CDM process for the project.

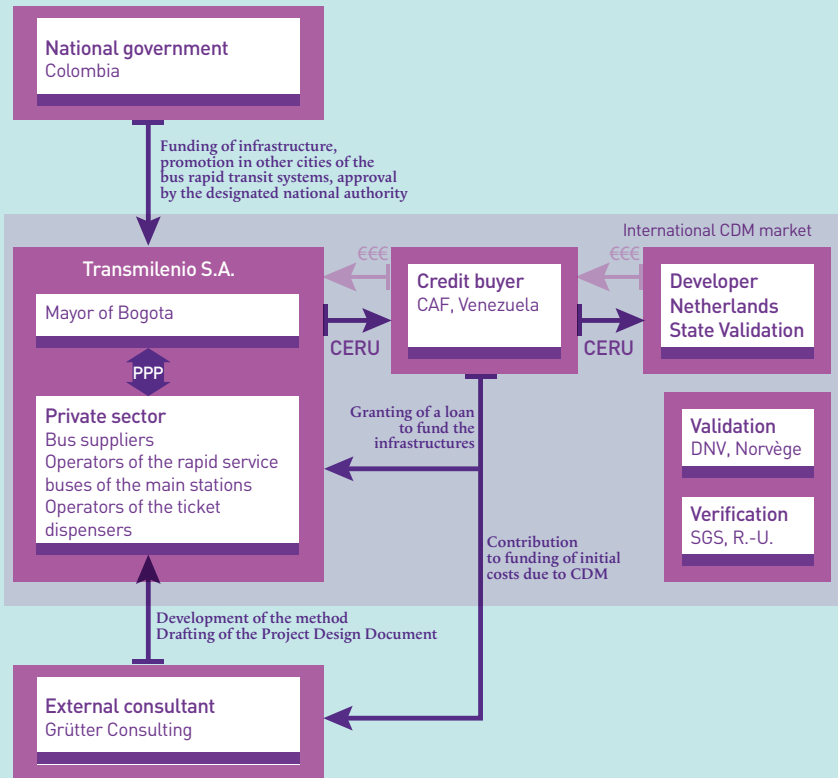


Figure 26 : Diagram illustrating the workings of the Transmilenio CDM project

According to the project design document, the objective of the Transmilenio was to set up a “modern public transport system that is efficient, safe, rapid, convenient, comfortable and effective, in order to accommodate the largest possible number of users”. Opened in 2000, the 42-km system (phase I) was doubled during phase II in 2006. Phases III and IV were to enlarge the system by 130 km. This infrastructure

development was combined with the commissioning of 1,200 new articulated buses with a capacity of 160 passengers and 500 new buses with a capacity of 70 to 90 passengers, enabling 1.8 million trips per day. The purpose of the CDM project corresponds to phases II to IV.

The cost of the project's infrastructure amounts to €1.75 billion over the period from 2000 to 2016, while the cost of the rolling stock is estimated at nearly €0.9 billion.

According to the projections contained in the project design document, the GHG emissions were to be reduced by 246,500 metric tons CO₂ equivalent/year from 2006 to 2012, thanks to the use of the new articulated buses, which consume less fuel per passenger, and thanks to the modal shift towards mass transit.

The preliminary monitoring results show that the emission reductions are below the estimated levels (the estimated BRT passenger numbers were higher than 200 million per year, whereas the actual number is closer to 114 million). However, the project proponents believe that, once all of the phases have been completed, the results will be in line with expectations. The project is currently in the process of renewing its crediting period. From 2013 to 2019, GHG emissions should be reduced by approximately 579,000 MtCO₂e/year. According to the latest estimates, total revenues from the sale of CERUs for this period should range from \$20 million to \$60 million.

■ The crucial role of evaluation

The effectiveness of NAMAs in the transport sector depends upon the availability of reliable data enabling the measurement and monitoring of the emission reductions generated. In order to ensure the simplicity of the MRV framework for credited NAMAs in the transport sector, several points, drawn from the experience of CDM projects, should be considered:

- The measurement and monitoring methods must be simplified,
- Increased evaluation capacities are essential;
- Data collection and management are crucial

A NAMA in Mexico: the Federal Mass Transit Programme

The transport sector is responsible for roughly 18% of total GHG emissions in Mexico, 90% of which come from road transport. The transport sector is experiencing the strongest increase in GHG emissions, due to the increasing number of motor vehicles: this figure tripled between 1996 and 2006.

The objective of the Federal Mass Transit Programme NAMA, launched in 2010 by the Mexican Secretariat for the Environment and Natural Resources (SEMARNAT), is two fold:


- In the short term, it will provide supplementary assistance to the Federal Mass Transit Programme by supporting an increase in the capacities and improvement of internal procedures;
- In the long term, it will fund the continued activities of the Programme beyond 2016, for about \$380 million:
 - Increasing capacities: at local level, to identify projects and develop an integrated sustainable development plan; and at national level, to facilitate the implementation of projects (\$20 million);
 - Developing evaluation methodologies: financial evaluation, cost-benefit analysis, health impacts and evaluation of the environmental impact (\$10 million);
 - Developing integrated transport systems: development of BRT systems, multimodal integration, development of low carbon-emission technologies and renewal of the fleet of vehicles (\$350 million).

■ NAMAs seek funding

By May 2013, approximately 57 countries had registered NAMAs, 25 of which mentioned the transport sector. Certain NAMAs may feature a transport component while covering a broader scope of action.

Given the current state of international negotiations on climate change, a number of questions remain regarding the NAMA concept, which lacks, among other things, a clear definition, methodological references for the evaluation of projects and appropriate funding mechanisms. NAMAs could be combined with the Green Climate Fund (GCF) mentioned above.

Summary



“Climate finance” could become a promising tool for co-funding urban transport projects in developing countries if they contribute to significantly reducing greenhouse gas effects. This funding applies more easily to high-capacity public transport, which reaches very low emission levels per passenger-kilometre, and has the advantage of reducing local pollution, when it is electric.

The Clean Development Mechanisms, which are part of an approach to projects led by private actors, have not met this expectation. However, NAMAs fit better into a public-policy approach to projects. They are considered to have a much greater potential for CO₂ emission reduction than CDM projects. At present, little international financing has been mobilised for NAMAs. However, many specialists consider that, within the context of climate negotiations and with the implementation of the Green Climate Fund in the coming years, they could benefit from multilateral or bilateral resources.

Conclusions **Keys to choosing the most appropriate funding framework**

Several cities have been analysed in this study. Each one operates under its own funding arrangements, which are a product of the people involved and of the city's cultural, social, political and institutional history.

However, in most cities, the funding arrangements combine the use of three major categories of contributors: the public authorities, the direct beneficiaries and the indirect beneficiaries of the urban transport system.

From one city to another, more or less public resources are mobilised depending on the type of financing (investment or operation) and to what extent the system's direct and indirect beneficiaries contribute to financing the system. Currently, the general trend is towards containing or even reducing public contributions and increasing the contributions of direct and indirect beneficiaries. However, sharp geographic disparities do remain.

Because the scope of powers exercised by transit authorities varies widely (modes, local areas, etc.), and financing mechanisms and transport systems are diverse, a comparison in the strict sense cannot be made between different cities. However, contrasts can be identified between different funding arrangements (see figure below): no public subsidies in Hong Kong, very heavy involvement of direct beneficiaries in London (84% of the budget) and an operation very heavily financed by indirect beneficiaries in Paris (mainly through the Transport Tax).

The balance to be struck between the different actors of the financing system is not a one-size-fits-all proposition. This balance develops gradually, guided by legislative and regulatory reforms governing the arrival of new actors or the implementation of new practices:

- For example, in Ile-de-France (Paris region), public funding increased 50% from 2000 to 2012. Its contribution to the operating budget rose from 17% to 20% during that period;
- In London during the same period, the transport authority turned increasingly to indirect beneficiaries, in particular for investment in the Crossrail project;
- In Brazil, widespread protests in 2013 led the public authorities to reduce the burden on transport users. They thus had to turn to public funds.

And so, each city must determine to what extent the various sources of funding can be used, which can be quickly mobilised because they are governed by regulations alone, and those which require a legal or political mechanism which may take longer to implement: passing laws, establishing a public transport authority, ensuring social acceptability, etc. The contribution of all the actors to financing the system (including through taxes) should, insofar as possible, be allocated to urban transport.

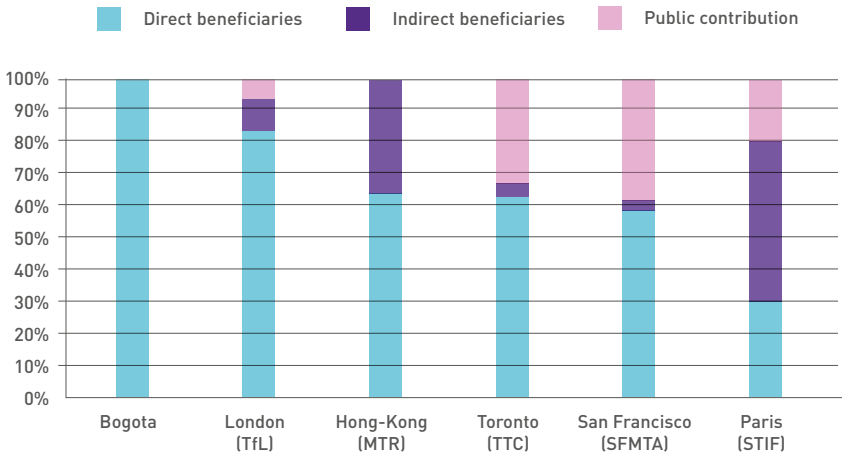


Figure 27: Contrasting operations funding arrangements

■ Each city must find its own mix of funding

This mix of funding must be adapted to each city’s specific context and institutional capacities while seeking to (1) cut costs, (2) optimise and (3) supplement ticket revenues.

◆ Cost reductions

When public funding possibilities are limited, the aim is to at least break even, meaning that direct operating expenses are covered by operating revenues. Measures to achieve this involve not only system management but must also take into account all levels and phases of the system:

- Proper design of the project which integrates all networks of the system with high-volume corridors and feeder lines, as well as a layout of the lines which optimises the distances between stations. Substantial savings can be made at this level;
- Transport modes adapted to forecasts for demand and future development;
- Separation of public transport from traffic congestion in order to ensure a good commercial speed. This means a need for fewer buses, met with

an equal supply, combined with higher energy efficiency. This involves dedicated or reserved lanes, as well as right-of-way at traffic lights, etc;

- Training drivers to use green driving practices;
- Modern operating systems: automated payment, integrated ticketing, real-time information;
- Group buying (by several local government agencies) of rolling stock, etc.

◆ Optimised revenues

Because ticket sales represent the primary source of revenue, it is important to make the system as attractive as possible:

- By redesigning fare policies in order to closely follow trends in commuting patterns (concentric, cell and mixed zone fare structures), optimise vehicle occupancy (modular fare policy) and encourage new customers to use public transport (solidarity fares);
- By fighting fare evasion: installation of control lines, awareness campaigns, etc;
- By attracting new customers and building their loyalty: functional and fare integration for public transport, regulated individual transport to encourage a modal shift, real-time information for users by means of the latest technologies, etc.

If the system management is delegated to a private operator, a contract must be established for a coherent duration, specifying the nature and volume of the delegated service, and clearly stipulating the respective roles of the transport authority and of the company, as well as the latter's commitments in terms of cost reduction and revenue optimisation. The reliability and long-term viability of funding for urban transport systems depends greatly on the quality of the operating contract and the negotiation phase.

If the system management is handled directly by a public corporation, an internal performance contract should be established in the same spirit as the private operator contract so that the objectives and responsibilities are assigned and understood by all.

◆ Additional revenues

Other sources of revenue can contribute significantly to the funding mix and, in total, allow for investments and help balance the operating budget:

- Congestion charging and parking tolls: €455.5 million in 2012 from tolls on seven bridges in the San Francisco Bay Area, €159 million in London from congestion charging in 2011-2012 and €61 million in Singapore in 2008;
- Employer aid to employees: approximately €230 per year per passenger for Vale Transporte in Brazil, half of the monthly pass in France;
- Land value capture: €850 million in Copenhagen, €500 million in Brasilia;
- Rent from retail and office space built in or alongside stations: €207 million in 2012 for the operator, MTR, in Hong Kong and 25% of operating revenue of JR East in Tokyo the same year;

- ▶ Advertising revenue in premises, stations and on vehicles: approximately a third of Hong Kong Tramway's revenues in 2012.

■ Each city must explore potential sources of funding

All potential sources of funding should be explored, without pre-conceived ideas, for their financial contribution and for their structuring and regulating role. This process must be part of a combined short- and long-term approach:

- ▶ Short-term: any solution which depends on regulations or is controlled by the transport authority: improved traffic plans for public transport, more revenue from parking, reduction in fare evasion, variable fares, more advertising revenue, etc;
- ▶ Long term: any solution which requires fundamental changes and social acceptance: congestion charging, integrated urban development projects, land value capture, transport tax based on payroll, etc.

Depending on the context, the implementation of certain sources of financing may require significant institutional reforms:

- ▶ establishment of public transit authorities;
- ▶ allocation of proceeds from certain taxes and revenues to financing urban transport;
- ▶ legislative or even constitutional changes.

Changing the system used to fund urban transport, by adding new sources and/or modifying existing ones, is a time-consuming process, requiring both an interdisciplinary approach (urban planning/transport) and a partnership-based approach (multi-actor and multi-level). This involves much reflection and a very specific study of the city's context in terms of its urban history, existing transport networks and their mode of management, local institutions and political possibilities. And the choices for the future of a city's public transport system must involve all decision-makers.

These issues are the same in cities all over the world, and so we need to seek opportunities to pool our knowledge by mobilising international research networks and by sharing skills and expertise through city-to-city cooperation agreements.

In the end, it is the political leaders who must find the best mix of funding for their territory so that the choices they make in favour of sustainable development for the urban transport system and the local area as a whole may one day become a reality.

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The growing needs of urban mobility makes the development of public transport networks crucial. The funding of these networks, whether operation or investment, is far from being assured only by the farebox and subsidies. Other sources of funding are required. Many cities and countries have tried to implement in their own way according to local and national contexts.

In a wide range of local and national contexts, many original mechanisms have been developed: land-value capture in areas served by transport networks, contribution of employers or users of private motorized modes. These experiments involve, as appropriate, different levels of public institutions, sometimes metropolitan transport authorities, but also private actors, including through public-private partnerships. Their goal remains common: the efficient and sustainable development of urban transport and its adaptation to the growing cities.

This Handbook of Good Practices in Funding Urban Transport is the product of a joint initiative between the French Ministry of Ecology, Energy, Sustainable Development and the Sea (MEEDDM) and the French Development Agency (AFD). It emphasizes, without being exhaustive, meaningful experiences mobilizing main funding opportunities in the sector. It was written by the association CODATU and draws from subjectbased analyses and case studies, with input by the Center for studies and expertise on risks, environment, mobility and planning (CEREMA).

It is by no means exhaustive but aims to highlight key examples of funding solutions which can be mobilised in the public transport sector. The idea is to present a frame of reference for decision-makers, in both the North and South, who would be brought to think about the organisation and financial structure of the urban transportation system which offer the best fit with their city's requirements and particularities.