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Integrated Approaches to Financing Sustainable Urban Mobility

Insights from Low- and Middle-Income Countries

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Integrated Approaches to Financing Sustainable Urban Mobility: Insights from Low- and Middle-Income Countries

United Nations Human Settlements Programmeme (UN-Habitat)

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Cover Image: Lined Up Bikes Parked on Sidewalk.Yang Junjun, 2021.

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Introduction

Urban areas worldwide face mounting challenges in achieving sustainable mobility amidst rapid urbanization, climate change and growing socio-economic disparities. Cities in developing countries, in particular, have an exacerbated set of challenges, with low creditworthiness, inadequate resources and high levels of poverty. The limited ability to address mobility issues not only aggravates congestion, pollution and road safety concerns, but also perpetuates inequality, limiting access to jobs, education and essential services for vulnerable populations. As cities grow, the need for inclusive, efficient and environmentally sustainable transport systems only becomes more paramount.

This report, developed by UN-Habitat, serves as a practical guide and reference for policymakers, urban planners, local governments and development practitioners, particularly in low- and middle-income countries (LMICs). Its primary purpose is to equip stakeholders with knowledge and normative approaches to support actionable strategies, innovative tools and financial mechanisms to address the unique challenges of financing and implementing sustainable urban mobility systems. By focusing on the specific needs and constraints of LMICs, the report aims to empower cities to create transport systems that are inclusive, resilient and climate-friendly.

The report is developed in alignment with the Resolution on Urban Planning and Sustainable Infrastructure (HSP/HA.2/Res.8), adopted at the second session of the United Nations Habitat Assembly, which emphasizes the urgent need for integrated approaches to urban planning and sustainable infrastructure. The resolution calls for leveraging innovative tools, knowledge-sharing platforms and capacity-building initiatives to address the global challenges of urbanization, ensuring that cities are inclusive, safe, resilient and sustainable. This document directly contributes to those goals by providing actionable strategies and financial mechanisms tailored to the realities of developing countries.

The topic of sustainable urban mobility is approached through the lens of UN-Habitat's five principles of sustainable neighbourhood planning.[1] Using these principles as guideposts, the report merges the reality of developing contexts –rapid growth, urban sprawl, informal economies and limited funding, to name a few characteristics– with the goal of creating actionable and realistic solutions to produce compact, integrated and connected cities.

Sustainable urban mobility is more than just moving people and goods. It is a catalyst for inclusive development. It enhances accessibility, fosters economic growth, reduces emissions and improves public health. However, achieving these outcomes requires cities to adopt a holistic approach, aligning mobility systems with environmental, social and economic goals. Traditional approaches to mobility planning, which often focused narrowly on traffic flow and infrastructure development, have frequently proven environmentally unsustainable. Sustainable mobility, on the other hand, goes beyond providing infrastructure and prioritises accessibility, ensuring that community members have easy access to places of work, schools and basic services. By focusing on principles such as safety, affordability, accessibility, efficiency, resilience and environmental sustainability, sustainable mobility directly contributes to the achievement of Sustainable Development Goal 11 and the broader 2030 Agenda.

Yet, despite its widespread positive impact, sustainable mobility remains underfunded, particularly in LMICs. A significant investment gap, coupled with fragmented governance, weak subnational finance and urban planning systems, hinders the ability of cities to deliver transformative mobility solutions.

1 These principles are: adequate space for streets and an efficient street network, high density, mixed land-use, social mix and limited land-use specialization (UN-Habitat, 2015).

This report will elaborate upon the numerous overlapping financial challenges that inhibit investment in sustainable mobility systems, including an overreliance on intergovernmental transfers, the limited creditworthiness of cities and underutilization of local revenue systems. Weak urban planning and inadequate investment planning further exacerbate these challenges by leading to inefficient resource allocation, poorly sequenced projects and higher infrastructure costs, limiting the long-term impact of mobility investments.

The lack of integrated financial and urban planning frameworks not only results in transport projects that are misaligned with land use priorities, contributing to congestion and underutilized infrastructure, but also prevents cities from effectively leveraging financial instruments such as land value capture (LVC) and public-private partnerships, which require stronger coordination between fiscal and urban planning. This report emphasizes the potential of an integrated approach to planning and financing to overcome the challenges of developing sustainable mobility systems. By aligning urban mobility strategies with broader land use frameworks and fiscal policies, such as through capital investment planning, cities can maximise revenue generation, optimise resource allocation and attract external funding.

This report advocates an incremental approach to financing sustainable mobility, beginning with the optimisation of Own-Source Revenue (OSR), strengthening institutional capacity and coordination, while embedding sustainable mobility within broader urban and financial planning frameworks. As cities improve their financial foundations, they must also enhance expenditure management and investment prioritisation to ensure that resources are allocated efficiently, and operating costs are accounted for. Over time, this enables the adoption of more advanced mechanisms, such as land value capture systems and private financing, paving the way for transformative mobility investments. Through this incremental approach to finance and by utilizing the appropriate sources of funding, developing cities can equip themselves with the means to implement integrated sustainable mobility strategies, thereby improving economic, social and environmental outcomes.

To complement this incremental approach, Annex II provides a compilation of key toolkits and resources that can assist policymakers and urban planners in designing and implementing sustainable urban mobility strategies. These toolkits offer practical guidance on financial mechanisms, transport planning methodologies and infrastructure development, supporting cities in achieving more integrated and effective mobility solutions.

Furthermore, the report highlights three core revenue categories that can be leveraged to finance sustainable urban mobility, elaborated upon in Annex I:

- **Own-Source Revenue**: Including land-based mechanisms like property taxes, betterment charges and tax increment financing, as well as non-land sources such as user charges, fuel taxes, and vehicle fees. These mechanisms provide cities with a stable and predictable financial foundation.

- **External Revenue and Financing**: This category covers funding instruments, such as intergovernmental transfers and official development assistance, and private debt instruments, such as municipal bonds and public-private partnerships (PPP), which supplement local resources and enable large-scale infrastructure investments. These require robust governance and financial systems to be effectively utilized.

- **Community and Grassroots Initiatives**: Participatory approaches like crowdfunding and microfinance empower local stakeholders, fostering ownership and accountability in sustainable mobility projects.

2

Sustainable Urban Mobility: A Cornerstone for Inclusive and Sustainable Development

2.1. The Importance of Sustainable Mobility for Sustainable Urban Development

Cities around the world are grappling with congestion, rising pollution levels and road safety issues, making the demand for efficient, inclusive and sustainable transport solutions more critical than ever. More than a billion people lack access to an all-season road, and only roughly 50% of urban inhabitants worldwide have easy access to public transportation (United Nations Department of Economic and Social Affairs [UNDESA], 2021). Moreover, in 2021, there were about 1.19 million global road traffic deaths, corresponding to a rate of 15 road traffic deaths per 100,000 people (World Health Organization [WHO], 2023). In many countries, public transport remains unsustainable, unsafe, inefficient, inaccessible or unaffordable – characteristics that disproportionately impact those living in poverty (United Nations, 2021).

At the heart of solving these challenges lies sustainable mobility, a concept that goes beyond merely moving people and goods. It plays a vital role in shaping city life, influencing the growth of communities, developing economies and minimising impact on the environment.

Sustainable mobility seeks to meet current mobility demands while ensuring future generations are not disadvantaged (United Nations Human Settlements Programme [UN-Habitat], 2021a). It applies a more holistic perspective to transportation planning, combining the way people move around a city with how communities and economies develop, taking into consideration the environmental conditions (UN Secretary-General's High Level Advisory Group on Sustainable Transport, 2016). A well-designed urban mobility system should be rooted in principles of sustainable urban development and target achieving the 2030 Agenda for Sustainable Development and the Paris Climate Change Agreement (UN-Habitat, 2021b; UNDESA, 2021).

This chapter provides an overview of sustainable mobility, highlighting the guiding principles and key approaches that cities can implement to make provisions for sustainable mobility infrastructure as well as the associated benefits of sustainable mobility to cities. This then contributes to the case for investing in sustainable mobility.

2.1.1. Guiding Principles: How Sustainable Mobility Drives Urban Development

The sustainable mobility principles have been developed using the Avoid-Shift-Improve (ASI) approach, which focuses on reducing the need to travel (Avoid), changing to more environmentally friendly modes of travel (Shift), and upgrading the transport mode technology (Improve) (Deutsche Gesellschaft für Internationale Zusammenarbeit [GIZ], 2019). The United Nations Secretary-General's High-Level Advisory Group on Sustainable Transport (2023) has advocated for the ASI as a useful framework for assessing transport measures and for taking action in support of sustainable urban mobility implementation. This approach integrates behavioural, infrastructural and technological interventions that will help policymakers and practitioners develop more sustainable mobility systems.

The six key principles outlined by the UN Secretary-General's High-Level Advisory Group on Sustainable Transport (2023), provide a framework to assess mobility practices and determine how to improve sustainability. Guided by these principles and the ASI approach, several key interventions highlighted in the next section were identified to apply sustainable mobility. Together, they pave the way for healthier and more vibrant urban environments that promote sustainability and urban growth.

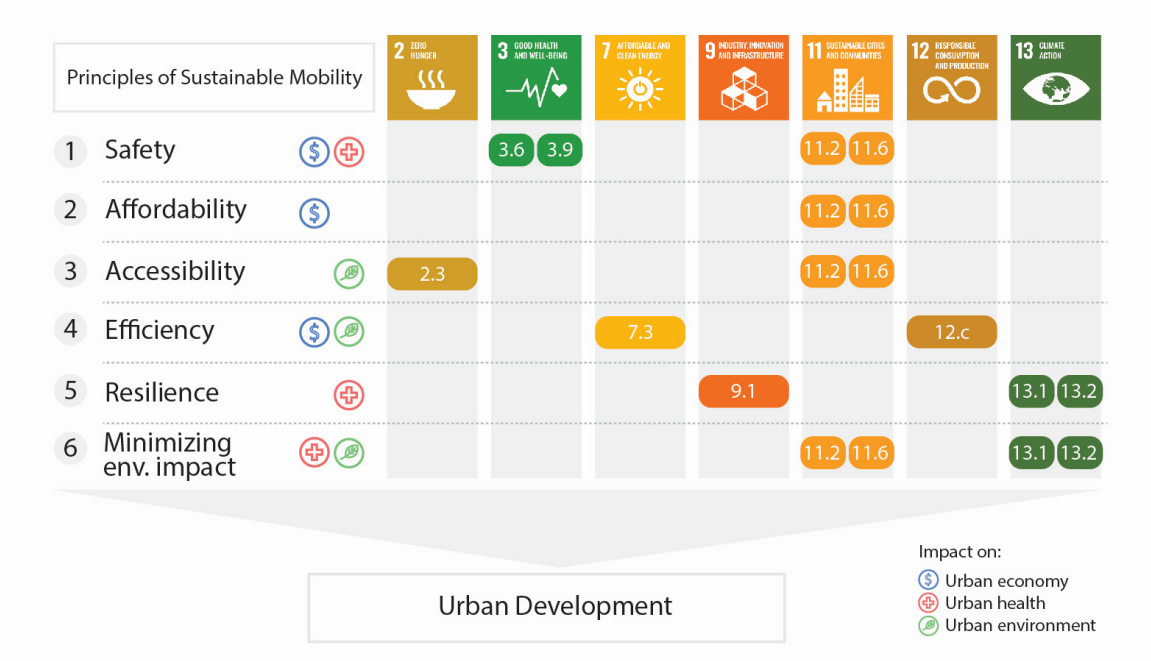

Figure 1. Principles of Sustainable Mobility.

Road safety is a key priority of sustainable mobility and a critical public health issue, particularly in LMICs, where 9 in 10 traffic fatalities occur (WHO, 2023). According to the World Health Organisation's 2023 Global Status Report on Road Safety, road traffic injuries are a leading cause of death and disability globally, imposing enormous economic costs on society (estimated to be between 1 and 3 percent of Gross Domestic Product). Implementing appropriate road safety measures, such as creating bike lanes, crosswalks, and traffic calming measures, can promote safer travel for all, reducing the economic burden.

Affordability of and **access** to transportation are interrelated principles that directly affect residents' ability to access basic services, job opportunities, education and social activities. Convenient access in the metadata indicator 11.2.1 by UN-Habitat is defined as being within a walking distance of 500 m to low-capacity public transport systems (e.g. Bus Rapid Transit) and/or within 1 km to a high-capacity system (e.g. rail, metro, ferry). According to 2020 data, only 60.6% of urban residents worldwide had convenient access to public transport (UNDESA, 2024). Affordable and accessible public transport infrastructure services are still inadequate in most countries in the world, especially for the economically disadvantaged individuals who spend over 20% of their income on transportation costs (UNDESA, 2021). The unaffordability of housing in transit-dense neighbourhoods limits low-income residents' access to transport, commonly requiring them to live on the outskirts of cities and spend more time and money to commute to work (OECD, 2020). This highlights the urgent need for more accessible and affordable public transport (UNDESA, 2021). Conveniently located transit hubs that are accessible to all, including vulnerable populations, reduce marginalisation and inequality, improve health and well-being, and create opportunities for personal and economic growth. This fosters social stability and, in turn, leads to higher living standards.

As urban centres expand, **efficiency** becomes a priority. Efficiency involves maximising the capacity and convenience of transportation networks and reducing the time, cost and energy required. According to UNDESA (2014), the global urban population is projected to reach 6.25 billion by 2050, accounting for 70% of the world's population (UN-Habitat, 2023a). Efficient cities are compactly planned, reducing the need for long-distance travel and encouraging the use of public transport and shared mobility services. Innovative ICT systems can improve the efficiency of transport networks through passenger information systems, real-time traffic management centres, integrated electronic ticketing systems, and many others. These systems decrease wait times and congestion by increasing information sharing and ease of movement through transit systems.

Mobility **resilience** is the capacity of transportation networks to endure shocks and bounce back from them, whether they come from societal shifts, natural disasters, or economic downturns (ITF, 2024). A resilient mobility system ensures that there is continued movement of people and goods, protecting both human well-being and economic stability, especially during climate crises like flooding and heat waves (UN Secretary-General's High Level Advisory Group on Sustainable Transport, 2016). Sustainable mobility supports building resilience by reducing reliance on long-distance travel that is prone to disruption, like traffic congestion. Moreover, it designs transport systems to be adaptive to cope with evolving transportation needs and environmental pressures.

Lastly, **minimising carbon emissions and environmental impact** remains essential to achieve our climate goals. As per the International Energy Agency (IEA, 2023), transport accounts for more than one-third of Carbon Dioxide (CO_2) emissions from end use sectors. Road vehicles were the largest source of CO2 emissions in the transport sector, accounting for 74% of global sector emissions. To meet the Net Zero Emissions (NZE) by 2050 target, transport CO_2 emissions must drop over 3% annually by 2030, requiring a shift to less carbon-intensive travel (IEA, 2023). As shown by these figures, car-oriented planning and development have contributed to increased congestion and higher emissions in cities, exacerbating environmental challenges. Sustainable mobility solutions, such as non-motorised (NMT) transport infrastructure, mass transit systems and electric mobility, contribute to reversing these trends and promoting a healthier urban environment.

These six principles are core characteristics of sustainable mobility systems and must be incorporated into urban planning to enhance quality of life, reduce disparities, and take meaningful steps toward a more sustainable and resilient future. These six principles need to be accompanied by key approaches to implement sustainable mobility.

2.1.1. Key Interventions to Implement Sustainable Mobility Principles

Implementing the aforementioned principles requires sustained efforts, foreplaning and integration into urban planning. Below are key strategies and focus areas that apply the ASI framework and can help transition urban transport to more sustainable forms.

- **Transit-oriented development (TOD)** plans focus on creating neighbourhoods around public transport hubs by increasing density near stations and incentivizing development along transit routes. By placing services, jobs and residences close together, traffic congestion and vehicle emissions can be reduced, supporting efficient public transit, healthier urban environment, and enabling cost savings on infrastructure which can be reinvested in enhancing mobility solutions (UN-Habitat, 2017a). Smart Growth America (2013) found that efficient land use, with mixed residential, commercial and service areas close together, and better street and neighbourhood connections, reduces upfront infrastructure costs by an average of 38% compared to conventional, car-dependent suburban development.

- In a rapidly urbanizing world, **public transport** is a key piece in promoting sustainable mobility in cities. Public transport refers to shared passenger transport services that are available to the general public and are provided for public good (UN-Habitat, 2018). Public transport helps move many people at once, providing efficient, inclusive and low-emission alternatives for commuting.

- **Active mobility plans** prioritise non-motorised modes of transport, such as walking and cycling. Walking and cycling optimise efficiency and reduce the negative environmental impacts associated with traditional transport systems (UNEP & UN-Habitat, 2022). Active mobility infrastructure invites a variety of uses, encouraging more vibrant and interactive spaces for people rather than spaces dominated by vehicles. This fosters community interactions while also allowing NMT users to reach their destination safely and conveniently (UN Habitat, 2013).

- Utilizing **smart mobility tools** (artificial intelligence, internet of things, etc.) provides real-time information to the public, allowing residents to make informed decisions about their travel options, thereby increasing efficiency in mobility. In the long term, smart mobility leads to innovative, more integrated and user-friendly transport networks (GIZ, 2019).

- Enforcing **parking regulations** and implementing **pricing** for on-street parking reduces space allocated to vehicles and encourages sustainable

transport modes (GIZ, 2023). Parking revenues can be used to invest in sustainable mobility solutions. This promotes a more equitable distribution of public space, creates urban environments that prioritises the residents' needs over vehicles, and incentivizes the use of public transit and NMT

- Encouraging the use of **electric vehicles** reduces carbon emissions and promotes the development of low-carbon transport technology. For example, improving and enhancing connectivity in the city through small electric vehicles like e-bikes and e-scooters encourages behavioural shifts among people from fuel-dependant modes. This shift enhances the city's fuel economy, lowers fuel costs, and reduces emissions (UN Habitat, 2022). One way in which this can be regulated is through the implementation of *Low Emission Zones* (LEZs): defined areas that restrict the use of polluting vehicles (ITDP, 2023). If LEZs are *priced*, vehicles pay to enter with prices varying based on emissions level; if they are *not priced*, vehicles below a minimum emission standard are banned, with non-compliant vehicles that enter paying a fine.

Together these interventions provide a holistic approach to sustainable mobility. From integrating transit-oriented development, prioritising public transport and active mobility, to embracing new technologies, these actions contribute to safer, more sustainable and resilient cities. Translating sustainable urban mobility principles into actionable interventions through the ASI lens provides the basis for creating compact cities. Streets in compact cities are designed through urban and transport planning to let people walk comfortably, shop, eat, drink and play, creating safe and liveable spaces for people, positively impacting their health and productivity, improving revenue and retail values, and reducing construction and maintenance costs for local governments (UN-Habitat, 2022).

2.2. Economic, Social, and Environmental Benefits of Sustainable Mobility

Many of the principles outlined above, such as accessibility and reduced carbon emissions, are benefits in and of themselves. Below, these and other benefits are elaborated upon with examples of successful sustainable mobility interventions from around the globe.

- **Improved Accessibility:** Compact urban development and transit-oriented development within cities reduce the travel distances by city dwellers enhancing their accessibility to services and opportunities. In Kiribati, a road rehabilitation project halved travel times for South Tarawa residents, allowing community members more convenient access to jobs, schools and other essential services. The improved road conditions also resulted in reduced dust levels, improved overall air quality, and better community health (UNDESA, 2021). The improvements in roadside conditions led small entrepreneurs, primarily women, to open food stalls, resulting in a 50% increase in registered vendors from 2017 to 2018. This example demonstrates the multidimensional impacts of mobility interventions. Not only was accessibility increased within the jurisdiction, but health outcomes and economic development were improved.

- **Environmental Benefits:** More use of public transport and active modes of transport bring down congestion, reducing greenhouse gas emissions and improving the air quality (World Bank 2002). Compact urban development also helps preserve green spaces, decreasing the carbon footprint of a city, improving air quality, and mitigating flood risk. One example of encouraging active forms of transport is the ECOBICI project in Mexico City. From 2022 to 2024, 49.9 million kilometres were travelled on ECOBICI cycle lanes, equivalent to a reduction of more than 2 thousand tons of CO_2 per year compared to motorised trips.

- **Enhanced Economic Competitiveness:** Cities with more active mobility systems attract more businesses, as these cities often have reduced traffic congestion and more foot traffic, making the city more vibrant and productive. The rise in land and property values offers cities opportunities to secure revenues and invest in further urban mobility improvements. In the United States, investments in pedestrian zones in city centres increased foot traffic by 20-40%, boosted retail sales by 10-25% and raised property values by nearly one third (UN Habitat, 2013). Similarly, in Cali, Colombia, each additional new meter of pedestrian street, raised

surrounding land values by $27.17 COP per m², and each new meter of bike lanes, raised values by $92.27 COP per m² (Lincoln Institute of Land Policy, 2019).

- **Social Equity:** Sustainable mobility systems need to aim at addressing the disparities in transit access through providing sustainable mobility solutions to those experiencing significant challenges, especially the most deprived socio-economic groups (Mwesigwa, Yin, & Farber, 2024). In Dar es Salaam, Tanzania, the first Bus Rapid Transit system was developed in 2016, which reduced commuters' travel by up to 50%, enhancing the commute of 160,000 passengers daily (World Bank, 2018b). The development of this system increased access to job opportunities and essential services for marginalized groups through promoting affordable public transport, equity in access to opportunities, and economic growth and social justice.

- **Health Benefits:** Implementation of sustainable mobility solutions in cities promotes a cleaner and healthier environment through improved air quality and increased physical activity. Kigali, Rwanda, has introduced Car-Free Zones, such as the Imbuga City Walk in the city's centre, a part of Kigali's push to become a green resilient city (Malonza, 2022). These zones promote physical activity, reducing the risk of chronic diseases such as obesity, diabetes, and heart disease. They also foster a vibrant local economy from higher foot traffic in retail areas. Similarly, Copenhagen, Denmark, has improved bicycle infrastructure and walkability to promote active transportation. From 1999 to 2019, cycling increased in Copenhagen which in turn prevented diseases in Denmark annually by 3328 type 2 diabetes cases, 5742 cardiovascular diseases cases, and 2076 cancer cases and 6190 prevented deaths (Andersen et al, 2018).

For cities to realize their potential as hubs of economic and social opportunity, investing in sustainable mobility systems is not just desirable—it is critical. To catalyse these benefits, actionable interventions must align with sustainable mobility plans and wider urban planning frameworks. This will ensure long-term sustainability and integration within a city's urban development strategy.

2.3. Aligning Sustainable Mobility Plans and Urban Planning Frameworks

Urban mobility is intrinsically linked to a city's urban development and land use planning. In many rapidly urbanising cities, especially in LMICs, unprecedented population growth often outpaces institutional capacity, resulting in fragmented planning, weak regulatory frameworks, and limited political coordination. This leads to urban sprawl—a scattered, low-density development pattern which increases reliance on private motor vehicles and makes it difficult and costly to implement sustainable public transport systems. Without effective land use controls, they continue to expand outward, leading to higher infrastructure costs and less sustainable urban mobility options.

To benefit from sustainable mobility and foster sustainable urban development, it is important to have urban mobility plans that are aligned with the land use plans and broader urban strategies, such as city-wide master plans (Bacon, 2001). A sustainable urban mobility plan is a strategic plan designed to meet the mobility needs of people and businesses in cities and the surrounding areas for a better quality of life (European Union, 2013). Integration of sustainable mobility plans into broader urban strategies helps ensure that city investments are well-aligned with local financial plans, ensuring optimisation of resources for sustainable mobility projects (Cleuet & Jehanno, 2023). This need for alignment also extends to leveraging urban planning tools that foster a comprehensive approach to city development.

An integrated approach promotes a compact city design and a multi-modal transport system. The benefits of having such approach include reduced need for long commutes, preventing the inefficiencies associated with urban sprawl, unlocking economic opportunities through improved connectivity and enhanced productivity. It also ensures that transportation investments align with broader financial and developmental goals, which leads to optimised resource use and more sustainable mobility solutions. The master plan of Singapore, for example, adopted a TOD approach that focused on compact development and mixed-use development around mass rapid transit

UN-Habitat's Integrated Planning Approaches and Tools that Enable Sustainable Urban Mobility

Two open-access UN-Habitat tools help city teams embed mobility in a holistic urban-planning framework:

My Neighbourhood
This is a tool for urban design principles that facilitates an integrated approach to neighbourhood design by incorporating principles across 5 key city objectives (compact, connected, vibrant, inclusive and resilient), across spatial dimensions. My Neighbourhood turns sustainable mobility principles into practical neighbourhood design guidance. It steers planners toward compact blocks, permeable street grids and short walking distances to services and transit, while prioritising safe walking, cycling and public-transport corridors. Integrated with broader aims of resilience and inclusion, it makes active, low-carbon travel the default way to move locally.

Our City Plans
UN-Habitat's Our City Plans is a global toolbox that guides and supports local governments and urban actors to better understand, customise and develop inclusive and integrated urban planning processes, using a participatory and incremental methodology that adapts to local contexts. It offers a dedicated **"Sustainable Urban Mobility"** theme that guides municipalities through assessment, visioning, scenario building and strategy formulation to prepare or update a Sustainable Urban Mobility Plan (SUMP) that delivers efficient, affordable and accessible transport systems

stations, ensuring accessibility to housing and services within short distances. This government-led long-term strategy resulted in coordinated transport and land use strategies that accommodate population growth and promote sustainable urban forms while ensuring sustainability in urban mobility (Trinh & Dao, 2020).

This case also demonstrates how strong government coordination of land use and transport planning is key in creating sustainable cities. Local governments are critical to planning, financing and maintaining sustainable urban mobility systems since many interventions require local implementation and people-oriented solutions. Local governments being closest to the people, are well-positioned to foster transparency and inclusion through participatory processes. They play a key role in local planning decisions and have the flexibility to implement integrated approaches that align transportation, land use and environmental goals while tailoring solutions to local needs.

Under the leadership of local governments, cities can leverage local resources, including own-source revenue streams, public and private land and financial instruments, such as land value capture mechanisms, to finance sustainable mobility investments and better integrate mobility with land use planning. Effective integration is essential, as transport demand and routing are directly shaped by the spatial distribution of people, jobs, services, and commercial hubs. However, local governments often encounter challenges related to the infrastructure investment gap that can hinder the implementation of sustainable mobility solutions. Strategies to deal with these challenges will be outlined in the upcoming chapters.

2.4. Informal Transport as Sustainable Mobility

The key elements of sustainable mobility discussed in this section are essential in all contexts. However, in rapidly urbanizing regions of the Global South, these elements often take on different forms to address challenges such as unplanned expansion and informal land use. Informal transportation networks, encompassing services like *ojeks, tuktuks, jeepneys, matatus*, and *colectivos*, are a fundamental part of urban mobility (Nebrija et al., 2024). These systems come in various forms, from shared minivans to motorcycle taxis, and they serve millions of people in the absence of sufficient formal public transit options. Despite operating outside government-run frameworks and often lacking standardized regulations, these systems provide crucial benefits such as affordability, increased economic access and adaptability to user needs.

In many cases, informal transport is the only available option, but even where formal alternatives exist, passengers often choose informal modes due to their reliability, flexibility and responsiveness to demand (Nebrija et al., 2024). These systems are often more direct, reducing transfer times, and provide a level of convenience that rigid formal networks may lack. For instance, while buses and metro systems follow fixed routes and schedules, informal transport often offers door-to-door service, shorter wait times, and routes that adapt to passenger demand. In some cities like Dar es Salaam, surveys indicate that passengers rank informal transport as more satisfactory than formal systems in terms of travel speed and ease of use, despite concerns over safety and comfort (Joseph et al., 2020). Additionally, in areas where public transit infrastructure is car-centric or fragmented, requiring multiple transfers to reach a destination, informal transport fills the gap by providing seamless connectivity.

Given their significance, integrating and enhancing these networks within formal transportation frameworks is vital. Informal transport is not merely a stopgap solution—it plays an active and dynamic role in urban mobility, often outperforming formal transit in meeting the everyday needs of commuters. Moreover, these systems contribute to the local economy by supporting livelihoods for thousands of drivers, operators, and small-scale entrepreneurs. Recognizing their value and fostering inclusive mobility policies can lead to more resilient, efficient, and equitable transport systems.

Informality in the American Context

Informality is not only a characteristic of mobility systems in developing countries. In most, if not all, transit systems, there are elements of informal operation that bridge the divide between formal public transits and the needs of citizens. This further evidences that informality is a vital part of transit networks, not simply a component that should be eradicated from transit systems. Even in developed cities, with extensive formal transit systems, informal modes persist where there is unmet demand and play a crucial role in filling service gaps left by formal public transportation systems.

For example, in the United States, informal transport services are especially prevalent in cities with large Latino and Caribbean populations, particularly in Miami and New York City (UN-Habitat, 2000). In New York, an estimated 5,000 unlicensed vans and private cars operate in boroughs like Queens and Brooklyn, offering faster, cheaper, and more convenient alternatives to public buses. These services often function as micro public transit solutions, playing a crucial role in last-mile connectivity by linking passengers from major transit hubs to residential neighbourhoods or destinations not well served by formal routes.

These services demonstrate that informality in transport is a universal phenomenon driven by the need for flexible, affordable, and efficient mobility solutions (UN-Habitat, 2000). Recognizing and studying these networks can provide valuable insights into how cities worldwide can create more inclusive and adaptive transportation policies.

3

Contextualizing the Problem: Challenges Local Governments Face in Funding Sustainable Mobility Systems

Despite the importance of sustainable mobility and the need to integrate it into urban planning frameworks to improve economic development and quality of life in cities and regions, local governments face a myriad of challenges sourcing sufficient funds to construct, operate and maintain mobility systems.

The global annual financing gap for transport infrastructure—considering only capital investment—is estimated to range from USD 244 to 944 billion (LèFevre et al., 2016). Cities in Low and Lower Middle Income Countries (LLMICs), especially, face urgent needs to invest in sustainable mobility, yet resources remain disproportionately scarce. Out of USD 1.27 trillion in annual global climate finance flows in 2021–2022, USD 336 billion were allocated to the transport sector. However, Least Developed Countries (LDCs) received only 2.4% of total climate finance, amounting to approximately USD 30 billion (Climate Policy Initiative, 2023). These figures indicate the scale of the capital investment needs (without accounting the costs to maintain and operate existing infrastructure to maintain a state of good repair).

In LLMICs, investment in non-motorised transport, road safety measures and infrastructure maintenance remain severely underfunded (United Nations Environment Programme [UNEP], 2016). This underinvestment has significant socio-economic consequences: 90% of global road traffic injuries occur in these regions, despite only hosting 60% of the world's motor vehicles (World Health Organisation, 2018). Additionally, only 0.2% of the world's roads have dedicated cycle lanes and 80% fail to meet pedestrian safety standards (World Health Organisation, 2023). In Africa, this issue is even more severe. Over a billion people walk or cycle for nearly one hour every day to reach work, school, or essential services (UNEP & UN-Habitat, 2022). Most people use non-motorised transit and yet Africa is also the least safe context to walk or cycle in. Africa leads the world in road fatalities with 26.6 deaths per 100,000 people, almost twice the global average (World Health Organization, 2015). These deaths result from insufficient mobility infrastructure, such as a lack of pedestrian-safe thoroughfares and low enforcement of traffic laws. Additionally, across Africa there has been a systematic decline in the provision of formal public transport, influenced by several factors, including inadequate maintenance, underfunding, and competition from informal transport services (Kumar & Barret, 2008). This stark reality underscores the pressing need for greater investment in mobility in LLMICS.

The global trend towards administrative decentralization has resulted in the devolution of service provision and infrastructure financing responsibilities to subnational governments in much of the world. While this shift benefits local authorities by granting them more fiscal authority, many of their responsibilities are insufficiently funded by intergovernmental transfers, often leaving cities to self-fund mobility initiatives. This provides ample incentive for cities to maximize local revenue, yet many cities fail to utilize their full revenue potential, particularly with respect to land and property taxation. Rapid urbanization and growing demand for local services add to the strain on municipal capacities. This strain is most pronounced in LLMICs, where subnational revenues account for only 20.9% of total government revenues compared to 31.48% in high-income countries (Organisation for Economic Co-operation and Development [OECD]/United Cities and Local Governments [UCLG], 2020). These financial limitations curtail a city's ability to plan, invest in, and maintain sustainable mobility systems. A myriad of challenges contribute to the mobility financing gap. These range from an inability to effectively leverage local land resources to a lack of coordination between governmental departments. This section will elaborate on the main issues that result in a lack of investment in sustainable mobility on the local level.

3.1. Local Revenue and Public Expenditure Challenges

Locally controlled revenues can provide local governments with flexibility to direct funds toward their own priorities, allowing them to invest directly in sustainable mobility projects. These funds can come in the form of own-source revenue, including land-based revenues, intergovernmental transfers and funding from third party sources in the form of loans or grants. A fundamental step in achieving fiscal sustainability is effective management of OSR. The relevance of OSR will be elaborated further in the following two chapters, but it's important to note that multiple challenges hinder local governments' abilities to maximize these revenues, which, in turn, exacerbate existing challenges in obtaining external funding. Below, the core challenges in attaining financial sustainability for mobility projects are outlined.

- **Own-Source Revenue Underperformance**: OSRs, which are locally generated funds such as property taxes, user fees, and land-based charges—are critical for fiscal sustainability. They give cities greater control to invest in sustainable mobility and ensure the operation, maintenance, and long-term upkeep of transport systems. However, many local governments in low- and middle-income countries mobilize only a small fraction of their OSR potential due to weak administrative capacity and enforcement. This underperformance limits service delivery and weakens their ability to secure external funding (UN-Habitat, 2015).

- **Overreliance on Intergovernmental Transfers**: Transfers from higher levels of government are often unpredictable and/or insufficient, creating financial pressures or instability. This can make it difficult to plan and invest in durable transport solutions that require long-term commitments.

- **Limited Access to External Finance**: Many cities in developing countries struggle to attract private investments or utilize mechanisms like loans, municipal bonds, or PPPs. These access limitations have two major causes:

  - Poor Creditworthiness: Only a small percentage of the 500 largest cities in developing countries are deemed creditworthy – about 4 percent in international financial markets and 20 percent in local markets (World Bank, 2013a). Creditworthiness reflects a city's financial stability, debt management capacity, and ability to generate reliable revenue. Low creditworthiness restricts access to external finance, as higher fiscal risk deters lenders and investors, limiting opportunities for loans, bonds, and private investment.

  - Restrictive Regulatory Environments: Legal constraints may prevent cities from borrowing or issuing bonds without central approval, reflecting concerns about local debt management capacity.

- **Inefficient Resource Utilization**: Even when funding is secured, weak governance and inadequate investment planning often result in inefficiencies, including suboptimal sequencing of projects, misallocation of funds, and poor asset management systems. Subnational governments globally allocate over $1 trillion annually to capital investments, including $314 billion in developing countries (OECD/UCLG, 2016), yet between one-third and one-half of this is lost due to inefficiencies (Schwartz et al., 2020). These inefficiencies stem from fragmented institutional coordination, lack of transparent procurement processes, and failure to integrate capital investment planning with long-term operational and maintenance needs. Many cities invest in infrastructure without planning for its full lifecycle, leading to premature deterioration of transport assets due to inadequate maintenance and higher long-term costs. In some cases, critical infrastructure components are implemented in isolation, such as sidewalks constructed before stormwater drainage, only to be dismantled later, causing unnecessary financial losses. Strengthening infrastructure asset management frameworks and embedding lifecycle planning into municipal budgeting can mitigate these inefficiencies, ensuring that mobility investments remain financially sustainable over time.

- **Underinvestment in Low-income Areas**: Mobility investments are often concentrated in wealthier areas, which can generate higher returns, leaving low-income or marginalized urban areas underserved. This results in a lack of access to affordable and reliable transportation for these communities, reinforcing socio-economic disparities. Public transport and NMT infrastructure, such as sidewalks or bike lanes, are frequently underfunded. This underinvestment further isolates

vulnerable populations, limiting their access to employment, education, and healthcare. For example, in Nairobi, Kenya, despite over 50% of daily trips being taken via walking or cycling, mostly by low-income residents, investment in NMT infrastructure has been limited, leading to safety and accessibility issues (Odhiambo, 2021).

3.2. Urban Planning and Land Management Challenges

As noted previously, urban planning and land management issues significantly impact the development of sustainable mobility systems. Improving urban planning regulations, development controls, land management practices is essential to limit urban sprawl and promote sustainable transit-oriented development, lower infrastructure costs by enabling high-density, well-integrated transit networks, and unlock the fiscal benefits of land-based finance mechanisms to support equitable and efficient mobility systems.

- **Inefficient Urban Growth**: Rapid urbanization and poor integration between land use and transport can lead to urban sprawl or unplanned urban expansion, increasing the costs and complexity of sustainable mobility systems. Infrastructure costs per capita are highest in low-density areas and lowest in high-density areas, if parking requirements are excluded (Kurvinen & Saari, 2020). This highlights the need to align sustainable and emerging mobility solutions with broader urban planning goals to optimise costs and improve efficiency.

- **Limited Planning, Land Use Management and Development Controls**: Ineffective regulatory controls (e.g., building permits, development conditions, zoning restrictions) lead to fragmented and informal development, making it difficult for local authorities to plan for and implement sustainable mobility initiatives.

Unclear land ownership and lack of proper titling create barriers to securing land for mobility projects, particularly in developing cities. This delays implementation, increases costs and deters investment in essential infrastructure. Even when ownership is known and documented, when significant portions of land are in private hands, it becomes difficult for cities to develop cohesive transport networks that integrate land use and mobility systems due to the high cost of land acquisition.

Weak urban planning frameworks further hinder municipalities from effectively leveraging LVC instruments, such as property taxes, betterment levies, and development charges. Lack of clear property rights, reliable cadastres, and consistent enforcement of zoning regulations prevent accurate property assessments and tax administration. Without these financing mechanisms, cities miss out on critical revenue streams that could be reinvested into sustainable mobility (Alipour & Dia, 2023).

The Concept of Land Value Capture

Land value capture (LVC) is the process by which governments capture a portion of the increased land value that results from public investments, such as transport infrastructure, and use those funds to finance further development. LVC mechanisms are particularly suitable for infrastructure-heavy projects, such as transit corridors, new metro lines or pedestrian and cycling paths, where enhanced accessibility and connectivity significantly raises nearby property values. Capturing this incremental value enables reinvestment into further sustainable mobility and urban development projects, creating a beneficial cycle of infrastructure improvement and urban growth.

3.3. Government Capacity and Data Challenges

The capacity of local governments to effectively plan, implement, operate and maintain local mobility systems is constrained by a variety of factors, especially in low-income contexts.

- **Limited Technical** and **Institutional Capacity**: Local governments in many developing countries often face constraints due not primarily to individual expertise gaps, but rather due to insufficient resources, specialised institutional systems, and clearly defined internal processes. This capacity limitation manifests through underdeveloped procedural frameworks, inadequate digital tools, and limited enforcement mechanisms for managing finances and implementing revenue reforms. Weak institutional processes—such as unclear decision-making protocols, ineffective data management, and fragmented interdepartmental coordination—often exacerbate these challenges, resulting in revenue shortfalls, delays in project delivery, cost overruns, and suboptimal project outcomes (Quium, 2015). Consequently, these institutional and procedural gaps significantly hinder local governments' ability to effectively coordinate complex transport projects, strategically integrate transport planning with land use policies, and attract external financing by demonstrating financial credibility and institutional reliability.
- **Data Limitations**: The lack of reliable data and effective management systems poses a significant barrier to planning and financing sustainable urban mobility systems. Many cities, especially in LLMICs, lack comprehensive transport data, such as public transport ridership, non-motorised transport patterns and real-time traffic volumes. Cities also often lack data on population growth trends, urban spatial data and financial data. Inadequate data collection methods and fragmented management systems exacerbate this issue, leaving cities without the information needed for strategic planning. These gaps hinder the development of strong business cases for mobility projects, limiting access to public and private financing and investor confidence. Additionally, institutional barriers, such as data silos and insufficient interagency coordination, restrict data sharing and effective use. Even when data is available, the lack of baseline indicators and monitoring frameworks undermines efforts to evaluate progress, adjust strategies and ensure transparency. Reliable data collection and coordinated planning are therefore crucial for designing integrated mobility systems that can leverage limited funds effectively (Climate Policy Initiative, 2016).

3.4. Political Economy Challenges

Building sustainable mobility systems is not just a technical challenge but one deeply rooted in the political and economic contexts of cities. Local governments, especially in LLMICs, face significant political economy challenges that affect their ability to plan, finance, and implement sustainable mobility initiatives.

- **Investment Bias Toward Visible, Large-Scale Projects**: Political bias toward large, high-visibility infrastructure projects, such as highways or bridges, that offer immediate political gains can skew public and private investment away from sustainable, equitable mobility solutions. These projects often attract more attention and funding than less visible but equally crucial investments in public transit, cycling infrastructure, or other NMT.
- **Institutional Fragmentation and Informality**: The fragmentation of governance structures poses another challenge. Urban transport responsibilities are often divided across multiple agencies or levels of government, making coordination difficult. This compartmentalization leads to disjointed planning efforts, where transport, housing, and land use policies are not aligned. A clear example is the failure to integrate informal transit systems—such as minibuses, motorcycle taxis, or shared vans—into formal transport and planning frameworks. Despite their importance in providing last-mile and affordable services, informal operators are often excluded from infrastructure investments, data systems, and regulatory strategies (Kustar et al., 2023). As a result, cities miss opportunities to build coherent and inclusive mobility systems, leading to inefficiencies and social exclusion.

- **Governance, Accountability and Corruption**: Corruption and lack of transparency in governance further undermine efforts to build sustainable mobility systems. In such instances, public funds are mismanaged or diverted, infrastructure projects are stalled due to inefficiencies in procurement processes, and/or investments are not maintained, hindering effective service delivery. Corruption can also distort planning priorities, with decisions favouring projects that offer political benefits or short-term financial gains for individuals rather than long-term sustainable mobility solutions. Strengthening governance frameworks, increasing transparency, and involving citizens and civil society organisations in planning processes are crucial steps to overcome these obstacles.

The responsibilities of planning, implementing, and operating a sustainable mobility system are manifold and are commonly thrust upon local governments with insufficient funding, expertise or legal frameworks. But when local governments successfully overcome these challenges and succeed in implementing sustainable mobility solutions, they create safe, environmentally friendly, economically vibrant and interconnected cities. In the next chapter, we will explore approaches to overcome these challenges and successfully implement sustainable mobility goals.

Urban Transport in the African Context

Institutional Context

Africa's rapidly growing population (projected at around 2.5 billion by 2050) and high urbanization rates amplify the need for efficient, equitable, and eco-friendly transportation systems. Yet, institutional coordination remains weak in many countries, as few cities have a dedicated agency for land use and transportation planning. Jurisdictional ambiguities further complicate governance: laws may not clearly delineate responsibilities between local and national levels, and financial transfers seldom align with the actual costs of providing mobility services (UN-Habitat, 2010; Okoth, 2013).

Economic and Financial Context

African cities vary economically but share common features: heavy reliance on informal sectors and limited capacities to generate OSR. For example, nearly 90% of subnational government revenues in Kenya and Rwanda and 96% in Uganda are from grants and subsidies from national government or donors, highlighting the critical gap in local revenue generation (Inam, 2020). Underdeveloped capital markets and low credit ratings make external financing difficult, effectively limiting resources for building and maintaining sustainable transport infrastructure.

Urban Development Context

Accelerating urban growth has led to uncontrolled sprawl in many African cities, with lower-density development at the periphery while established urban centres remain major job hubs. A significant share of this peripheral growth occurs in informal settlements, which often lack basic infrastructure and are poorly connected to transport services. This dynamic elevates congestion, forcing residents to travel increasingly long distances. Because land use and transportation policies often operate independently, new transport projects may disrupt local neighbourhoods by shifting routes or displacing residents without adequate mitigation. Existing infrastructure also suffers from poor maintenance and limited rehabilitation, causing severe congestion bottlenecks and reduced traffic flows on key arterial roads.

Social Context

Income inequality is widespread, and many lower-income communities rely on informal transport, that is often unsafe, while car-based infrastructure primarily benefits higher-income areas. Underinvestment in public transport, sidewalks, and cycle lanes further marginalizes certain neighbourhoods, perpetuating views that non-motorised transport is solely an indicator of poverty (Sub-Saharan Africa Transport Policy Program [SSATP], 2021). Changing these perceptions and dedicating public transport services or infrastructure improvements to underserved areas are crucial steps toward inclusive mobility.

So What?
This African experience illustrates how institutional fragmentation, limited municipal revenues, and uneven resource distribution deepen mobility challenges. For integrated approaches to take root, sustainable mobility strategies must be tailored to each city's unique governance structures, economic realities, and social norms. Proactive land use coordination, the introduction of equitable funding models, and capacity-building at the local level can help African cities (and similarly structured regions) plan and finance transport networks that are inclusive, adaptable, and climate-resilient.

Insights from Practice: Nairobi Metropolitan Matatu Summit (2024)
In 2024, the Nairobi Metropolitan Area Matatu Summit convened key stakeholders in the Matatu sector, including government, development partners, academia, transport providers, and civil society, to discuss finance and capacity building (National Public Transport Alliance [NAPTA], 2024). Discussion focused on topics such as strengthening legal frameworks for finance and operation, exploring green technology and digital tools, and incorporating the needs of vulnerable groups in public transport design. The summit closed with several recommendations:

- Develop a roadmap to formalise and corporatize the matatu sector to enable bankable projects.
- Recognize the need for alternative financing models tailored to public transport operators.
- Promote the adoption of green technologies and digital tools within the sector.
- Utilize technology and data-driven approaches for system improvements and planning.
- Foster stronger partnerships between government, transport operators, and development partners.

4

Integrated Approaches for Planning and Financing Sustainable Urban Mobility

Financing sustainable urban mobility requires more than just securing funds; it demands a strategic and coordinated approach that integrates urban planning, financial mechanisms, and governance frameworks. While the previous chapter outlined the key challenges, including fragmented governance, limited revenue generation and institutional constraints, this chapter shifts towards solutions, outlining three interrelated pillars that cities can leverage to strengthen mobility financing as part of a broader strategy by:

1. Aligning with national and international frameworks
2. Linking land use with urban mobility strategies
3. Integrating revenue-expenditure frameworks

Building on these three pillars, Section 4.2 explores how Capital Investment Planning (CIP) serves as a critical tool to effectively combine spatial and financial planning. A CIP, here understood as area-based investment prioritisation, systematically connects revenue streams to prioritised expenditures and reinforces strategic urban development approaches, including compact growth and transit-oriented development.

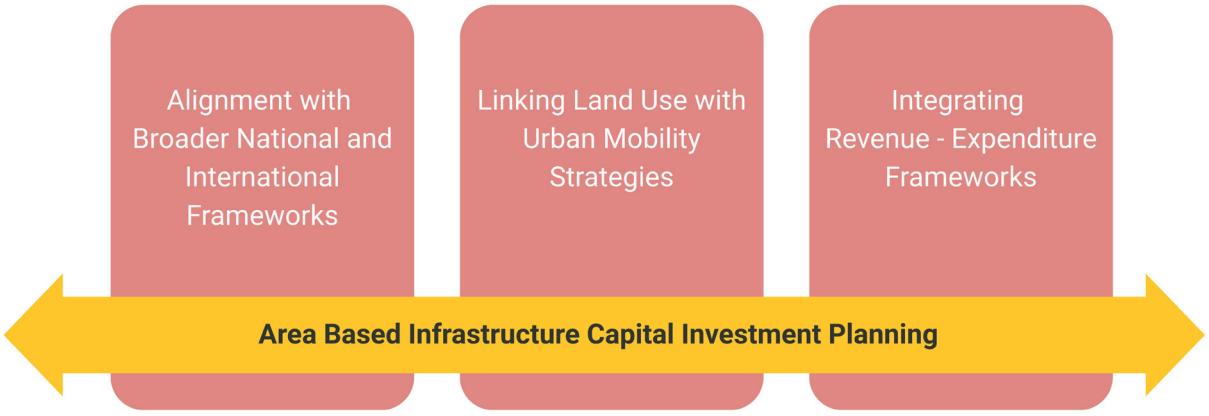

Figure 2.Urban planning, financial mechanisms, and governance frameworks integration.

4.1. Aligning with National and International Frameworks to Unlock Grants and Policy Coherence

Aligning local mobility initiatives with national and international development frameworks (e.g., the SDGs, climate action commitments, or national growth strategies) confers multiple advantages. Beyond fostering policy coherence, it amplifies the city's ability to tap into external funding and technical support (GIZ, 2010):

- **Enhanced Eligibility for Grants and Subsidies**: National and supranational agencies frequently earmark funds for local projects that fulfil specific macro-level objectives, such as reducing carbon emissions, improving air quality, or cutting travel times. By framing local transit or NMT investments as enablers of these objectives, cities stand a better chance of receiving direct monetary support or co-financing.

- **Access to Climate and Development Finance**: International donors (e.g., Green Climate Fund, bilateral aid agencies) often tie their financing to projects that demonstrate alignment with national low-carbon pathways or inclusive growth strategies. For example, incorporating an Environmental Impact Assessment (EIA) ensures compliance with sustainability criteria, strengthens project credibility, and enhances funding eligibility by demonstrating environmental safeguards.

- **Intergovernmental Coordination and Reduced Duplication**: Harmonizing local plans with provincial or national priorities encourages collaborative project pipelines, preventing contradictory or overlapping investments. This synergy is especially vital when regional corridors cross multiple municipal boundaries.

- **Investor Confidence and Stability**: Private investors and development banks prefer initiatives that align with stable policy trajectories, such as multi-year national commitments to transit electrification or corridor development. Coherence with these broader frameworks reduces perceived political risk, attracting a wider pool of financiers.

4.2. Linking Land Use and Mobility Planning to Unlock Value Capture and External Finance

Compact Development and Transit-Oriented Development

Land use policies critically shape urban mobility by influencing where people live, work and commute. Two interrelated strategies, compact development and TOD, can simultaneously promote sustainable transport and increase the city's financial capacity to fund those interventions:

- **Compact Development** promotes higher-density, mixed-use neighbourhoods across urban areas, not solely within transit corridors. It encourages vertical growth by increasing the Floor Space Index (FSI), and supports infill development on underutilized plots. By reducing travel distances, compact cities lower infrastructure costs for roads and utilities while enhancing public transport viability. Over time, they foster cohesive, well-served communities that attract businesses and improve the quality of life (UN-Habitat, 2017b).

- **Transit-Oriented Development** is a transit-focused form of compact development that focuses on clustering housing, commerce and services around high-frequency transit stations or corridors. It employs zoning incentives like density bonuses, streamlines permitting for developments near transit hubs and integrates station design for multimodal connections. TOD increases public transport ridership, leading to higher fare revenues and justifying service expansion. It also raises property values, as seen in cities like San Francisco and Hong Kong, where proximity to transit hubs has led to significant appreciation (Cervero & Duncan, 2002; Cervero & Murakami, 2009), creating opportunities for LVC to reinvest in mobility infrastructure (UN-Habitat, 2017a).

Ensuring that compact development and TOD deliver their intended benefits requires strict development control mechanisms to regulate density, land use, and building standards around transit corridors.

Well-enforced zoning laws, permitting processes, and planning regulations prevent uncontrolled sprawl, ensure alignment with transit investments, and help capture value from new developments to reinvest in sustainable mobility.

Addressing Informality in Transit-Oriented Development

Informal transport, prevalent in many low- and middle-income cities, complicates effective implementation of TOD and reduces opportunities for leveraging LVC. Informal operators often follow irregular schedules and routes, limiting the efficiency and attractiveness of formal public transit investments and constraining land value appreciation potential around transit corridors (International Transport Forum [ITF], 2025; OECD, 2022). Nevertheless, informal transport is essential, often accounting for the majority of motorised trips in cities such as Dakar and Mexico City, where institutional public transit services inadequately cover peripheral areas (Venter et al., 2020).

Rather than displacing informal services entirely, successful integration can enhance TOD benefits. Effective measures include formalising and professionalising informal operators through regulatory frameworks, route integration, fleet renewal, infrastructure upgrades, and fare system integration (ITF, 2025). For example, Jakarta's introduction of the Transjakarta BRT successfully integrated informal minibus operators (Mikrotrans) into a feeder-trunk service, improving coverage and operational efficiency (Agustiar & Sururi, 2025). Similarly, Mexico City's transport authority (Semovi) facilitated gradual formalisation through targeted subsidies, fleet modernisation, and stakeholder engagement, significantly reducing congestion and emissions (ITF, 2025; OECD, 2022).

Thus, actively engaging informal transport stakeholders and providing supportive regulatory environments can maximise TOD and LVC potentials, resulting in safer, more inclusive, and financially sustainable urban mobility systems.

Leveraging Informality for Sustainable Transport

While informal urban transport is often discussed in terms of its challenges, it should not be necessarily viewed as a problem to be eliminated, but rather as an essential mobility network that can be improved and integrated into broader transportation systems (Nebrija et al., 2024). Despite concerns, such as emissions from aging vehicles and inefficient route planning, informal transport plays a crucial role in providing affordable and flexible transit options, particularly for low-income populations. Its adaptability allows it to fill gaps left by formal transit systems, ensuring mobility in underserved areas. However, issues such as inadequate safety regulations, lack of accessibility for people with disabilities, and gender-based harassment in unregulated transport spaces must be addressed to ensure that informal systems serve all passengers equitably. Rather than seeking to replace informal transport, efforts should focus on enhancing its strengths while minimizing its weaknesses, recognizing it as a key part of urban mobility solutions.

Environmental Impact

Informal transport systems often rely on aging, poorly maintained vehicles that contribute significantly to air pollution and carbon emissions. However, smaller vehicles, such as motorcycles and three-wheelers, are emerging as leaders in electric vehicle (EV) adoption (McKerracher et al., 2022; Nebrija et al., 2024). With millions of electric two- and three-wheelers already in use globally, governments can accelerate this transition by offering financial incentives, such as subsidies for EV purchases and investments in charging infrastructure (Nebrija et al., 2024). These measures can help reduce emissions while ensuring the sustainability of informal transport systems.

Safety and Accessibility

While often more accessible than formal transportation models, some informal transit systems are overcrowded and lack inclusive accessibility components (Nebrija et al., 2024). Unregulated vehicles can create unsafe or non-inclusive conditions, particularly for women and people with disabilities. Government-promoted safety regulations, gender-sensitive policies, and vehicle accessibility improvements can make informal transport safer. In some cities, formalised minibus routes have introduced safer boarding areas and vehicle standards to protect passengers.

Lack of Integration with Formal Systems
Informal transport sometimes operates in parallel with formal networks, leading to inefficiencies and gaps in service. Hybrid models that integrate informal services with formal networks, such as in Cape Town, South Africa, where minibus taxis act as feeders to the Bus Rapid Transit (BRT) system, create more seamless multimodal transit options (Behrens et al., 2021; Nebrija et al., 2024).

Limited Financial Stability for Operators
Many informal transport operators lack access to financial services, making it difficult to invest in vehicle upgrades or business improvements (Nebrija et al., 2024). Digital financial tools, such as mobile banking and credit tracking, can help operators access loans and investment. In Kenya, fintech companies use GPS and mobile transaction data to assess creditworthiness and provide financing to drivers.

Resistance to Formalisation
Drivers and operators may resist government-led formalisation due to fears of losing autonomy, increased costs, and stricter regulations (Nebrija et al., 2024). Bottom-up approaches that involve operators in policy discussions and co-designed regulations can help ease transitions.

Unstable and Poor Working Conditions
Although informal transport provides employment to millions, working conditions are often exploitative. Many drivers work long hours with little financial security, lacking access to social protections such as healthcare and retirement benefits (Nebrija et al., 2024). In some countries, cooperative models have been introduced to improve financial stability and provide access to benefits. For instance, in Nairobi, Kenya, driver cooperatives have enabled access to services for drivers. Supporting similar initiatives in other regions can help make informal transport work more sustainable.

Rather than enforcing rigid formalisation, cities can adopt strategies that support and strengthen informal transport while improving sustainability, safety, and efficiency. Governments and transit agencies can implement fleet renewal programmes and financial incentives to encourage a transition to cleaner, well-maintained vehicles. Digital solutions, such as mobile payments, GPS tracking, and data-driven route optimisation, can help operators improve efficiency and access financial services, fostering long-term sustainability. Hybrid models, where informal transport is integrated with formal networks while maintaining its adaptability, offer another promising approach, as seen in cities where small-scale transport services complement larger transit systems. Importantly, any effort to enhance informal transport must include the voices of drivers, operators, and passengers to ensure that policies align with real-world needs. By recognizing informal transit as an existing entrepreneurial ecosystem and providing the right support, cities can transform it into a more sustainable, safe, and inclusive mobility solution. Blending regulatory oversight with the flexibility and market responsiveness of informal transport can create mobility systems that are both efficient and inclusive. Supporting financial stability for workers, improving environmental sustainability through EV adoption, and ensuring accessibility for all users will be key to maximizing the potential of informal transport as an essential part of urban mobility.

When well-planned transit corridors and compact mixed-use urban zones see property values rise, local governments can harness the increment in land value to generate revenue for further infrastructure expansion. This virtuous cycle, in which transit investments boost land values, leading to higher municipal revenue that then funds additional mobility projects, relies on sound urban planning and strong governance (van der Krabben et al., 2019). Cities that adopt TOD with compact urban planning early can:

- **Attract Private Sector Engagement**: Developers are more willing to co-finance stations or related amenities if they benefit from density bonuses or special permits.
- **Cross-Subsidize Non-Revenue-Generating Initiatives**: Gains from increased property tax or betterment levies can fund bicycle lanes, sidewalk upgrades or fare subsidies, ensuring more inclusive mobility.
- **Support Equitable Development**: TOD frameworks can direct major transit investments toward marginalized neighbourhoods, improving access to jobs and services while spurring local economic growth.

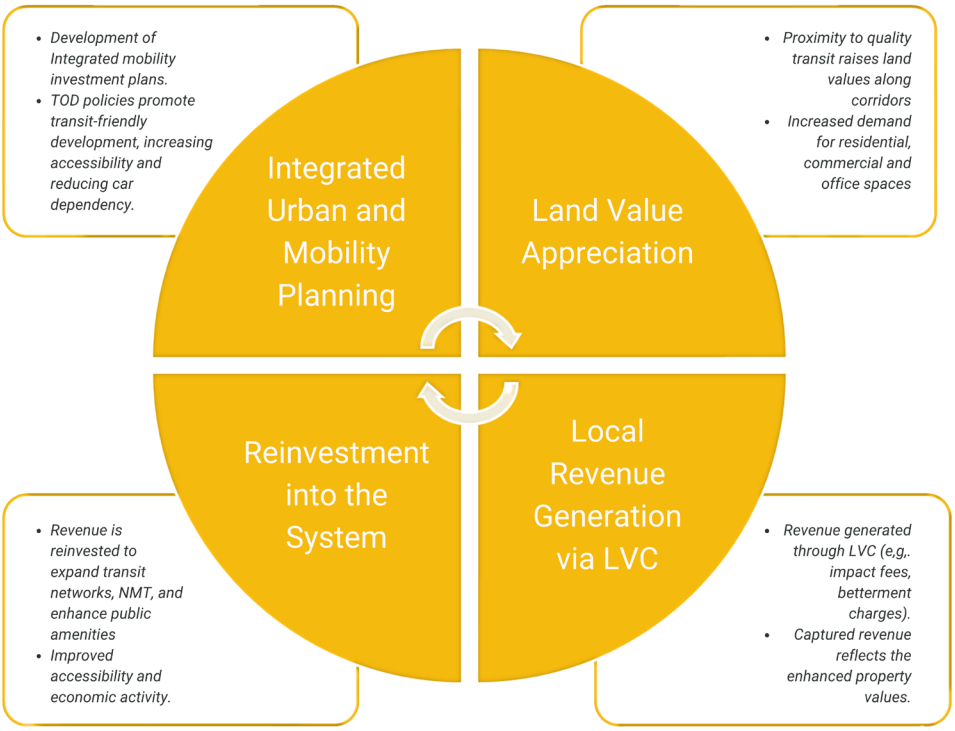

Figure 3. Illustrative Example of the Land Value Capture Cycle for Sustainable Mobility.

Leveraging Land Value Capture for Sustainable Transport

Hong Kong's "Rail plus Property" Model

Hong Kong's Mass Transit Railway (MTR) Corporation exemplifies successful LVC through its "Rail plus Property" model. By integrating rail infrastructure development with adjacent property development, the MTR captures the increased land value resulting from improved transit access. This approach has enabled the MTR to be one of the few profitable public transit systems globally, generating a profit of $1.5 billion in 2014. Developments such as LOHAS Park and Union Square are notable outcomes of this model, demonstrating how strategic integration of transit and property development can create sustainable urban growth (Verougstraete & Zeng, 2014).

Curitiba's Integrated Planning Approach

In the 1960s, Curitiba, Brazil, faced rapid urbanization and increasing traffic congestion. To address these challenges, the city adopted a TOD approach, integrating land use and transport planning. The Institute of Urban Planning and Research of Curitiba (IPPUC) led this initiative, coordinating efforts across various sectors.

A key aspect of Curitiba's strategy was the use of LVC mechanisms to finance its transit infrastructure. The city purchased land along planned transit corridors and allowed developers to acquire rights for additional building floors by contributing to a fund designated for low-income housing. This approach not only promoted high-density, mixed-use development along BRT routes but also generated revenue to support public housing initiatives (Global Platform for Sustainable Cities, 2016).

4.3. Integrating Revenue and Expenditure Management for Sustainable Urban Mobility

Sustainable urban mobility requires not only capital investment in infrastructure, but also a stable financial framework to cover ongoing operational and maintenance costs. To ensure financial sustainability, national and local governments must establish mechanisms that guarantee that transport-related revenues are directed and reinvested into urban mobility interventions (GIZ, 2010).

Aligning Municipal Budgets and Sustainable Mobility Planning

A major challenge for many cities is the misalignment between municipal budgeting processes and sustainable mobility investment planning. Municipal budgets are typically structured around separate capital and operating budgets, often resulting in a disconnect between infrastructure investments (capital expenditures) and their long-term operational and maintenance needs (recurrent expenditures) (Government Finance Officers Association [GFOA], 2022). This disconnect can lead to funding shortages for crucial activities such as road maintenance, public transport subsidies, and non-motorised infrastructure upkeep, ultimately undermining the financial sustainability of mobility systems.

To address this, cities must integrate mobility investment planning into their municipal budgeting frameworks (GFOA, 2022). This involves:

- Ensuring **recurrent costs** are factored into transport investment decisions so that new mobility projects have sustained funding beyond their initial construction.
- **Aligning revenue streams** with expenditure needs by earmarking a portion of local revenues (e.g., fuel levies, property taxes, congestion charges) for ongoing transport services and infrastructure maintenance.
- **Linking municipal budget cycles** with infrastructure investment plans to enable multi-year financial planning, ensuring that transport infrastructure projects are prioritised based on both fiscal capacity and long-term financial sustainability.

By pooling revenues from OSRs, including LVC, alongside other sources such as nationally managed taxes and external grants, local governments can establish dedicated urban mobility-related funds or SPVs, in order to develop a stable financial mechanism to cross-subsidize essential infrastructure that does not directly generate income. As Deloitte (2016) notes, this approach isolates project liabilities from general municipal funds, enabling revenue from high-performing assets to support non-revenue-generating facilities, such as sidewalks, bus shelters, street lighting and other critical public amenities. This model helps maintain high-quality, safe urban infrastructure and contributes to more equitable, sustainable mobility.

Governance Fragmentation and the Need for Coordinated Financial Oversight

Strong institutional coordination across transport, finance, land use and infrastructure agencies is essential to ensure that all potential revenue streams, including land value capture mechanisms, fare revenues and dedicated national transport funds, are effectively mobilized and allocated to sustainable mobility initiatives. However, fragmented governance, unpredictable revenue management and unclear funding responsibilities between national and local governments often hinder this process (World Bank, 2024).

Overcoming these challenges requires:

- **Institutional Alignment**: Clear fiscal roles and responsibilities between local and higher-level governments, ensuring the alignment of investment priorities with budgetary resources.
- **Predictable Financial Planning**: Multi-year budgeting cycles that sync transport investment priorities with annual operating budgets, ensuring crucial operations and maintenance (O&M) costs are not overlooked.
- **Multi-Level Coordination**: Mechanisms, such as Urban Mobility Authorities (UMAs) or formal inter-agency committees, that unify decision-making, prevent contradictory investments, and integrate spending priorities with broader sustainability goals.

Institutional Structures for Financial Coordination

To address these needs, some cities and governments have established dedicated institutional structures that consolidate financial oversight, coordinate urban

mobility planning and integrate transport-related funding streams into a unified framework (World Bank, 2013b). Two key approaches include:

- **Urban Mobility Authorities (UMAs) and Coordination Bodies**: Many cities have created UMAs to consolidate functions that would otherwise be spread across multiple agencies. Sometimes referred to by other names, these leading transport authorities are generally city- or metropolitan-level entities responsible for coordinating transport planning, investment, and operations across agencies and modes, ensuring revenue and expenditure frameworks for sustainable mobility (Kumar & Agarwal, 2013). By consolidating transport-related functions, UMAs can align spending priorities with sustainable mobility objectives and ensure ongoing funding for infrastructure and operations. However, as noted by the World Bank (2013), while many cities attempt to establish lead urban mobility authorities that span multiple jurisdictions, functions, and modes, few have successfully implemented fully integrated UMAs. This underscores the complexity of creating centralized authorities, which often depends on specific local contexts. While establishing centralized authorities is a solution that is being advocated for by many experts (GIZ, 2013), in many cases, strong coordination to ensure all sources of potential revenues are allocated to sustainable mobility interventions is still needed.

  Example: The Lagos Metropolitan Area Transport Authority (LAMATA) in Nigeria has been established to coordinate urban transport policies and investments across multiple municipalities in the Lagos region. LAMATA serves as the primary regulatory and planning body for public transport. Beyond unifying transport regulation and project planning, LAMATA plays a crucial financial role by levying and collecting transport user fees and managing a dedicated transport fund. This fund, which receives stable financing from the Lagos State budget, allows LAMATA to cover its operational expenses while making strategic investments in transport infrastructure and services (World Bank, 2013b).

- **Special Purpose Vehicles (SPVs)**: SPVs are entities that are legally distinct from the local government. They can be created to finance and manage specific transport projects, such as BRT systems or metro networks. SPVs can be financially autonomous, allowing them to issue bonds, engage in PPPs and generate revenue through fares, advertising and land value capture mechanisms. Importantly, SPVs can separate project profits and liabilities from the city's general finances, reducing fiscal risks while ensuring sustainable funding for transport operations.

  Example: The Government of Odisha, India, established the Capital Region Urban Transport (CRUT) as a SPV under the Housing and Urban Development Department to manage urban transport services in the state's capital region. CRUT operates the 'Mo Bus' service, which features a fleet equipped with modern amenities like Wi-Fi, real-time tracking, and an automated fare collection system. This SPV structure ensures operational independence and streamlined decision-making, contributing to an efficient public transportation system. (Capital Region Urban Transport, n.d.).

CRUT's financial autonomy allows it to generate revenue through passenger fares, advertising, and other innovative mechanisms. By separating project liabilities from the state's general finances, CRUT reduces fiscal risks while ensuring sustainable funding for transport operations.

Leveraging Earmarked Transport-Related Revenues for Sustainable Urban Mobility

It is important for national and local governments to reassess transport-related revenue streams, including OSR and national managed taxes, establishing better financial arrangements that focus on providing dedicated revenues sources and cross-subsidies for sustainable mobility. Earmarked revenue streams should follow two rationales (ITF, 2024). First, the "beneficiary pays" principle ensures that those who benefit from mobility improvements, such as landowners and businesses, contribute financially. Local governments can achieve this through earmarking OSR streams, such as land value capture mechanisms (e.g., betterment charges, tax increment financing, and development impact fees), allowing public authorities to recover and reinvest a portion of the increased property values generated by transport infrastructure investments. Second, to advance sustainable and equitable transport, funding mechanisms should support the transition to low-carbon mobility while ensuring accessibility. This requires increasing taxes on

private vehicle use to account for their external costs and redirecting revenues from fuel levies, congestion charges, and similar sources toward public transport, maintaining affordability for those unable to rely on private vehicles. When established through legislative frameworks, these revenue mechanisms provide greater financial stability for urban mobility systems than politically volatile direct grants.

In practice, earmarked revenues for urban mobility are typically managed through two primary mechanisms:

- **Dedicated Funding Vehicles**: These are specialized ring-fenced funds established (often through legislation or institutional arrangements) to secure stable long-term financing for transport infrastructure investments. These vehicles channel specific revenue streams directly into initiatives focused on infrastructure construction, maintenance, expansion and operational improvements.

  Examples: (1) The UK's Local Sustainable Transport Fund (LSTF) supports a broad range of mobility solutions beyond road maintenance, including public transit, cycling, and pedestrian infrastructure (Werland & Rudolph, 2019). (2) Costa Rica's National Road Fund, established in 1998, is funded by fuel levies, with 25% allocated to municipal roads and 75% to national roads. Municipalities receive funds based on a formula that considers their road network length and must provide matching local contributions (Zietlow, 2005).

- **Municipal Earmarking for Mobility:** At the local level, municipal earmarking involves allocating revenues generated from own-source revenues as well as transfers and other funding sources directly toward sustainable transport initiatives. This approach ties both locally raised funds and external resources to specific community transport needs ensuring that interventions are tailored to address local challenges. Municipalities can earmark funds through legal requirements such as by-laws, ensuring that a portion of specific revenue streams like parking fees or congestion charges is dedicated to sustainable mobility projects. One approach is the use of reserves and reserve funds, which allow municipalities to manage funds effectively for both operational and capital needs. Reserves are flexible funds set aside for future municipal needs that can cover multiple expenditures while reserve funds are more structured and legally established for a specific purpose, accumulating interest and ensuring financial discipline (Municipal Finance Officers' Association of Ontario, 2018). Maintaining an adequate buffer within reserves helps municipalities stabilize service provision and avoid sudden tax increases during economic downturns while also ensuring long-term financial capacity for major infrastructure investments (Association of Municipal Administrators of Nova Scotia [AMANS], 2013).

  Example: In Bogotá, Colombia, a betterment levy captures land value increments from public transport investments and reinvests them into transit improvements (Borrero, 2011). While this method primarily focuses on financing capital projects it demonstrates how municipalities can structure financial mechanisms to support long-term mobility planning.

4.4. Capital Investment Planning (CIP) as a Tool for Integrating Spatial and Financial Strategies

A CIP is a multi-year, strategic framework that helps local governments identify, prioritise, and coordinate infrastructure projects to align with broader development goals. This structured approach not only ensures that projects are carefully selected based on current and projected needs, but also prevents significant resource waste, which can range from one-third to half of total public investment (Schwartz et al. 2020). An effective spatially-informed CIP fundamentally relies on clearly linking plans, projects, and funding through their shared spatial dimension. Incorporating a spatial lens ensures infrastructure investment addresses both immediate needs and sustainable, long-term urban goals. Using spatial data not only provides objective prioritisation but also supports transparent, stakeholder-driven decision-making. Utilizing a multi-criteria decision-making analysis (MCDA) approach that combines spatial and non-spatial criteria, such as infrastructure deficits, population densities, and environmental risks, can significantly enhance objectivity and transparency in prioritising infrastructure projects. This methodology systematically rates and ranks projects, reducing bias and ensuring alignment with overarching development

strategies.

By aligning land use strategies, infrastructure investments and financial mechanisms, a well-crafted spatially-informed CIP supports each of the pillars introduced in this chapter: (A) aligning local mobility initiatives with national and international frameworks, (B) linking land use planning with urban mobility strategies and (C) integrating revenue-expenditure frameworks for long-term financial sustainability. As an added benefit, this process enhances a city's appeal to private investors, stimulating local economic development and enabling area-based transformations of the urban built environment.

4.4.1. Aligning with National and International Frameworks (Pillar A)

CIPs can integrate policy objectives from higher-level frameworks, such as the SDGs, national climate commitments, national and regional development strategies, into local investment decisions. By mapping project proposals against these macro-level targets, cities can more effectively demonstrate their contribution to national and international objectives (for instance, emission reductions or inclusive growth) and become eligible for grants, subsidies or development finance tied to these goals. Moreover, the systematic nature of CIPs helps local agencies coordinate with state or national ministries, reducing redundant or contradictory investments across jurisdictional boundaries. This alignment not only streamlines approvals but also boosts investor confidence, as public and private financiers recognize that the city is pursuing a stable and coherent policy trajectory.

Moreover, as a part of CIP, clear spatial mapping of how local projects align with specific national and international targets (such as the SDGs or national climate commitments) can visually demonstrate a city's contribution to broader goals, strengthening eligibility for development finance and facilitating smoother intergovernmental coordination.

4.4.2. Linking Land use Planning with Urban Mobility Strategies (Pillar B)

Because a CIP systematically evaluates where and how to allocate funds for infrastructure, it naturally bridges spatial planning with transport needs. For instance, if a city envisions transit-oriented development around a planned metro line, a CIP can cost out station upgrades and the supporting bike-lane and pedestrian works that complement the mixed-use zoning already adopted in the spatial plan.

Applying spatial prioritisation through MCDA can support identifying strategic locations for projects, such as TOD projects, enabling cities to systematically evaluate which areas would most effectively benefit from integrated transport and land use investments. This includes identifying secondary nodes or corridors where targeted interventions can catalyse sustainable urban growth.

Furthermore, a spatially informed CIP uses plan-identified redevelopment or infill opportunities to define cost and phasing priorities. In practice, this entails drawing on existing maps of under-utilised parcels along planned transit routes or coordinating land acquisition to support affordable housing near key stations. By combining these spatial insights with financial modelling, the CIP helps local agencies prioritise interventions that yield both mobility improvements and enhanced public revenue, for example, assessing whether betterment levies or special assessment districts can capture rising property values.

Ultimately, CIP-supported implementation of the land-use plan leads to more coherent, walkable and transit-served communities, reinforcing the broader aim of sustainable mobility. The CIP process can further refine prioritisation by considering spatial indicators such as infrastructure deficit mapping, public asset distribution, and environmental hazard overlays, ensuring selected sites for redevelopment or infill align with broader strategic and sustainable objectives.

4.4.3. Integrating Revenue-Expenditure Frameworks for Long-Term Financial Sustainability (Pillar C)

Beyond sequencing projects, a CIP aligns multi-year capital costs with the city's longer-term O&M projections, signalling where additional operating funds will be required. This alignment is critical for avoiding funding shortfalls that frequently arise when cities focus narrowly on construction without accounting for long-term operational demands.

Incorporating comprehensive spatial and financial diagnostics into the CIP allows cities to anticipate multi-year budgetary needs and revenue potentials effectively. For example, by spatially correlating revenue streams with planned infrastructure investments, cities

can proactively earmark revenues for both upfront works and, where policy allows, long-term operation and maintenance. Presenting projected fare box receipts, parking fees, developer contributions and external grants in one table, the CIP clarifies phase-by-phase budget needs and makes it easier to raise multi-year financing. This process enables local governments to earmark part of the land value increments generated around transit corridors for reinvestment in public transport and non-motorised infrastructure. In turn, these well-funded systems support reliable service and attractive urban environments, which further spur private investment and reinforce sustainable development, as illustrated above.

Because each project line in the CIP has a schedule, budget and funding source, the document becomes a transparent scorecard that citizens, investors and auditors can track year by year. This iterative approach reduces financial risk and promotes continuous learning, making sustainable urban mobility more resilient to economic or political shifts. Regular monitoring and public reporting using spatial data dashboards can further improve stakeholder confidence and support sustained financing commitments.

Figure 4. Illustrative example of how Spatially-Informed CIPs can support the financing of Bus Rapid Transit Systems.

UN-Habitat's CIP Approach – Khorog, Tajikistan

UN-Habitat's Spatially Informed Capital Investment Plan (CIP) methodology was piloted in Khorog, Tajikistan (UN-Habitat, 2023b) to bring evidence-based rigour to a small city whose public transport is limited mainly to shared taxis.

Rather than pursuing full transit-oriented development or land-value-capture strategies—which are impractical where virtually all land is state-owned—the exercise focused on spatial diagnostics and participatory mapping to pinpoint secondary centralities outside the congested core. The CIP then costed a package of pragmatic mobility upgrades: resurfacing and traffic-calming the central circulation loop, widening sidewalks, and adding basic cycle lanes to create a safe non-motorised network.

By linking these modest capital works to the city's land-use pattern and budget envelope, the Khorog CIP demonstrated how spatial prioritisation can still improve access and decongest the centre even where advanced TOD or private-sector value capture is not feasible.

Through the spatially informed CIP, UN-Habitat supported:

Targeted Urban Mobility Planning: The CIP assessed infrastructure deficits (e.g., inadequate road networks, limited pedestrian access), guiding investment prioritisation to address mobility gaps and improve connectivity.

Pragmatic Funding Focus: With land entirely state-owned, the plan centres on affordable upgrades financed through the municipal budget and donor grants rather than land-value capture.

Participatory and Data-Driven Decision-Making: Quantitative GIS indicators (population density, accessibility) were combined with community feedback to ground each recommendation in both evidence and local priorities.

Efficient Resource Allocation: The ranked project list allows officials to channel scarce funds to the highest-impact sidewalk, cycling and road-resurfacing works—once the city adopts the CIP's priorities.

Targeted Partner Engagement: Although large PPPs are unlikely, the CIP flags niche opportunities for local contractors and development partners to support implementation.

5

An Incremental Approach to Financing Sustainable Urban Mobility

In the previous chapter, we explored how cities can integrate urban planning, financial mechanisms and governance frameworks to strengthen sustainable mobility. We examined the importance of aligning investments with national and international commitments, leveraging land use strategies such as TOD and coordinating revenue-expenditure frameworks through Capital Investment Planning. However, cities vary widely in governance capacity, financial health and institutional readiness. While some may face basic revenue-collection challenges, others have already experimented with land value capture or fare integration. Consequently, a one-size-fits-all approach would not be practical.

This chapter proposes a three-stage incremental framework that practitioners can adapt to local conditions. Each stage focuses on interconnected finance, expenditure and planning mechanisms that cities can leverage based on their specific context.

The stages are not strictly sequential: cities with higher capacity in specific areas may leap ahead to more advanced measures. Nevertheless, the incremental progression provides a roadmap for strengthening own-source revenues, earmarking funding for sustainable mobility, adopting TOD principles and eventually leveraging PPPs or municipal bonds for large-scale projects. Through this flexible structure, municipalities at different starting points can see how the concepts described in the previous chapter can be applied without being overwhelmed by overly complex solutions.

Table 1. Three-Stage Incremental Framework.

	Stage 1	***Stage 2***	***Stage 3***
Dimensions / Stages	**Building the Foundations**	**Leveraging Integrated Value Capture Systems**	**Leveraging External Finance**
Finance	OSR Optimisation	Implementation of LVC mechanisms	Leveraging improved access to external finance (PPPs, bonds, etc.)
Expenditure	Soft Ring-Fencing or Earmarking for SM	Dedicated Transport Funds, CIP-Based Budgeting	Integrated governance structures (e.g., Urban Mobility Authority)
Planning	Improved Land Management & Coordination, Basic CIP	TOD and Compact Development, spatial CIP	Advanced Integration of Land use and TOD

5.1. Stage 1: Building the Foundations

Cities at this stage often face constrained governance capacity, underdeveloped revenue systems and limited integration between land use and mobility planning. Given these constraints, Intergovernmental Transfers (IGTs) remain the primary source of funding for most local governments, but they are often insufficient and unpredictable, leaving little flexibility for cities to expand mobility investments. Before undertaking more complex land value capture or PPP transactions, it is crucial to build the foundations of municipal financial sustainability by:

1. Optimising existing local revenues
2. Establishing basic earmarking mechanisms
3. Strengthening fundamental planning processes (e.g., a basic CIP) to guide future expansions

5.1.1. Finance Dimension

Own-Source Revenue Optimisation

A core priority is boosting own-source revenues, which are the funds a municipality collects directly, such as property taxes, user fees and transport-related charges. Many low-capacity municipalities underutilize these revenue streams due to weak valuation systems, limited enforcement, or political opposition. Given that land and property represent the world's largest asset class, valued at over $300 trillion (Fernandes, 2011), effectively harnessing them can substantially increase local revenues (UN-Habitat, 2023c).

At this stage, improving OSR is not just about generating more revenue but about building a stronger financial foundation for sustainable mobility, which includes streamlining financial management, enhancing transparency and creating predictable revenue flows, ensuring that funds can be effectively reinvested into the sustainable mobility system (e.g., infrastructure, maintenance). This, in turn, builds institutional capacity, fosters transparency and enhances creditworthiness, which are prerequisites for advanced mechanisms like municipal bonds or PPP projects.

5.1.2. Expenditure Dimension

Establishing Basic Ring-Fencing or Earmarking

To ensure sustainable mobility revenues are effectively reinvested, cities should establish basic financial safeguards:

- **Earmarking and Budget Structuring**: Allocate a portion of revenues (e.g., 20% of parking fees) to transport projects and manage these funds through a dedicated mobility budget line to improve transparency and prevent diversion.

Kampala's Success in Enhancing OSR and Creditworthiness

Kampala, the capital city of Uganda, provides a compelling example of how targeted administrative reforms can significantly increase OSR and enhance creditworthiness without widespread policy changes. Within five years, these reforms led to a doubling of OSR, substantially boosting the city's financial resources. Improved financial management and increased revenues enhanced Kampala's credit rating, making it more attractive to investors and lenders. Additionally, the funds enabled the Kampala Capital City Authority (KCCA) to invest in critical infrastructure and services, including urban mobility projects, thereby improving the quality of life for residents (Harman et al., 2021).

Key Reforms Implemented

Automation and Digitisation of Revenue Collection: KCCA introduced electronic systems for tax assessment, billing and payment, reducing revenue leakages and increasing efficiency.

Simplification of Taxes and Fees: KCCA streamlined the number of taxes and fees, making it easier for taxpayers to understand and comply with their obligations.

Expansion of the Tax Base: Efforts were made to identify and register new taxpayers, including informal businesses, thereby broadening the revenue base.

Rapid Own Source Revenue Analysis (ROSRA)

The **Rapid Own Source Revenue Analysis (ROSRA)** is an online diagnostic tool developed by UN-Habitat and applied in over 20 countries to optimise local revenue systems in developing contexts. It assesses overall own-source revenue (OSR) gaps, breaking them down by individual revenue streams and further decomposing these into functional categories (registration, assessment, collection, and tax rate). Through a simplified, data-efficient methodology, ROSRA identifies critical entry points for reform, linking common OSR challenges to targeted, best-practice recommendations. By clearly visualising OSR weaknesses and priority areas, ROSRA supports local governments in strategic decision-making, enhances municipal financial sustainability, strengthens creditworthiness, and improves their capacity to leverage external finance for urban development.

- **Linking Budgets to Investment Planning**: Integrate Capital Investment Plans (CIPs) into municipal budgets to align funding with long-term transport priorities, ensuring both capital and operational costs are covered (Allen et al., 2020). This includes incorporating basic infrastructure asset management practices—such as inventories of existing mobility assets, routine maintenance schedules, and lifecycle costing—to extend asset longevity, reduce long-term costs, and inform more accurate budgeting.

- **Strengthening Budget Oversight and Coordination**: Establish basic financial coordination mechanisms between transport and finance departments, introduce multi-year budgeting, and provide training to finance officers on sustainable mobility investments.

These steps improve financial predictability, ensuring mobility investments are systematically embedded into municipal budgets, setting the stage for more advanced financing mechanisms.

5.1.3. Planning Dimension

Strengthening Land Management and Basic Coordination

Weak or outdated land use regulations can undermine attempts to concentrate development along viable transit corridors or to collect property taxes efficiently. At this stage, local governments might:

- **Undertake Basic Land use Reforms**: Simplifying zoning codes and clarifying land tenure to reduce informal expansions and encourage compact growth.

- **Coordinate Departments**: Establishing a formal communication channel between land and finance departments so that potential land value gains can be captured for mobility projects in the future.

- **Improve Land Tenure Security**: Prioritise efforts to document land ownership and occupancy rights, particularly in informal or peri-urban areas, to establish the legal clarity needed for effective valuation, taxation, and future land value capture. Strengthening tenure security not only supports local revenue collection but also builds public trust and facilitates inclusive planning around future transit investments.

Introducing a Capital Investment Plan (CIP) for Mobility

While the CIP might be rudimentary in Stage 1, it can already serve to:

- **Outline Preliminary Lifecycle Costs**: Underscore that building infrastructure entails long-term maintenance costs, preventing quick-fix projects that degrade prematurely.

- **Align Investments with Broader Goals**: Even a simple CIP can help secure grants or donor funding by showing how local road safety measures or initial bus lanes support national climate or transport targets.

- **Build Momentum for Next Stages**: This foundational CIP can evolve into more comprehensive spatial planning with TOD or linked to advanced finance tools/vehicles (e.g., PPPs, municipal bonds, SPVs) in Stages 2 and 3

5.1.4. Considerations and Approaches to Finance Sustainable Mobility Investments for Stage 1

At the foundational level, simple OSR measures, IGTs and external grants/voluntary contributions are the most viable strategy. These instruments require relatively low administrative capacity and serve as a starting point before exploring more advanced options. However, combining finance with effective expenditure oversight (e.g., basic ring-fencing) and a preliminary CIP ensures resources are allocated to high-impact interventions. The table below outlines financial instruments, expenditure mechanisms, and planning considerations most suitable for different sustainable mobility interventions. For a deeper discussion on each instrument's advantages, disadvantages, requirements and global case studies, refer to Annex I.

Table 2. Sustainable Mobility Interventions for Stage 1.

Sustainable Mobility Interventions	Financial Instruments		Key Planning / Enabling Elements
	Capital Investment	**Recurrent Commitments**	
Roads & Safety (basic upgrades, safety features, small reconfigurations, speed management)	- **Intergovernmental Transfers / ODA**: Grants from national government or donors for initial roadworks.	**- Parking Fees / Fines:** Modest ring-fencing of on-street parking or traffic fines for routine road maintenance.	**- Basic CIP.** Estimate life-cycle costs in a simple multi-year plan.
	- Land and Property Taxes *(one-time charges on property transactions)*: Potential extra revenue if property transactions occur regularly.	**- Fuel taxes** (if legally permissible, commonly imposed on vehicle ownership/use): Small portion earmarked to a "road upkeep" line item.	**- Coordination w/ Land Dept.:** Simplify alignments, avoid duplication.
	- Transfer Taxes and Stamp Duties: Earmarked surcharges in areas experiencing land value growth.		**- Minimal Ring-Fencing:** A basic mobility account in the municipal budget ensures funds go back into road upkeep.
Non-Motorised Transport (NMT) (sidewalks, bike lanes, pedestrian zones, crossing points)	**- Intergov. Grants / Voluntary Contributions and Advertisement** (*private or philanthropic support*): Donor grants or philanthropic funds can jump-start sidewalk/ bikeway expansions.	**- Property / transfer taxes:** Small Earmarks from for walkway/cycle-path upkeep.	**- Incremental Zoning Adjustments:** Encourage walkability in new developments, but large-scale land management reforms may still be pending.
	- **Civil Society Involvement / Microfinance** (*small loans, crowdfunding*): Funds local bike-share or walkway pilots.	- **Modest Cross-Subsidy** from bus fares if city runs a small transit service	**- Basic CIP.** Overlay foot traffic data or crash hotspots to prioritise sidewalk segments.
			- Local NGOs can fill capacity gaps for small NMT improvements or campaigns.

Public Transport (Buses, Minibuses) *Essential bus corridors, basic stations/shelters, initial route expansions.*	-**Intergovernmental Transfers:** Main source for new bus vehicles, depot construction.	- **Public Transport Fares:** Usually a key source to fund bus operations (drivers' salaries, minor station maintenance).	**- Coordinating with National/Regional Policy:** Align bus expansion with any national climate/urban policy to attract grants.
	- **Official Development Assistance** (Early-Stage External Grants): Fund feasibility studies, small pilot BRT lanes if national policy encourages it.	**- Voluntary Contributions and Advertisement:** May subsidize O&M (e.g., bus shelters, route signage).	**- Basic Service Management:** Establish a city-level bus unit to facilitate coordination of routes, operations, and service standards.
	- **Property Taxes / Business License Fees:** Partial revenue can support basic station infrastructure.		
Traffic Management & Safety Campaigns (enforcement, low-cost behaviour change, pilot ICT)	- **Small Donor Projects**: Tech vendors might co-fund traffic signal upgrades in exchange for pilot data.	- **Voluntary Contributions and Advertisement:** Could partially finance low-cost ICT systems or printed safety materials	- **Basic ICT Integration:** Establish minimal digital infrastructure (e.g., stable power, basic data systems) to support traffic data collection, safety audits, and early coordination of public transport services or enforcement tracking.
	- **Intergov. Transfers:** Some national programmes support city digitisation or e-governance.	- **Fines** (for enforcement and compliance)	- **Institutional Readiness and Capacity Development:** Use available data to identify priority corridors for safety improvements (e.g., signal timing, traffic calming), and initiate training programmes on road safety compliance, ICT tools, and mobility data management.
		- **Congestion/Parking Charges**: If feasible, can help fund additional traffic sensors or enforcement	

5.2. Stage 2: Leveraging Integrated Value Capture Systems

By optimizing OSR systems, introducing basic ring-fencing, and advancing land tenure and management reforms, local governments can begin to consider more intermediate financing mechanisms and stronger alignment of their Capital Investment Plans. Stage 2 typically involves deploying land value capture instruments beyond basic property taxes—such as betterment levies, impact fees, exactions, or the sale of development rights—and expanding the CIP to incorporate transit-oriented development and compact urban development principles

5.2.1. Finance Dimension

Diversifying Land value Capture (LVC) Tools

In stage 2, property assessments are more accurate and local authorities have begun coordinating land use and transport planning. This opens the door to LVC strategies that recover a portion of increased land value resulting from public investment in transit corridors or station areas. Betterment levies, impact fees and sale of development rights can finance larger, more capital-intensive projects, including extended BRT lanes or multi-modal stations, without over-relying on national transfers.

- **Betterment Levies**: One-time charges on property owners who benefit from new infrastructure or station upgrades.
- **Impact Fees/Exactions**: Require developers to contribute infrastructure or funding in exchange for construction permits or higher density allowances.
- **Sale of Development Rights or Land Leasing**: Grant higher building heights or different land use rights for a fee, generating upfront capital for transit projects.

Combined with refined non-land revenues, such as advertising, voluntary contributions or selective user charges (e.g., congestion pricing or emissions-based vehicle taxes), these measures can finance larger, more capital-intensive investments without over-relying on national transfers. As outlined in the preceding chapter, effective LVC implementation hinges on clear legal frameworks, administrative capacity for regular valuation, well-defined capital investment planning and cross-departmental coordination.

5.2.2. Expenditure Dimension

Structured and Transparent Mechanisms Linking Revenues to Mobility

As revenue flows become more sophisticated, local governments need consistent processes for directing these funds into the transport system:

- **Dedicated Transport Funds**: Transition from basic ring-fencing to a formal fund that automatically receives earmarked revenue sources, such as betterment levies or developer contributions.
- **Investment Budgeting Processes**: Strengthen investment planning and budgeting procedures by aligning annual allocations with prioritised transport projects, while incorporating multi-year

From Land Registries to BRT Lines: Putting LVC into Practice

Cities that effectively adopt LVC mechanisms typically use robust property assessments and transparent land governance. For example, Cuenca (Ecuador) introduced betterment charges (Contribución Especial de Mejoras) after clarifying land registries and institutional roles (see Annex I). This allowed the city to recoup infrastructure costs for roads and neighbourhood upgrades, tripling local land values while financing over 270 km of paved roads.

In Nanchang (China), local authorities combined accurate land-leasing frameworks with TOD around new metro lines (Annex I). By selling development rights and increasing allowable floor space near stations, the city raised substantial capital to co-finance critical rail expansions. In both cases, early efforts to map land parcels, establish legal certainty and coordinate planning departments laid the groundwork for impactful LVC approaches.

cost estimates, operation and maintenance (O&M) needs, and basic asset management practices (e.g., asset inventories, lifecycle costing)

- **Transparent Procurement and Reporting**: Adopt clear procurement procedures and regularly report on the use of earmarked funds to strengthen public trust and investor confidence.

5.2.3. Planning Dimension

Formalising TOD and Compact Development Approaches

Stage 2 is where local governments operationalise:

- **Transit-Oriented Development Corridors:** Updating zoning and permitting frameworks to incentivize high-density, mixed-use development around stations or high-frequency bus corridors.
- **Capacity for Integrated Land use Control**: Possibly with new municipal by-laws or an enabling act from the regional government to tie building permits, density bonuses or exactions to CIP-identified corridors.

Integrating Transport and Land use Planning

At this stage, cities should strengthen the integration of transport and land use planning by using more robust data on ridership, real estate trends, and population densities to guide investment decisions. Environmental and social criteria are also incorporated to help sequence projects based on accessibility, equity, and sustainability goals. Planning tools—such as spatially-informed Capital Investment Plans (CIPs)—can support this process by identifying corridors where land value capture is |most viable and by aligning infrastructure upgrades with development priorities.

5.2.4. Considerations and Approaches to Finance Sustainable Mobility Investments for Stage 2

At this intermediate stage, cities have established a basic CIP and improved OSR and financial management systems. They are ready to diversify into more sophisticated land-based and non-land revenue instruments while reinforcing expenditure oversight and ensuring CIP-based budget allocation. The table below outlines financial instruments, expenditure mechanisms, and planning considerations most suitable for different sustainable mobility interventions. Full details on each instrument's advantages, disadvantages, enabling conditions and global case studies are available in Annex I.

Table 3. Sustainable Mobility Interventions for Stage 2.

Sustainable Mobility Interventions	**Financial Instruments**		**Key Planning / Enabling Elements**
	Capital Investment	**Recurrent Commitments**	
Road & Multi-Modal Upgrades (major corridors, safer intersections, partial BRT lanes)	- **Betterment Charges** (one-time charges on benefiting landowners).	**- Fuel Taxes / Vehicle Taxes and Fees/ Sales Tax** (if legislation allows) funnel revenue into corridor upkeep.	- **Refined CIP.** Includes corridor-level data on traffic, safety and land value increments.
	- **Exaction and impact fees** (charges on developers offsetting public costs): Property owners benefiting from corridor improvements can be charged.	- **Dedicated Transport Fund** (eg. Road funds) covers routine maintenance & expansions.	- **Intermediate Land use Reforms:** Encourage mixed-use near upgraded corridors.
	- **Sale of Development Rights:** Where higher density is permissible.		- **Legal Authority:** Formalise exactions or betterment fees; adopt local ordinances enabling these LVC tools.
	-**Land Readjustment:** Pooling and reorganising land parcels along transport corridors to support infrastructure development and value capture.		

Non-Motorised Transport Networks (connected bike lanes, pedestrian zones integrated with transit)	- **Exaction and Impact Fees:** New commercial or residential developments must fund or build NMT facilities.	- **Exactions and Impact Fees** (for sidewalk and cycle lane upkeep)	- **TOD Integration:** NMT routes planned around transit hubs for maximum intermodal connectivity.
	- **Land Leasing / Public Land Sales** (transferring public land rights) in some corridors can generate capital for large-scale pedestrian improvements.	- **Sales Taxes** (if earmarked for sustainable transport projects).	- **Spatially Informed CIP:** Identify areas with high pedestrian volumes or potential for mode shift.
	- **Local Sales Tax** (if legally permissible): A portion earmarked for capital outlays or safety improvements.	- **Congestion Charges and road Pricing** (if feasible) can cross-subsidize NMT expansions.	- **Institutional Set-Up:** Possibly a specialized NMT unit under a larger mobility department.
		- **Dedicated Transport Fund** (eg. Road funds)	
Public Transport Expansions (enhanced BRT, partial rail, improved stations)	- **Betterment charges, Exaction and Impact Fees, or Land Leasing** near stations to fund capital-intensive improvements.	- **Fare Revenues:** Strengthened by integrated ticketing or modern fare collection.	- **Comprehensive TOD Plans:** Zone around stations to capture density & property value increments.
	- **ODA** (e.g., dev. Banks, climate funds) if city demonstrates CIP-driven revenue continuity.	- **Advertising & Voluntary Contributions** at stations can offset O&M.	- **Mid-Level Land use Controls:** Condition building permits on developer co-funding for station amenities.
	- **Sale of Development Rights** near prime stations for near station hubs, capturing high property values.		
	- **Land Readjustment:** Aligning land reorganisation with transit-oriented development (TOD) to enhance accessibility and revenue generation.		
Advanced Traffic Management & Moderate ITS (city-wide signal upgrades, real-time info, integrated fares)	- **Exaction and Development fees** on new real estate projects reliant on advanced traffic solutions (e.g., integrated fare systems).	- **Toll Revenues & Congestion Charges and Road Pricing: I**f politically feasible, revenue can maintain advanced systems.	- **Coordinated CIP:** Combine advanced signal or fare projects with corridor expansions or parking reforms.
	- **ODA** (e.g., dev. Banks, climate funds) if city demonstrates CIP-driven revenue continuity.		- **Institutional Data-Sharing:** Collaboration among transit agencies, police and public works.
			- **Legal Tools:** Local laws ensuring city can manage sensor/data governance.

5.3. Stage 3: Leveraging External Finance

In Stage 3, local governments have stronger institutional capacity, a robust OSR base (including land value mechanisms) and a mature transport planning framework for identifying and prioritising high-impact mobility investments. The city is now positioned to access large-scale external finance including PPPs, municipal bonds or international loans and manage these instruments effectively. At this advanced stage, institutional coordination mechanisms are well-defined in terms of land use, municipal finance, and urban mobility planning, ensuring alignment between land use and transport planning, financial management and regulatory oversight. Some cities might opt for a dedicated Urban Mobility Authority (UMA) to consolidate key functions, while others achieve similar results through strengthened inter-agency coordination, metropolitan councils, or transport-focused departments. The goal is to scale up sustainable mobility while maintaining fiscal and operational sustainability.

5.3.1. Finance Dimension

Cities that have strengthened their creditworthiness through OSR optimisation, structured expenditure frameworks, and coherent transport planning strategies are better positioned to access external financing on favourable terms. A robust financial profile—built on predictable revenue streams, transparent budgeting, and alignment between investment planning and urban mobility priorities—reduces investor risk, making PPPs, municipal bonds, and development bank loans more viable for large-scale projects. This, in turn, enhances a city's ability to negotiate favorable terms, manage implementation risks, and oversee complex infrastructure partnerships with greater confidence and institutional control.

Public-Private Partnerships (PPPs)

A PPP is a long-term, contractual arrangement whereby a private sector entity designs, builds, finances and/or operates public infrastructure or services in return for financial remuneration, either through user charges, government payments or a combination of both (World Bank, 2017). The primary goal is to share risks, responsibilities and rewards between the public and private sectors, potentially allowing local governments to access capital, technical expertise and innovation that might otherwise be out of reach:

- **Risk-Sharing**: Private sector participation in rail expansions, BRT corridors or advanced NMT networks becomes more viable when municipalities can provide stable revenue assurances, such as guaranteed OSR backing, earmarked user fees or structured co-financing arrangements. A predictable financial framework reduces investor risk, increasing the likelihood of successful PPPs and long-term private sector engagement

- **Better Deal Terms**: Improved credit ratings and a well-run CIP help local governments negotiate better concession agreements, lowering borrowing costs or user fees.

Bonds and Other External Finance Instruments

Cities that have strengthened their financial management and institutional capacity through foundational reforms (e.g., OSR optimisation, revenue-expenditure alignment, and investment planning) are better positioned to access external financing mechanisms. Improvements in own-source revenue not only enhance municipal creditworthiness but also increase the repayment potential of borrowing, making cities more attractive to investors and lenders. These conditions allow local governments to begin issuing municipal bonds (including green or climate bonds) or to access preferential loans from development banks to finance large-scale mobility investments, such as metro expansions, integrated multimodal hubs, or station-area redevelopments.

5.3.2. Expenditure Dimension

Institutional Coordination at Scale

Cities must ensure that large-scale mobility investments are managed efficiently. Some cities establish an Urban Mobility Authority with delegated financial and regulatory powers, while others strengthen existing governance structures through formalised inter-agency coordination frameworks. Regardless of the model, institutional coordination should focus on the following priorities:

- **Revenue Consolidation**: A well-coordinated mobility agency or inter-agency framework ensures that sources of revenue such as congestion charges, fare revenue and LVC funds are allocated efficiently to sustain operations.

Examples of PPPs and Bonds in Developing Countries

Cities with solid credit profiles and cohesive CIPs are better positioned to leverage PPPs or bonds for large-scale mobility. In Santiago, Chile, PPP concessions financed a 210-km network of modern toll expressways, transferring construction risks to private operators while introducing innovations in tunnelling and electronic tolling. Vietnam's Pham Van Dong Road in Ho Chi Minh City used a Build-Transfer model: the private contractor built vital road infrastructure and was compensated with public land, lowering the city's immediate fiscal burden. However, strong oversight was needed to avert undervaluation of land assets.

Regarding bonds, 1990s Poland leveraged municipal issuances for roads and public transport. Cities like Gdynia and Kraków raised funds for bus fleets and tram expansions by issuing local bonds, backed by transparent financial reporting. Additionally, Kuala Lumpur has used sukuks (sharia-compliant bonds) to finance major MRT corridors, phasing repayment through projected fare revenues. These examples show how high-capacity municipalities, fortified by ring-fenced revenues and a well-run CIP, can access large pools of capital to transform urban mobility (for references and more detailed descriptions of these cases, see Annex I).

- **Coordinated Expenditure**: Ensures that capital investments align with CIP priorities and financial sustainability strategies
- **Outsourcing or PPP Management**: It can more effectively oversee private operators, monitor performance metrics (e.g., ridership, user satisfaction) and enforce service standards.
- **Life Cycle Management**: With a stable revenue system and high institutional capacity, the city can more confidently commit to refurbishment, expansions and system upgrades, closing the feedback loop on CIP-lifecycle planning.

5.3.3. Planning Dimension

Advanced Integration of Land use and Transport

Now that the city possesses advanced institutional coordination structures and an integrated spatial CIP, it can systematically manage:

- **High-Impact TOD Corridors**: Stimulating new mixed-use districts around rail lines or major BRT stations, capturing added land value to fund expansions or station enhancements.
- **Equity-Focused Growth**: Directing advanced TOD or station area improvements to historically underserved neighbourhoods, ensuring affordable housing near transit and offering last-mile connectivity solutions.
- **Planning Frameworks**: This would allow to secure land for public amenities and sustainable mobility systems

5.3.4. Considerations and Approaches to Finance Sustainable Mobility Investments for Stage 3

At the advanced stage, cities with demonstrated capacity in financial management, municipal budgeting, transport planning, and infrastructure asset management are better positioned to leverage high-value instruments such as municipal bonds, PPPs, and loans for large-scale mobility expansions. Effective governance structures, such as an Urban Mobility Authority, ensure these projects remain financially sustainable and aligned with compact urban growth. The table below outlines financial instruments, expenditure mechanisms, and planning considerations most suitable for different sustainable mobility interventions. Full details on each instrument's advantages, disadvantages, enabling conditions and global case studies are available in Annex I.

Table 4. Sustainable Mobility Interventions for Stage 3.

Sustainable Mobility Interventions	Capital Investment	Recurrent Commitments	Key Planning / Enabling Elements
Comprehensive Urban Mobility Systems (metro lines, city-wide BRT expansions, integrated station redevelopment)	- **Bonds and Loans:** Supported by strong foundational reforms that improved financial credibility.	- **Integrated Fare Systems yield predictable revenue** (distance/time-based passes)	**Effective Governance and Implementation Capacity:** UMA or similar bodies oversee fare policy, ring-fence land value capture, negotiate PPP terms, and enhance the city's ability to manage construction projects and oversee large-scale implementation.
	- **PPPs**: Private co-financing for major rail or BRT expansions, with risk-sharing agreements.	- **Dedicated UMAs or SPVs** can manage cross-subsidies between modes (bus, rail, NMT).	- **Sophisticated Spatial Planning Tools:** Multi-year expansions are phased by station or corridor using advanced cost modelling and spatial prioritisation.
	- Large **Land Sales or Leasing** near station hubs capturing high-value increments.		- **Regulatory Certainty:** Clear laws for bond issuance, PPP procurement and public transparency.
	- **Tax Increment Financing (TIF)** *(surtax on property value increments in designated areas)* if legal framework supports it.		
	- **Employment Taxes** *(levies on wages)* can fund large network expansions if permissible.		
	- **Land Readjustment:** Large-scale land pooling to optimise transport corridors and capture rising property values for reinvestment		
High-End ITS / Tech Ecosystems (city-wide management center, integrated e-ticketing, mobility-as-a-service platforms)	- **Bonds**: For major data centers, control rooms and hardware.	- **Congestion charges and Road Pricing:** Dynamic pricing can partially fund system upgrades.	- **Lifecycle IT Management**: CIP plans for hardware renewals, staff training and upgrades.
	- **ODA** (Global Climate / Smart City Funds): Donor institutions may support advanced low-carbon or big-data solutions if CIP indicates measurable benefits (e.g., emission reduction).		- **Unified Payment Platforms:** Single pass or app for multi-modal integration, overseen by the UMA.
			- **Institutional Data Architecture**: Collaboration across police, utilities and transit agencies to ensure real-time data flow.

Extensive NMT Expansions (large pedestrian zones, cycle superhighways, integrated micro-mobility solutions)	- **PPPs** for large bike-share networks (private partners invest in docking infrastructure).	- **Congestion Charges / Parking Revenue** heavily earmarked for NMT expansions and maintenance.	- **Advanced Urban Form Integration:** CIP merges new NMT corridors with high-density or tourist districts.
	- **Public Land Sales / Land Leasing** in prime areas can fund wide-scale pedestrian improvements or superhighways.	- Dedicated **Cross-subsidies for NMT**: merges user-fee surpluses (high-ridership corridors) with targeted subventions to NMT.	- **Equity-Oriented:** Target expansions to underserved areas.
			- **High Public Engagement:** Maintain community support for large pedestrian zones or car-free initiatives.
Major Road/Regional Linkages (high-capacity arterials with environmental protections, ring roads with integrated BRT corridors)	- **Bonds** for large-scale road expansions that include BRT or bus lanes.	- **Expanded Toll Systems or Vehicle Taxes** can finance O&M.	- **Comprehensive Regional CIP**: Must address cross-jurisdictional corridors, environmental protections (GHG emission zones, biodiversity).
	- **PPP** frameworks for road expansions featuring multi-modal integration (e.g., built-in bus corridors or park-and-ride hubs).	- **Fuel Taxes** *(levies on fuel)* can subsidize advanced maintenance or expansions.	- **UMA or Regional Transport Authority:** Harmonises toll policy, enforces BRT-lane governance.
	- **TIF** possible if corridor property values expected to rise significantly.		- **Environmental Safeguards:** Possibly link expansions to greenhouse-gas reductions or reforestation requirements.
	- **Employment Taxes** for metropolitan expansions.		

5.4. Local Infrastructure Finance Framework for Sustainable Mobility

UN-Habitat's **Local Infrastructure Finance Framework (LIFF)**, the logic of which underpins the incremental financial approach elaborated in this chapter, highlights a critical lesson: not all financing instruments are equally suitable across varying city contexts. The choice of financial instruments for sustainable mobility projects must carefully consider two fundamental criteria: project profitability and the local government's creditworthiness. These two variables were strategically selected because they effectively capture the interplay between a city's capacity to sustain more complex but potent sources of finance, including LVC and external finance (creditworthiness) and the inherent ability of infrastructure projects to generate revenues or realize cost savings (project profitability).

Local governments with limited creditworthiness should first concentrate on improving their existing financial capabilities, primarily through optimizing OSR, enhancing fiscal discipline, and aligning intergovernmental transfers with strategic investment priorities. Attempting to leverage advanced financial instruments, such as PPPs or bonds, without these fiscal and institutional reforms often proves counterproductive. For instance, research indicates that only 10% of infrastructure projects classified as 'bankable' in Africa successfully achieve financial close, while around 80% fail at the feasibility and business-plan stage. The associated high costs of project preparation, which frequently exceeding 10% of

total project costs, underscore the importance of this incremental approach.

Figure 5 illustrates how the incremental approach developed in this paper relates project profitability (vertical axis) with municipal creditworthiness (horizontal axis). The figure depicted above demonstrates how sustainable mobility interventions can be systematically matched with appropriate financial instruments based on a city's creditworthiness (which serves as an indirect indicator of institutional and fiscal capacity) and the specific project's revenue or cost-saving potential.

Non-motorised transport interventions typically have limited direct revenue-generating capacity, making foundational financing sources such as grants and optimised OSR their primary funding mechanisms across all the stages/creditworthiness ratings. Nevertheless, given the critical role of NMT within inclusive and comprehensive urban mobility systems, it is crucial that these interventions benefit from cross-subsidisation from higher-revenue-generating projects, such as public transport and road safety initiatives.

More profitable projects provide greater opportunities to leverage increasingly sophisticated financing tools as cities progress along the incremental financial pathway outlined in this chapter, enhancing their fiscal and institutional standing. Ultimately, this structured approach ensures that revenues from financially viable infrastructure strategically support essential, yet inherently less viable, components of a sustainable urban mobility network, a principle fundamental to the successful implementation of sustainable urban mobility systems.

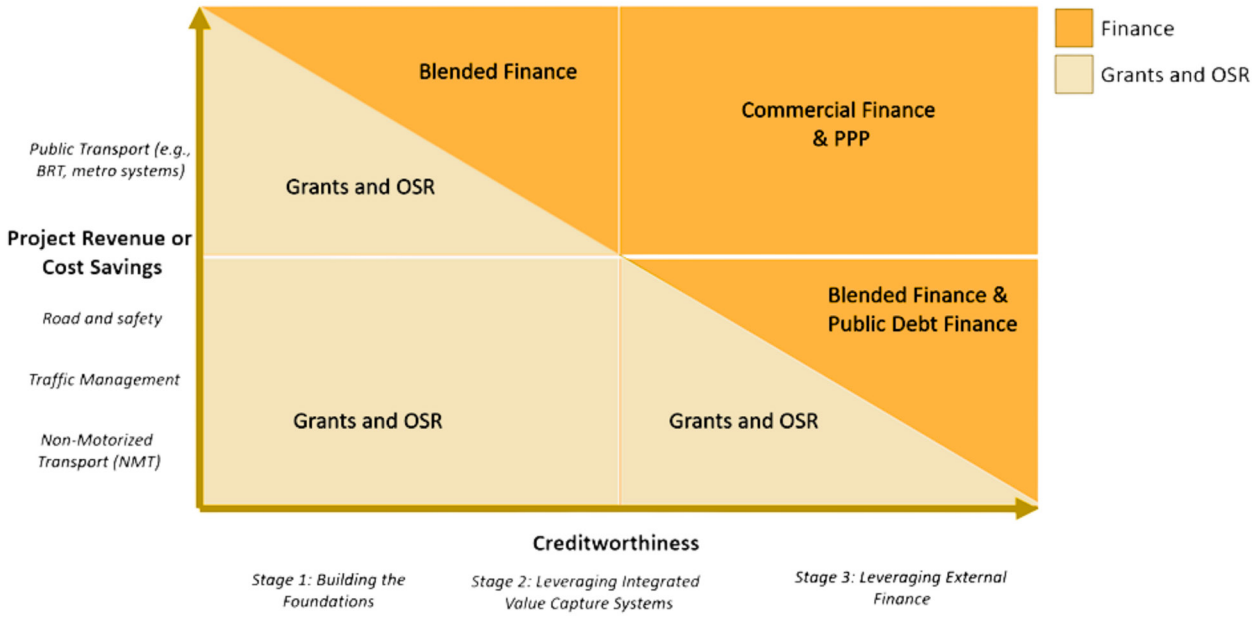

Figure 5. Local Infrastructure Finance Framework for Sustainable Mobility Rapid Transit Systems.

6

Conclusion

Sustainable urban mobility is central to creating inclusive, vibrant and climate-resilient cities. By reducing congestion, lowering emissions and improving accessibility to jobs and services, well-designed transport systems serve as a catalyst for broader urban transformation. They stimulate local economies, enhancing public health and revitalizing neighbourhoods. Yet, many cities in developing countries grapple with fragmented governance, weak revenue collection and limited capacity to plan, finance and manage essential transport infrastructure. These challenges are further compounded by alarmingly high road traffic fatality rates, particularly in low- and middle-income contexts, emphasizing the urgent need for safer, more sustainable transport solutions.

This report emphasizes the interdependence of urban form, financial sustainability, and governance structures in fostering equitable and effective transport systems. An integrated approach that aligns mobility planning with financial frameworks, institutional reforms and land use strategies is essential for sustainable urban growth. Strengthening coordination between urban planning and finance enables cities to optimise investment decisions, reduce inefficiencies and maximize long-term value creation by ensuring that the economic benefits generated by urban mobility investments are effectively captured and reinvested. Leveraging integrated approaches (e.g., TOD, land value capture mechanisms, and spatially informed CIP) can unlock economic and financial opportunities by linking transport investments to broader land use and fiscal strategies. First, aligning urban mobility initiatives with national or international development goals can open doors to grants and technical support, reducing the burden on local budgets. Next, integrating urban growth strategies through compact development and TOD allows cities to generate stable revenue streams from rising property values, which can be reinvested in transport improvements. Lastly, well-structured revenue and expenditure management mechanisms ensure that transport-related revenues directly support public transport, non-motorised infrastructure, and high-priority projects, rather than being absorbed into general accounts.

Strong institutional coordination among transport, finance, land use and infrastructure agencies is essential for aligning policies and investments in sustainable mobility. In some cases, lead urban transport authorities help overcome institutional fragmentation by centralizing oversight of these functions. However, the key is not centralization itself but the establishment of robust inter-agency frameworks or regional and municipal coordination mechanisms. Ensuring that decision-making structures integrate transport planning with financial management is fundamental to securing long-term, sustainable investment in urban mobility.

Capital Investment Planning is pivotal in this process, offering a multi-year, spatially informed roadmap that clarifies how and when specific investments should be made, how they will be financed, and how operational and maintenance costs will be covered over time. By embedding financial forecasting within urban planning, cities can avoid budget shortfalls and direct funds where they have the greatest impact, particularly in underserved neighbourhoods.

A gradual and incremental approach to financing provides cities with a structured roadmap for reform, ensuring that financial and institutional capacity evolves alongside mobility investments. Early steps should focus on strengthening municipal financial management systems, improving coordination between planning and finance departments, and establishing earmarking mechanisms to prioritise urban mobility investments. As cities advance, leveraging LVC mechanisms alongside a spatially informed CIP allows for better alignment of financial resources with long-term urban mobility strategies, ensuring that transport investments generate

sustainable revenue streams and maximize economic returns. Strengthening institutional coordination among transport, finance, and land use agencies is also key to optimizing funding flows and sequencing investments more effectively.

In later stages, cities with stronger financial systems and improved creditworthiness can access larger-scale financing mechanisms, including PPPs, municipal bonds, and climate-aligned funding, which enable transformative investments such as metro systems, BRT, and multimodal transport hubs. However, successfully leveraging these tools requires robust local revenue generation, sound expenditure management, and well-integrated planning frameworks that enhance financial sustainability. By progressively strengthening fiscal management, improving institutional coordination, and embedding transport planning into broader economic and land use strategies, cities can transition from fragmented, short-term funding approaches to resilient, long-term financing solutions that support sustainable, inclusive, and climate-responsive urban mobility systems.

ANNEXES

Annex I: Financial Instruments to Fund Sustainable Urban Mobility Systems

This annex provides an overview of specific finance instruments that can be used to pay for urban mobility investments. Although comprehensive in scope, it does not discuss every single potential financing instrument (e.g., market and business license fees, which can have a considerable importance in developing cities). It covers the **instruments most typically used to finance urban mobility interventions,** whether by local governments, urban mobility authorities or other relevant public or semi-public entities responsible for urban mobility infrastructure and operations. It includes brief descriptions of each tool, the main advantages and disadvantages, a comprehensive list of requirements that should be met before considering employing them and several case studies to illustrate the tools' real-life applications, focusing on developing contexts. Apart from fully operational schemes, among the cases there are a few time bound pilots and documented proposals.

The structure of the chapter follows the categorization of local government revenue sources proposed by UN-Habitat in its *Finance for City Leaders Handbook* (2017). Revenue sources are generally divided into two broad categories: internal or own-source revenue and external revenue and finance. A third category is included in this report to account for grassroot and civil society initiatives.

Own Source Revenues

Own-source revenues (**OSR**) are funds directly collected and managed by a municipal government without external dependency. This means that **municipalities have the discretion to allocate these funds** according to local priorities. They become the main source of local financial resources once national governments devolve tax collection and service provision responsibilities to lower administrative levels and, in parallel, limit the amount of transfers. Consistent OSR provide an essential foundation for local governments to leverage external finance.

OSR can be further thought of in terms of: **land-based revenue** tools and **non-land revenue** tools.

Land Revenue

Land revenue refers to land value capture (LVC) and land-based finance mechanisms. This section builds upon UN-Habitat and Global Land Tool Network's *Leveraging Land: Land-Based Finance for Local Governments – A Reader* (2016), while the framework and categorization of LVC instruments used align with those outlined in the World Bank's *Financing Transit-Oriented Development with Land Values* (2015).

As mentioned in the corresponding box, LVC is the process by which governments capture a portion of the increased value of land resulting from public investments, such as transport infrastructure, and use those funds to finance further development. LVC mechanisms are particularly suitable for infrastructure-heavy projects, such as transit corridors, new metro lines or pedestrian and cycling paths, where enhanced accessibility and connectivity significantly raises nearby property values.

LVC mechanisms may be grouped into two categories: **tax- and charge-based mechanisms,** which includes mechanisms such as property taxes and betterment charges and **development-based approaches**, such as the sale of development rights, public land sales and leasing.

Tax-based mechanisms rely on ongoing or incremental levies on property value increases. The most common land-based finance tool is the property tax. Most local governments worldwide rely, at least in part, on property taxation (UN-Habitat, 2009). Property tax is also typically the most lucrative local revenue source. **Property and land taxes** provide stable long-term revenue. In contrast, charge-based mechanisms, such as **betterment charges** target specific beneficiaries

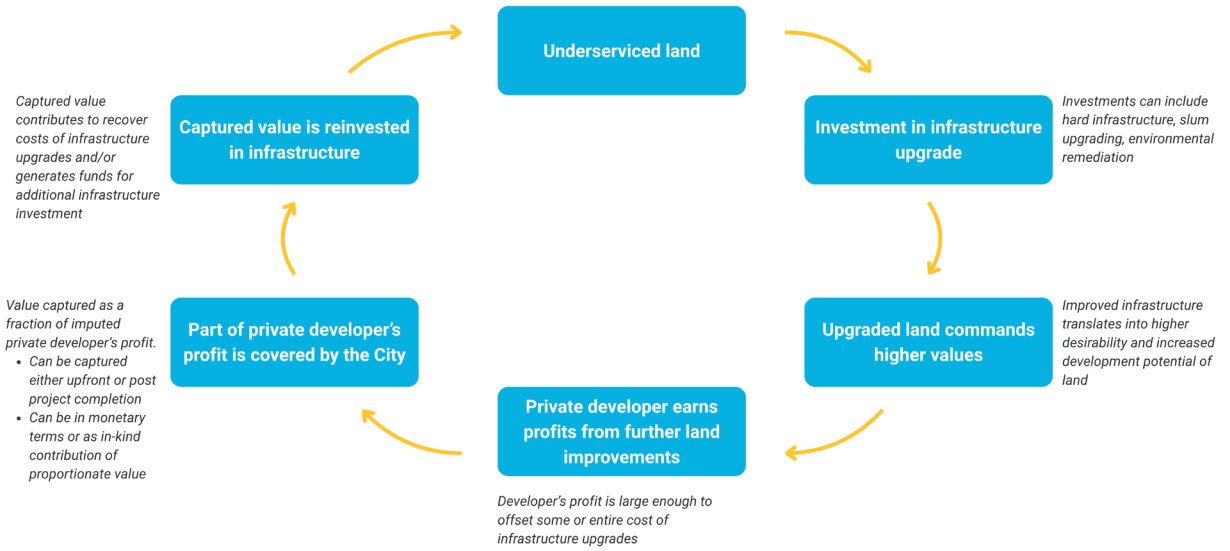

Figure 6. Process of Capturing Land Value.

to recover upfront construction costs, making them ideal for infrastructure improvements, transit-oriented developments and localized improvements. **Transfer taxes and stamp duties**, levied during property transactions, can generate significant one-time revenues, particularly in areas experiencing rapid development or increased property turnover due to improved connectivity. Tax Increment Financing (TIF), on the other hand, allocates future tax revenue increases to fund current infrastructure investments, aligning financial returns with project success.

Development-based approaches involve direct financial transactions or contributions tied to land use and development activities. **Developer exactions,** which require developers to contribute funds, land or infrastructure as part of project approvals, directly tie private investments to public mobility needs. **Land readjustment** reallocates and consolidates parcels to optimise land use, with landowners contributing a portion of their land or its increased value to finance public infrastructure improvements. The **sale of development rights** allows governments to grant higher-density construction permissions in exchange for payment, providing substantial upfront capital for large-scale infrastructure projects. Public **land sales** involve the outright transfer of publicly owned land to private entities, generating immediate revenue, while **land leasing** retains public ownership, allowing governments to earn recurring income over time.

Non-land Revenue

Non-land revenue refers to financial resources generated by municipalities from activities and assets not directly tied to land ownership or value. This can include **user charges and fees** and **other types** of non-land based revenue.

User charges are fees collected directly from individuals or businesses in exchange for the use of municipal services or infrastructure. These charges are critical for ensuring the financial sustainability of urban mobility systems, as they link service provision directly to its beneficiaries. In this report, user charges are explored through mechanisms such as **public transport fares**, which fund the operation and maintenance of bus or metro networks and road tolls, used for both financing new road construction and maintaining existing infrastructure. Additionally, **congestion pricing** schemes are highlighted as effective tools to manage demand while generating revenue. **Parking fees** are another key instrument, often tied to efforts to reduce car dependency and promote more sustainable transport modes.

User charges are particularly suitable for the operations and maintenance phase of mobility projects, ensuring that infrastructure remains functional and efficient while incentivizing sustainable travel behaviour. They also provide an opportunity to engage the private sector, as seen in public-private partnerships where user charges help recover investment costs.

Other types of non-land based revenue include mechanisms such as **advertising** revenues (e.g., funding urban infrastructure by allowing private companies to advertise on bus shelters or transit vehicles), **voluntary contributions** from businesses for urban mobility projects and **fines** for traffic violations as a sustainable funding source for transport infrastructure maintenance. These instruments are particularly suitable for smaller-scale urban mobility initiatives, such as enhancing non-motorised transport systems, improving pedestrian walkways or maintaining public transit infrastructure.

These non-land revenue mechanisms are complemented by various taxes that municipalities can levy to generate consistent and scalable funding for urban mobility initiatives. **Sales taxes,** imposed on the purchase of goods and services, are a reliable source of revenue that can be allocated to operational and capital investments such as transit system expansions or maintenance projects. **Fuel taxes**, collected per unit or as a percentage of fuel costs, are often earmarked for road maintenance, public transit subsidies and non-motorised transport infrastructure, while also serving as a tool to discourage private vehicle use and promote environmental sustainability. **Vehicle taxes**, calculated based on ownership, engine capacity or emissions levels, provide targeted funding for road infrastructure improvements and encourage the adoption of cleaner technologies. Similarly, **employment taxes**, typically a payroll-based levy, are sometimes designated for large-scale public transit systems like metro or BRT networks, offering financial stability for these vital services. In recent years, some municipalities have experimented with **tourist taxes** to pay for the added strain that visitors place on local transport networks and to finance last mile mobility improvements in popular tourist districts.

External Revenue and Finance

Concerning local government external revenue, it refers to **financial resources that municipalities receive from sources beyond their immediate jurisdiction**. Unlike own-source revenues, which are generated and managed directly by municipalities, external revenues are obtained through transfers, grants, loans or contributions from national or regional governments, multilateral institutions, private sector investments or international aid. These funds typically supplement local resources and are often earmarked for designated projects or purposes, incorporating clauses related to performance, accountability or compliance with specific standards. External revenue plays a crucial role in enabling municipalities to finance large-scale infrastructure projects, address funding gaps and undertake initiatives that exceed their financial capacities.

Intergovernmental transfers are often the first and most straightforward form of external revenue municipalities receive. These transfers play a vital role in financing urban mobility initiatives, even in developed or industrialized countries, where they remain a cornerstone of municipal funding. They are particularly critical for initiating large-scale capital investments, such as constructing metro systems, highways or BRT networks.

On the other hand, instruments involving the private sector, such as public-private partnerships (**PPPs**) and municipal **bonds**, are advanced mechanisms that should be explored only after municipalities have maximized their own-source revenues through robust collection efforts, enforcement and the integration of digital technologies. These tools require a well-developed internal framework, including strong financial management and debt-handling capabilities.

Lastly, Official Development Assistance (**ODA**), while not as directly tied to long-term financing as the aforementioned mechanisms, plays a crucial enabling role. ODA is often used to fund assessments, feasibility studies and capacity-building initiatives that pave the way for larger investments. Additionally, it frequently provides seed capital for environmentally sustainable and socially inclusive mobility projects, particularly in developing countries. These early-stage interventions often target planning, pilot programmes or the introduction of innovative technologies, creating the foundation for scaling up sustainable urban mobility systems.

Community and Grassroots Approaches

The inclusion of community and grassroots revenue sources in this report highlights the growing importance of **participatory financing mechanisms** that directly engage citizens, local organisations and businesses in funding urban mobility initiatives. These sources represent a shift towards more localized and inclusive financing approaches, empowering communities to contribute actively to their infrastructure development while fostering a sense of ownership and accountability.

Community and grassroots revenue sources include two primary instruments: i) crowdfunding and ii) microfinance and asset financing.

Crowdfunding enables local governments and civil sector organisations to raise funds for specific projects by soliciting small contributions from a broad base of supporters, often through online platforms. This mechanism is particularly effective for smaller-scale or pilot interventions such as launching non-motorised transport schemes. **Microfinance and asset financing,** in turn, involve providing small-scale loans or lease-to-own schemes to individuals or groups, enabling them to acquire mobility-related assets such as bicycles, motorcycles or electric vehicles. This tool has been particularly transformative in creating sustainable livelihoods and improving access to mobility in underserved areas.

Table 5. Financial Instruments to Fund Sustainable Urban Mobility Systems.

INSTRUMENT	DEFINITION	ADVANTAGES	DISADVANTAGES	CASE STUDIES
OWN-SOURCE REVENUE				
LAND REVENUE				
Land and Property Taxes	Recurring taxes based on land value or attributes, or the value of immovable improvements.	Reliable revenue stream, encourages effective land use, promotes sustainable uses.	Can disproportionately affect low-income property owners, complex valuation, discourages property investment, burdens asset-rich but cash-poor owners.	Argentina, Mexico, South Africa
Transfer Taxes and Stamp Duties	Charges for recording land title transfers.	Fair distribution of tax burdens, moderates real estate market, simplicity, encourages long-term property ownership.	Discourages property transactions, inefficiency, unpredictable revenue.	India, United States
Betterment Charges	One-time charges for infrastructure improvements, assessed to benefiting landholders.	Reliable revenue, equitable funding, cost-benefit linkage, minimal fiscal impacts.	Restricted applicability, potential social inequity.	Ecuador, India
Tax Increment Financing (TIF)	Surtax on property value increments in designated areas to finance redevelopment projects through municipal bonds.	Increases tax revenues, minimal fiscal impact, risk distribution, encourages redevelopment.	High transaction costs, repayment risks, districting issues, unnecessary investments, lengthy timeline.	Scotland, United States
Sale of Development Rights	Payments for permission to develop land at higher density or for changed use, sometimes transferable or auctioned.	Revenue source with minimal fiscal impact, property value improvements, city-owned land retention, flexible execution.	Restricted applicability, potential for social inequity.	Brazil, China, India

Public Land Sales	Converts public land to cash through sales to the private sector, generating significant one-time revenue.	Provides upfront capital, simplifies administration, increases market efficiency, removes future liabilities.	Loses future control, transparency issues, non-recurring revenue, expensive reacquisition.	China, South Africa, Turkey
Land Leasing	Leasing publicly owned land to private entities for long-term development, allowing reversion to public control.	Generates long-term revenue, retains public control, market-flexible terms, facilitates development.	Requires strong administrative systems, undervaluation risk, less liquidity, complex management of lease terms.	China, Ethiopia
Exactions and Impact Fees	One-time charges imposed on developers to offset the public costs of new developments, such as infrastructure or social improvements.	Targeted funding, growth pays for growth, mitigates negative externalities, can discourage overdevelopment.	Can increase development costs, deter investments, requires administrative capacity, risk of legal challenges.	Chile, Guatemala, United States
Land Readjustment	Pooling and redistributing land parcels to facilitate public improvements and optimise land use, while returning equivalent value property to original owners.	Self-financing, minimizes displacement, optimises land use, improves public spaces and infrastructure.	Complex process, high administrative costs, risk of inequity, potential resistance from landowners.	Japan, Colombia, India
NON-LAND REVENUE				
Sales Taxes	A consumption tax on goods and services, collected at the point of sale, often earmarked for public services like transport infrastructure.	Reliable revenue stream, proportional to spending habits, supports public services.	Regressive impact on low-income individuals, susceptible to economic downturns.	Mexico, Morocco
Fuel Taxes	Levies imposed on the sale of fuel products, used to fund transport infrastructure and promote sustainable energy consumption.	Encourages reduced fuel consumption, lowers emissions, steady revenue source.	Financial burden on low-income households, risk of tax evasion or fuel adulteration.	Colombia, Kenya
Vehicle Taxes and Fees	Charges on vehicle ownership or use, including registration fees, annual taxes, or emissions-based taxes.	Promotes adoption of eco-friendly vehicles, direct revenue from vehicle owners.	Burdens low-income individuals, may deter vehicle ownership in underserved areas.	Morocco, Philippines

Employment Taxes	Levies on wages paid by employers and employees, funding public services like transportation infrastructure.	Stable revenue source, progressive structure reduces inequality.	May increase labour costs, burdens low-income workers, administrative complexity for small businesses.	Brazil, France
Tourist Taxes	Charges on visitors, typically applied to accommodation or tourism services, to fund public services and infrastructure.	Generates dedicated revenue, shifts costs to visitors, supports sustainable tourism.	May reduce tourist demand, revenue volatility, opposition from businesses.	Italy, Spain
Fines	Monetary penalties for traffic violations, providing funds for urban mobility improvements while encouraging compliance with safety and environmental laws.	Deters unlawful behaviour, provides steady revenue, relatively low collection costs.	Disproportionate impact on low-income individuals, risk of public dissatisfaction if poorly managed.	Vietnam, United Kingdom
Voluntary Contributions and Advertisement	Contributions from private entities or advertisement contracts that support public infrastructure without direct return on investment.	Reduces government burden, fosters public-private collaboration, simple agreements.	Uneven funding distribution, excessive advertising reduces urban aesthetic, private motives may misalign.	India, Kenya, Romania
USER CHARGES				
Congestion Charges and Road Pricing	Fees imposed on vehicles during peak times or in high-congestion areas to manage traffic and encourage alternative transport modes.	Reduces congestion, lowers emissions, generates revenue for public transport.	High setup costs, potential public resistance, equity concerns for low-income drivers.	Colombia, Indonesia, Singapore
Parking Charges	Fees for using on-street or off-street parking spaces, used to manage urban congestion and fund public infrastructure projects.	Steady revenue source, reduces vehicle use, improves urban land use.	Public resistance, potential impact on businesses, initial setup and maintenance costs.	China, Mexico
Public Transport Fares	Fees paid by users for accessing public transit services, contributing to operational and maintenance costs.	Direct funding from users, encourages operational efficiency, tiered pricing possible.	Public resistance to fare increases, insufficient to cover all costs, may reduce accessibility.	Brazil, Colombia

EXTERNAL REVENUE AND FINANCE				
Intergovernmental Transfers	Funds allocated by higher levels of government (national or regional) to local governments, often earmarked for specific projects like transportation or infrastructure.	Reliable revenue source, supports equity among regions, reduces local fiscal disparities.	Dependency on higher government, lack of autonomy in fund usage, unpredictable revenue flows.	Brazil, Mexico
Public-Private Partnerships (PPPs)	Collaborative agreements where private sector entities finance, build and/or operate public infrastructure or services in exchange for long-term revenue opportunities.	Shares risks and costs, promotes innovation, leverages private expertise, reduces public burden.	Complex to negotiate, risk of unequal benefits, long-term commitments, potential lack of transparency.	Chile, South Korea, Vietnam
Bonds	Debt instruments issued by local or national governments to raise capital for infrastructure projects, repaid with interest over time.	Provides significant upfront capital, suitable for large-scale projects, spreads costs over time.	Requires strong credit rating, risk of default, long-term debt obligations, high interest costs.	Benin, Kenya, Malaysia, Poland, Rwanda
Official Development Assistance (ODA)	Financial aid provided by international institutions, governments, or organisations to support development in lower-income countries.	Promotes sustainable development, provides expertise and funding, improves international relations.	Dependency risks, may not align with local priorities, lengthy application processes.	Côte d'Ivoire, Latin America and the Caribbean, Nigeria
COMMUNITY AND GRASSROOTS APPROACHES				
Civil Society Involvement	Participation of NGOs, community-based groups and advocacy organisations in resource mobilization through fundraising, grants and partnerships.	Inclusive, mobilizes alternative funding, fosters trust, tailored to community needs.	Limited capacity, fragmented efforts, lack of technical expertise for large projects.	Tanzania, United States
Microfinance	Small loans or asset financing for individuals or businesses excluded from traditional banking systems, supporting mobility solutions like vehicles or infrastructure.	Promotes financial inclusion, supports entrepreneurship, flexible repayment terms.	Higher interest rates, long-term costs and repayment pressures on low-income groups.	India, Uganda

I.i. Local Government Own Source Revenue

I.i.i. Land Revenue

Tax-based LVC Instruments

Land and Property Taxes

Definition

One of the oldest land-based revenue sources, these are recurring taxes based on an estimate of the value of land or on land attributes and/or based on the value of immovable improvements or on the attributes of the improvements. They are assessed annually and can be collected in instalments. These taxes must follow four principles: i) they should respect local institutions and traditions, ii) they should reflect the current formal and informal land right holdings, iii) maturity of real estate markets should determine the taxable values and iv) local administrative capacity must be carefully considered.

Advantages

- Land and property taxes are a stable and buoyant revenue source. As economic development and/or land values increase in a jurisdiction, revenues also increase
- These taxes incentivise property owners to utilize their land effectively, reducing underutilization and promoting productivity.
- Typically, land and property is owned by wealthier individuals, so this form of tax can be progressive and redistributive.
- Land and property taxation is a very visible form of taxation, which can encourage taxpayers to have more dialogue with governments and request services in exchange for taxes.
- Can encourage more sustainable land uses.

Disadvantages

- Can disproportionately affect low-income property owners.
- Assessing land values accurately can be complex and contentious.
- Can discourage property purchases and investments.
- Can unfairly burden those who are asset rich but cash poor.
- Land and property taxes are often politically unpopular, and it can be difficult to increase rates.

Requirements

- Appropriate enabling legal framework that establishes the authority of municipalities to levy taxes on land and properties, defines taxable items, sets tax rates and outlines the procedures for collection.
- Fiscal cadastre (land registry) that includes all taxable land plots within a jurisdiction, including details about their size, location, ownership and use.
- Appropriate estimate of taxable value (reflecting the market value or income-generating potential of a property). The valuation process needs to be objective, consistent and regularly updated to capture any changes in property value due to improvements or external factors, so revenue losses due to underestimation or public resistance and non-compliance due to overestimation are avoided.
- Administrative ability to manage the entire taxation process, preferably using digital tools for processing tax data, automated billing, online payment options and mechanisms for managing arrears or delinquent payments.
- Public awareness and acceptance that help owners understand their tax obligations, the benefits of paying taxes and how the revenue will be used. This can be accomplished through education campaigns explaining how taxes are reinvested into transport infrastructure, annual reports where governments detail how tax revenues are spent or setting up a transparent appeals process and an effective dispute resolution mechanism.
- Mechanisms for handling non-compliance or delinquency including penalties, interest charges on late payments and property liens.

Cases

In **Buenos Aires**, temporary property tax rate increases were used as a value capture mechanism to finance large-scale urban infrastructure projects. In 1987, Law 23.514 created a dedicated fund—financed via a levy—for a 40-km metro expansion intended to roughly double system capacity. Revenues came from a citywide 5%

add-on to all property-tax bills plus a further 2.4% levy on parcels within a 400-m radius of the planned stations. By 2012, this mechanism had generated approximately US$750 million in revenues. However, other funding sources, such as expressway tolls, betterment contributions and automobile licenses, collectively generated four times the amount raised through property taxes. Despite this, the property tax in Buenos Aires supplies about 8% of municipal revenue and is structured with progressive rate bands tied to assessed values (Smolka, 2013).

In the 2015 revision of its MyCiTi (BRT system) Business Plan, **Cape Town** highlighted that its broad revenue base rests chiefly on property rates plus its apportioned share of the national fuel levy. For the 2014/2015 financial year, property rates generated approximately R5,931 million (around $547.5 million), while the city's share of the fuel levy contributed an estimated R2,003 million (around $184.8 million). In 2012, the municipality set a ceiling: no more than four 4% of property-rate revenues would be available to support MyCiTi's operating budget (Shikukutu, 2018).

In 1989, **Mexicali** (Mexico) implemented a major reform to its property tax system to address inefficiencies, corruption and outdated land valuations. Previously, property values used for taxation were significantly below market prices, leading to low revenue and inequitable tax burdens. The reform shifted to a land only (*Base Suelo*) tax, aiming to reduce speculative holding of vacant urban lots (*baldíos*) and bring under used parcels into development. By modernizing the cadastral system with updated mapping and valuations, the reform aimed for greater accuracy and transparency in property assessments. Community involvement was key to the reform's success. A Cadastral Council, comprising residents, business owners and industry representatives, helped ensure fairness in property valuations, reducing corruption. This broadened, multi-sector Cadastral Council process democratized valuations, helping rebuild public confidence in the system. The reform resulted in a fourfold increase in property tax revenue between 1984 and 1989, providing the municipal government with the funds needed to improve public services and infrastructure. Initial scepticism gave way to higher compliance as clearer, location-based valuations and broader stakeholder representation increased perceived fairness (Perló & Zamorano, 1999).

Transfer Taxes and Stamp Duties

Definition

Charges assessed for recording the transfer of a land title from one private party to another. They can be either a fixed fee or a percentage of the value of the property being transferred. They are applied annually to the total value of a land transaction and must be paid to complete the transfer. Different rates may also apply based on the length of time the seller or owner has held the property.

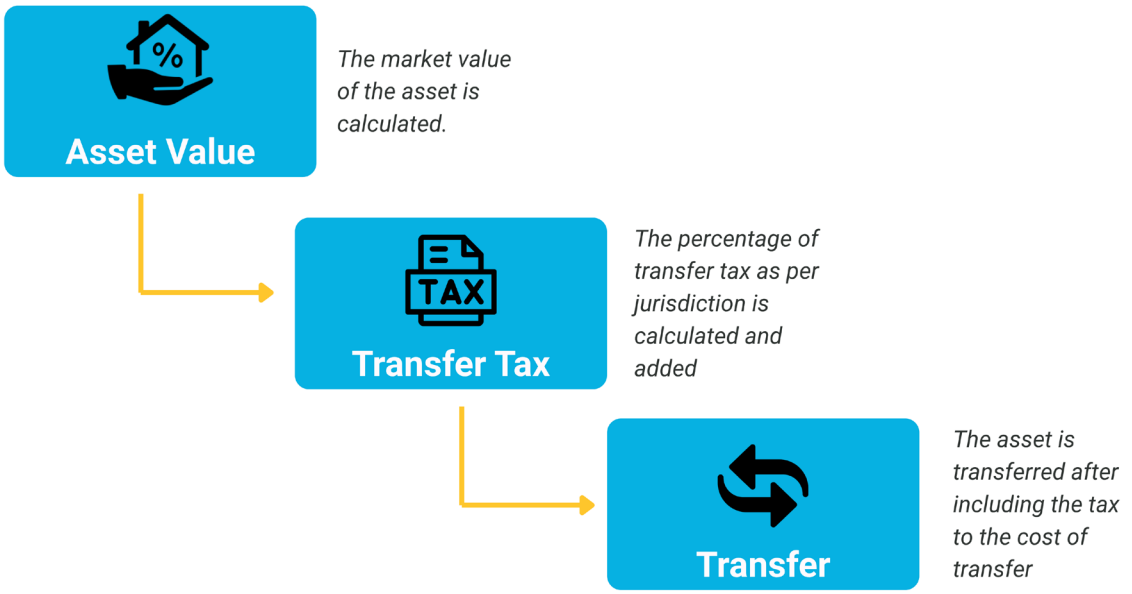

Figure 7. Process of Applying Transfer Taxes.

Advantages

- Can help moderate the real estate market.
- Paid by those participating actively in the market, which can be seen as fairly distributing tax burdens among those benefiting from government services.
- Simplicity.
- Encourage investors to hold properties longer.

Disadvantages

- Can discourage the buying and selling of property.
- Can be seen as an inefficient tax: they are incurred regardless of the owner's income level or ability to pay.
- Unpredictable revenue.

Requirements

- Appropriate enabling legal framework that establishes the authority of municipalities to levy transfer taxes and stamp duties. The framework should define the scope of the tax, including which transactions are taxable, applicable tax rates and procedures for payment and enforcement.
- Effective land registration system that records, in a digital and centralized manner, property ownership, transfers and any encumbrances on properties.
- Administrative capacity to identify when the tax is due to maximize revenue collection. The tax authority must have the ability to identify *trigger events* such as property sales, inheritance or leases. Real estate agents or lawyers may be required to notify tax authorities to guarantee that all property transactions are flagged, processed and taxed in a timely manner.
- Coordination between agencies such as the land registry, tax department and legal authorities. Without inter-agency coordination, discrepancies may arise between recorded transactions and those subject to tax, leading to potential revenue loss.
- Appropriate estimate of taxable value (reflecting the market value or income-generating potential of a property). The valuation process needs to be objective, consistent and regularly updated to capture any changes in property value due to improvements or external factors, so revenue losses due to underestimation or public resistance and non-compliance due to overestimation are avoided.
- Administrative ability to manage the entire taxation process, preferably using digital tools for processing tax data, automated billing, online payment options and mechanisms for managing arrears or delinquent payments.
- Public awareness and acceptance that help owners understand their tax obligations, the benefits of paying taxes and how the revenue will be used. This can be accomplished through education campaigns explaining how taxes are reinvested into transport infrastructure, annual reports where governments detail how tax revenues are spent, or setting up a transparent appeals process and an effective dispute resolution mechanism.
- Mechanisms for handling non-compliance or delinquency including penalties, interest charges on late payments and property liens.

Cases

The **Nagpur** (India) Metro Rail Project has effectively utilized stamp duties as a crucial financial instrument to support its development. Under the Transit-Oriented Development policy, a 1% additional surcharge on stamp duties was imposed on property transactions within the metro corridor, which includes areas within 500 meters on either side of the metro rail track. This surcharge was implemented following the Government of Maharashtra's decision to classify the metro project as a vital urban transportation initiative. The revenue generated from this surcharge has been shared between the Maharashtra Metro Rail Corporation Limited (at state level) and local urban bodies such as the Nagpur Municipal Corporation and the Nagpur Improvement Trust, depending on whose land the property is situated. This financing mechanism has been instrumental in generating funds for the metro project, particularly for Phase I. The additional revenue has also contributed to repaying loans from international financial institutions, such as a loan of the German KfW Bank and a prospective AFD facility under consideration. As of September 2022, the stamp duty surcharge for Nagpur Metro had raised 249.21 crores (around $30 million), supporting the project's long-term financial sustainability. This approach, combining non-fare revenue sources like property development with direct taxation through stamp duties, has provided a reliable source of funding for Nagpur Metro, easing the burden on public finances and supporting long-term infrastructure development (Maharashtra Metro Rail Corporation Ltd, n.d; Roy, 2016; The Hitavada, 2023).

The **New York** Metropolitan Transportation Authority (NYMTA) has utilized real estate transfer taxes (RETT) and mortgage recording taxes (MRT) as dedicated funding mechanisms for its transit operations and capital projects. The RETT, applied to commercial real estate transactions exceeding $500,000 within the city, along with MRTs—such as MRT-1 ($0.30 per $100 of recorded mortgages) and MRT-2 (0.25% on mortgages tied to residential properties with one to nine dwelling units)—serve as medium-yield dedicated revenue streams for the authority. These taxes are specifically earmarked for NYMTA's operations and capital investments, supporting services like the Long Island Railroad, Metro North Railroad and New York subway system. However, these revenue sources have shown vulnerability to economic downturns, notably during the 2008 housing crisis, when combined revenues from MRTs and Urban Taxes dropped sharply from $1.5 billion in 2007 to $389 million in 2009 (Cambridge Systematics & Stanley, 2012; Cambridge Systematics & Economic & Planning Systems [EPS], 2016; Salon, n.d.). Despite this volatility, these mechanisms remain crucial, providing medium to high revenue yields under stable economic conditions. Additionally, there have been discussions about reviving New York's Stock Transfer Tax (STT) by repealing its rebate structure. This tax could generate billions in revenue annually for urban infrastructure, including transit systems. However, its implementation faces legal and logistical complexities, particularly concerning tax incidence and jurisdiction (Hussein, 2024).

Betterment Charges and Special Assessments

Definition

Betterment charges are one-time charges for specific infrastructure improvements. They are assessed to landholders benefiting from the improvement. The specific improvements to be made, the land area that will benefit from the improvements and the level of benefit in terms of increased land value of each parcel must be identified. The cost of the improvements is then assigned to each land parcel based on the share of benefits received. Special assessments provide a mechanism for collecting betterment charges over a period of years and can make the burden on taxpayers much easier to bear.

Advantages

- Reliable source of revenue.
- Equitable funding mechanism.
- Directly link costs to benefits.
- Minimal fiscal impacts.

Disadvantages

- Restricted applicability.
- Potential for Social Inequity.

Requirements

For both betterment charges and special assessments:

- An appropriate legal framework that authorizes municipalities to impose them. This includes defining the types of public improvements that can be financed, the method for calculating charges and the procedures for billing and collection.
- Identification of all affected land plots to ensure that all beneficiaries of the improvement must contribute their fair share. This involves using land registries, property records and GIS mapping.
- Estimated impact of the improvements on the land value of each affected plot. This requires appraising the before-and-after value of the land and determining how much the improvements will increase its market value.
- Accurate estimate of improvement costs, including both capital (e.g., construction, materials) and operational costs (e.g., maintenance) that will serve as the basis for calculating the charges.
- A method for allocating the improvement costs to individual plots based on the share of benefit received. Allocation methods might include calculating charges based on property frontage, land area or the estimated increase in property value. Ensuring that the charges are proportional to the benefit received is key to maintaining fairness and equity.
- Public consultation and participation that gives property owners the opportunity to provide feedback on the proposed improvements and the associated charges before they are finalised.
- A clear process for property owners to dispute the valuation of their land, the calculated benefits

or the amount of the charge. This should include procedures for submitting appeals and how grievances will be addressed.

- Adequate one-time billing and collection system. Digital billing platforms can streamline the process, allowing property owners to view their bills online and make payments electronically. Additionally, reminder systems should be in place to ensure compliance.

For special assessments:

- Adequate instalment billing and collection system that tracks payments, applies interest (if applicable) and ensures that the total amount is eventually collected.

- Agreement of a majority of landowners that prevents municipalities from imposing charges without the consent of those directly affected.

Cases

The Chappan Dukan project in **Indore**, Madhya Pradesh (2019-2020, India), is a smart city initiative that transformed a bustling 200-meter-long street of food shops into a pedestrian-friendly zone. Previously, the area lacked proper amenities and on-street parking and it was dominated by motorised vehicles, creating conflicts with pedestrians. The project aimed to create a vehicle-free zone, enhance the aesthetic appeal and improve the overall experience for visitors. The redesign incorporated seating areas, ample greenery, dynamic lighting and improved safety features like closed-circuit television (CCTV) surveillance. The project was completed efficiently within 54 days, with ongoing maintenance handled by the Indore Smart City Limited. One of the key financial instruments used in this project was the implementation of betterment charges. These charges were calculated at 5% of the guideline value over three years, providing a significant source of revenue for the city. In addition to betterment charges, revenue was also generated through on-street and off-street parking fees, as well as a decade long licence premium for digital advertising rights. This combination of financing tools has helped the city capitalize on the increased footfall, which grew from 6,000 to 15,000 people per day after the redevelopment. The Chappan Dukan project is expected to contribute around 40% of the 5000 crore (approximately $600 million) annual turnover from food markets in Indore, showing the significant economic impact of the transformation (Smart Cities Mission, 2024).

In **Ahmedabad**'s TOD strategy, betterment charges are imposed on properties located within 250 meters of the transit corridor. These charges are applied to capture a portion of the value increase in properties due to their proximity to improved transit infrastructure. Along the corridor, the Floor Space Index has been increased, ranging from 1.8 to 4, allowing property owners to develop more intensively. Additionally, local authorities allow for the purchase of a supplemental FSI of 2.2, with the income generated from these sales contributing to the city's transport fund. This approach helps fund transport infrastructure while incentivizing denser development near transit hubs (Institute of Urban Transport (India), 2017).

In **Cuenca**, Ecuador, special assessments, referred to as *Contribución Especial de Mejoras* (CEM), have been instrumental in funding urban infrastructure projects, particularly transportation. The CEM system allows the city to recoup the increased value of properties resulting from public investments by charging property owners a fee based on the improvements made. This revenue mechanism is used primarily for neighbourhood improvements, such as paving roads, installing basic services and constructing transit infrastructure. Cuenca implemented CEM during a time of economic crisis in 2000, as a way to repay infrastructure loans. It has since become a sustainable financing model for the city. The assessment is calculated based on two factors: 40% of the cost is distributed according to street frontage, while 60% is based on the increase in property values due to the improvements. The maximum repayment term is seven years and discounts are offered for prompt payment, with most citizens paying within the first four years. The CEM has proven highly effective, financing the construction of over 270 km of paved roads through 1,800 contracts, with an estimated total investment of $106 million. Land values in the areas affected by these projects have reportedly tripled. The programme has garnered significant public support, with 95% of the projects being backed by at least 60% of the beneficiaries. This success is attributed to clear rules, shared responsibility between citizens and the government, political stability and strong institutional credibility (UN-Habitat & Global Land Tool Network [GLTN], 2016).

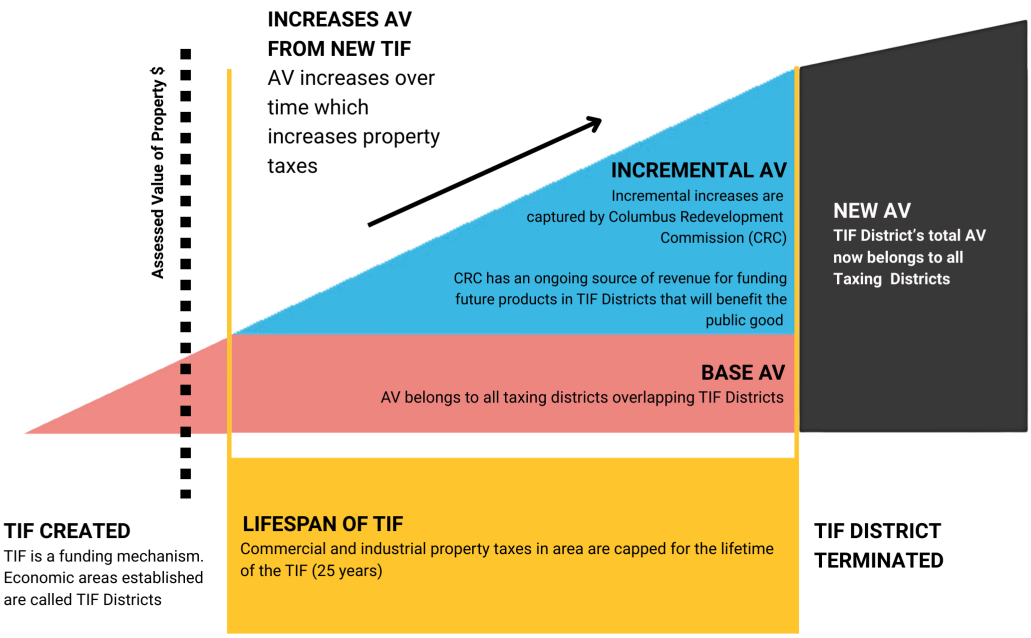

Figure 8. Process of Applying Tax Increment Financing.

Tax Increment Financing (TIF)

Definition

Surtax on properties within an area to be redeveloped and financed by municipal bonds. After a municipality has declared a qualified area a TIF district, assessment values of all dwellings within the district are frozen. Any future change in the assessed tax base is subject to an extra tax on top of the existing property tax. TIF collections are earmarked for servicing and repaying the municipal bonds issued against such expected increases in tax revenue. Mainly used in the US.

Advantages

- Increased tax revenues.
- Ease of negotiation.
- Minimal fiscal impacts.
- Distribution of risk.

Disadvantages

- Unnecessary investments.
- Districting issues.
- Unsuitable real estate conditions.
- High transaction costs.
- Lengthy timeline.
- Repayment risks.
- Changing property values.
- Higher cost to taxpayers.

Requirements

- A legal framework to authorize the use of TIF as a financing mechanism. This includes defining the conditions under which TIF can be applied, specifying eligible public infrastructure projects, setting the duration of the TIF district and outlining procedures for allocating future tax revenues generated from the incremental increase in property values.
- Creation of well-defined TIF district, identifying all land plots that are likely to benefit from public improvements. This involves mapping out the geographic area where property values are expected to increase due to the planned infrastructure or development projects.
- Clear criteria for selecting projects to ensure that only those with a high likelihood of increasing property values and benefiting the community are financed through TIF. Public improvements should be carefully vetted and justified through cost-benefit analyses.
- Estimation of the total cost of the infrastructure project, along with the expected increase in property values (the incremental tax revenue) within the TIF district. This involves both project cost estimation and economic modelling to predict future increases in property values.

- Clear mechanism for allocation of the incremental tax revenues, that details how much of the new tax revenue is earmarked for infrastructure funding, over what period and how the funds will be managed. Special accounts can be used exclusively for debt repayment or direct financing of infrastructure projects within the TIF district.

- Financing and debt management capacity for the issuance and repayment of the bonds that frequently accompany TIF projects. Municipalities must ensure that they do not overextend their borrowing capacity and that the tax increment is sufficient to cover debt repayment without negatively impacting other municipal services.

- Legal safeguards against speculation or displacement of low-income residents such as anti-speculation taxes or provision of affordable housing and social services.

- Public participation and stakeholder engagement.

Cases

Although its implementation has been discussed in several developing countries (Asian Development Bank, 2021; Santos & Goliath, 2017; UK Aid, 2015), TIF has mainly been used in the United States and other industrialized anglophone nations.

In **South Burlington**, Vermont, Tax Increment Financing was utilized to support various infrastructure projects aimed at enhancing urban mobility and facilitating new development. Approved in 2012, the TIF district allows the city to use the increase in property tax revenues from the district to fund public improvements. Among the key projects financed through TIF were transportation enhancements, such as the completion of Garden Street, where voters approved debt to cover the project's remaining costs, including property acquisitions and intersection realignment. Another major project was the Williston Road Streetscape, for which voters approved debt to fund 50% of the costs, involving stormwater treatment and property acquisition. The TIF also supported a pedestrian and bicycle bridge over I-89, providing a vital east-west link for cyclists and pedestrians. This project was funded by leveraging federal funds, with voters approving the city's share of the costs. The TIF district's original taxable value in 2012 was $35.39 million and by 2023, it had increased by 90% to $67.23 million. By the projected end of the TIF district in 2037, the taxable value is expected to reach over $342 million. The increase in property tax revenues resulting from the growth in property values is used to fund the public infrastructure investments while also contributing to education and municipal funds (Vermont Economic Progress Council, 2024).

The **Edinburgh** St James Growth Accelerator Model (GAM) is an innovative variation of the TIF model, aimed at financing infrastructure projects that unlock urban development in Scotland. GAM was piloted in collaboration with the City of Edinburgh Council, the Scottish Government and the private sector stakeholders involved in the St James Quarter redevelopment. The total investment through the GAM is £61 million, primarily used to fund the redevelopment of the Picardy Place junction, which enhances traffic flow, pedestrian routes, cycleways and public spaces. The project also includes provisions for a tram extension and a new tram/bus interchange, aimed at reducing motor vehicle traffic in the city centre. Additionally, GAM has been used to fund an energy centre and improvements to nearby roads. This infrastructure investment facilitates the larger £850 million St James Quarter redevelopment, which is transforming Edinburgh's East End with new retail, leisure space, hotels and homes, generating hundreds of jobs and attracting more visitors to the city centre. Similar to TIF, GAM involves borrowing funds to invest in assets that stimulate growth, with the resulting proceeds used to repay the debt. However, GAM introduces distinctive elements: the payments the City Council receives from the Scottish Government are not solely based on increased tax revenues but also depend on the Council meeting non-financial targets, such as creating employment and training opportunities. Additionally, the private developer involved in the project contributes financially to help repay the borrowing and shares super-profits with the public sector. This arrangement incentivises cost efficiency, as both government and private developers benefit from reduced costs in delivering the assets (Werland & Rudolph, 2019).

Development-based LVC Instruments

Sale of Development Rights

Definition

Payments received in exchange for permission to develop or redevelop land at higher density or changed land use. They can either be sold at auction or at fixed price and may be transferable to other locations or resold. There are 2 categories: converting rural land to

urban use, readjusting zoning rules or height restrictions within a current urban area to either modify land use or allowed density.

Advantages

- Provides a new revenue source, with almost no negative fiscal impact to the government budget.
- Selling development rights can improve the site's property values by increasing the buildable square footage or the allowable use.
- Selling development rights, rather than the underlying land can allow the government to retain city-owned land.
- This source may allow flexibility in the use of proceeds.
- This source is also flexible in how it is executed: governments can use this strategy in different ways, such as by changing the land use or allowing higher density, depending on policy goals.

Disadvantages

- Restricted applicability: This source may not be possible to implement in all contexts. It requires a robust real estate market where developers are interested in purchasing development rights. It also requires a context where there are no adverse effects from increasing density or changing use.
- Potential for social inequity as the sale of development rights can concentrate development in certain areas, leading to infrastructure strain and uneven benefits.
- Requires administrative and legal complexity, such as clear zoning codes, transparent regulations, and institutional capacity to manage development rights effectively
- It can foster land speculation as developers may hoard rights or delay projects, reducing immediate impact and distorting land markets

Requirements

- Clear and enforceable zoning code that outlines specific land use restrictions, density limits and permitted development types across various zones. The code should identify areas where development rights can be sold or transferred and areas where growth is restricted (e.g., historic districts or conservation zones). These regulations should be transparent, legally binding and resistant to discretionary amendments that could undermine public trust.
- Legal authority to implement and enforce the sale of development rights, which often requires the passage of enabling legislation at the national, regional or local level. This legislation should clearly define what rights are being sold (e.g., additional height, floor area, or density allowances), how the programme will function and the legal obligations of all involved parties.
- Detailed procedures and guidelines for the calculation (based on factors such as market demand, land use intensity, location and zoning restrictions), allocation and transfer of development rights.
- Capacity in the planning, legal and financial departments. This involves having experienced personnel (city planners who understand urban growth patterns, legal experts who can draft and review contracts and financial experts who can oversee transactions and assess their fiscal impact) and continuously training them so they can stay updated on best practices and new tools.
- Active real estate market and demand for additional development capacity. The sale of development rights is only viable if there is sufficient demand from developers for additional building capacity.
- Up-to-date and comprehensive urban development plan that identifies areas for growth, conservation and redevelopment.
- Capacity to monitor use and any resale of rights sold, which can be done via digital or manual tracking systems

Cases

Since the mid-1980s, the **Hong Kong** Metro (operated by Mass Transit Rail) uses a “Rail plus Property” (R+P) model to finance urban transport infrastructure. The government grants MTR development rights for land around new rail stations and depots at “pre-rail” market prices. MTR builds the new rail line and partners with

private developers to construct properties on these sites through a competitive tender process. MTR receives a share of the profits from these property developments, either as a percentage of total profits, a fixed sum, or a portion of the commercial properties built (Verougstraete & Zeng, 2014; Aveline-Dubach & Blandeau, 2019).

São Paulo and **Curitiba** (Brazil) have used Certificates of Additional Construction Potential (CEPACs) as an innovative land value capture mechanism since the early 2000s. These are financial instruments sold by the city government through electronic auctions on the São Paulo Stock Exchange. Developers purchase CEPACs to obtain additional building rights, such as higher floor area ratios, within the designated Urban Operation areas. The revenue generated from the sales must be reinvested in infrastructure and public improvements within the same Urban Operation area where they were sold. CEPACs have been used to fund transportation projects, including the expansion and improvement of Faria Lima Avenue and the development of bus corridors and BRT systems (e.g., Linha Verde in Curitiba) (Sandroni, 2009; Institute for Transportation and Development Policy [ITDP], n.d.a.; Smolka, 2013).

Transferable Development Rights (TDR) were introduced in **Mumbai** in 1991 as a mechanism to acquire land for public purposes without direct monetary compensation. Landowners who surrender their land for transport infrastructure receive TDRs certificates that can be used to build additional floor space in designated "receiving areas", typically in the northern suburbs of Mumbai. TDR generated from transport projects can be sold on the open market, providing compensation to landowners without direct government expenditure. For the Mumbai Urban Transport Project, which affected over 19,000 households, TDRs were used to construct resettlement housing for displaced slum dwellers. Developers were given TDR in exchange for building housing for project-affected persons. However, the use of TDR has led to concentrated development in certain receiving areas, especially M Ward in eastern Mumbai, raising concerns about overburdened infrastructure (Nallathiga, 2006; Nainan, 2008; Takeuchi, n.d.).

Public Land Sales

Definition

The sale of public lands converts one type of public asset (land) into another (cash) through the sale of the land to the private sector. This is a one-time revenue generator. Sales can generate large upfront payments which can provide the capital for critical investments, particularly where access to other capital is constrained. In selling public land, the public relinquishes a good deal of control over how the land is used.

Advantages

- Provides significant upfront revenue.
- Simplifies the administrative process.
- Potentially increases efficiency in the urban land market by allowing for rapid development and utilization.
- Eliminates future governmental liability.

Disadvantages

- Once sold, the government loses any future control over the land.
- Potential for transparency issues and corruption.
- The revenue is non-recurring, limiting long-term financial planning capabilities.
- Re-acquiring land can be costly and politically challenging.

Requirements

- Clear legal ownership of the land. This minimizes risks of legal challenges from other parties, ensuring that the land can be transferred to buyers without complications.
- Appropriate enabling legal framework. This may involve legislation that governs land ownership, zoning regulations and public asset disposal laws. The framework should outline the processes for declaring public land surplus and legally eligible for sale.
- Reliable and up-to-date land registry system to ensure that all information related to land parcels, such as boundaries, ownership, zoning and restrictions, is readily accessible.
- Administrative and planning capacity to determine which lands should be developed.

- Capacity to conduct thorough market analyses to ensure that public land is sold at a fair market value. This involves assessing the demand for land in specific areas, prevailing property prices, economic trends and potential future development prospects.

- Capacity to manage a transparent and fair sales process. All information related to the land sale—such as the terms of the sale, expected land use, zoning and any other conditions—should be made publicly available. Public auctions or competitive bidding tend to be the most transparent approaches, allowing multiple stakeholders to participate.

- Capacity to allocate and manage sale proceeds. The revenue generated from land sales should be integrated into the municipality's broader budgeting and financial planning processes. This ensures that the funds are allocated according to strategic priorities, such as sustainable urban mobility, housing projects or environmental initiatives.

Cases

In November 2006, Transnet, the parastatal transportation agency in South Africa, sold the Victoria and Albert Waterfront property in **Cape Town** for R7.04 billion (US$1.0 billion). The proceeds from the sale were used to recapitalize Transnet and support its investment in core transportation infrastructure. The sale proceeds exceeded Transnet's total capital spending in fiscal 2006 and equalled 17% of its five-year capital investment plan prepared in 2006. The sale was part of Transnet's strategy to increase infrastructure investment without government grants or subsidies, by divesting non-core assets and sharpening its focus on freight transportation (Peterson, 2008).

Nanchang, a provincial capital in southeastern China, proposed building a metro system in 2000 to address growing congestion and support the city's projected population growth to 3.5 million by 2020. The Nanchang Railway Transit Group, incorporated in 2008, adopted development-based land value capture to help fund the construction of Metro Lines 1, 2 and 3, totalling around 70 km. Their approach involved i) acquiring excess land around metro stations through the Nanchang Municipal Government's public land leasing scheme, ii) increasing allowable floor space within 500m of stations to make DBLVC profitable, iii) developing high-density mixed-use TOD around stations, with 23 developments above stations and 5 underground developments and iv) directly financing some developments while co-financing others with private developers (Global Platform for Sustainable Cities, 2018).

The **Istanbul** Metropolitan Municipality (IMM) and other Turkish state agencies have used land sales as a significant source of capital revenue to finance transportation infrastructure and moderate-income housing. In the 1990s, IMM borrowed heavily in foreign currency and faced repayment problems when the Turkish lira depreciated. To curb reliance on borrowing, IMM pivoted to land and property disposals. Major auctions in 2006-2007 produced US$705 million from the former central bus station and US$800 million from a Roads Authority district-office site. The full proceeds were channelled to the metropolitan transport-investment programmeme. By 2007, cumulative municipal-plus-Roads-Authority land receipts had reached US $1.5 billion—far exceeding IMM's outstanding capital debt of US $180 million and helping the city cut borrowing to 7 percent of cash receipts while recovering its international credit rating (Peterson 2008).

Land Leasing

Definition

Leasing publicly owned land through multi-year creates a private leasehold interest that allows private entities to develop the land and potentially sell the lease in a secondary market. The advantage of leasing public land is that it ultimately reverts to public control. The time lag may be substantial, but reversion is inevitable. In addition, leasing has the potential to generate both upfront cash payments in the form of lease premiums and on-going revenue in the form of annual lease payments.

Advantages

- Generates a steady, long-term income stream.

- Retains public control over land use after the lease term ends.

- Flexibility to adjust lease terms and payments to reflect changing market conditions and land use needs.

- Allows for development while influencing the process.

Disadvantages

- Requires a strong administrative system.
- Potential complexity in updating lease terms and managing lease renewals.
- Less immediate liquidity Risk of undervaluation if lease terms do not adequately reflect market conditions or if initial premiums are set too low.

Requirements

- Appropriate enabling legal framework. This framework should specify the terms under which the land can be leased (e.g., short-term vs. long-term leases, leasing for specific purposes like commercial, residential, or agricultural use), the rights and obligations of both the public authority and the lessee and provisions for renewing or terminating leases. These laws should also outline the approval process and any required public consultation.
- Administrative and planning capacity to determine which lands are available for lease. This involves regular land assessments to determine which lands are underutilized or strategically positioned for lease, based on demand, urban growth patterns and environmental considerations. Planning departments should collaborate with economic development, environmental and legal departments to align leasing decisions with broader urban planning objectives.
- Appropriate estimate of market value of land to be leased. This involves evaluating current market trends, the location's desirability, existing infrastructure and the intended use of the land. For long-term leases, it's essential to incorporate mechanisms for periodically reassessing the value of the land. This ensures that lease payments remain fair over time, especially in cases where land values may rise due to infrastructure development or economic growth.
- Administrative ability to solicit and negotiate leases and to monitor leases for the duration of the lease. Municipalities must have personnel skilled in determining the lease terms, including the duration, rent, use restrictions and any obligations for infrastructure improvements or environmental protections that the lessee must undertake. Once a lease is in place, the municipality must have systems to conduct regular site inspections, ensuring that rent payments are made on time and taking action if the lessee violates the lease terms (e.g., unauthorized land use or failure to maintain the property).

Cases

China's constitution was amended in 1988 to permit transferable land use rights and long-term leases, leading to a thriving real estate market in major cities. On average, from 2004-2008, **Chinese cities** derived off-budget revenue from land leases equivalent to 49.53% of their entire budgetary revenue levels (Anderson, 2012). Some cities earned at least twice as much from land leasing as from all budgetary sources combined. Cities like Shanghai have minimized the amount of public financing spent on infrastructure by effectively using land sales to raise funds for infrastructure development through prepayments from future land users and sale of developed land (UK Aid, 2015). Land leasing has been used extensively in highway construction: municipal governments directly lease land to companies who gain development rights to surrounding areas. These companies then finance highway construction through borrowing on the collateral of the land, which is expected to appreciate in value (Peterson, 2008).

Ethiopia has followed China's model of public land ownership and leasing to enable municipalities to capture land value and dedicate that revenue to infrastructure investment. Under this system, the central government leases land to other levels of government and the private sector. These leases are paid through a one-time, upfront fee, with national law requiring that 90% of the revenue generated be allocated to municipal infrastructure investment (Muluneh & Amsalu, 2022). The leasing contracts are typically emphyteutic leases, allowing long-term use of land. Two key negotiation processes are central to Ethiopia's land leasing system. First, the pricing of land leased to the private sector is determined. Originally, land prices were fixed, but after introducing public auctions, it was discovered that market prices were up to 80 times higher than the initial set prices. This significant increase has had a transformative effect on the financing available for municipal infrastructure. The second negotiation

process occurs at the neighbourhood level. Local districts, known as Kebeles, identify key infrastructure needs, such as street lighting and paving, and work with local authorities to facilitate these projects. Community members agree on a formula to allocate costs, often based on land size or value, and collectively contribute to the project. In the Tigray Regional State, for example, Kebeles typically cover 50% of the costs for street paving (UK Aid, 2015).

Exactions and Impact Fees

Definition

One-time, standardized charges assessed by local governments to the developers or landowners seeking approval for the development or redevelopment of land. Nearly always assessed at the time the project receives approval. Generally, they take one of three forms: i) required on-site improvements, ii) payments required to offset the impact of the new project and iii) payments required as the development's contribution to social improvements within the city but not tied directly to the project.

Advantages

- Targeted way to fund necessary public infrastructure.
- Improvement in property values.
- Growth pays for growth: Current citizens are not responsible for the cost of new urban growth.
- Help mitigate negative externalities.
- Can discourage overdevelopment by making it more costly to build.

Disadvantages

- Can significantly increase the cost of new developments, which is often passed on to buyers.
- High upfront costs can deter development, particularly in less affluent areas or during economic downturns. Administrative complexity must be carefully structured to avoid legal challenges.

Requirements

- Appropriate enabling legal framework that outlines the purposes for which exactions can be used (e.g., infrastructure improvements, environmental mitigation, public amenities) and the conditions under which they can be levied. The framework should also define the legal basis for determining the amount and ensuring the proper use of collected fund.
- Updated master plans and detailed plans to determine where exactions are necessary, such as in rapidly developing areas where new roads, water systems or public facilities are required to accommodate increased demand. These master plans should specify the types of developments that trigger exactions and the infrastructure improvements required.
- Engineering estimates of the impact of the proposed development on existing infrastructure and the cost of meeting the increased infrastructure needs.
- Administrative capacity to administer approved plans, process applications, calculate the exaction due (clear formulas or guidelines should be used and made easily accessible by developers and the public) and monitor compliance (verifying that the funds are used for the intended infrastructure improvements and ensuring that the developer completes any in-kind contributions, such as constructing roads or public facilities).

Cases

Very popular in the Americas, impact fees were increasingly favoured in the United States during the 1970s due to stagnant household incomes and rising property taxes. This prompted local governments to find alternative revenue sources as taxpayer resistance to property taxes grew (Burge, 2009). Nowadays, the City of **San Francisco** imposes traffic impact fees on certain types of non-residential developments, while the City of Baton Rouge applies traffic impact fees to new developments, including residential projects (wbcsd mobility, 2015).

In **Santiago de Chile**, impact fees were introduced in the early 1990s to finance transportation infrastructure in response to rapid suburbanization and real estate

development. Two municipalities in the Santiago Metropolitan Area faced strong development pressures but lacked the resources to fund necessary infrastructure connections to the city. To address this, they implemented an ad hoc impact fee scheme, charging developers for major road connections. The most prominent case involves Chacabuco Province, a rapidly suburbanizing area just north of Santiago. The national government developed a transportation plan using the so-called EMME/2 model to calculate the infrastructure needs arising from 14 proposed real estate projects. The total infrastructure costs, including major roads and interchanges, were estimated at US$106 million, with the developers required to contribute based on the peak travel demand generated by their projects. Impact fees were used to fund 41 kilometres of roadways and other infrastructure improvements. The allocation of costs was based on each project's contribution to peak transportation demand. The government subsidized 39% of the total infrastructure costs for the area and there was a focus on exempting low-income housing from impact fees to promote affordability (Zegras, 2003).

In **Guatemala**, an instrument called *Impacto Vial* shifts the responsibility for road improvements from the public sector to private developers. When a large development project is proposed, a road traffic study assesses its impact on the surrounding area. Based on this evaluation, an infrastructure plan is created, and the developer is assigned a share of the costs to mitigate the negative impacts on the community. The developer executes the necessary infrastructure work under municipal supervision. If the cost of the work exceeds the developer's share, part of the project's license fee (approximately 4.5% of total building costs) is used to cover the difference. Should these funds still be insufficient, other prospective developments in the area are charged to fill the budget gap. In cases where even this is not enough, an earmarked fund is established to collect contributions from future projects in the vicinity. This system operates similarly to the cost-recovery betterment contribution impact fees commonly used in some U.S. counties. However, in Guatemala, the policy has a narrower focus, and developers typically provide in-kind payments by directly completing the infrastructure work. This approach is seen as more efficient, with private contractors completing projects like overpasses in just four months, compared to 12-16 months if handled by the government. Since 2006, this instrument has financed nearly all road construction around the Municipality of Guatemala, totalling over US$20 million (Smolka, 2013).

Land Readjustment

Definition

Land readjustment consists of pooling all land parcels within the readjustment area, the joint planning for servicing the land and the redistribution of parcels in an orderly configuration, making room for public improvements. Although it does not typically generate revenues, it has the potential to defray the costs associated with provision of public space and neighbourhood upgrading.

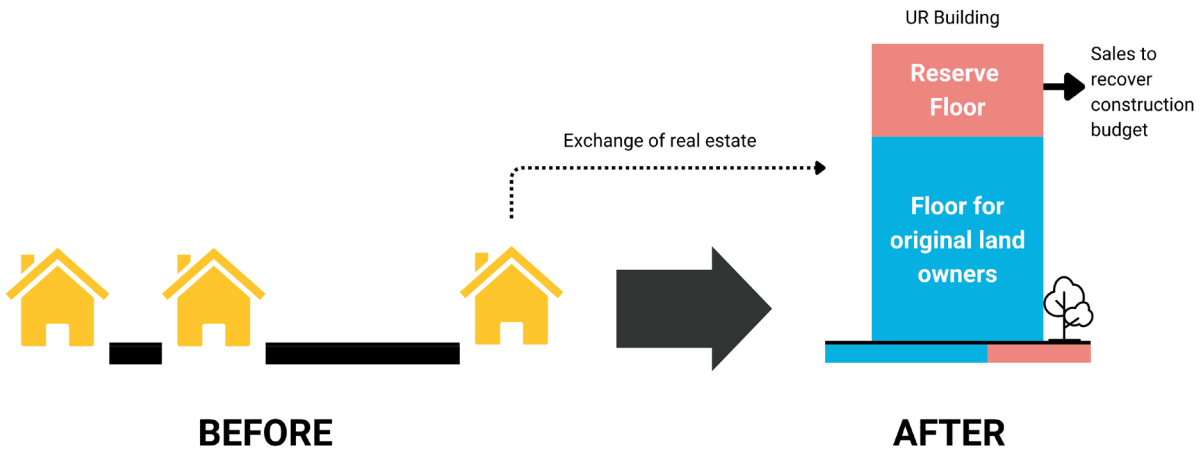

Figure 9. Process of Land Readjustment.

Advantages

- Land use optimisation which might not be possible through conventional methods.
- Displacement of existing landowners is minimized, as they receive serviced land or property of equivalent value within the project area.
- Improved access to roads, transportation, public utilities and green spaces.
- Landowner participation and consensus are encouraged.

Disadvantages

- The process is complex and often requires significant time for negotiations, planning and consensus-building among landowners, developers and the local government
- High administrative and planning costs.
- Risk of perceived or real inequity in the redistribution of land or property values, especially if some landowners receive more valuable plots than others or if certain areas benefit disproportionately from the improvements.
- Risk of social resistance.

Requirements

- Projects should be self-financing to the extent practical (including infrastructure and constructions costs where possible). There must be a financing plan in place that minimizes the reliance on external funding source, and where full self-financing is not possible, cost-sharing mechanisms with private developers or local property owners should be explored.
- Robust legal framework to ensure fair land reallocation and secure property rights. This includes laws that guarantee secure property rights, protect landowners from unjust expropriation and establish transparent mechanisms for compensation. The legal framework should also include procedures for resolving disputes between landowners and the government or among landowners themselves.
- Sufficient land use, infrastructure and financial planning. The plan should clearly define which areas are designated for residential, commercial or public use and identify the necessary infrastructure upgrades (roads, utilities, public spaces) to support future development while guaranteeing financial viability by estimating project costs, potential revenue from land sales or leases and sources of financing.
- Active participation of landowners and other stakeholders. This involves consulting with them from the initial planning phase, ensuring they understand the reallocation process and allowing them to provide input on project design and compensation mechanisms, to secure the informed consent of most landowners involved in the project.
- Adequate project management and technical personnel. This can be achieved by having a multidisciplinary team with expertise in urban planning, engineering, real estate, legal affairs and financial management, capacity building programmemes for personnel in the latest technologies, legal regulations regarding land use and best practices for stakeholder engagement and conflict resolution.
- A favourable real estate market that ensures financial viability for land readjustment projects by attracting buyers and investors. Municipalities must conduct market analyses to gauge demand and create flexible zoning that appeals to developers.
- Fairly shared project benefits and costs among all stakeholders.

Cases

Land readjustment as a financing mechanism for transit-oriented urban development in **Japan** has been described in detail in numerous studies (Hong & Needham, 2007; Matsui, n.d.; Suzuki et al., 2015; Souza & Hosono, 2018). Known as *tochi kukaku seiri,* it is a highly structured and participatory process designed to reorganise urban land parcels and develop infrastructure. It involves consolidating irregularly shaped plots, replotting them into more orderly configurations and allocating part of the land for public use or sale as “reserve lands.” This approach not only optimises land use but also funds the associated infrastructure upgrades. Landowners

contribute a portion of their original holdings, known as the "contribution ratio," which helps create public amenities and finance the project. The process is underpinned by a robust legal framework established through the Land Readjustment Law of 1954, which ensures secure property rights, equitable cost-sharing and transparent administration. A significant emphasis is placed on consensus-building, requiring agreement from two-thirds of landowners in the project area. Landowners typically receive smaller but serviced and more valuable plots, minimizing displacement and fostering community continuity. Key applications of this mechanism include urban development, rehabilitation of aging areas, disaster recovery and integrated transit-focused redevelopment. For example, the Nagakute Nanbu project addressed suburban residential growth, the Shin-nagata Ekikita project facilitated post-earthquake reconstruction, and the Akihabara Station project combined land readjustment with urban redevelopment to support high-density, transit-integrated zones. Despite its advantages, the process is complex, requiring significant administrative effort and stakeholder collaboration.

The **Ahmedabad** Urban Development Authority (AUDA) assembled land for a 76 km, 61-meter-wide regional ring road almost entirely through a chain of 46 neighbourhood-scale land-readjustment (Town Planning Scheme) projects. About 77 % of the alignment (59 km) was secured in this way; the remaining southern stretch lay in agricultural zoning and was acquired conventionally. Within each scheme AUDA pooled all parcels, re-plotted them, reserved the right-of-way plus other public uses and a small "land bank", and returned the rest to owners. On average around 30–40 % of every parcel was taken, well below the legal ceiling of 50 % set in the amended Gujarat Town-Planning & Urban-Development Act 1976. The 46 schemes together produced around 9 217 ha of serviced land, enabling AUDA to carve the entire 460-ha corridor without paying cash compensation or displacing owners. Works were phased between 2004 and 2012. Land fronting the new road typically doubled (and sometimes trebled) in value, providing a strong incentive for voluntary participation, while AUDA monetised its land bank and betterment levies to help fund construction and complementary infrastructure (Mittal, 2014).

In **Medellin**, Colombia, land readjustment was used to facilitate urban redevelopment and improve infrastructure in the impoverished Juan Bobo area. As part of the *Mejoramiento Integral de Barrios* programmeme, the project aimed to improve living conditions in high-risk areas while integrating them into the city's broader urban framework. The land readjustment process involved reallocating property rights, converting land into apartment units of similar value and securing legal ownership for residents. The project spanned from 2004 to 2008 and included significant infrastructure improvements such as sewage pipes, stream basin cleaning, public space improvements and new roads to enhance pedestrian mobility. Additionally, the construction of a gondola-lift system (Metro Cable K Line) in 2002 connected these marginalized hillside neighbourhoods to the city's metro system, substantially improving access to jobs and services for approximately 170,000 residents. The land readjustment process allowed public spaces to be secured, including the construction of a bridge, library and community centres, while reducing environmental risks by transforming landslide-prone areas into green spaces. Eight apartment blocks rehoused 118 families, and a further 115 houses were upgraded, benefiting roughly two-thirds of the enclave's 300 households. This project contributed to enhancing the Human Development Index in the area and coincided with a significant reduction in crime, with the homicide rate in Medellin dropping from 381 per 100,000 in 1991 to 26 per 100,000 in 2007 (Sato, 2013).

I.i.ii. Non-land Revenue

Sales Taxes

Definition

A sales tax is a consumption tax imposed on the sale of goods and services. It is collected at the point of sale and can be earmarked to fund various public services, including transportation infrastructure. By taxing the expenditure of individuals and businesses, sales tax serves as a broad-based revenue source that can be directed towards enhancing sustainable urban mobility.

Advantages

- Sales tax provides a consistent and reliable source of revenue, which can be allocated to improve and expand public transport systems over time.
- Since sales tax is based on consumption, it distributes the tax burden among citizens in proportion to their spending habits, potentially aligning tax contributions with usage of public services.

Disadvantages

- Disproportionately affects lower-income individuals, as they spend a higher percentage of their income on taxed goods and services compared to wealthier individuals, potentially exacerbating income inequality.
- The reliance on consumer spending makes sales tax revenue susceptible to fluctuations during economic downturns, when discretionary spending decreases.
- In some jurisdictions, sales tax is only available on the national level, which would require a national transfer to the local government for implementation.

Requirements

- A clear legislative framework must be established to define the rate and scope of the sales tax, ensuring transparency and consistency in its application.
- In some contexts, to introduce a new sales tax on the local level, voters will need to approve the change. This requires constituents that are supportive of mass transit and are willing to assume a portion of the cost.
- Efficient systems for the collection and enforcement of sales tax are essential to ensure compliance and minimize evasion. This includes technological infrastructure for tracking sales transactions and enforcing tax payments.
- Educating the public about the purpose and benefits of sales tax can enhance compliance and acceptance, ensuring that revenues are effectively utilized for sustainable mobility projects.
- Depending on the size and scope of the project, a significant amount of economic activity must be present to obtain sufficient funding to make a significant contribution to an urban mobility project. This will likely only be present in a capital city or on the national level.

Cases

Morocco established the Fund for the Support of Urban and Interurban Road Transport Reforms (*Fonds d'Accompagnement des Réformes du Transport routier urbain et interurbain* – FART) in 2007 to promote the development of mass transit infrastructure in its cities. The fund aims to address infrastructure investment needs and support the operational sustainability of new transit systems during their initial years. With a target total investment of approximately USD 3.27 billion by 2027, the FART focuses on projects in Morocco's 10 major cities. It is financed through allocations from the state budget and a special-purpose Value Added Tax account managed by the Ministry of Interior. The fund supports eligible projects, such as the construction of tramway and Bus Rapid Transit lines, including coverage of operational deficits for up to three years after operations commence. Additionally, it finances dedicated bus lanes and infrastructure designed to enhance commercial speeds, such as traffic signal systems prioritising buses and trams. Allocation criteria for funding include the project's strategic importance, socio-economic impact and the effectiveness of its planning and implementation processes. The FART provides a crucial dedicated funding mechanism for urban mobility in Morocco, enabling cities to expand their transit infrastructure and address urgent transportation needs. Its emphasis on covering initial operational deficits ensures the viability of mass transit projects during their early stages. (SSATP, 2018).

In **Mexico City,** given the concentration of economic activity, revenue from the district's Value Added Tax is sufficient to cover a significant portion of the city's BRT infrastructure costs. In contrast, BRT projects in Mexico outside of Mexico City rely more heavily on funding from state and national governments (Wright & Hook, 2007).

Fuel Taxes

Definition

Fuel taxes are levies imposed on the sale of fuel products, such as gasoline and diesel. These taxes are typically applied per unit of fuel sold and are used to fund transportation infrastructure and promote sustainable energy consumption by incentivizing reduced fuel use and the adoption of more efficient vehicles.

Advantages

- By increasing the cost of fuel, these taxes encourage consumers to reduce fuel consumption or switch to more fuel-efficient or alternative energy vehicles, thereby lowering greenhouse

gas emissions and promoting environmental sustainability.

- Help curb air pollution and greenhouse gas emissions by discouraging the use of fossil fuels, contributing to cleaner cities and healthier communities.

- Provide a consistent and predictable stream of income that can be directly allocated to maintaining and improving transportation infrastructure, including roads and public transit.

Disadvantages

- Fuel taxes can disproportionately affect low-income households that rely heavily on fuel for transportation, potentially increasing their financial burden.

- If not carefully managed, high fuel taxes may lead to unintended consequences such as fuel switching to less taxed or untaxed fuels or adulteration of fuel products, which can undermine environmental and revenue goals.

Requirements

- Effective implementation requires careful consideration of the tax rate, inflation rate and structure to avoid excessive burdens on low-income populations while still achieving environmental and revenue objectives.

- Clear legislative policies need to be established for setting fuel tax rates, with transparency on how revenues will be allocated, particularly for specific projects like sustainable mobility.

- Policymakers must ensure that adequate monitoring systems are in place to prevent tax evasion and maintain compliance. This includes measures to track fuel sales and usage effectively.

- Governments must invest in viable transportation alternatives, such as efficient public transit or electric vehicle infrastructure, to support reduced fuel dependency.

- To mitigate the regressive impact, complementary policies such as subsidies for low-income households or investments in public transportation can help balance the effects of fuel taxes.

Cases

In **Bogotá**, a 20% fuel surcharge is collected on all gasoline sales. Half of the revenue generated is used to finance the infrastructure of the TransMilenio Bus Rapid Transit system. This innovative model ensures that private vehicle owners (who represent only 19% of the population) contribute significantly to the development of public transport infrastructure. The system is used primarily by low-income citizens, promoting social equity by redistributing the benefits of the fuel tax to fund public transportation that is accessible to the wider population (GIZ, 2010).

Kenya relies on fuel levies to finance its extensive 239,122 km road network, valued at Kshs 4 trillion (US$31 billion) under the Road Sector Investment Programmeme (RSIP III) 2023-2027. Currently, the Road Maintenance Levy Fund (RMLF) collects KSh 80 billion annually ($619.3 million) at KSh 18 per litre, which is insufficient to address a KSh 727 billion ($5.65 billion) maintenance backlog caused by factors like urbanization and economic pressures. To bridge this gap, the government proposes increasing the levy to Kshs 25 per litre, expected to generate KSh 115 billion annually ($890.2 million). This increase aims to enhance road quality, reduce vehicle operating costs and support sustainable mobility by improving infrastructure reliability (Kenya Road boards, 2024).

Vehicle Taxes and Fees

Definition

These taxes refer to charges levied on vehicle ownership or use. They can include registration fees, annual taxes based on vehicle characteristics, such as weight, engine size or emissions, and taxes related to the operation of the vehicle. They are designed to generate revenue from vehicle owners and can be structured to encourage the use of more environmentally friendly vehicles.

Advantages

- Vehicle taxes and fees provide a two-fold advantage of disincentivizing car usage and ownership while also generating funding for mobility investment.

- By imposing higher taxes on less efficient or more polluting vehicles, can incentivise the adoption of environmentally friendly vehicles, contributing to reduced emissions and sustainable urban mobility.

- Vehicle taxes provide a straightforward method for governments to generate revenue from vehicle owners, which can be allocated to transportation infrastructure and maintenance.

Disadvantages

- Vehicle taxes can create inequities, as they may disproportionately burden lower-income individuals who own older or less efficient vehicles, limiting their access to mobility.

- If not structured properly, high vehicle taxes may discourage vehicle ownership altogether, which could negatively impact mobility in underserved or rural areas where alternative transportation options are limited.

Requirements

- Governments need to establish a clear legislative framework that defines the basis for vehicle tax rates, including considerations for vehicle type, emissions and size.

- A well-developed enforcement mechanism is necessary to ensure proper vehicle registration and tax compliance, which may involve integrating with local or national vehicle databases.

- Public awareness campaigns should highlight the environmental benefits of the tax, particularly how it can help reduce pollution and promote the shift to greener vehicles.

- To ensure fairness, governments may need to consider providing incentives or subsidies for low-income individuals to switch to more efficient vehicles, thereby minimizing the regressive impact.

Cases

In the **Philippines**, vehicle taxation plays a crucial role in funding transportation infrastructure. Revenues from the Motor Vehicle User's Charge (MVUC) are earmarked as follows: 80 % for national-road maintenance (Special Support Fund), 5 % for the Special Local Road Fund, 7.5 % for the Special Road-Safety Fund and 7.5 % for the Special Vehicle-Pollution-Control Fund. This model demonstrates how vehicle taxes can not only support urban road infrastructure but also enhance public safety and environmental management. The MVUC effectively channels funds to both local and national projects, aligning with sustainable urban transport goals (GIZ, 2010).

In **Morocco**, the Special Road Fund (FSR), established in 1989, is an earmarked account funded by vehicle registration tax, in addition to fuel taxes and axle load charges on heavy vehicles. This fund is used for the construction, maintenance and operation of roads and expressways within the country (African Development Bank, 2007).

Employment Taxes

Definition

Employment taxes are levies imposed on wages paid by employers and employees. These taxes fund various social programmes and public services, including transportation infrastructure. By linking tax contributions to employment, this instrument taps into the labour market to generate revenue for sustainable urban mobility initiatives.

Advantages

- Employment taxes provide a stable and predictable source of funding for public services that benefit all citizens, including transportation infrastructure.

- Employment taxes are typically progressive in nature, meaning that higher earners pay more, which can help reduce income inequality and ensure that contributions are aligned with the ability to pay.

Disadvantages

- Employment taxes can increase the cost of labour for businesses, potentially discouraging hiring or leading to reduced wages, particularly for small businesses with tight budgets.

- They may disproportionately affect low-income workers, as the taxes take a significant portion of their wages, potentially worsening income inequality.

- Complex tax structures and compliance requirements can increase administrative burdens for businesses, particularly small and medium-sized enterprises (SMEs), requiring additional resources to manage payroll and tax filing.

Requirements

- A clear legislative framework is needed to define tax rates, employer and employee contributions and specific uses of employment tax revenues, ensuring transparency and accountability.
- Efficient systems for tax collection and enforcement are essential, ensuring that both employers and employees comply with tax regulations and that revenues are accurately allocated to social programmes.
- Governments should consider offering tax credits or relief programmes for small businesses or sectors disproportionately affected by high employment taxes to mitigate the negative impact on hiring.
- Setting balanced tax rates that generate necessary revenue without significantly discouraging employment or burdening businesses is crucial for maintaining economic stability.

Cases

France funds its public transportation system in part through the *Versement Mobilité*, a payroll tax applied to businesses and public employers with more than 11 employees (La Fabrique de la Cité, n.d.). Introduced in 1971, this tax helps finance the development, operation and maintenance of urban transit networks, including metros, buses, and trams. The rate varies depending on the municipality and the extent of available public transport, ranging from 0.2% to 2.85% of payroll. Higher rates apply in regions Paris, which has a more extensive transit system. The VM provides nearly half of urban public transit funding in France. (Ministère de l'Économie, des Finances et de la Souveraineté industrielle et numérique, 2025).

The Vale-Transporte programme is an employment tax-funded subsidy in **Brazil** that provides formal-sector workers with discounted public transportation. While the programme aims to help low-wage earners afford their commutes, it primarily benefits those in formal employment (Kawka, Cotti, & Santos, 2023). However, similar employment-tax-based schemes could be more effective if reformed to include informal sector workers and broadened to support a variety of sustainable mobility interventions.

Tourist Taxes

Definition

Tourist taxes are charges levied on visitors staying in a city, region, or country, typically collected as a surcharge on accommodation or other tourism-related services. These taxes are intended to offset the costs of increased public service demand due to tourism, such as infrastructure maintenance, environmental conservation, and urban mobility improvements. In some cities, a portion of the revenue is earmarked for financing transport infrastructure, pedestrianization projects, and sustainable mobility initiatives to mitigate the impact of tourism on local transportation systems.

Advantages

- Provides a dedicated funding source that reduces reliance on property taxes and intergovernmental transfers.
- Instead of burdening local residents, tourists contribute to the upkeep of the destinations they visit, aligning costs with usage.
- Can help manage over-tourism by discouraging excessive visitor numbers, particularly in areas experiencing congestion or environmental strain.
- Unlike some other local revenue sources, tourism taxes provide a steady income stream that grows with the sector.
- Rates and collection methods can be adjusted based on seasonality, location, or accommodation type, allowing for targeted policy implementation.

Disadvantages

- May discourage some tourists, particularly budget travellers, from choosing a destination.
- Hotels, restaurants and tourism-related businesses may resist them.
- Short-term rental platforms and informal accommodations may not always comply with tax regulations, leading to revenue leakage.
- Tourist taxes are highly dependent on visitor numbers, making them less reliable during

economic downturns, pandemics, or other crises affecting travel.

Requirements

- Legal framework at the national or municipal level that authorizes the imposition of tourist taxes, defines their scope, sets collection mechanisms, and establishes how revenues can be allocated. The law should specify whether the tax is applied per night, per visitor or as a percentage of accommodation costs.
- Clear definition of taxable entities to ensure compliance. This includes defining which types of accommodations (hotels, hostels, short-term rentals, Airbnb, etc.) are subject to the tax and whether exemptions apply (e.g., local residents, children or business travellers).
- Efficient collection and enforcement mechanisms that ensure taxes are collected and remitted by accommodation providers. This may include requiring registration with tax authorities, automated reporting systems and penalties for non-compliance.
- Technology and digital payment integration to streamline tax collection, reducing administrative burdens on accommodation providers and local governments.
- Transparent allocation and reinvestment strategy that specifies how revenues will be used, particularly if funds are earmarked for sustainable mobility, infrastructure improvements or environmental conservation.
- Public awareness and stakeholder engagement to ensure acceptance from both the tourism sector and the general public. This includes consultations with hotel associations, local businesses and transport authorities to align expectations and communicate how revenues benefit the city.
- Assessment of economic impact and competitiveness to determine how the tax affects visitor numbers and spending behaviour. Benchmarking against similar destinations ensures that the tax remains competitive without discouraging tourism.
- Flexibility to adjust tax rates based on seasonality, visitor volume or inflation to optimise revenue generation while maintaining a balance between economic benefits and sustainable urban development.

Cases

Barcelona has steadily increased its tourist tax as part of a strategy to manage mass tourism and fund essential city services. Since 2012, the city has applied a surcharge on top of Catalonia's regional tourist tax, with recent increases aiming to enhance public infrastructure and urban mobility. As of October 2024, the municipal surcharge rose to €4 per person per night, generating an estimated €115 million in annual revenue. This increase built on previous hikes in April 2024 (€2.75 to €3.25 per night). The new rate applies to all accommodation categories, including hotels, rental apartments, and cruise passengers spending less than 12 hours in the city. Barcelona's government emphasized that the revenue will be reinvested into city infrastructure, particularly to improve cleaning, security, lighting and public transport. Funds will also support the Plan for High-Impact Spaces (EGA), designed to minimize tourism-related disruptions in residential areas, and attract international fairs and congresses to diversify the city's economy. City officials argue that the increase is necessary due to the high demand on public services caused by 32 million annual visitors, many arriving on cruise ships. The policy aligns with a broader shift towards “quality tourism” over high visitor numbers, ensuring that tourists contribute proportionally to the services they use (Ajuntament de Barcelona, 2024a; Ajuntament de Barcelona, 2024b; Euronews, 2024).

Milan has also implemented progressive increases in its tourist tax to finance local public services, particularly public transport, security, and urban maintenance. The first adjustment took place in January 2024, raising rates by €0.50 to €1.50 per night, depending on accommodation type. Short-term rentals and budget accommodations saw the highest percentage increases, while 4- and 5-star hotels remained at €5, the legal maximum at the time. A second increase, approved in November 2024, took effect on January 1, 2025, allowing Milan to raise its tourist tax further under Law 213/2023, which grants provincial capitals the right to adjust rates during the Jubilee Year 2025. The increase will be up to €2 per night, bringing 4- and 5-star hotels from €5 to €7 per night and short-term rentals from

€4.50 to €6.30. The additional revenue will be allocated to improving public transport infrastructure, enhancing urban maintenance and cultural heritage preservation. City officials emphasized that the goal is to balance economic benefits from tourism with the quality of life for residents. Milan's tourist tax revenues will also help combat tax evasion in the short-term rental sector, as funds will support a dedicated enforcement task force. They also argued that Milan's growing popularity as a global destination, with over 16.7 million overnight stays in 2019, justifies these measures to ensure long-term sustainability of the city's tourism-driven economy (Agenzia Nova, 2023; Agenzia Nova, 2024).

Fines

Definition

Fines are monetary penalties imposed for violations of traffic rules and regulations, such as speeding, illegal parking or failure to comply with emissions standards. They serve a dual purpose: deterring unlawful behaviour and generating revenue that can be reinvested into urban mobility systems. Properly structured fines can incentivize compliance with safety and environmental policies while providing municipalities with funds to improve infrastructure, public transportation and road safety initiatives.

Advantages

- Fines act as deterrents to unlawful behaviours, promoting safety.
- They provide a steady stream of funds that can be reinvested in urban mobility projects.
- Once the enforcement system is in place, collecting fines typically incurs relatively low ongoing costs.
- When tied to specific initiatives, fines can foster public trust by showing a clear link between penalties and mobility improvements.

Disadvantages

- Fines can disproportionately affect lower-income individuals, for whom penalties represent a higher percentage of disposable income.
- Excessive or inconsistently enforced fines can lead to public dissatisfaction or loss of trust in authorities, particularly if revenues are not transparently allocated.
- Without proper oversight, fine revenues may be misused or diverted from intended purposes.
- Effective implementation requires robust enforcement mechanisms, including surveillance and personnel, which may be expensive to maintain.
- Relying heavily on fines for funding could create perverse incentives to prioritise revenue generation over fairness or road user safety improvements.

Requirements

- Clear legal framework and enforcement structure. The legal system must define the nature, application and collection of fines. This includes specifying violations subject to fines, the applicable penalties and the process for challenging fines.
- A robust enforcement mechanism is essential to ensure compliance and fairness. Well-equipped monitoring systems, such as surveillance cameras, automated ticketing systems and traffic enforcement officers, to detect and record violations reliably.
- Transparent allocation and usage of funds. This includes clear reporting on how the funds are used, ensuring accountability and public trust.
- Educational initiatives highlighting how fines contribute to improved infrastructure and mobility that can foster acceptance.
- Equitable design and application. Progressive fine structures or exemptions for certain groups can promote fairness.
- Efficient systems for paying fines and resolving disputes must be in place, such as online payment platforms, appeal processes and accessible support for the public to address concerns or errors.
- The fine system should be periodically reviewed to assess its effectiveness in achieving policy goals, such as reducing violations or funding mobility projects. Adjustments to fine amounts, enforcement methods or fund allocation may be necessary based on these evaluations.

Cases

Vietnam stands out as one of the few (if not the only) countries that earmark all revenue generated from traffic fines exclusively for road safety initiatives (Global Road Safety Partnership, n.d.). This approach provides a dedicated funding stream for activities such as traffic law enforcement, public awareness campaigns and infrastructure improvements. Between 2013 and 2016, annual revenue from these fines ranged from approximately VND 2,696 billion to VND 3,920 billion (approximately USD 115 million to USD 168 million). Fines are applied through a detailed regulatory framework. For instance, Decree No. 46/2016/ND-CP outlines penalties for violations such as speeding, driving under the influence of alcohol and failure to wear seatbelts. Additional sanctions, like license suspensions, accompany severe infractions. For example, speeding violations can incur fines ranging from VND 600,000 to VND 8,000,000 (approximately USD 25 to USD 342), depending on the severity of the infraction. The earmarking of traffic fine revenue in Vietnam represents a unique model in road safety financing, as it departs from the global norm of directing such funds into general state budgets (United Nations, 2018). This approach ensures that the funds are reinvested into sustaining and enhancing road safety measures. However, the system faces challenges, including declining revenue as enforcement becomes more effective, and resistance to increased fines due to public perception and affordability concerns (World Bank, 2002; Job et al., 2015).

The **United Kingdom** has successfully utilized fines from traffic violations as a funding mechanism for road safety initiatives, particularly through the implementation of speed and red-light camera enforcement programmes. In 1999, a national board was established to oversee the recovery of operational costs for these safety cameras using fines. This board included representatives from various key organisations, such as the Department for Transport, Her Majesty's Treasury and the police. The initiative was piloted in 2000 across eight areas, achieving significant improvements in road safety. Encouraged by these outcomes, the government introduced legislation to extend the programme nationwide. Local partnerships, comprising entities like local authorities, magistrates' courts, the Highways Agency and the police, were required to submit operational plans for approval to the national programme board. By 2003, the programme expanded to 24 areas, showing remarkable results. The initiative led to a significant reduction in road casualties and improved compliance with traffic laws. Excessive speeding decreased by 80% at fixed camera sites, while personal injury collisions dropped by 33%, and fatalities and serious injuries were reduced by 40% at camera locations. The programme also proved cost-effective, achieving a benefit-cost ratio of 4:1, with societal benefits, including reduced casualties, valued at approximately £221 million annually. By the third year, the programme generated £54 million annually, which was reinvested into safety camera enforcement and related education efforts (previously, fines accrued to the national Treasury). Public support for the initiative was strong, as surveys at both local and national levels indicated widespread approval for targeted safety camera enforcement (European Conference of Ministers of Transport [ECMT], 2006; OECD/ITF, 2015; Bliss & Breen, 2019).

Voluntary Contributions and Advertisement

Definition

Voluntary contributions and advertisement refer to financial inputs from private sector entities or individuals that support public infrastructure or services without any direct return on investment, other than potential reputational or indirect economic benefits. Private businesses, such as transport operators, insurance companies and corporations, may contribute voluntarily to road safety or urban mobility initiatives. Additionally, advertisement contracts allow private companies to fund public infrastructure, such as bus shelters or bike-sharing schemes, in exchange for advertising space, creating mutually beneficial partnerships between the public and private sectors.

Advantages

- Provide additional financial resources reducing the burden on government budgets.
- Foster collaboration between the public and private sectors.
- Advertisement-based financing often involves relatively simple agreements.

Disadvantages

- May be concentrated in areas where businesses are more active or where advertisement exposure is higher, potentially leading to uneven distribution

of funding and infrastructure improvements across regions without the proper financing system in place.

- Excessive advertising in public spaces can reduce the aesthetic quality and feel of urban environments, leading to public backlash.

- Private sector motivations, such as maximizing advertisement visibility, may not always align with public goals.

Requirements

- A well-defined legal structure to govern the use of public spaces for advertisements and ensure transparency in managing voluntary contributions. This includes clear guidelines on contract terms, permitted advertisement locations and standards for the type of advertisements allowed.

- Established frameworks for creating formal agreements between governments and private entities to ensure fair, transparent and mutually beneficial relationships.

- Administrative capacity to manage contracts, monitor compliance and ensure that funds or revenues from advertisements are used effectively for their intended purposes, such as transport maintenance or public infrastructure improvements.

- Public consultation processes to ensure that advertisement plans in public spaces are acceptable to local communities and aligned with aesthetic and cultural values, preventing excessive commercialization.

- Capacity to plan and evaluate the potential for sustainable, ongoing revenue generation from advertisements or voluntary contributions, ensuring that these funds can provide consistent support for long-term mobility projects rather than one-off contributions.

Cases

In **India**, the Zero Fatality Corridor (ZFC) initiative was launched in 2016 to tackle the country's alarming road death rates, which account for roughly 11% of the world's crash deaths. The project focuses on the Mumbai-Pune corridor, a high-speed roadway notorious for traffic accidents, fatalities and serious injuries. Through a multi-stakeholder approach, the ZFC integrates engineering improvements, better enforcement of road laws, enhanced emergency care and public engagement. The initiative, supported by Mahindra & Mahindra and ŠKODA AUTO Volkswagen India as part of their corporate social responsibility efforts, along with the Government of Maharashtra, has delivered notable results. On the Mumbai-Pune Expressway, where Mahindra & Mahindra has provided funding, road fatalities dropped by 43% in four years, from 151 in 2016 to 86 in 2019. Similarly, on the NH-48 stretch, with ŠKODA AUTO Volkswagen's support, fatalities reduced by 30% between 2017 and 2019, from 298 to 206 (Pulido & Raffo, 2022).

In **Bangalore**, multiple private sector companies, including 3M, Volvo, Coca-Cola, Infosys, Tata and Koshy Holdings, partnered with the government and NGOs for the Road Safety Drive 2000 initiative. One notable contribution was the establishment of the Emergency Motorcycle Unit, where volunteers from the Red Crescent Society were equipped to respond to traffic accidents. Using motorcycles, they could quickly navigate traffic jams where ambulances and cars could not, significantly improving emergency response times (Zietlow, 2006).

In **Romania**, 3M focused on road safety by enhancing the visibility of vulnerable road users, such as cyclists. The company provided retro-reflective safety devices and road markings as part of its global road safety initiative. These devices have been crucial in reducing accidents by making cyclists and pedestrians more visible to motorists, especially at night (Zietlow, 2006).

In **Nairobi**, local businesses in the downtown area have actively participated in implementing non-motorised transport measures by voluntarily funding the installation of bollards along paved walkways. These bollards prevent vehicles from parking on pedestrian paths, ensuring easier access for shoppers and improving foot traffic to the businesses. Shop owners view their contributions as beneficial, as the bollards enhance the pedestrian environment, making it more convenient for customers to reach their stores (Pendakur, 2005).

I.i.iii. User Charges

Congestion Charges and Road Pricing

Definition

Road pricing and congestion charges are mechanisms used to manage road use by imposing fees on vehicles during peak traffic times or in highly congested areas. The goal is to reduce traffic congestion, lower emissions and encourage the use of alternative transport modes. Fees are often variable, depending on factors such as location, time of day and vehicle type, with higher charges during peak congestion periods.

Advantages

- Reduce traffic congestion and improve traffic flow, particularly in city centres.
- Reducing the number of vehicles on the road helps lower greenhouse gas emissions, noise pollution and overall energy consumption.
- Road pricing is highly flexible and can be adjusted based on time, location and vehicle type, making it a precise tool for managing demand.
- In developing countries, this system can be progressive, as higher-income individuals who typically own cars bear the financial burden, while the revenue can benefit public transport users.

Disadvantages

- Setting up and maintaining the technological infrastructure for road pricing (e.g., electronic toll collection, vehicle tracking systems) can be expensive.
- May face political and public opposition, especially from car owners who are reluctant to pay extra charges.
- While the overall equity impact may be positive, congestion pricing can disproportionately affect lower-income drivers who rely on cars and have fewer public transport alternatives.
- If not properly designed, congestion charges may simply push traffic to other areas that do not have pricing in place, shifting the congestion problem rather than solving it.

Requirements

- Legislation at the national or regional level that allows for the imposition of fees on road users, defines the scope of these charges and provides mechanisms for enforcement. The legal framework should also specify how revenue generated from road pricing will be allocated.
- Access to the necessary technological infrastructure to monitor and collect road usage data and payments. This includes implementing automated systems such as electronic toll collection, license plate recognition technology or GPS-based vehicle tracking to ensure that charges are applied accurately and without disrupting traffic flow.
- Detailed knowledge of local traffic patterns, peak congestion times and high-traffic areas. This requires conducting comprehensive traffic and mobility studies to assess where and when congestion charges will be most effective as well as ability to analyse and model traffic data to forecast how road pricing will affect traffic volumes, pollution and public transport demand.
- Adequate and efficient public transportation options available that provide commuters with viable alternatives to driving, making the congestion pricing system fair and less burdensome.
- Detailed economic and environmental impact assessments to determine whether the financial benefits of reduced congestion and pollution outweigh the costs of implementing and maintaining the pricing system and how the charges might impact low-income drivers and businesses.
- Clear pricing strategy reflects traffic demand. Charges can vary based on time of day, location and vehicle type, with higher fees during peak congestion times and lower fees during off-peak hours.

Cases

The **Singapore** Area Licensing Scheme (ALS), introduced in 1975, was the world's first successful urban

congestion pricing scheme. It required motorists to purchase daily or monthly licenses to enter a designated "Restricted Zone" in central Singapore during peak hours. Initially covering a 6-square-kilometer area (later expanded to 7.25 square kilometres), the scheme led to an immediate 44% reduction in traffic within the zone, diverting vehicles that used the area as a shortcut and encouraging people to adjust their travel times. While the ALS significantly reduced traffic in the city centre, it did not result in a substantial shift to public transport. In 1998, the Singapore government replaced the manual ALS system with the more advanced Electronic Road Pricing (ERP) system, an automated congestion pricing mechanism. The ERP system improved upon ALS by allowing for variable charges based on time and location, which better reflected the true cost of vehicle use. All vehicles were fitted with an in-vehicle unit that read a stored-value card to deduct charges when entering the restricted zone. ERP charges varied depending on traffic conditions, with prices reviewed quarterly to optimise traffic speeds, aiming for 45-65 km/h on expressways and 20-30 km/h on arterial roads. This system cost S$200 million (approximately US$125 million) to implement, half of which was spent on fitting vehicles with IUs at no cost to motorists. The ERP achieved further reductions in traffic, with vehicle entries dropping by 20-24% and average speeds increasing from 30-35 km/h to 40-45 km/h. While reducing overall revenue by about 40% compared to the ALS, the new system successfully met its goal of reducing congestion rather than raising government income (Asian Development Bank, 2016; Theseira, 2020; World Bank, 2002).

Jakarta is actively exploring and implementing several congestion management policies to address its traffic woes, learning from successful cases in cities like Singapore. A key action is the planned introduction of an ERP, initially proposed in 2004, with renewed discussions in recent years. The ERP system aims to charge motorists between IDR 5,000 and IDR 19,000 ($0.32–$1.22) per trip across 25 roads, covering 54 kilometres, between 5:00 AM and 10:00 PM daily. This congestion pricing measure is expected to generate significant revenue—estimated at Rp 30 billion to Rp 60 billion per day ($1.92–$3.84 million)—which would be reinvested in public transportation improvements, pedestrian facilities and bike lanes. Additionally, Jakarta is implementing complementary strategies to tackle its traffic problems. The city introduced a Bus Rapid Transit system, TransJakarta, and has expanded public transport options with mass rapid transit and light rail transit lines (Kuang & Teo, 2018; Institut Teknologi Bandung, n.d; ITDP, 2024).

In **Bogotá**, congestion pricing is being implemented through a market-based reform of its *Pico y Placa* programmeme, a vehicle restriction system initially designed to limit the number of cars on the road based on license plate numbers. The traditional restriction method, introduced in 1998, initially barred about 40 % of private cars (plates ending in four specified digits) from driving on specific days, gradually evolving to 50% of cars being restricted based on odd-even license plates. This created perverse incentives for citizens to buy additional vehicles, increasing congestion and pollution. In 2020, Bogotá introduced the *Pico y Placa Solidario* programmeme, allowing drivers to pay a fee to be exempted from the restrictions. The fee system, which was initially set at a flat rate regardless of vehicle type or emissions, was later modified in 2021 to introduce variable pricing based on a vehicle's emissions and commercial value. The revenue collected from these fees is earmarked for improving public transport, thus turning the driving restrictions into a tool to both reduce congestion and fund sustainable urban mobility. This reform aimed to increase efficiency by allowing those who need to drive the most to pay for the exemption while encouraging others to use alternative transport. Despite the increase in traffic, the exemption fee has been found to bring substantial welfare gains. The authorities also considered reducing public transport fares with the revenue collected from the exemption fees to alleviate the distributional impact across different income groups (Montero, Sepúlveda & Basso, 2022).

Parking Charges

Definition

Parking charges refer to fees imposed on the use of on-street or off-street parking spaces. These charges can vary by location, time of day and duration of parking. They are commonly used as a tool to manage urban congestion, allocate parking space efficiently and generate revenue for public infrastructure projects. When applied strategically, they also encourage the use of public transportation and reduce the number of vehicles in congested urban areas.

Advantages

- Steady source of revenue that can be reinvested in public transportation, road maintenance and other

urban infrastructure projects. Higher parking costs can motivate people to use public transport or other mobility options instead of driving.

- Can be used as a tool to discourage excessive vehicle use, particularly in city centres, by making it more expensive to park during peak hours or in highly congested areas.
- By discouraging car use, parking charges can help reduce emissions, noise pollution and air pollution in urban areas, contributing to a more sustainable environment.
- Charging for parking encourages better use of urban land by reducing the demand for large parking spaces and freeing up land for other productive uses.

Disadvantages

- Drivers often view parking charges as an inconvenience or unfair cost, which can lead to potential backlash against such policies.
- In some cases, increased parking fees can deter customers from visiting retail or commercial areas, which may lead to reduced footfall for local businesses.
- Increased parking fees in one area may cause drivers to seek free parking in nearby neighbourhoods, creating issues in those locations.
- Setting up a parking management system can incur significant initial costs and requires ongoing maintenance.
- Can disproportionately affect low-income individuals who may not have alternative transportation options or cannot afford the fees.

Requirements

- Legal authority to impose fees. This often requires passing legislation that outlines the rules for collecting and enforcing parking fees, defines pricing structures and regulates fines for non-payment. The legal framework must also allow for periodic adjustments to the fees, based on factors like demand and inflation.
- Clear and transparent pricing strategy that reflects demand. For example, charges could be higher during peak hours and in high-demand areas like city centres. The pricing model should also differentiate between long-term and short-term parking to promote turnover in high-demand areas.
- Municipalities must have a robust system for enforcing parking regulations, including the issuing of fines for non-compliance. This can involve training enforcement officers, implementing automated systems for tracking parking violations and setting up an easy process for paying fines.
- Access to technology that allows for easy collection of parking fees. This can include parking meters, mobile payment apps, or smart card systems that offer convenience to users. The system should also allow for digital receipts and easy tracking of payments. To ensure compliance, municipalities also need a system for monitoring and enforcing parking regulations which can include license plate recognition systems, parking sensors or manual enforcement officers.
- Ensure that there are sufficient public transport alternatives. This allows residents and visitors to choose public transit options instead of driving.
- Engagement with key stakeholders, including residents, local businesses and transportation authorities, to explain the rationale behind parking charges and to gain support.
- Revenue allocation and reinvestment plan.

Cases

In 2012, **Mexico City** launched the ecoParq programme to address issues arising from unregulated parking, including traffic congestion and illegal parking. Prior to this, parking in Mexico City was mostly free or controlled by informal *franeleros* (independent attendants who collected parking fees), leading to long search times and public dissatisfaction. The ecoParq system introduced on-street parking meters in neighbourhoods such as Polanco, reducing cruising times, improving parking space utilization and generating revenue for public services. Under the ecoParq model, private operators manage parking, keeping 70% of the revenues, while the remaining 30% goes to Mexico City's Ministry of Mobility (SEMOVI). These funds are used for local streetscape

improvements, including sidewalk rehabilitation, lighting and planter installations. Over six years, the programme generated nearly USD $31.2 million for the government, which was reinvested in urban enhancement projects. Additionally, Mexico City implemented off-street parking reforms in 2017, shifting from parking minimums to maximums for new developments, especially in downtown areas. Developers exceeding 50% of parking maximums must contribute to a Mobility Fund used for public transport and road safety improvements. Together, these measures have made parking management a tool for funding sustainable urban mobility and enhancing public services in Mexico City (Yanocha et al., 2021; Yanocha & Mackenzie, 2023).

Beijing piloted a *hutong* (traditional alleyway) parking-management scheme in 2012, regularising curb spaces in Xisi North 6th and 7th Alleys and investing municipal funds in sanitation, landscaping, security patrols and toilet maintenance. Although the pilot itself did not charge for parking, researchers modelled a scenario in which permits auctioned at roughly US$80 a month and would raise about US $50,000 a year, more than covering the alley's operating costs and, in theory, paying back the initial US $62 000 capital outlay in 2.5 years. The study shows that market-rate pricing could turn on-street parking into a reliable funding stream for local public services, but Beijing has yet to adopt the fees city-wide (Shoup et al., 2017).

Public Transport Fares

Definition

Public transport fares refer to the fees paid by users to access public transit services such as buses, trains, subways and ferries. These fares are typically designed to cover part of the operational and maintenance costs of the transport system. Fare levels may be influenced by various factors, including operational efficiency, economic conditions and social equity concerns. In many cities, they represent a primary source of revenue for sustaining local transit systems, although they are often supplemented by public subsidies.

Advantages

- Key source of income for transport operators. While they may not always cover the full cost of services, they contribute significantly to operational costs and reduce the reliance on government subsidies.
- Fares allow transport authorities to directly charge users based on their service consumption, ensuring that those who benefit from public transport contribute to its upkeep.
- When tied to operational performance, it encourages public transport operators to run more efficiently. This can lead to improved service quality, better route management and optimal allocation of resources.
- Can be adjusted to reflect different user categories (e.g., senior citizens, students) or based on the distance travelled.

Disadvantages

- High fares can disproportionately affect low-income individuals who rely on public transportation, potentially making mobility less accessible for vulnerable populations.
- In many cases, fare revenue is insufficient to cover all operating and capital expenses. This can create a funding gap, requiring government intervention through subsidies.
- Fare increases often face public and political resistance, especially in cities where affordability is a concern.
- Collecting and managing public transport fares, particularly with the introduction of more advanced systems like electronic ticketing or contactless payment systems, requires significant investments in technology and administrative capacity.
- In many developing countries, keeping fares low to ensure accessibility can result in a deterioration of service quality over time. If fares are not adjusted to reflect real operational costs, this could lead to insufficient maintenance, outdated infrastructure and underinvestment in public transport.

Requirements

- Appropriate enabling legal framework that allows for fare setting, adjustments over time and the collection of payments. Additionally, laws should define who has the authority to approve fare increases, whether it's a municipal body, a regional transport authority, or an independent agency.

- A transparent and equitable fare structure that reflects the diverse needs of different passenger groups. This can include tiered pricing based on passenger categories, such as lower fares for students, elderly citizens or low-income riders. Tiered fares can also account for the distance travelled or the time of use, with peak and off-peak fares helping to manage demand.

- High quality of public transport services to justify the fares being charged. This includes maintaining a well-functioning fleet of buses, trains or ferries, offering reliable schedules and ensuring safety for all passengers. If service quality is poor, fare collection may not be well accepted by the public, leading to dissatisfaction and reduced ridership.

- Investment in modern fare collection technology, such as contactless payment systems, mobile payment apps or smart cards, to make paying fares more convenient for riders. These systems reduce the operational burden of collecting fares manually, improve accuracy and reduce fare evasion.

- Engagement with key stakeholders, including transit users, transportation advocacy groups and the general public.

- Revenue allocation and reinvestment strategy.

Cases

Medellín, Colombia's second-largest city, with a population of approximately 2.5 million people, has transformed itself through investments aimed at reducing social inequality and improving mobility, particularly in the most deprived districts. The city's public transport system is a significant part of this transformation, for which it received the Sustainable Transport Award in 2012. The public transport system integrates metro, cable cars, buses and even escalators to connect hilly neighbourhoods with the city centre. Special attention is given to seamless intermodal links between transport modes. The operation of the system is financially sustainable, as ticket revenues are supplemented by advertising and retail space leasing in metro stations. Public investment for the construction of the system was mainly funded through cigarette and fuel taxes. One of the key aspects of Medellín's transport system is its differential pricing model, which sets fares based on socio-economic criteria. The population is divided into six strata, with the wealthiest 3% of residents paying higher fares that subsidize the lower-income 90%. This system ensures equitable access to mobility. Concessionary fares are provided for students, the elderly and users of line L of the cable car, which serves some of the most vulnerable communities. Additionally, those using the Civica transport card, a re-loadable contactless card, benefit from fare discounts depending on the number of modes used in a trip (Agence Française de Développement [AFD], 2014a).

Curitiba's public transport system, primarily built around its Bus Rapid Transit network, has utilized a flat fare structure to promote equity and accessibility. This system allows passengers to pay a single fare regardless of the distance travelled or the number of transfers made within the integrated network of express, feeder and circular buses. The flat fare particularly benefits low-income residents living on the city's outskirts, who need to travel longer distances. The system also functions as a cross-subsidy mechanism, where passengers making shorter trips effectively subsidize longer trips, making the network financially accessible across socio-economic groups. In 2002, Curitiba introduced a pre-paid smart card system for fare collection, enhancing efficiency and reducing boarding times. Initially, the transport network was fully self-financing, relying solely on fare revenues without external subsidies. However, in 2013, rising fares led to public protests, prompting the city to reduce fare prices and introduce public subsidies. These subsidies offset the revenue gap created by the fare reduction; the discounted rides for students and older adults remain partly financed by cross-subsidy within the flat fare (AFD, 2014b; ICLEI, 2016; Lindau et al, 2010).

I.ii. Local Government External Revenue

I.ii.i. Intergovernmental Transfers

Definition

Intergovernmental transfers refer to financial support provided by higher levels of government (national or regional) to local governments or cities to fund public infrastructure projects, including sustainable urban mobility initiatives. These transfers can take the form of grants, subsidies or shared tax revenues and are often aimed at addressing public goods that benefit the entire country or region. National governments frequently offer regulatory frameworks, funding policies or programmes that guide local governments in planning and implementing sustainable transport systems. They may also provide technical assistance or capacity-building programmes to ensure the effective use of these funds. These transfers are crucial for cities, particularly in developing regions, to meet the growing demands for mobility and urbanization while promoting environmental sustainability.

Advantages

- Access to significant funding for local governments, enabling them to undertake capital-intensive projects that would be unaffordable with local revenue alone.
- Help ensure that all regions, including less affluent ones, receive the necessary funding to improve urban mobility, promoting more balanced development across the country or region.
- By directing funding towards specific mobility projects, national governments can align local transport improvements with broader policy objectives, such as reducing greenhouse gas emissions, improving air quality and enhancing energy efficiency.

Disadvantages

- Over-reliance on national or regional transfers can reduce local governments' incentive to develop their own revenue-generating mechanisms, leading to long-term financial dependency.
- Securing national or regional funding often requires navigating bureaucratic procedures, which can be time-consuming and administratively burdensome for local governments.
- National or regional funds may come with restrictions or conditions that limit how local governments can allocate resources, potentially reducing their ability to address immediate or context-specific needs.
- Allocation of funds may be subject to political considerations, resulting in unequal distribution.

Requirements

- Well-defined legal structure governing the allocation and use of national and regional transfers. This framework should outline eligibility criteria, the purpose of the funds and the procedures for applying, managing and reporting on the use of transfers.
- Institutional capacity to effectively manage the funds. This includes the ability to plan, implement and monitor large-scale mobility projects, as well as the capability to meet reporting and compliance requirements.
- Transparent allocation process to ensure that all local governments, regardless of political affiliation, have an equal opportunity to access resources. Criteria for project selection and funding distribution should be based on clear, objective indicators such as project feasibility, social impact and alignment with sustainability goals.
- Strong municipal financial management and auditing systems to handle the funds responsibly. This includes maintaining proper accounting systems, ensuring accountability and having mechanisms to prevent misuse or misallocation of funds.
- Collaboration between national, regional and local governments that helps reduce bureaucratic delays, align goals and ensure effective project implementation.

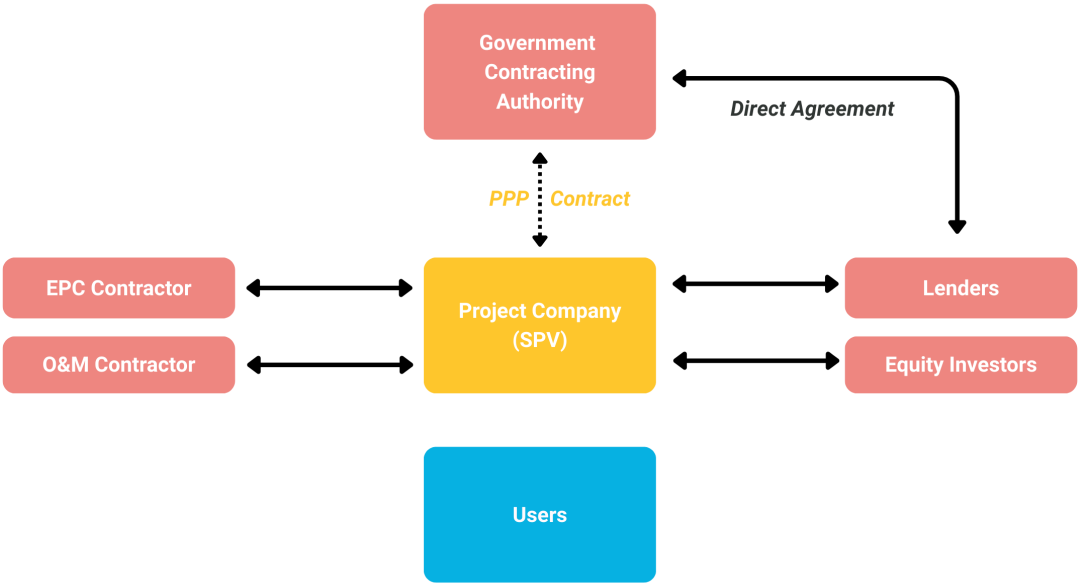

Figure 10. Public-Private Partnerships Project Cycle.

Cases

In **Brazil**, the National Policy on Urban Mobility mandates that cities with over 20,000 inhabitants develop mobility master plans linked to urban development strategies. Despite this, there is no direct financial mechanism at the federal level prioritising sustainable urban transport. The Growth Acceleration Programmeme – Mobility in Large Cities, administered by the Ministry of Cities, serves as the primary source of funding for mass transit projects such as BRT, Light Rail Transit and metro systems in large urban centres. Under this programme, the national government can cover up to 95% of the project costs, with a minimum local contribution of 5%. Beyond infrastructure projects, bus fleet expansion and operational aspects are supported by the Brazilian Development Bank (BNDES) through its Investment Maintenance Programmeme (PSI). This programme offers loans to local governments and small to medium enterprises for purchasing buses and other capital goods, financing up to 50% of the total value for microenterprises and 30% for larger entities. These loans play a critical role in modernizing urban fleets across cities in Brazil (GIZ & EMBARQ, 2013).

In **Mexico**, the federal government—despite lacking a comprehensive national urban transport policy—has built a financing architecture for sustainable urban transport through BANOBRAS and FONADIN. The Federal Support Programmeme for Mass Transit (PROTRAM) finances up to 50% of studies for cities over 500,000 inhabitants and up to 50% of the rest of the overall cost, with the remainder typically covered by state/municipal resources and loans, and with private participation required for at least 34% of capital assets. In practice, funding structures diverge between Mexico City and the rest of the country. In the Federal District, five Metrobús corridors (US$641.7 million total) were funded mostly by the city government (around 69%), with private operators contributing approximately 30%; roughly 34% of total costs were debt-financed, largely via private commercial banks. Outside the capital—e.g., State of Mexico, Puebla, Monterrey, Chihuahua—project costs ranged from US$77–249 million, and PROTRAM covered about 15–37%, while state governments provided about a third and, unusually, private investors more than 30%, including shares of infrastructure because of PROTRAM rules. As a result, around 46% of funding on average was debt-financed, predominantly from private banks (e.g., Bancomer, Interacciones), and some private partners now face unsustainable financial burdens that may require government bailouts. Mexico City's suburban rail and the State of Mexico BRT illustrate how this framework has enabled large projects, but the centralised, loan-heavy, and bureaucratically complex model can strain local coordination and long-term financial viability. (GIZ & EMBARQ, 2013; ITDP, n.d.b.).

I.ii.ii. Private Sector Involvement

Public-Private Partnerships

Definition

A public-private partnership (PPP) is a collaborative, risk-sharing arrangement between the public sector and one or more private or voluntary sector partners aimed at delivering a public service or achieving an agreed-upon public outcome. Unlike traditional procurement, the public sector is not purchasing an asset; instead, it is buying a stream of services that are delivered under predefined conditions and performance criteria. Key elements are:

- Payments are only made once the required assets are delivered and fully operational.
- Design, construction and operational risks—such as cost overruns and delays—are transferred to the private sector, which assumes control over the necessary assets and resources.
- By devolving control over resources to the private sector, the public sector allows private entities to bear the financial risks and reap the benefits associated with effective asset ownership and management.
- This structure ensures that the private sector is incentivized to deliver services efficiently, while the public sector focuses on ensuring that the specified public outcomes are achieved.

Advantages

- Significant risks, such as construction delays, cost overruns or operational inefficiencies, are transferred to the private sector, which is better positioned to manage them.
- PPPs allow municipalities and public entities to access private financing for large infrastructure projects, reducing the immediate fiscal burden on public budgets.
- By leveraging the expertise and experience of private sector companies, PPPs can lead to more efficient project delivery and management. Private partners are often more incentivized to operate with cost efficiency and technological innovation.
- Public entities can defer payments until services are delivered or generate revenue. This model allows municipalities to implement large-scale projects without having to provide full funding upfront.

Disadvantages

- Contracts are often complex and time-consuming to negotiate. They require detailed structuring to ensure that risks are appropriately shared, and responsibilities are clearly defined.
- While risk is transferred to the private sector, public entities are still reliant on the private partner's performance. If the private entity fails to meet service delivery standards, it can lead to public dissatisfaction, and the government may need to step in.
- While PPPs can bring operational efficiencies, they can sometimes result in higher overall costs for the public sector due to private sector profit margins, financing costs and potential renegotiations during the project lifecycle.

Requirements

- A strong legal framework that provides clarity on the municipality's ability to enter into PPP contracts. This includes laws that outline the rights and obligations of both the public and private sector partners, along with mechanisms to enforce contracts and resolve disputes if necessary. Without this legal certainty, private partners may be reluctant to engage.
- Adequate institutional capacity to manage the PPP throughout its lifecycle. This includes the ability to draft contracts, monitor performance and ensure compliance with service delivery standards. The authority managing the PPP must be equipped with the necessary technical expertise and operational capacity to oversee project implementation and resolve issues as they arise.
- The proposed project must be technically viable, aligned with the goals of the municipality, and designed to improve public services (e.g., reducing travel costs or improving infrastructure). A clear output specification and performance criteria must be set to ensure that the private sector delivers the required services efficiently.

- Sufficient fiscal capacity to support the PPP. This includes the ability to provide necessary subsidies, particularly for projects that may not be financially self-sustaining, such as public transportation systems. The public sector must ensure it can meet its financial commitments over the long term without jeopardizing other municipal responsibilities.

- Clear allocation of risks between the public and private sectors. Typically, the private sector assumes risks related to construction, cost overruns and operational inefficiencies, while the public sector may take on risks related to demand fluctuations or regulatory changes. This allocation ensures that both parties are incentivized to perform their roles effectively.

- Integration with the broader transportation or infrastructure system. Partial or isolated solutions risk creating inefficiencies or underperformance. For instance, a new bus route or service should align with existing routes and demand patterns to ensure operational success.

Cases

In response to rising public dissatisfaction with transport services and increasing congestion and pollution in the capital city, the Chilean government introduced the **Santiago** Urban Transport Plan (2000–2010). This plan combined large infrastructure projects with reforms aimed at improving public transport services. A significant portion of the infrastructure work, including the construction of urban toll roads was carried out through PPPs. Chile's experience with PPPs in urban toll-road construction was built on a decade of successfully using similar partnerships for interurban toll roads. The first major urban project, the 40-km Costanera Norte expressway, was initially met with public and environmental opposition, but after significant design revisions, it was concessioned in 2000. By 2010, Santiago had developed a 210-km network of modern toll expressways, constructed and operated by private concessionaires under strictly regulated contracts. These projects, costing around US$4 billion, introduced innovations in tunnelling, bridge construction, drainage and electronic tolling, with tolls varying based on traffic conditions (three speed based bands applied since 2004) to manage congestion. On another note, the bus reforms under the Transantiago programme aimed to involve the private sector more extensively in providing services, with 15 competitively awarded concessions for trunk and local bus services. However, the implementation of these reforms faced significant challenges, including system failures at launch, leading to public dissatisfaction and political fallout. Although the infrastructure component of the PPPs performed well, issues with fare evasion, operational inefficiencies and rising costs have continued to affect the system. Despite these difficulties, the reforms succeeded in reducing the number of buses in circulation, improving environmental outcomes and increasing private investment in public transport infrastructure (Willoughby, 2013).

Ho Chi Minh City used a "land-for-infrastructure" Build–Transfer deal to deliver the Pham Van Dong (Tan Son Nhat–Binh Loi) corridor. After an earlier BOT attempt collapsed, the city signed a BT contract in 2007 with South Korea's GS E&C to build 13.7 km of roadway and a Saigon River bridge for about US$340 million, including support for land clearance. Instead of cash, the municipality granted the contractor 102 hectares of development land in five sites around the city, which the firm could develop or even resell. This greatly reduced the city's upfront cash burden. A major controversy arose when the central government re-appraised the exchanged land and judged it to be worth nearly US$100 million more than the contract assumed, raising concerns that the city had over-compensated the investor. Negotiations also stretched out. Despite these issues, the road was completed (2008–2015) and now forms a key element of HCMC's network. (Nguyen et al., 2018).

In Korea, PPPs have played a critical role in addressing the growing demand for urban transport infrastructure, especially in **Seoul**. By the late 1980s, it became apparent that public sector efforts to expand road and rail infrastructure would not be sufficient to meet the rapidly increasing travel demands and car ownership. In response, legislation was passed in 1994 and reinforced in 1998 to promote private investment in transport projects to be repaid through scheme revenues (income generated by a public infrastructure project, typically through fees or charges collected from the users of the service). One of the most notable achievements under this model was the completion of the Seoul Beltway and new transport links to the rapidly growing satellite towns around the city. These projects, including both road and rail infrastructure, were delivered on time and at competitive prices. However, the number of PPP projects implemented was lower than initially expected,

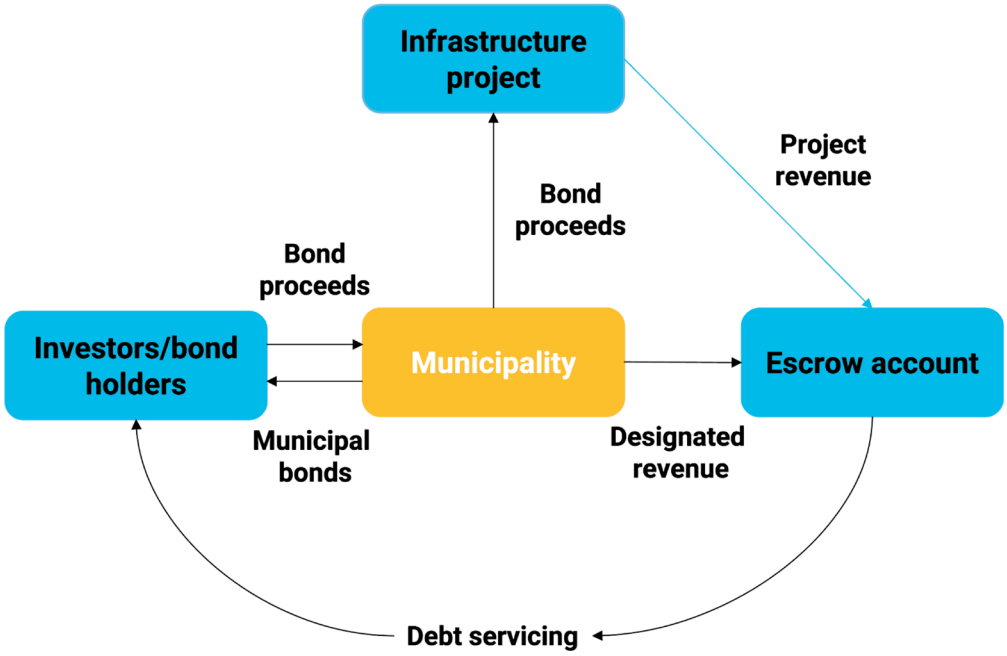

Figure 11. Process of Issuing Municipal Bonds.

partly due to macroeconomic challenges like the Asian financial crisis in 1997 and the global financial crisis in 2008. As environmental concerns grew, Seoul's city administration began introducing additional measures, such as congestion charges and bus system reforms. These reforms, initiated in 2003, were highly participatory, involving multiple stakeholders, including private-sector operators, labour unions and civic groups. The city also undertook a large-scale replacement of an elevated expressway with the Cheong Gye Cheon Park, a project that garnered strong public support. Additionally, significant reforms to the city's bus system, including the introduction of a GPS-based Bus Management System and the T-money smartcard system, were implemented through PPP arrangements, allowing private companies to contribute financially and operationally. Furthermore, the PPP model was extended to the Seoul Subway Line 9 project, where the private sector was responsible for the electrification and operation of the line, offering a benchmark for comparison with the publicly operated subway lines. Despite some initial challenges with implementation, the PPP approach in Korea proved successful in modernizing urban transport, improving environmental outcomes and increasing private sector involvement in infrastructure projects (Willoughby, 2013).

Bonds

Definition

Bonds are debt securities issued by states, cities, counties and other governmental entities to fund day-to-day obligations and to finance capital projects such as schools, highways or sewer systems. The bond holder lends money to the bond issuer in exchange for a promise of regular interest payments, usually semi-annually, and the return of the original investment, or "principal." Short-term bonds mature in one to three years, while long-term bonds won't mature for more than a decade.

Advantages

- Enables municipalities to leverage future cash flows to raise resources to meet the upfront investment usually required to fund capital projects.
- Although initial bond issues may require extensive structuring to achieve a good credit rating, by doing regular issuances, municipalities can seek to build a credit profile and history that can bring down financing costs and credit enhancements needs in the future.

- A push to raise external resources will also push municipalities to implement stringent reporting and disclosure standards.
- It allows municipalities to attract long-term resources and from numerous investors.

Disadvantages

- Preparing a bond issue can be a very complicated process that requires good data, understanding and disclosure of financial and economic information on the local government and knowledge of the market to ensure that the issue is placed at favourable terms.
- The cost can be considerably high, for local issuers must pay fees to a rating agency, the underwriting bank that sells the bonds publicly, for the capital market operations, and also cover the cost of marketing and publicity.
- It can be difficult for cities in developing countries to receive bond ratings.

Requirements

- Existence of a legal framework that supports municipalities' authority to issue bonds. This includes laws that regulate borrowing limits, procedures for bond issuance and investor protection mechanisms. Local governments may also need approval from central or regional authorities to issue bonds.
- A high standard of financial discipline and transparency, including accounting systems that follow accrual accounting principles, timely finalization and auditing of financial statements, and consistent, high-quality disclosure of financial information
- Ring-fenced projects to build investor confidence. These projects should have clear implementation plans, with defined financing mechanisms for both capital investment and maintenance, signalling project readiness to the market.
- An independent credit rating from recognized rating agencies. A strong credit rating can improve investor confidence and reduce the cost of borrowing by reflecting the municipality's financial health and ability to repay the debt.
- Bond ratings require transparent and auditable accounting practices.
- Capacity to develop a multi-year planning perspective and maintain a shelf of prioritised projects for bond financing. Presenting a series of upcoming projects beyond the initial bond issuance helps sustain investor interest and promotes regular investment in municipal bonds.
- An appropriate bond issuance size that considers both the municipality's assessed debt capacity and the transaction costs involved. This ensures cost efficiency and aligns with market appetite, especially for long-term institutional investors.
- Strong communication channels with potential investors through roadshows, prospectuses and regular updates on the municipality's financial performance. Building trust and fostering relationships with institutional investors can boost the chances of successful bond sales.
- Capacity to escrow specific revenue streams for debt servicing to mitigate investor risk. Establishing an escrow mechanism provides certainty of cash flows, improving the credit quality and rating of the bond issuance.

Cases

In the 1990s, as **Poland's** municipalities assumed greater responsibility for capital investments, they turned to bond markets for long-term financing, moving away from traditional bank loans due to the inadequacies of the banking system and a lack of understanding from lenders. The 1993 Law on Municipal Finance and the 1995 Law on Bonds provided municipalities with the legal framework to issue bonds, although limits were placed on how much debt they could accumulate. By 1996, several cities had begun issuing bonds to finance public transportation and road infrastructure projects. For example, Gdynia and Łódź each issued nearly Zł 30 million (approximately $11.1 million at the time) in bonds to purchase public transportation vehicles, while Kraków issued Zł 15 million ($5.55 million) to fund street modernization and a high-speed tram project. Gdańsk's bond issue of Zł 99 million ($36.63 million), the largest in the country, was used for road repair and the acquisition of new public transportation vehicles. Smaller cities, such as Ostrów Wielkopolski and Gorzów Wielkopolski, also issued

bonds for infrastructure projects like road repair and construction (Phelps, 1997).

Kuala Lumpur's MRT Project started in 2010 with the purpose of improving and transforming the poor and inappropriate public transportation system of the Klang Valley metropolitan area and to make it comparable to those of developed cities. The project has been using a hybrid public-private financing model. A frequently used tool has been sukuks (sharia-compliant bond-like instruments used in Islamic finance that involve a direct asset ownership) whose holders are repaid using ticket fares' revenue. In July 2012, Danainfra (a government-backed a funding vehicle for certain infrastructure projects) issued a RM8 bn government-guaranteed sukuk as the first tranche of the Sungai Buloh-Kahang line. Two years later, they raised RM2.5 billion (US$789.14 million) by selling three Islamic bonds, with tenors of seven to 20 years; Maybank, RHB Capital and Standard Chartered Saadiq jointly lead-managed the sale. Lastly, in 2021, the Government of Malaysia successfully priced the world's first sovereign USD Sustainability Sukuk whose underlying assets were vouchers representing travel entitlement on Malaysia's Light Rail Transit, Mass Rapid Transit and KL Monorail networks (malaymail, 2014; Ministry of Finance of Malaysia, 2021; Bond+Sukuk Information Exchange, n.d.).

In Africa, there is no record of municipal bonds being used to pay for urban mobility interventions. Nonetheless, various national governments have made use of bonds to pay for their development strategies. In July 2021, **Benin** issued its first SDG Eurobond, raising €500 million for a 12.5-year period. The funds are allocated to projects that align with Benin's commitment to achieving the United Nations' 2030 Agenda. Specifically, the bond proceeds are dedicated to projects that address social, environmental and infrastructure needs, with a focus on the SDGs. Eligible expenditures are an emergency programmeme to build 15 steel bridges to improve Access to all areas of Benin and a special programmeme to contribute to the improvement of the living environment and transport conditions in the historic city of Abomey (Benin, 2021).

In East Africa, on the one hand, **Rwanda** successfully issued a USD 400 million Eurobond in 2013 on the Irish Stock Exchange with a coupon rate of 6.625%. This marked a significant moment for Rwanda's economic strategy, allowing the country to fund infrastructure projects and bolster economic growth. Despite global financial pressures, including the impacts of COVID-19, Rwanda managed to repay the Eurobond by 2023, partially utilizing IMF support and Special Drawing Rights allocations (Business Insider Africa, 2023; The New Times Rwanda, 2013). On the other hand, the 12-year infrastructure bond issued by the Government of **Kenya** in September 2013 raised KSh 20 billion as the first tranche to a total borrowing of KSh. 36bn, with a significant portion allocated to transport infrastructure. Specifically, KSh 14.28 billion ($229 million at the time) was dedicated to the transport sector, focusing on the construction, overhaul and refurbishment of roads across the country (Central Bank of Kenya, 2013). This includes improvements to both classified and unclassified roads, which are critical for enhancing accessibility and promoting economic development.

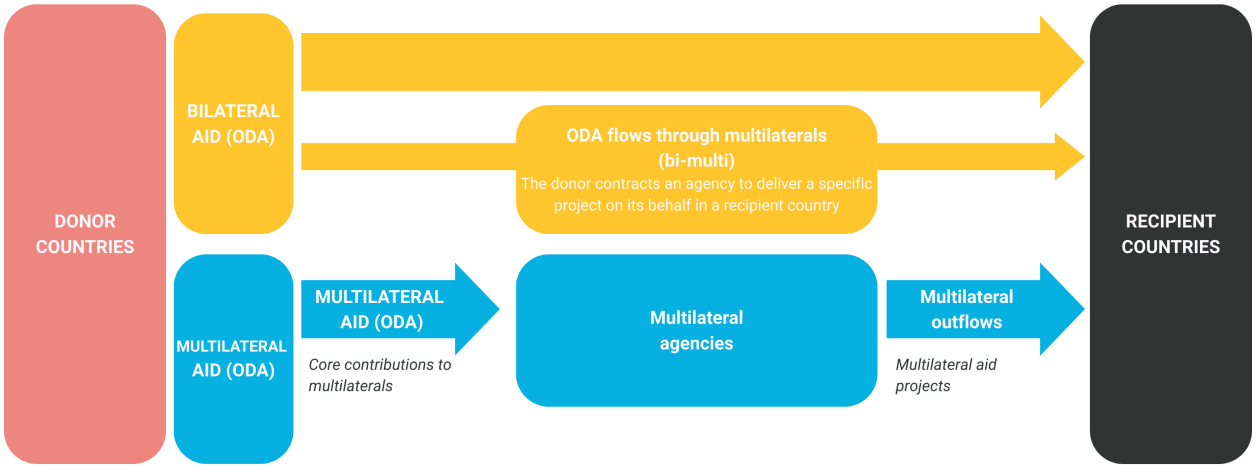

Figure 12. Official Development Assistance.

The projects aimed to improve the condition of Class A, B and C roads, addressing the poor state of Kenya's road network, which had been identified as a major barrier to the country's social and economic progress.

I.ii.iii. Official Development Assistance

Definition

Official Development Assistance (ODA) refers to financial resources provided by developed countries, multilateral institutions or international financial organisations to support the economic development and welfare of developing countries. ODA is typically offered in the form of grants, concessional loans or technical assistance, and usually channelled through national governments. It is aimed at addressing a wide range of development challenges, including infrastructure, health, education and poverty alleviation. In the context of sustainable urban mobility, ODA can be critical in financing transport projects that reduce greenhouse gas emissions, improve access to public transport and promote non-motorised transport modes. ODA can take different forms:

- **Grants** – Non-repayable financial support for specific projects or sectors.
- **Concessional Loans** – Loans with below-market interest rates and extended repayment terms.
- **Technical Assistance** – Capacity-building, knowledge transfer and advisory services.
- **Debt Relief** – Partial or full cancellation of debt to free up resources for development.

Advantages

- Access to concessional financing at more affordable terms than developing cities could obtain from commercial markets.
- Strengthens relationships between donor and recipient countries, facilitating knowledge transfer, partnerships and shared best practices in development.
- ODA programmes often come with technical support, training and expertise, helping recipient countries improve their institutional capacities to plan, implement and maintain projects.
- ODA, especially when provided by multilateral organisations, often comes with political and financial risk management support, making it easier to attract private investments to large projects.
- Supports long-term development goals creating a foundation for long-term economic and social benefits.

Disadvantages

- Dependency risk by making developing countries too reliant on foreign aid, reducing their incentive to develop internal revenue streams or implement sustainable local financing mechanisms.
- Managing ODA projects can be bureaucratically demanding, with stringent reporting, compliance and coordination requirements that may strain local institutions.
- ODA is subject to changes in donor country policies or economic conditions, leading to potential funding instability for long-term projects in recipient countries.

Requirements

- Well-defined legal and regulatory frameworks that govern how ODA funds. This includes ensuring compliance with national laws, international agreements and donor stipulations to facilitate smooth project execution and avoid legal disputes.
- Strong institutional and administrative capacity, including the ability to plan, implement, monitor and report on projects, as well as comply with donor requirements for transparency, accountability and financial management.
- Reliable financial management systems in place to handle the disbursement and tracking of ODA funds. This includes proper accounting, auditing and monitoring mechanisms to ensure that the funds are used for their intended purposes and that corruption risks are minimized.
- Open communication and strong coordination with donor agencies to ensure that projects are well-managed and that reporting requirements are met. Clear coordination helps align expectations, timelines and project goals.

- Ensure that ODA-funded projects adhere to environmental and social safeguards. This may include conducting environmental impact assessments, ensuring the protection of vulnerable populations and mitigating potential negative impacts.

- Capacity to co-finance and provide local contributions to demonstrate commitment to the project.

Cases

Over the past few years, the World Bank has played a pivotal role in supporting sustainable urban mobility in developing countries. This support has aimed to tackle critical challenges such as congestion, pollution and limited access to efficient public transport, all while promoting environmentally sustainable solutions. For example, the World Bank contributed to Nigeria's **Lagos** Urban Transport Project 2 (LUTP2) with a US$190 million IDA credit blended with a US$4.5 million GEF grant to extend and upgrade Lagos's BRT system, strengthen institutions, and improve key roads. It financed the 13 km Mile 12–Ikorodu BRT extension with segregated lanes, stations, pedestrian facilities and an interchange, plus an Intelligent Transport System later procured after restructuring; it also upgraded the earlier BRT-Lite shelters and built the Ikeja bus terminal. Beyond infrastructure, the Bank funded extensive capacity building—383 trainings, 50 workshops, eight study tours—and helped establish five Transport Planning Units, while supporting LAMATA, LASTMA and other agencies to plan, regulate and monitor the network. It rehabilitated about 17 km of strategic state roads and enhanced the pavement management system. Outcomes included a 28% cut in end-to-end BRT travel time (120 to 86 minutes), average BRT speeds of 23 km/h, lower monthly transport spending (NGN 4,120 to 2,141 in 2012 Naira), a drop in corridor crash rates (139 to 96 per 100,000 vehicles), and an estimated 13% CO_2 reduction versus the without-BRT scenario. The project also provided technical assistance to Kano (concept for hubs/terminals) despite security-related delays. Three restructurings reallocated funds (e.g., from a cancelled Oshodi–Obalende BRT section and air-quality monitoring to the Ikorodu corridor and ITS) and adjusted indicators, but the PDOs remained intact (World Bank, 2017a; World Bank, 2018a).

In Côte d'Ivoire, the **Abidjan** Urban Transport Project, was financed by the African Development Bank (AfDB) with support from the Ivorian Government, the Japanese International Cooperation Agency (JICA) and the Global Environment Facility (GEF). This is a significant infrastructure development initiative aimed at alleviating traffic congestion in Côte d'Ivoire's economic capital. One of the major components of this project is the construction of the 4th Abidjan Bridge, which is designed to ease the heavy traffic burden in the Yopougon district, a densely populated area home to around two million people. The bridge is expected to serve as a critical link between various parts of the city, including facilitating faster commutes to the Plateau business district and the Adjamé commercial hub. The construction will not only decongest the city's western suburbs but also improve access to jobs, services, and other parts of the city, reducing the daily struggle faced by commuters who spend hours in traffic. In addition to the 2.4 km bridge, the AfDB's funding also supports the incorporation of a BRT system into the project. The BRT lane will facilitate faster and more efficient public transport, further enhancing urban mobility. The AfDB has financed $263.7 million of the project, which is part of a larger $629.49 million investment in improving Abidjan's urban transport infrastructure, including the construction of six interchanges and 88 kilometres of expressways (African Development Bank, 2022).

The E-Mobility Programme for Sustainable Cities in **Latin America and the Caribbean** (GCF-FP189), funded by the Green Climate Fund (GCF) and led by the Inter-American Development Bank (IDB), aims to accelerate the transition to low-carbon, climate-resilient public transport systems in nine countries: Barbados, Chile, Colombia, Costa Rica, Dominican Republic, Jamaica, Panama, Paraguay, and Uruguay. With a total investment of US$450 million (including US$200 million from the GCF—US$145 million in loans and US$55 million in grants), the programme focuses on financing electric vehicle deployment, including commercial e-mobility solutions such as buses, taxis and trucks, alongside increasing climate resilience of urban transport infrastructure and grids. Key components include the use of green hydrogen, vehicle-to-grid projects, and technical assistance. The programme expects to reduce greenhouse gas emissions, enhance grid resilience, and improve public and private sector capacity for sustainable transport planning (Early Warning System, 2022).

I.iii. Community Grassroots Financing Approaches

I.iii.i. Civil Society Involvement

Definition

Civil society engagement refers to the participation of non-governmental organisations, community-based groups and other advocacy organisations in the development process, often focusing on social, environmental and economic issues. These groups play a key role in mobilizing financial resources through fundraising, partnerships and grants, and can act as intermediaries between the private sector and local communities. Civil society organisations also contribute by advocating for inclusive and equitable policies, ensuring transparency in financial flows and implementing projects aimed at community development, climate resilience and public infrastructure.

Advantages

- Increased inclusivity and representation of vulnerable populations.
- Can help mobilize alternative sources of funding, such as crowdfunding, partnerships with private sector actors or social impact bonds.
- Civil society organisations (CSOs) can act as intermediaries between governments, the private sector and local communities, fostering trust, collaboration and community buy-in for projects.
- CSOs are often deeply embedded within communities and possess a strong understanding of local challenges and needs. This expertise allows them to tailor projects more effectively, ensuring they are culturally appropriate and address the most pressing issues.

Disadvantages

- Limited financial capacity.
- Civil society can be highly fragmented, with multiple organisations working in the same space without proper coordination. This can lead to duplicated efforts, inefficient use of resources and competition for limited funds.
- While CSOs often excel in community-focused initiatives, they may lack the technical expertise or experience required for large infrastructure projects, such as road networks or public transportation systems.

Requirements

- A clear legal and regulatory framework that defines the role of civil society organisations in mobilizing resources, collaborating with municipalities and participating in development projects. This framework should also protect the rights of CSOs to operate freely without unnecessary restrictions or bureaucratic hurdles.
- Ensure that both the local government and CSOs possess the technical capacity to manage resource mobilization effectively. This includes expertise in financial management, project implementation, and community engagement. If needed, municipalities can invest in capacity-building initiatives for CSOs.
- Systems to monitor and evaluate the impact of civil society's resource mobilization and project outcomes. This helps ensure that resources are used effectively, goals are met and adjustments are made as needed to improve performance.
- Public awareness campaigns that highlight the benefits of civil society participation in funding infrastructure projects, such as urban mobility initiatives. This includes educating citizens on how CSO-led projects contribute to local development and promoting trust through transparency and open communication.

Cases

In **Denver**, Colorado, the Arapahoe Protected Bike Lane project stands as a successful example of how crowdfunding was used to finance part of a sustainable urban mobility initiative. It was designed to use parked cars as barriers between cyclists and motor traffic, creating a safer environment for cyclists. The project was led by the Downtown Denver Partnership, a business organisation focused on the development of Denver's downtown area. The need for safer bike infrastructure was evident as cycling commuting rates increased, yet the city's bike lane projects were

progressing slowly. Initially, the Partnership secured $120,000 in donations from large private sector organisations, including a significant contribution from the Gates Family Foundation. However, an additional $35,000 was still needed to cover design costs. Rather than seeking traditional funding sources, the Partnership launched a crowdfunding campaign through the ioby platform, which specializes in community-led development projects. The campaign was successful, raising the required amount through contributions from around 250 individuals and small businesses. This public involvement not only helped fund the project but also raised awareness and support for safer cycling infrastructure. The project was seen as a way for citizens to "vote with their dollars" and demonstrate the community's commitment to improving urban mobility. This project paved the way for more public and private collaborations in Denver and inspired other cities in the U.S. to adopt similar crowdfunding models for their cycling infrastructure (Joanneum Research & United Nations Development Programme [UNDP], 2014; Reffell, 2020).

In **Tanzania**, the Road Safety Ambassadors (RSA) organisation has been at the forefront of funding road safety measures through a combination of crowdfunding and partnerships with other civil society groups and international donors. Their efforts have focused on raising awareness about road safety and advocating for policies that e pedestrian safety and other vulnerable road users. RSA initiated crowdfunding campaigns targeting local communities and individuals affected by road accidents. These campaigns successfully mobilized funds from citizens and well-wishers to support road safety campaigns. By using platforms that allowed small contributions from a large number of donors, RSA managed to expand its road safety programmes both online and offline. Through these efforts, RSA's membership grew from 20 members in 2015 to 60,000 by 2017. They have also been a key player in advocating for the inclusion of 30 km/h speed limits in Tanzania's National Road Safety Plan. Working with government agencies, NGOs, and other stakeholders, RSA provided data-driven evidence to demonstrate the importance of reduced speed limits in high-traffic areas, particularly for pedestrian safety. In addition, RSA, alongside other civil society groups such as the Tanzania Women's Media Foundation, has played a pivotal role in shifting the media narrative around road safety. Instead of focusing solely on individual accidents, RSA worked with journalists and editors to highlight systemic issues, such as drunk driving and seatbelt use, that could be addressed through legislative reforms. This media advocacy helped pave the way for policy discussions on amendments to Tanzania's Road Traffic Act (Global Alliance of NGOs for Road Safety, 2023; Global Health Advocacy Incubator, 2019; Seka & Marwa, 2018).

I.iii.ii. Microfinance and Asset Financing

Definition

Microfinance and asset financing involve providing small-scale financial services, such as loans and leasing, to individuals or businesses typically excluded

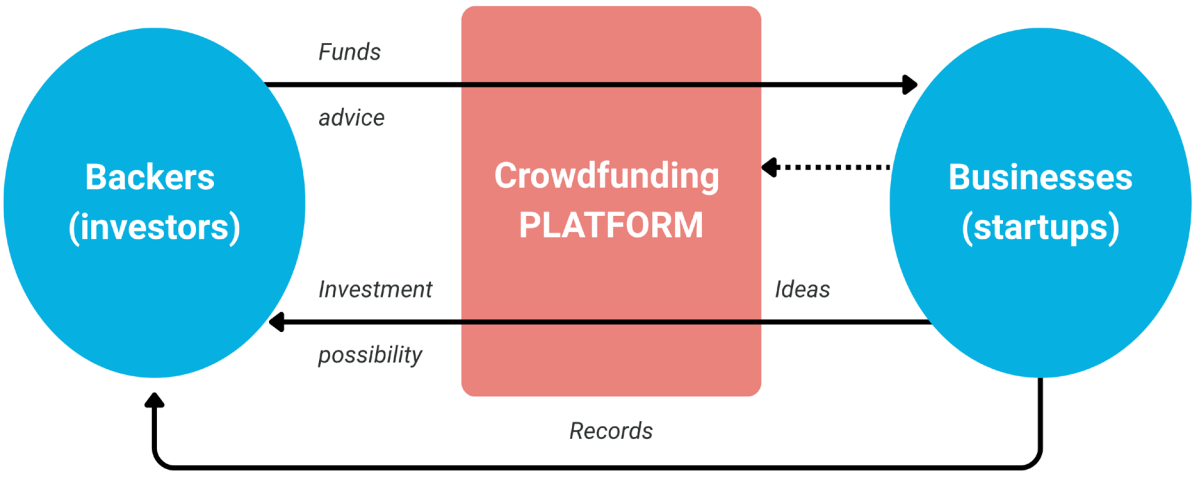

Figure 13. Crowdfunding Platform Structure.

from traditional banking systems. Microfinance institutions offer credit, savings and insurance products to low-income individuals, including informal transport operators, small business owners and non-motorised transport users, enabling them to invest in affordable, sustainable urban mobility solutions. Asset financing allows individuals or businesses to acquire necessary equipment, such as bicycles, electric vehicles, or public transport infrastructure, through leasing or instalment payment arrangements. These mechanisms are crucial in expanding access to sustainable transportation by supporting local entrepreneurs, reducing upfront capital costs, and encouraging inclusive, climate-resilient urban mobility systems.

Advantages

- Promotes financial inclusion by expanding access to capital for individuals and small businesses excluded from traditional banking systems.
- Enables operators to own their vehicles, shifting from a rental model to ownership, which enhances financial stability and reduces long-term costs.
- Supports local economic growth and entrepreneurship, particularly in the informal sector.
- Flexible repayment terms can be tailored to the borrower's ability to pay, reducing financial burden.

Disadvantages

- Higher interest rates compared to traditional loans due to the higher risk profile of borrowers.
- Asset financing arrangements may result in higher long-term costs compared to upfront purchases.
- Repayment pressures on low-income individuals or small businesses can be challenging if income fluctuations occur.

Requirements

- A strong legal and regulatory framework is needed to govern microfinance institutions (MFIs) and asset financing providers, ensuring transparency, fair lending practices, and the protection of borrower rights. This framework should include clear guidelines on interest rates, repayment terms, and penalties to prevent predatory lending.
- To ensure success, borrowers must have adequate financial literacy and understanding of how microfinance and asset financing work. Programmes should be in place to educate individuals and small businesses about budgeting, debt management, and the risks and benefits of financing instruments.
- Proper risk management tools such as loan insurance, credit guarantees or risk-sharing arrangements to minimize the financial exposure of MFIs and encourage responsible lending.

Cases

In **Uganda**, microfinance and asset financing play an important role in enhancing transportation, particularly through the *boda boda* (motorcycle taxi) sector. Several companies have developed innovative models to provide financing options for boda boda riders who typically lack access to traditional credit. Two key examples are Asaak and Tugende (Republic of Uganda, 2023). The former was founded in 2016 and offers asset-backed loans for motorcycle purchases, allowing riders to eventually own their vehicles. Asaak utilizes an innovative digital platform to assess creditworthiness based on the rider's trip data from mobility apps (like Bolt and Jumia) and their history with Savings and Credit Cooperative Organisations (SACCOs). It has provided loans to a significant number of riders, offering terms of 15 to 24 months for full ownership. This model helps riders transition from renting motorcycles to owning them, fostering financial independence and improving job stability (Asaak Financial Services Limited, 2023; Mukwaya et al., 2022). Tugende, on the other hand, specializes in lease-to-own financing for boda boda riders. With a focus on safety and financial inclusion, Tugende provides not only financing but also training in road safety and offers insurance packages. Riders typically make a 10% down payment and weekly installments over a period of 20 to 24 months to fully own their motorcycles. This model has had a significant social impact, helping riders achieve economic security and improving operational efficiency, as riders become more cautious with their own vehicles (Curran & Hsia, 2018; Mukwaya et al., 2022).

In India, microfinance has been playing an important role in improving access to transportation for low-income workers, particularly rickshaw pullers and three-wheeler drivers. Around 90% of India's three-wheelers are financed by private entities or individuals rather

than traditional banks. To address this financing gap, companies like Three Wheels United have developed innovative microfinance solutions that focus on daily repayment structures, which better align with the irregular earnings of drivers. Instead of monthly payments, drivers make small, daily payments through digital platforms, making it easier for them to own vehicles while reducing default risks. The use of digital wallets and payment platforms also helps drivers build credit histories based on their transaction data and performance (Nandhi, 2011). Regarding cycle rickshaw pullers in **Delhi**, studies have shown that, despite their irregular earnings and lack of formal banking, they are capable of saving and remitting money. This is why programmemes like EKO Technologies have partnered with the State Bank of India to offer mobile-based micro-savings accounts, which are designed specifically for low-income workers. This allows rickshaw pullers to make flexible deposits and withdrawals while accessing financial services without having to visit bank branches, which would otherwise result in lost income (UNDP, 2024).

Annex II: Key Toolkits and Resources for Sustainable Urban Mobility Planning and Financing

This annex presents a **comprehensive collection of toolkits and resources** that support the planning, financing and implementation of sustainable urban mobility projects. These toolkits, developed by international organisations, research institutions, and government agencies, provide practical guidance, analytical frameworks and best practices for urban mobility professionals.

The selection of toolkits reflects the broad range of challenges associated with urban transport planning and financing. Some focus on technical aspects, such as developing Sustainable Urban Mobility Plans (SUMPs), planning for non-motorised transport (NMT) or implementing transit-oriented development. Others emphasize financial mechanisms, offering guidance on public-private partnerships, road safety funding, and climate finance for low-carbon transport solutions.

By compiling these key resources, this annex aims to support policymakers, urban planners and transport professionals in identifying and applying the most appropriate tools for their specific contexts.

Table 6. Key Toolkits and Resources for Sustainable Urban Mobility Planning and Financing.

TOOLBOX	AUTHOR(S)	DESCRIPTION
Sustainable Urban Mobility Plans SUMP	GIZ	The SUMP Toolkit is a set of products intended to support national and local government officials, planning practitioners, and policy makers of transitional and developing countries to design and implement a process for developing a Sustainable Urban Mobility Plan.
		The modules cover a range of topics essential for effective urban mobility planning, such as introduction to SUMPs, diagnosis tools, scenario development and measure selection.
Toolkit for Public- Private Partnerships in Roads & Highways	PPIAF	This toolkit aims to assist transport sector policy makers in low- and middle-income countries in implementing procedures to promote private sector participation and financing in developing their road and highway sector. It provides guidance on PPP strategy, policy, project preparation, risk allocation and financing.
Sustainable Transportation Planning	UNEP, FiA foundation	This book covers topics including: i) principles of sustainable transportation and its impacts on public health, social equity and the environment, ii) vision for sustainable cities of the future, iii) street design principles focused on pedestrian needs, iv) detailed guidance on planning and designing for pedestrians, including sidewalks, crossings, and measuring pedestrian level of service. This publication serves as an introduction to transit planning, including different transit modes and design considerations. The book takes an integrated approach to sustainable transportation planning.
NMT Toolkit	UNEP, FiA foundation	This guide offers a step-by-step explanation of the process of developing an NMT strategy. It begins with a discussion of the design principles for NMT facilities, followed by a description of methodologies for assessing the existing NMT environment and institutional capacity. The guide then covers the typical components of an NMT strategy and how they can be customised for the local context. Finally, it describes stakeholder engagement strategies and opportunities for institutional development to support the implementation of the strategy. It also includes cases of NMT strategies from Africa, East Asia and the Americas.
The Planning for Walking Toolkit	Transport For London	The Planning for Walking Toolkit is a handbook providing advice for planners and designers involved in redesigning or creating public realm spaces in London to prioritise walking. It aims to raise aspirations for creating improved walking conditions and references tools to plan targeted improvements that deliver comfortable, safe and enjoyable places to walk.

Non-Motorised Transport Project Assessment Tool (NMT-PAT)	**UNEP**	NMT-PAT functions by utilizing a combination of qualitative and quantitative assessment methods. It incorporates common aggregate transport and economic indicators to evaluate various aspects of NMT infrastructure without requiring extensive contextual data that is often unavailable in developing regions. The tool's operation involves several key steps. During the data collection, users gather relevant data on existing transport conditions. It's followed by the evaluation using assessment indicators that encompass health outcomes, environment, social benefits. The tool has been applied in various case studies within Nairobi such as Thika Highway and Haile Selassie Avenue.
Promoting Non-motorised Transport in Asian Cities	**UN-Habitat, Clean Air Asia, SHAKTI**	This is a "Policymakers' Toolbox" for promoting non-motorised transport in Asian cities, developed by Clean Air Asia in 2013. It provides motivation, assessment tools and implementation strategies for improving walking and cycling infrastructure.
Transportation Cost and Benefit Analysis Techniques. Estimates and Implications	**Victoria Transport Policy Institute**	VTPI offers a comprehensive guidebook that covers techniques, estimates and implications of transportation costs and benefits across various modes. The institute emphasizes the need for "smarter" solutions to transportation problems, moving beyond traditional approaches like building more roads or increasing subsidies. VTPI advocates for comprehensive analysis of transportation benefits and costs, including often overlooked factors such as land use impacts and the costs of automobile dependency.
Toolkit for Child Health & Mobility in Africa	**UNEP, FiA Foundation, Share the Road, ITDP**	The Toolkit for Child Health & Mobility in Africa was jointly developed by the University of Cape Town and the Institute for Transportation and Development Policy. This toolkit is designed to guide stakeholders through the process of achieving safe and healthy mobility for children in urban contexts. It is structured into three main sections: The Challenge, Planning Process and Toolbox.
GCAP's Transport Toolkit	**GCAP**	The Low Emission Transport Toolkit supports development planners, technical experts and decision-makers at national and local levels to plan and implement low emission transport systems that support economic growth. This toolkit helps users navigate a variety of resources to identify the most effective tools to design and implement climate action in the transport sector.
The Road Forward	**US Department of Transportation**	The toolkit provides strategies and approaches to reduce both the occurrences and consequences of crashes for motorists and non-vehicle users, focusing on the Safe System Approach.
Building Great Transportation Infrastructure	**US Department of Transportation**	The toolkit provides detailed guidance on each stage, including best practices, tools and resources for transportation agencies and governments. It emphasizes data-driven decision-making, performance-based planning and sustainable approaches to transportation infrastructure development.
Road Safety Toolkit	**iRAP**	This toolkit is a collaborative effort between various international organisations. Key features of the Road Safety Toolkit include:
		Information on safety measures for various road users, including pedestrians, cyclists, motorcyclists, and car occupants.
		Guidance on addressing different crash types, such as intersection crashes and bicycle/light mobility incidents. Resources for various road types, including streets, highways, and urban roads.
		Treatments for safer roads, including speed management, traffic calming, and skid resistance improvements.
		The toolkit contains over 110 case studies from around the world, demonstrating successful road safety interventions.
Climate Finance Toolkit for Low-Carbon Transport	**Changing Transport**	This toolkit is a set of knowledge materials intended to give an overview of existing climate finance sources for low-carbon transport. It is based on GIZ's broader definition of climate finance as all public and private financial flows for climate projects in developing countries and emerging economies.
		This toolkit is targeted at national and local policy makers, transport planners and operators. It aims to enhance their understanding of the complex climate finance architecture and to support them in finding the right source of financing and funding for low-carbon transport projects in order to ensure financial sustainability.

Share the Road: Design Guidelines for Non-Motorised Transport in Africa	**Share the Road**	This toolkit provides design guidelines for NMT infrastructure in Africa, developed by UNEP's Share the Road programmeme. The guidelines aim to increase the capacity of engineers, designers and planners to create safe, intermodal urban transport systems that prioritise walking and cycling.
Transit-oriented development implementation. Resources and Tools	**World Bank Group**	The Transit-oriented Development Implementation Resources & Tools publication brings together knowledge resources from multiple sources and countries that help in breaking down the concept of TOD for application in cities from World Bank client countries. The World Bank, through its Community of Practice (COP), and the Global Platform for Sustainable Cities (GPSC), identified the need for such a resource through their work with over 30 cities on TOD at all scales across all geographic regions. The COP focuses on supporting TOD assessment and implementation, expanding the available TOD knowledge base and leveraging partnerships with other global think-tanks and agencies.
Toolkit for Comprehensive Mobility Plan	**Ministry of Urban Development Government of India**	The document is a revised toolkit for preparing Comprehensive Mobility Plans (CMPs) for cities in India. The toolkit outlines a 6-task process, Define CMP scope and timeframe, collect and analyse existing transport data, develop Business-as-Usual scenario, develop Sustainable Urban Transport scenarios, develop Urban Mobility Plan, prepare Implementation Programme
		It emphasizes integrating land use and transport planning, promoting public and non-motorised transport, and considering all socioeconomic group. The toolkit is designed for cities with populations over 500,000 but provides a simplified approach for smaller cities.
Sustainable Financing Tools and Strategies for Equitable, Community-Based Mobility and Transportation Solutions	**Steer**	The document categorizes various funding and financing strategies into several categories, each with specific characteristics. The Funding Strategies include:
		Community Benefits Agreements (High cost, Covers capital and operating costs, Supports non-revenue generating programmes).
		Development Impact Fees (Low cost, Continuous funding source, New source of funds for local governments).
		Low Carbon Fuel Standard (LCFS) Holdback Credits (High cost, Continuous funding source, Supports non-revenue generating programmes).
		The Financing Strategies include:
		Green Banks (High cost, Focus on capital costs, Aims to lower finance costs).
		Public-Private Partnership Financing (High cost, Varies in support for non-revenue generating programmes, Delays funding needs through collaboration with private companies).
		Revolving Loan Fund (Medium cost, provides continuous capital support, Helps delay funding needs).
Smart Mobility Toolkit for World Bank Operations	**World Bank**	The Smart Mobility Implementation Toolkit for World Bank Operations is a comprehensive resource designed to guide the implementation of smart mobility solutions in urban environments.
		The steps for implementing the Smart Mobility Implementation Toolkit are as follows: conduct a readiness assessment; perform data collection and analysis; conduct a gap analysis; develop a smart mobility concept; create an action plan; engage stakeholders; implement smart mobility solutions; and evaluate outcomes. The document includes a detailed case study illustrating the application of the toolkit in Bogotá. It includes an assessment of the city's readiness for smart mobility initiatives, prioritisation of actions, and recommendations based on local conditions.

Toolbox for the Establishment of Metropolitan Transport Executives (MTE) in ASEAN Metropolitan Regions	**ASEAN**	The MTE Toolbox consists of several key components that provide a structured approach to developing metropolitan transport governance. The toolkit delineates three governance levels: **Strategic Level:** Involves high-level planning and policymaking by authorities such as national ministries. **Tactical Level:** Focuses on the coordination and execution of transport strategies, typically managed by the MTE. **Operational Level:** Engages various service providers and operators responsible for day-to-day transport services. The toolkit presents different governance frameworks: **Regulator Model:** A market-oriented approach where government regulates transport operators. **Agency Model:** A state-directed model where government directly manages transport services. **Metropolitan Transport Executive Model:** A hybrid approach that combines elements from both previous models to enhance coordination and efficiency. The key steps suggested by the Metropolitan Transport Executives Toolbox for establishing effective governance in urban transport systems include assessing current governance structures, defining clear objectives and developing legal frameworks. Creating comprehensive masterplans, engaging stakeholders throughout the process and implementing change management strategies to facilitate transitions. Establishing robust budgetary frameworks is crucial for securing funding and ensuring sustainable operations. Finally, fostering national and international cooperation is essential to share best practices.

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