

Scaling up investment for sustainable urban infrastructure: A guide to national and subnational reform

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Summary for policy makers

Towns and cities are growing at an unprecedented rate. By 2050, two-thirds of the global population will live in urban areas. Delivering on the Sustainable Development Goals (SDGs) and the Paris Agreement on Climate Change will require coordinated policy actions at the national and subnational levels. Creating clean, compact, and connected cities would play a major role in generating sustainable growth, improving air quality and public health, enhancing accessibility and safety, reducing poverty, and avoiding the costs of sprawl—all while reducing carbon emissions. Funding such a program is challenging, however, as the sustainable urban infrastructure financing gap exceeds US\$1 trillion a year.

This paper makes the case for a coordinated or systems approach to urban finance. Traditional approaches to urban finance have often focused on actions that cities can take, such as issuing municipal bonds or securing a good credit rating. Much of the recent literature emphasizes mechanisms such as debt financing, public-private partnerships, and land value capture instruments. *Financing the Urban Transition*, a 2017 report by the Coalition for Urban Transitions, surveyed more than 70 financing instruments that national and subnational governments could deploy, identifying instruments with especially high potential to raise and steer new resources for sustainable urban infrastructure. These instruments can potentially catalyze increased investment—but they also add to local debt and to the overall liabilities and risks facing government.



Photo credit: Visty Banaji

About this working paper

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Fiscal sustainability therefore has to be carefully assessed, not just for the concerned subnational jurisdiction but also for the country as a whole, alongside potential benefits. Focusing narrowly on such strategies will not mobilize resources at sufficient scale, however, because they are not firmly based on local taxation and “ability to pay” and consequently overlook the limitations and risks associated with such strategies.

In contrast, this paper recognizes that national governments are responsible for ensuring that all tiers of government respect sustainable borrowing constraints while making the investments necessary to sustain human and economic development over longer horizons. It therefore argues for a far-sighted, coordinated approach to fiscal policy. It recommends that national governments generate the bulk of revenues from wide-area taxes, some of which are shared with subnational entities, but that local governments also generate own-source tax revenues with control over the margin. Such a system can enable governments to access different forms of credit and involve the private sector in providing public infrastructure. National governments also play a key role in apportioning liabilities across different tiers of administration. The paper emphasizes the importance of strategically combining different tax instruments, spending choices, and financing mechanisms to incentivize and enable fairer, faster, cleaner economic growth while minimizing both fiscal and climate risks.

This paper sets out a two-step framework to illustrate how national and subnational governments can systematically strengthen their urban finance systems. First, it underscores the importance of getting the basics right in terms of multilevel tax and spending choices to ensure effective, fair, and sustainable fiscal policy outcomes. Second, it identifies many of the preconditions for deploying key financing instruments at scale, typically at the city or local level. The paper can help economic decision-makers consider how to reform and strengthen both fiscal and finance systems to raise the scale of resources needed to fund core services and finance sustainable urban infrastructure.

The starting point for the sustainable deployment of a range of financial instruments is the overall government revenue envelope. This paper argues that only a complementary set of wide-area taxes and public spending instruments, typically at the national level, should be considered to provide a balance of self-reinforcing incentives that can concurrently achieve efficiency, equity, and environmental/climate goals. Such instruments include the following:

- value added tax (VAT), which can play an important role in meeting overall revenue targets, improving data on financial flows, and creating a level playing field for public and private investments, provided the base is integrated and the rate structure is kept simple;
- income taxes, which remain a major source of revenue raising and redistribution, as long as the base is sufficiently broad
- a carbon tax, which can incentivize sustainable behaviors by both producers and consumers and raise additional revenue for reinvestment in low-carbon infrastructure.

The paper shows how governments can complement this fiscal agenda by strategically deploying a range of financing instruments to help fill the investment shortfall and crowd in key private sector capabilities for sustainable urban infrastructure. Debt financing, for example, offers a way to distribute the public costs of sustainable urban infrastructure investment equitably over time. PPPs can secure private sector capabilities in the design, construction, and management of large sustainable infrastructure projects. Land-based financing instruments can harness the interrelationships between more productive use of land and rising land values to unlock financing for sustainable urban infrastructure such as mass transit systems.

At the city level, the paper explores options for scaling up investments in sustainable infrastructure through a mixture of fiscal reform and financing mechanisms that include the following:

- piggy-backed arrangements on income or carbon taxes
- user fees and charges
- simple property tax systems
- stamp duties on property sales
- debt financing including green bonds
- land sales
- betterment levies
- PPPs for infrastructure development.

The paper emphasizes the need for national and other tiers of government to address a wide range of preconditions before using these financing instruments. Decision-makers must pay close attention to fiscal, regulatory, and policy; institutional; and investment and credit environments to ensure that these mechanisms are deployed in a fair and sustainable way. Liabilities need to be tracked consistently within and across jurisdictions using international standards to generate consistent balance sheets for every level of government. National governments need to clearly establish regulatory and legislative frameworks that explicitly articulate which government agencies can use specific financing instruments and under what terms. They also need to ensure that government agencies can develop or access the technical capacities necessary to design and implement financing mechanisms, such as the legal expertise to draft suitably tight contracts and the financial expertise needed to structure a bankable project.

National and subnational governments can accelerate the transition to more dynamic, more efficient, and cleaner urban development, which in turn can drive national economic growth. Doing so depends on systematically establishing a comprehensive and complementary bundle of tax instruments and governance and financing arrangements and helping all tiers of government work effectively and in partnership to deliver sustainable urban infrastructure at scale.

1. Introduction

Towns and cities can be powerhouses of economic opportunity, innovation, and development. Urban agglomerations can help countries generate employment, stimulate productivity, and diversify economic activities. In the absence of urgent and coordinated action, however, inefficient, exclusionary urban growth and the impacts of catastrophic climate change threaten this potential. Strategic urban planning and coordinated urban infrastructure investment are essential to create a system of cities that secures economic prosperity and protects populations and economies from environmental risk.

The shortfall in financing available for sustainable urban infrastructure currently exceeds US\$1 trillion a year.¹ National governments have a crucial role to play in raising these unprecedented levels of investment for low-carbon urban infrastructure and services and directing resources away from damaging and high-carbon infrastructure. Doing so can help achieve development priorities such as job creation and poverty reduction² and deliver national climate commitments.

This paper makes the case for a coordinated or systems approach to urban finance. Traditional approaches to urban finance often focus on actions such as issuing municipal bonds or securing a good credit rating. Much of the recent

literature emphasizes mechanisms such as debt financing, public-private partnerships, and land value capture instruments. Focusing narrowly on such strategies will not mobilize resources at sufficient scale, however, because they are not firmly based on local taxation and “ability to pay” and consequently overlook the limitations and risks associated with such strategies.

This paper recognizes that national governments are responsible for ensuring that the different tiers of government respect sustainable borrowing constraints while making the investments necessary to sustain human and economic development over longer horizons. It therefore argues for a farsighted, coordinated approach to fiscal policy, in which governments strategically combine different tax instruments, spending choices, and financing mechanisms to incentivize and enable fairer, faster, cleaner economic growth while minimizing both fiscal and climate risks.

The paper sets out a two-step framework to illustrate how national and subnational governments can systematically strengthen their urban finance systems. First, it underscores the importance of getting the basics right in terms of effective, fair, and sustainable multilevel fiscal systems. National governments can deploy a judicious balance of income taxes, value added taxes (VAT), and carbon taxes to increase public revenues while addressing distributional and environmental goals. They can also strengthen the capacities and accountabilities of local governments, including by guaranteeing reliable and adequate fiscal transfers and establishing clear arrangements for own-source revenues. Appropriate property tax systems and piggy-back arrangements on national taxes can be particularly valuable instruments for state and local governments. Focusing on these fundamentals can enable national and subnational governments to raise more resources for public services and investment while simultaneously incentivizing the allocation of private capital toward more inclusive, sustainable urban growth.

Second, the paper evaluates three financing instruments with significant potential for scaling up, shifting, and blending investment with private capital: debt financing (loans and bonds), public-private partnerships (PPPs), and land-based financing mechanisms. *Financing the Urban Transition*, published in 2017, describes more than 70 financing instruments that could be deployed by national governments and identifies three sets of instruments with especially high potential to raise and steer new resources for sustainable urban infrastructure once the essential fiscal preconditions are in place or are being strengthened.³ This paper examines those preconditions. It articulates the importance of a nationally coordinated, far-sighted approach to urban finance. While recognizing the importance and promise of debt financing, PPPs, and land-based financing, it notes that scaling up specific financing instruments is likely to be effective or fiscally sustainable only if heads of state and finance ministers, in partnership with governors and mayors, put in place fair, effective, and balanced taxation policy and systems and ensure that the technical preconditions for successful deployment are in place. It shows that governments can systematically build efficient urban finance systems that unlock more just, sustainable economic growth and sets out how they can do so, detailing the capacities needed to deploy multilevel fiscal and financial instruments to scale up investment and the strategic reforms required at the national level.

The political economy of fiscal reform is country specific. High-income countries typically have well-developed capital markets, so that sophisticated debt and equity instruments can be deployed to finance new urban infrastructure. Even many city governments in these countries have investment-grade credit ratings, typically linked to property-based tax revenues. High per capita incomes also mean that many infrastructure investments can generate revenues that enable cost recovery and profit. In contrast, many low-income countries have less effective revenue collection systems and lack investment-grade credit ratings. With low per capita incomes, even returns from revenue-generating assets may be too low to provide a sufficient profit margin for prospective investors without compromising affordability. The actual and perceived risks of capital investments are also typically higher than in high-income countries.

Even advanced countries have difficulties recognizing the buildup of liabilities, many of which are off-balance sheet. These liabilities can compromise the effectiveness of financing mechanisms, especially bonds and PPPs. The problem is highlighted by post-2008 crises in a number of countries in the European Union that have had difficulties with PPPs charged with providing a range of public services (see, for instance, the failure of Carillion in 2017 in the United Kingdom). There is thus no assured “transition to maturity” based on income levels unless a range of

basic fiscal preconditions is met. Indeed, a number of emerging market economies that have addressed key fiscal underpinnings, such as China, may be better placed to address future urban infrastructure needs than some of the highest-income countries.

Political, cultural, and economic norms may limit the options available to reform-minded heads of state and finance ministers. To gain traction, tax and spending systems need to accommodate individuals' behavior and preferences. For example, loss aversion (the fact that the pain of a loss exceeds the benefit afforded by an equal gain) influences people's perceptions of taxation. Evidence from Uganda suggests that citizens are much more likely to hold corrupt officials to account when they siphon off tax revenues (money that people once had)⁴ than international development assistance (money that people might have had). These considerations need to be taken into account to ensure that fiscal reforms are accepted.

No single roadmap can chart a course for all governments. National governments need to develop locally specific strategies to enhance their ability to raise and steer low-carbon, climate-resilient urban investment.⁵ Governments would benefit, however, from a broad overview of the urban finance landscape and a deeper understanding of the preconditions for building effective, fairer systems for scaling up investment in sustainable urban infrastructure. This paper seeks to meet this need.

The paper is organized as follows. Section 2 discusses the importance of scaling up investment in sustainable urban infrastructure. Section 3 explores how governments at different levels can reform their tax and spending choices and governance mechanisms to incentivize low-carbon urban development while raising sufficient revenues to open up access to private finance to scale investment in sustainable urban infrastructure. It emphasizes the need for systemic fiscal reform to drive the low-carbon urban transition while also delivering against other goals, such as efficiency and equity. Section 4 evaluates the preconditions—legal and institutional arrangements, governance, capacity constraints, and skills—that need to be in place before these instruments can unlock private finance at scale. Section 5 provides recommendations for policy makers.

2. The sustainable urban infrastructure imperative

Cities are the powerhouses of national economies. The rapid growth of metropolitan areas in emerging and developing economies has been driven by a search for jobs and improved income opportunities. The clustering of people and firms in cities enables specialization, reduces costs, and stimulates innovation.⁶ These agglomeration economies can support long-term economic development. Just 600 cities account for 60 percent of global GDP.⁷ National governments should therefore see the growth of sustainable urban hubs as a platform for diversifying economic activities, generating employment, and responding to new international trading patterns.

Many governments have not yet fully recognized the opportunity that urban finance presents to foster economic development and promote environmental sustainability at the national scale. A well-designed urban finance system can accelerate economic development in towns and cities, capture a proportion of the wealth generated, and reinvest it equitably across the country. Property tax systems, for example, can anchor borrowing to cover the capital costs of infrastructure while incentivizing more efficient urban land use. Both of these outcomes can help sustain future economic growth and thereby increase future tax revenues. Simultaneously, a well-designed urban finance system can incentivize more sustainable economic decision-making by households and firms. A carbon tax, for instance, favors investment in more efficient buildings, energy, and transport, helping steer private finance toward more climate-compatible options. This opportunity to use urban finance to stimulate sustained and sustainable economic growth is often missed.

Many countries are struggling to realize the full potential of agglomeration economies or structural transformation.⁸ Urban sprawl, congestion, pollution, and poverty pose significant challenges to the efficiency and productivity of cities.

Countries from Chile to China have seen a concentration of activities in a few coastal hubs, which face congestion, pollution, exposure to natural hazards, and increasing inequality. Air pollution alone costs the global economy US\$5 trillion every year.⁹ Countries from Brazil to South Africa have failed to accommodate urban population growth, and retrospective efforts to provide sufficient housing and infrastructure to urban residents are proving complex and costly.¹⁰ At least one in four urban residents globally does not have decent housing, secure tenure, or access to improved water or sanitation, which carries immense human and environmental costs.¹¹

A global temperature rise above 1.5°C risks setting back recent development gains and undermining economic growth. Without immediate and profound system change, many major ecosystems and national economies could risk collapse in the next 40–50 years.¹² Cities around the world are already facing more severe and frequent storms, floods, wildfires, and heatwaves, and many will be inundated as sea levels rise. Thirteen percent of the world’s urban population already lives in coastal areas that are less than 10 meters above sea level, and almost two-thirds of urban settlements with populations greater than 5 million are located at least partly in these zones.¹³ Yet a substantial share of urban population growth and urban infrastructure investment continues to take place in areas that are particularly vulnerable to climate change impacts, such as floodplains, steep slopes, and low-lying coastal areas.¹⁴ Responding to these multiple urban challenges effectively will be key to protecting and propelling national economic well-being in the face of climate crisis. Urban areas are crucial sites of climate action. They are responsible for up to three-quarters of energy-related carbon emissions.¹⁵ The urbanization of the world’s population—and the urbanization of poverty—also mean that economic and human development priorities must increasingly be tackled in cities.¹⁶ Efforts must take place against a backdrop of global economic turbulence, as automation, digitalization, and protectionism reconfigure industry and trade. Delivering on the SDGs and the Paris Agreement will depend on creating sustainable urban centers that can generate employment and stimulate innovation while achieving zero emissions within this century—ideally earlier—to stay within the global carbon budget.

More compact urban growth, connected infrastructure, and coordinated governance could enhance the performance of cities while reducing the risks of climate change.¹⁷ The 3C (compact, connected, coordinated) model of urban development can enhance agglomeration economies. Larger markets enable firms to better match their unique requirements for labor, premises, and inputs. Better flows of information enable firms to access knowledge and ideas that stimulate innovation. Increased economic activity also improves access to shared infrastructure and services, which reduces transaction costs.¹⁸ Higher density is also associated with lower per capita carbon emissions, thanks to lower demand for transport energy, reduced construction, and avoided land use change around the urban periphery.

Higher density can also impose costs, however, particularly in the absence of risk-reducing infrastructure and services such as sanitation, piped water, drainage, and solid waste collection. Planning and investment should therefore foster “good density,” defined as functionally and socially mixed neighborhoods with access to green spaces; comfortable, affordable, and efficient housing for all; and high-quality public transport networks.¹⁹ Whether understood as “good density” or “3C urban development,” effective planning and large-scale investment are required to achieve livable, dynamic cities.

Creating a national system of compact, connected, and coordinated cities will require unprecedented levels of investment, financed in a fiscally sustainable manner and allocated in an environmentally sustainable way. The global infrastructure investment deficit stands at about US\$1 trillion a year, much of it in urban areas.²⁰ Because urban populations and economies are growing rapidly, much of the needed infrastructure investment is in and around cities. Innovations in energy, mobility, and other sectors and the critical need to mitigate climate change have created the need for new and different urban infrastructure. The demand for new urban infrastructure presents an important opportunity to transition to more sustainable patterns of urban growth. But the short-term financing gap for *sustainable* urban infrastructure is likely to be even larger than it is for infrastructure of any kind, given the higher upfront costs and perceived risks associated with lower-carbon options (box 1).²¹ In the medium term, the fiscal gap will be tempered by potential economic savings, which have been well documented in cities.²²

Box 1

Defining sustainable urban infrastructure

Urban infrastructure can be understood as physical structures and facilities that fall within the boundaries of an urban area or are intended to meet the needs of city dwellers and industry. Such infrastructure includes commercial, public, and residential buildings; electricity generation, transmission, and distribution systems; bridges, canals, railways, roads, and tunnels; solid waste disposal systems; parks and other green or blue spaces; sewage and wastewater networks; telecommunications networks; and water supply systems.

Sustainable infrastructure can be defined as infrastructure that is economically, socially, and environmentally sustainable:

- Economically sustainable infrastructure provides decent employment and increases household incomes and firm profits without generating debt crises.
- Socially sustainable infrastructure is inclusive, designed to meet the needs of low-income and other marginalized groups, including women, children, the elderly, people with disabilities, migrants, and indigenous communities.
- Environmentally sustainable infrastructure has a minimal impact on local, regional, and global environments, including by reducing greenhouse gas emissions, improving natural resource efficiency, and safeguarding critical ecosystems and biodiversity.

Source: Godfrey and Zhao (2016), New Climate Economy.

Raising and steering capital into sustainable urban infrastructure will require the right combination of taxes, spending decisions, and financing instruments. The first priority is to redirect existing investment flows away from high-carbon, business-as-usual projects toward low-carbon options. The second priority is to fill the urban infrastructure investment gap with additional resources. Governments need to select a bundle of tax instruments, spending choices, and financing arrangements that complement one another to lock in the desirable structural change.²³ These choices need to reflect the domestic political economy of taxation in different countries and at different levels of government, as well as transparency and governance requirements.

3. Reforming multilevel tax and spending systems to support investment in sustainable urban infrastructure

National leadership is required to establish an efficient, transparent, and fair system of taxation and public investment for sustainable development that is capable of achieving two interrelated objectives. First, fiscal systems should incentivize sustainable investment decisions by firms and households, including in towns and cities, where most production and consumption takes place.²⁴ National decision-makers wanting to scale up investment in sustainable urban infrastructure should consider reviewing and reforming key tax and spending choices, with the goal of ensuring that fiscal policy consistently favors compact, connected, and carbon-efficient urban development. Such a review should not look solely at the fiscal instruments narrowly associated with urban areas (for example, congestion pricing) or local government taxation (for example, property taxes). It should also systematically look at how to direct investment to low-carbon urban options through a more comprehensive program of reforms to both taxes and public spending. In 2015 and 2016, for example, the G7 countries provided at least US\$100 billion annually in government support for the production and consumption of oil, gas, and coal, both at home and abroad, including

US\$81 billion in direct spending and tax breaks and US\$20 billion in public finance.²⁵ These subsidies distort economic decision-making and slow the energy transition that will be necessary to achieve zero-carbon cities by midcentury.

Second, fiscal systems need to raise sufficient resources to deliver sustainable urban infrastructure at scale. The low-carbon transition will require massive investment to decarbonize economic and social activity while meeting human and economic development needs.²⁶ Total public revenues and international development assistance are rarely sufficient to meet upfront investment needs. The problem is even more marked at the subnational level, where states/provinces and cities often lack effective control over a tax base—and very few countries have robust and reliable transfer systems. Taxation systems therefore need to efficiently raise sufficient “own-source” revenues for subnational governments to finance some of their current spending and secure sustainable access to credit for long-term infrastructure investments. Such investments are typically financed by borrowing and leveraging private resources, so that future generations share the costs of infrastructure that yields long-term benefits. These efforts should be underpinned by full disclosure of intertemporal liabilities at every level of government.

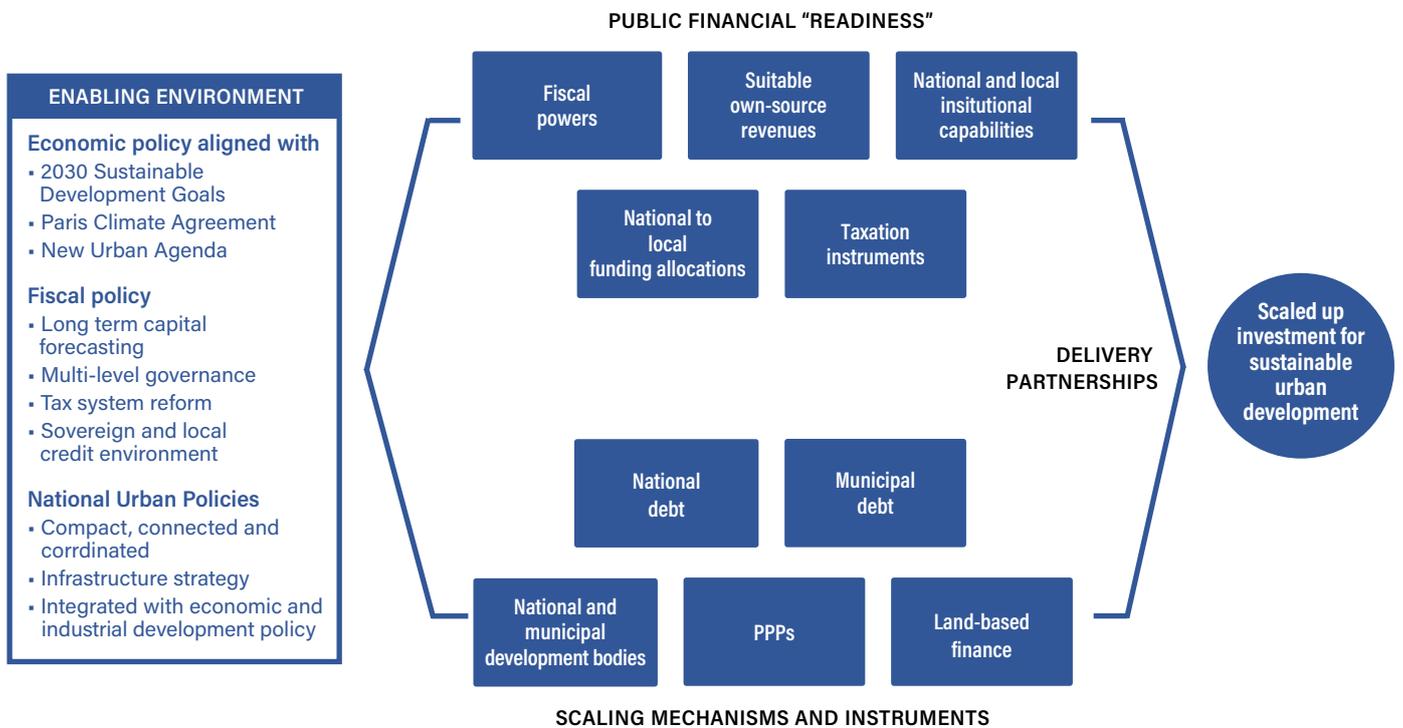
To bring these elements together, governments need to develop a combination of tax instruments and spending choices to establish the right incentives and secure a stable revenue base for the low-carbon urban transition. Three factors are especially important to keep in mind:

- 1. Governments’ capacity to drive the low-carbon transition in cities through tax and investment spending is contingent on maintaining long-term fiscal sustainability.** The scope to deploy liability-generating instruments (including debt financing and PPPs) is a function of the total tax revenues collected by the government and the rate of growth of the tax base. It is therefore essential that governments at all levels monitor the growth of their liabilities relative to growth of their revenues to ensure long-term access to credit. The national government needs to ensure an adequate general government revenue envelope over the medium term, recognizing that decisions today have implications for public revenues and aggregate access to credit in the longer term.
- 2. The bundle of fiscal options needs to be coherent and complementary across levels of government²⁷ and supported by effective public administration and transparent management of information.** Simplicity is an advantage: The more complex a policy, the harder it is to make it work and the more scope there is for rent-seeking behavior.²⁸ The tax instruments, spending choices, and financing arrangements chosen must complement one another, in order to lock in the desirable structural change,²⁹ including rapid and deep decarbonization, and ensure that towns and cities are resilient to global warming.
- 3. Fiscal reform will create both winners and losers; these trade-offs need to be addressed.** Tax reform measures need to go hand in hand with spending measures to reduce potential negative impacts, particularly on low-income and other marginalized groups. A carbon tax may meet revenue and environmental objectives, for instance, but it may also increase the cost of energy in the short to medium term. Adjustments to energy subsidies or the adoption of carbon pricing may therefore create a need for targeted cash compensation for poorer households.³⁰ In the longer term, it is useful to look beyond direct cash compensation to the gamut of employment-creating investments that can be put in place, as Mexico already has. Public investments have significant potential as part of these rebalancing efforts.

The panoply of fiscal measures needs to be deployed to incentivize low-carbon urban growth while achieving a sufficient public resource envelope to fund and finance sustainable urban infrastructure in a fair and sustainable way. These objectives typically come together in compact, connected, and coordinated towns and cities that can generate wealth and employment while reducing greenhouse gas emissions. The rest of this section unpacks the type of fiscal reforms that can be considered. Figure 1 summarizes the overarching framework.

Figure 1

Issues to consider in scaling up investment in sustainable urban infrastructure



USING TAXES TO SUPPORT SUSTAINABLE URBAN DEVELOPMENT

National taxes

Effective tax systems are central to a government’s ability to fund the infrastructure and public services needed to spur economic development. Inefficient or complex tax design can facilitate corruption, undermine public service delivery, and exacerbate inequality.

Many governments, particularly in low- and lower-middle-income countries, face major barriers to effective tax collection, enforcement, and administration. Tax systems must be designed in a simple manner to take these constraints into account.³¹

Modern tax systems depend crucially on simple design, incentives for self-policing, and systems for verifying information by third parties, such as employers, banks, and pension funds. Many governments in developing countries lack access to such verifiable financial data, and they have limited digital coverage of financial transactions, making it difficult to monitor, verify, and enforce tax payments.³²

VALUE ADDED TAX

A substantial share of total government revenues in many countries is typically generated by wide-area taxes at the national level. Personal and corporate income taxes and VAT, combined with excise taxes and some form of carbon taxation, can go a long way toward meeting general government revenue requirements and make an important contribution to a more efficient, fair, and environmentally sustainable fiscal system.

A simple VAT with broad and integrated coverage is important in generating revenues while creating a level playing field for investment. It is increasingly recognized that such a VAT generates crucial information that is needed to block leakages in other taxes, such as income tax. Because “value added” represents the additional wages and profits at each stage of a businesses’ value chain, a VAT can provide information on key stages of a business production cycle. It can also be used to track “base shifting” by international corporations (tax avoidance/evasion on corporate and income taxes). Although taxes on inputs, turnover, and trade are traditionally considered regressive, a VAT can generate information that expands the base of the income tax, making the combined tax system more progressive.

A VAT requires a simple rate structure, broad coverage, and robust national administration to work well. Simplicity and broad coverage can reduce the cost of doing business, encourage economic integration, and generate robust information to tackle tax evasion. Exemptions in the VAT for investment and distributional purposes tend not to work, because they create complexity and reduce revenue-raising capabilities. Splitting the VAT base across levels of government adds to complexity in administration and makes it more difficult for businesses to operate across regions.

A number of countries, notably China, India, and Mexico, have moved to integrate the VAT on goods and services and to better cover small and medium-size firms. In 2013 Mexico adopted reforms that led to integration of the VAT base and a significant increase in its overall revenues.³³ China adopted similar reforms in 2015, and India is trying to do so through a constitutional amendment. A single tax administration, as in China and Mexico, is a big advantage for revenue collections and ease of doing business.

Although a VAT can be regressive, it can be made proportional or moderately progressive by exempting unprocessed food consumed by the poor.³⁴ Excise duties on items consumed by the rich often supplement a VAT, to achieve the desired degree of redistribution. In Mexico the VAT, excise, income, and carbon tax reforms of 2013 increased the share of non-oil revenues in GDP from just under 11 percent in 2012 to more than 17 percent by 2017.³⁵ Much of this increase came from the increase in income tax revenues due to the VAT reforms.

INCOME TAX

An income tax is based on individuals’ or entities’ income. Income is typically defined broadly, including compensation for services, interest, dividends, rents, royalties, pensions, annuities, and more. Most countries have progressive personal income tax systems (higher tax rates apply at higher income levels). Such systems are intended to increase equity. In emerging market countries, a large share of income tax revenue comes from withholdings on formal sector wages; the highest nonwage incomes often escape the tax net. In this case, the income tax system can be regressive.

CARBON PRICING

Carbon pricing is arguably the most efficient way to incentivize low-emission urban development. A price on greenhouse emissions shifts the costs of climate change on to the parties responsible for creating it, thereby enhancing equity. Carbon pricing is also a low-cost and flexible way to tackle climate change, as it provides an economic signal that allows emitters to decide how best to reduce their emissions.

An emissions trading scheme is one carbon pricing approach. It provides certainty about the environmental impact but uncertainty about the cost per unit of emissions. A carbon tax guarantees a specific cost per unit of emissions but does not guarantee emissions reductions, as polluters may simply choose to incur that cost.

As of 2018, 51 carbon pricing initiatives had been or were being implemented around the world, covering about 20 percent of global greenhouse gas emissions and generating total revenue of US\$82 billion.³⁶ However, few, if any, include a carbon price that is commensurate with the real cost of carbon pollution to economies. Recent work by the High-Level Commission on Carbon Prices and the Global Commission on the Economy and Climate recommends a carbon price of US\$40–US\$80 per tonne.³⁷

Addressing the issue of winners and losers from a carbon tax is important to secure political support. Conditional cash transfers are often recommended for the poorest, who generally live in rural areas.³⁸ But the people most affected tend to be fixed-income households and informal workers in cities. Improved living conditions and reinvestment of the proceeds of revenue raised in social services and new employment opportunities might be the most appropriate form of compensation for people able to participate in the labor market. In the 2013 reforms in Mexico, the potential impact of tax reform on the poorest households was mitigated by the adoption of a universal pension for people 65 and older. This measure protected the main group unable to participate in the labor market. The conditional cash transfer system was abolished by Mexico in 2019 to finance infrastructure connectivity in poor regions for employment generation.

LOCAL TAXES

Much of the effort required to achieve the SDGs involves action at the local level. Although local taxation is likely to be relatively small in relation to wide-area national tax bases, it is critical in establishing accountability for the delivery of local services. Even more important is the role that local taxation, particularly control over rates at the margin, plays in unlocking additional financing mechanisms, especially municipal bonds (including green bonds) and PPPs, which need to be recorded on local balance sheets.

Effective and accountable local governments, especially at the city level, are critical to stimulating local economic development. They will be equally critical to addressing climate change. Service delivery, infrastructure provision, and rate-setting frequently benefit from local negotiation, coordination, and administration, in line with the subsidiarity principle, which states that spending responsibilities should be pushed to the lowest level at which they can be effectively implemented.³⁹ Many towns and small cities do not need to administer taxes themselves if they can piggyback on national systems instead. The key thing is that subnational governments have the option of setting rates at the margin, so that choices about spending are linked to choices about revenue.

Some local governments have experimented with participatory budgeting, to improve the use and transparency of public resources. Care is needed to avoid bypassing the established legislative process or creating parallel budgeting systems.⁴⁰ Cities can also initiate climate finance experiments, which can then be scaled up or replicated.⁴¹ For example, London, Milan, Singapore, and Stockholm have adopted congestion pricing, and several Chinese cities, including Beijing, Chongqing, Shanghai, Shenzhen, and Tianjin, have adopted emission trading schemes.

Fiscal transfers from higher levels of government are an important source of financing subnational investment and spending, but they do not constitute own-source revenues, which are critical for managing liabilities and improving access to credit at the city level. Even if they are untied, grants and revenue shares do not constitute own-source revenues, because recipients cannot vary tax rates at the margin if needed (for the repayment of debt, for instance).

Local control over tax rates is essential to anchor access to credit at the local level. Two options available to local governments are piggy-backs (or surcharges) on certain national taxes and property taxes.

PIGGY-BACKS ON NATIONAL TAXES

Subnational governments can raise revenues very efficiently through piggy-backs on national income and carbon taxes. Under a piggy-back, the central government typically defines the tax base and takes responsibility for administration of the tax; the local government sets a rate at the margin, which may be within a band set by the national legislature in unitary countries.

This model has three key advantages:

- It generates many of the advantages of own-source revenues in terms of accountability and decision-making autonomy.
- It counts as “own-source” revenue for the purpose of anchoring credit and liabilities at the subnational level.
- It removes capacity constraints at the local level, as it uses the national tax administration.

Piggy-backs on the carbon tax have not been widely used. They could be drivers of sustainable urban transformation. The scope to set a higher tax rate in a congested and polluted metropolitan area than in a clean and compact new hub would send important signals to both producers and consumers. Meanwhile, the national base and rate would prevent a competitive race to the bottom.

Mexico adopted such a tax as part of its 2013 fiscal reforms. A national tax/excise was set above a level determined by the world price (in order to eliminate implicit subsidies). States were then able to impose an additional excise on top of the national rate, to raise revenue and further incentivize emissions reduction.

PROPERTY TAXES

A driver for municipal financing, including green bonds, is the property tax system. Clearly linking property taxes to service delivery is a way to enhance accountability and offset political resistance to the most visible taxes. Property taxes can also be designed to incentivize more compact, connected, and coordinated urban development—although too often, they are designed in ways that favor sprawl. In many emerging markets, wealthy and well-connected people evade US-style property tax based on valuation, which is hard to keep up to date. In many cases, titles are not clearly defined. As a result, in developing countries, the average property tax collection is less than 1 percent of GDP; in many African countries, it is often much less than 0.5 percent of GDP. For reference, property tax is often worth more than 2 percent of GDP in high-income countries.⁴²

Land and built-up property can be taxed in various ways. A US-style recurrent property tax is based on ownership or occupancy of a property. It depends on the accurate valuation of a property (including changes in values as a result of public investments). Implementing this model requires clear property rights, an accurate record of ownership titles, and up-to-date-valuations.

Urban sprawl is generated by interactions between zoning rules and property taxes, as luxury housing moves outside formal city boundaries to take advantage of lower tax rates, and cities try to extend their jurisdictions. This problem is magnified when cities rely on land sales to generate revenues, as China has done since the early 1990s.

An alternative “recurrent” model is based on a simple flat-rate tax linked to occupancy, property size, and location, with rate setting linked to the cost of basic service delivery. This model does not depend on recent, accurate valuation of the property. It can be easily implemented, as only simple registration is required. The tax is based on simple criteria (such as floorspace) and is imposed on residents (whether or not they own the property), as they benefit from services. The registration of properties and occupants can be supplemented by modern satellite-based mapping (as being developed in Tanzania) or the use of decentralized blockchain registers (which have shown promise in some Baltic and Eastern European countries). This type of system can be useful for transforming informal dwellings and slums, as payments can enable inhabitants to qualify for loans and access to public services. The tax thus has a direct link to the SDGs.

In contrast, nonrecurrent taxes are imposed only after specific events (such as the sale or transfer of a property or the completion of physical infrastructure investments) rather than on a regular basis. Such taxes include for capital gains tax on the sale of property, stamp duties, and betterment levies that “mop up” changes in valuation associated with public infrastructure and other investments. For these nonrecurrent instruments to work, recurrent property taxation must be in place.

Property taxes typically make only a small contribution to revenues in most developing and emerging market countries. The average collection in Latin American countries and India (which use the US-type model) is less than 0.3 percent of GDP.⁴³ Recent experiments with variants of the US model—in the Chinese cities of Shanghai and Chongqing, for instance—have failed to generate expected revenues. The poor performance of property tax in these contexts reflects sustained political resistance from property owners; a weak tax administration, including difficulties establishing property titles and assessing changes in valuation; and weak enforcement (confiscation of property is rarely politically feasible), particularly where corruption is widespread and accountabilities weak.⁴⁴ In many countries, many residents have pensions or other types of fixed incomes and cannot cope with revaluation of properties to market prices.

A flat rate tax on occupancy can be expected to generate public revenues worth 1–2 percent of GDP.⁴⁵ The link to the public services provided by the local government makes the property tax a “beneficial tax” and helps overcome political resistance. Such a tax can unlock access to bond systems and other financing mechanisms needed to finance public infrastructure.

Given the rapid growth of informal settlements around metropolitan areas in large parts of Latin America, Africa, and Asia, the introduction or enforcement of a US-style property tax carries risks to low-income households excluded from formal markets and services. This type of property tax is also problematic for low-income households living in areas where prices have appreciated rapidly. However, many informal households would welcome a simple property tax on occupancy, as it provides official recognition of their residence.⁴⁶ A legal address is a powerful mechanism for accessing public services; it is typically required for urban residents to register to vote; access entitlements and welfare payments; open a bank account; or get formal connections to water, sanitation, and electricity infrastructure.⁴⁷ However, if not implemented in an inclusive and equitable way, an ownership-valuation property tax system typically excludes the informal sector. Formalization (including through property tax systems) may lead to displacement, as elites capture the most valuable land sites, through either forced eviction or rising land/housing prices.⁴⁸ Enforced titles on communal lands can also undermine risk-sharing mechanisms, which are critical in many developing countries.⁴⁹ Property taxes must thus be designed to support inclusive urban growth while achieving economic and environmental goals.

The efficient design of tax systems in isolation is not sufficient: Both national and local governments need to foster a tax culture linked to public service delivery. In the long term, domestic revenue mobilization depends on a culture of compliance in which citizens view paying taxes in return for effective public services as an integral aspect of their relationship with the government. Creating such a culture requires both parties to appreciate their rights and responsibilities, sometimes facilitated through taxpayer education, literacy, and outreach efforts.⁵⁰

Rwanda is a notable success story in this regard. The Rwanda Revenue Authority committed to build a new social contract and convince citizens to pay their full tax liabilities in exchange for government services—an immense challenge.⁵¹ It overhauled tax collection procedures, improved information management, and launched a major public education campaign. As a result of its efforts, between 1998 and 2017, Rwanda’s total tax revenues increased by a factor of 10, the number of registered tax payers grew by a factor of 13, and tax revenues as a share of total revenues rose from 10.8 percent to 16.7 percent. By 2017, 62 percent of the country’s annual budget was financed from domestic tax revenues, up from 39 percent in 2000. Recognizing the political economies of taxation was crucial to long-term success.

SUMMARY OF THE TAX AGENDA

Countries need to use a combination of national and local taxes to achieve economic, social, and environmental goals—including raising and steering investment toward more sustainable and efficient forms of urban growth. VAT and income taxes have a fundamental role to play in ensuring that the fiscal system is efficient and fair. Carbon taxes and property taxes can be designed to deter carbon-intensive urban development. Some degree of fiscal devolution, in line

with the capabilities of local administrations, can enhance the accountability of local governments and expand access to credit. It can be achieved through local collection of property taxes or a piggy-back on taxes administered at the national level, complemented, as appropriate, with other user fees and charges.

DESIGNING AND MANAGING PUBLIC INVESTMENTS TO SUPPORT SUSTAINABLE URBAN DEVELOPMENT

The allocation of public spending and investment significantly influences the quality and direction of urban development. Like taxes, public investment generates costs and benefits that have effects on firms, households, and the environment.

Designing and managing individual public investments well is an important part of fiscal policy. Public investment in infrastructure and the built environment plays a crucial role in shaping the way population and economic growth are accommodated within urban areas and how this growth is distributed across towns and cities within a country.⁵² The interests and needs of different levels of government need to be considered, as much public spending and investment is at the local level. The national frameworks that determine public investment choices (including relevant shadow prices and discount rates) need to be analyzed and reformed in the same way as tax systems, to ensure that they align behind encouraging compact, connected, and coordinated urban growth.

International agencies have developed a range of useful guidelines that national governments can draw on for this purpose. The World Bank's Public Investment Management Assessment (PIMA) guidelines, for example, focus on the project life cycle but also provide insights into the institutional, regulatory, and legal frameworks needed to improve the efficiency of fiscal policy frameworks.⁵³ The International Monetary Fund (IMF) has developed a complementary PIMA that provides a ratings-like assessment of how to improve the efficiency of public investment.⁵⁴ It covers central–local coordination, national and sectoral planning, transparent project selection processes, improved management of infrastructure assets, and enhanced oversight and control over PPPs. The Organisation for Economic Co-operation and Development (OECD) has also developed a flexible investment governance toolkit. It focuses on effective public investment management across levels of government.

Economically and environmentally sustainable urban development will depend on governments taking a more strategic and coherent approach to public spending and investment.⁵⁵ Public resources need to be allocated in ways that foster the growth of dynamic, interlinked urban centers, in order to ensure the long-term generation of employment opportunities, inclusive growth, and urgent reductions in greenhouse gas emissions. One option is to use shadow prices and distributional weights to capture the effects on the environment and households in different circumstances.⁵⁶

Efficient public investment management is not enough. Chile has been commended for its effective public investment management by the World Bank,⁵⁷ the OECD, and the IMF.⁵⁸ But despite prudent macroeconomic management over two decades, its growth pattern has increased the country's reliance on primary exports, leaving the economy increasingly vulnerable to fluctuations in global demand (as highlighted by the post-2008 economic crisis). Chile also shows signs of being in a middle-income trap, struggling to create employment opportunities for an increasingly vocal and educated workforce. Despite the well-constructed North-South Highway, most employment opportunities continue to be generated in Santiago's metropolitan area; private investment in smaller urban centers has been slow to materialize. The result is a buildup of informal settlements, congestion, and pollution in the metropolitan area and one of the highest levels of inequality in Latin America.⁵⁹

Well-planned, far-sighted public investment is essential to create a sustainable and inclusive “system of cities” throughout a country. Both national and cross-border connective infrastructure play roles in changing the cost structures that govern the location of private investment and activity. Infrastructure projects should therefore be chosen to support urban hubs and trade linkages that can generate employment and stimulate innovation.

Doing so can be a challenge in federal countries, such as Pakistan and the United States, where the central government does not always have the information or authority to act and subnational governments lack the resources or strategic vision needed for these kinds of investments. Ideally, governments should ensure that smaller urban areas are effectively linked to rural areas and large urban areas, so that they can provide goods, services, and nonfarm employment to rural regions as well as act as market nodes for processing agricultural products and natural resources.⁶⁰ In larger urban areas, public infrastructure investment is essential to manage the local environmental costs of agglomeration, particularly the provision of core services and infrastructure, such as sewers, piped water, waste collection, and drainage.⁶¹ To stay within the global carbon budget, all infrastructure investments need to have minimal embedded greenhouse gas emissions and support cleaner economic and social activity within cities.

Public investment in sustainable urban infrastructure is critical. But scaling up investment in a fiscally sustainable way will require national governments to be aware of four major risks and challenges:

- **Urban infrastructure investments generate assets, but they also generate liabilities, typically at the subnational level, which need to be managed well.** Public investment involves the creation of assets, which affect the government's total resource envelope in the longer term, either by generating profits or requiring ongoing subsidies to offset losses. Loans, bonds, and PPPs create liabilities, which may also be hidden in special purpose vehicles and state-owned enterprises. If neither markets nor central governments are aware of the full extent of liabilities, it is difficult for them to price and manage risk. Long-term fiscal sustainability depends on full and consistent information on intertemporal liabilities across levels of government on balance sheets. Without reliable recording of assets and liabilities on balance sheets, there is a danger that neither governments nor markets will be aware of the full extent of the inherent risks. Lack of such knowledge contributed to the economic crises in the European Union in the late 2000s and Mexico in the 1990s.⁶²
- **Information on the build-up of liabilities needs to be generated in a consistent manner at all levels of government.** The use of balance sheets that capture all cash flows and future liabilities reduces the ability of lower jurisdictions to hide debts from other jurisdictions, including the national government, and from voters. The use of well-developed international standards, such as the IMF's *Government Finance Statistics Manual* (GFSM) 2001/14 can help national governments to detect the growth of local liabilities in off-budget operations, which can eventually become a huge liability that the center would be forced to clear. In many high-income countries, it has proven difficult to require subnational governments to record information about the build-up of financial obligations in a consistent and transparent way. Developing countries, with a few exceptions, face the same problems. The problem reduces local accountability, limits political constraints on nonperforming jurisdictions, encourages rent-seeking, and facilitates the hiding of liabilities from the central government.⁶³ Without a clear and uniform way to record them, liabilities tend to emerge as nonperforming loans in the banking system. Recapitalization can transfer local debt into national liabilities overnight, as happened in Mexico and Spain. There is therefore a clear moral hazard: if local governments believe that the central government will absorb their debts, no hard budget constraint exist, and fiscally irresponsible projects are likely.
- **Effective coordination across levels of government is key to designing, financing, and delivering transformative urban infrastructure investments.** National, state, and municipal governments have different roles to play. Effective multilevel governance, including but not limited to the apportionment of spending and liabilities, is critical. The London Crossrail investment is a good example of joint financing of city infrastructure by the central government, city administration, and businesses that benefit from the infrastructure. Central government financing (almost half the total outlays) was conditional on local co-financing. Crossrail is intended to enhance connectivity across the city of London, linking workers more effectively with existing jobs and creating additional pockets of employment at new transport hubs. At £15 billion, it is one of the most important public infrastructure projects in the United Kingdom in recent years.

The project is partially funded through a betterment levy of about £4.1 billion, charged at a flat rate to all large businesses in London that are expected to benefit at large (rather than individually) from the new stations and improved connectivity. The higher business rate surcharges were a precondition for securing a central government grant of £4.7 billion. In addition, selected entities, such as the Heathrow Airports Authority and Canary Wharf, made voluntary contributions.

■ **Natural disasters pose an increasingly important risk to public spending and investment.**

Local governments are primarily responsible for risk-reduction measures, including regulations concerning land use and building codes and preventive infrastructure (drains, dikes, shelters, and the like).⁶⁴ But local budgets seldom have the capacity to meet the large additional spending needs following natural disasters. As a result, intermediate and national levels of government are primarily responsible for relief measures, reducing the incentives for vulnerable regions to invest in costly disaster prevention infrastructure. In these cases, it is important for national governments to support the development of local balance sheets that anticipate potential loss of assets and to encourage the use of private insurance to share risks.⁶⁵ Fiscal measures must be complemented with spatial planning and regulation to reduce exposure to more frequent and severe climate hazards, such as flooding, storm surge, and sea level rise.

Sound public investment choices by national governments will play a key role in complementing and reinforcing effective tax systems to achieve sustainable urban development. Government spending affects the incentives and options facing firms and households, including how they produce, transport, and consume goods and services. Public spending and investment decisions need to be made with close attention to their fiscal implications (particularly the tax burden and liabilities), as well as the effects on the environment and the distribution of income. Done well, a strategic program of public investment offers major opportunities to create new and high-quality jobs, improve productivity, and enhance quality of life by fostering a network of dynamic urban hubs across a country. It can also help put urban development on a less carbon-intensive path by funding the infrastructure necessary for compact and connected towns and cities.

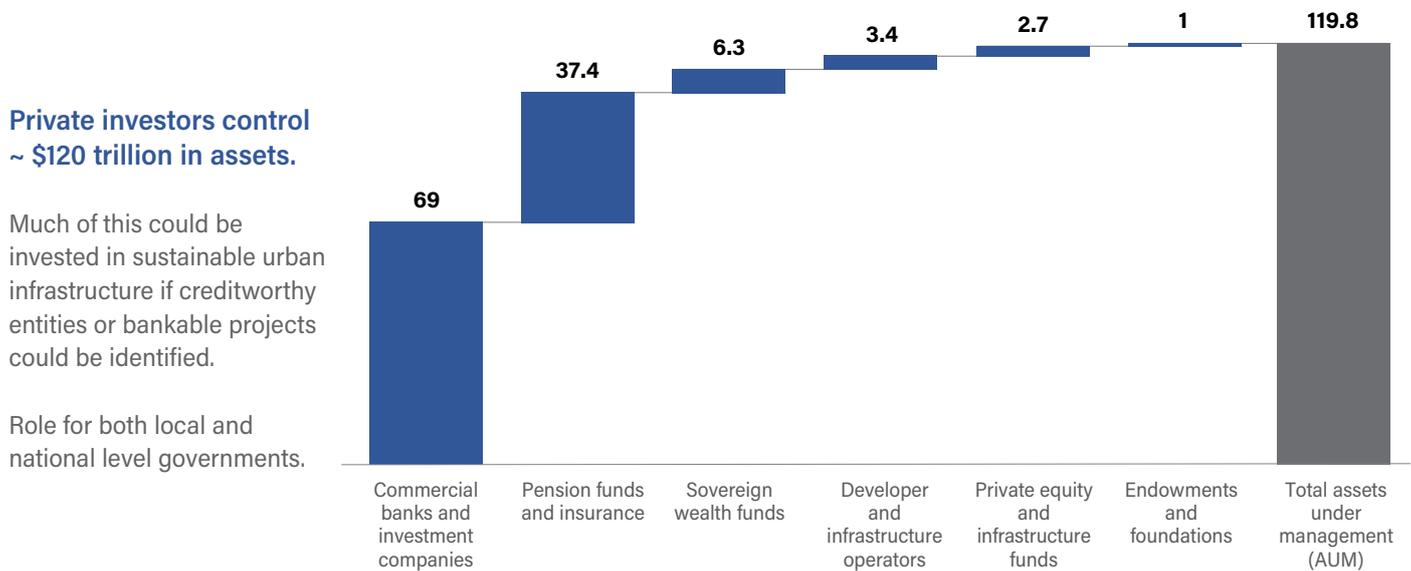
4. Mobilizing private finance for sustainable urban infrastructure: Debt financing, public-private partnerships, and land-based finance

Substantial infrastructure investment will be required to create dynamic, sustainable urban hubs that help deliver the SDGs and the Paris Agreement. Funding it will require massive amounts of private resources.

Commercial banks and investment companies manage nearly US\$70 trillion of assets. Pension funds, insurance companies, and sovereign wealth funds represent another US\$44 trillion.⁶⁶ Unlocking these private resources requires appropriate public resources, including guarantees by multilateral agencies (see figure 2).

Figure 2

Leveraging private finance to fill the investment deficit and complement public finance



Source: McKinsey Centre for Business and Environment (2016) *Financing Change: How to mobilise private-sector financing for sustainable infrastructure.*

Involving the private sector in public urban infrastructure investment has many potential benefits beyond expanding the resource envelope. Crowding in long-term private finance can help achieve intergenerational equity goals, by distributing the cost of large-scale urban infrastructure more fairly over its lifetime. Private sector participation can also secure management and technical expertise. The profit motive can incentivize greater efficiency and innovation, which can cut costs and respond to market opportunities. Engaging private partners also creates opportunities for knowledge transfer and mutual learning, generating spillovers into other plans and projects. Long-term finance for urban infrastructure has the potential to accelerate development by expanding productive capacity and stabilizing economies (although volatility cannot be entirely prevented and must be managed with public finance anchors). Private finance and capabilities can therefore add substantial value where governments are in a position to balance and manage private and social returns across investments.

Partly because of regulatory and market failures, financial systems do not currently provide an adequate supply of affordable, long-term, cross-border finance for sustainable urban infrastructure. Few governments use longer-term, cross-border financing for major infrastructure projects. Incentive structures and portfolio restrictions (such as the restriction that allows pension funds to allocate only a small proportion of their resources to equities) constrain long-term investment.⁶⁷ The cost of private capital is also typically higher than the cost of capital from development agencies.

There is a need to facilitate flows of affordable, long-term capital to countries with large investment needs, particularly rapidly industrializing and urbanizing economies. Several instruments have the potential to leverage long-term private capital. They could be refined, adapted, and deployed at greater scale with the support of national governments. This chapter focuses on three of them: debt financing (through loans and bonds), PPPs, and land-based financing. Guarantees and other risk-mitigation instruments can also be designed to overcome barriers to private investment in sustainable urban infrastructure, such as institutional inertia, real or perceived risks, mixed/low-return profiles, and imperfect information.

This section presents a coordinated framework for understanding the preconditions for the successful use of these instruments. It identifies factors and constraints that governments should consider in order to deploy these mechanisms in a fiscally sustainable and economically strategic way. These preconditions are grouped into four categories: the fiscal environment, the regulation and policy environment, the institutional environment, and the investment and credit environment. The framework highlights areas where strategic reforms or capacity building could enhance a country's readiness to deploy specific financing instruments.

Political economy considerations are also essential to effectively leverage private sources of finance. The efficacy and appropriateness of an instrument often depends on complex and sensitive politics. Single-term mayors, for example, may not be concerned about the long-term repayment for urban infrastructure, especially if the liabilities can be disguised off the balance sheet in the short to medium term. Standardized balance sheets at the subnational level are absent in most countries. France, for example, has required municipalities to generate standardized balance sheets only since 2015, and Mexico has required standardization only since 2014. Asymmetric information on the operation of the private partner, including the effort exerted, cost, and liabilities, has created difficulties for the state. Particularly in countries in which different parties are in power at different levels of government, there can be a sharp incentive for subnational governments to pass the liabilities on to the center.

Beyond experimenting with specific financing mechanisms, national governments have three broader roles to play. First, on the supply side, national governments can facilitate the growth and diversification of long-term financing instruments. Much cross-border financing has been through bank loans, which typically have short maturities (an average of 2.8 years in emerging markets) and are subject to considerable volatility, as seen during the financial crisis.⁶⁸ Access to a wider range of finance sources and instruments can improve the resilience of financial systems. National governments can facilitate the development of debt and equity markets by improving legal and regulatory infrastructure, promoting transparency, and strengthening financial supervision.⁶⁹ Governments can reform credit rights, investment limits, reserve requirements, the valuation of assets and liabilities, and limits on foreign investment to tackle gaps in the availability and costs of long-term cross-border finance.

Second, on the demand side, national government can create enabling policy frameworks, infrastructure strategies, and financing platforms to systematically guide investment. Investors need to be confident of the certainty and consistency of these policies if it is to guide economic decision-makers. Such policies should help make socially inclusive and environmentally sustainable investments more commercially attractive than business-as-usual options.⁷⁰ Working in partnership with local governments, national governments can develop integrated spatial and infrastructure strategies that can systematically guide investment toward sustainable infrastructure projects and efficient urban forms. Such strategies should also foster national and cross-border connectivity that can take advantage of local competitive advantages and balance urban growth across the country. For major infrastructure projects, governments can improve feasibility assessments and bid processes to ensure that financing choices align with wider economic development strategies and long-term fiscal considerations. They can also establish platforms that help build private sector confidence with new markets and financing instruments. Kenya's Pooled Water Fund, Rwanda's National Climate and Environment Fund, and Thailand's Energy Efficiency Revolving Fund all effectively connect private capital to a wide range of actors experimenting with social and environmental investments.

Third, national governments can build the capacities of subnational governments or provide them with institutional or technical support. National tax administrations can provide functional services to local governments, including audit capabilities and the use of satellite technology. National project preparation facilities can provide financial and technical assistance to develop bankable projects that are attractive to the private sector. This assistance can be provided at any stage of the project preparation lifecycle; it is usually provided to support feasibility studies and project structuring. Project preparation facilities can help governments acquire and retain expertise (rather than depending on consultants and advisors), which can help reduce the costs of project development and financing. One estimate suggests that greater policy predictability could reduce global financing costs by a 1–2 percent, saving as much as US\$100 billion a year.⁷¹

THE URBAN FINANCE PRECONDITIONS FRAMEWORK

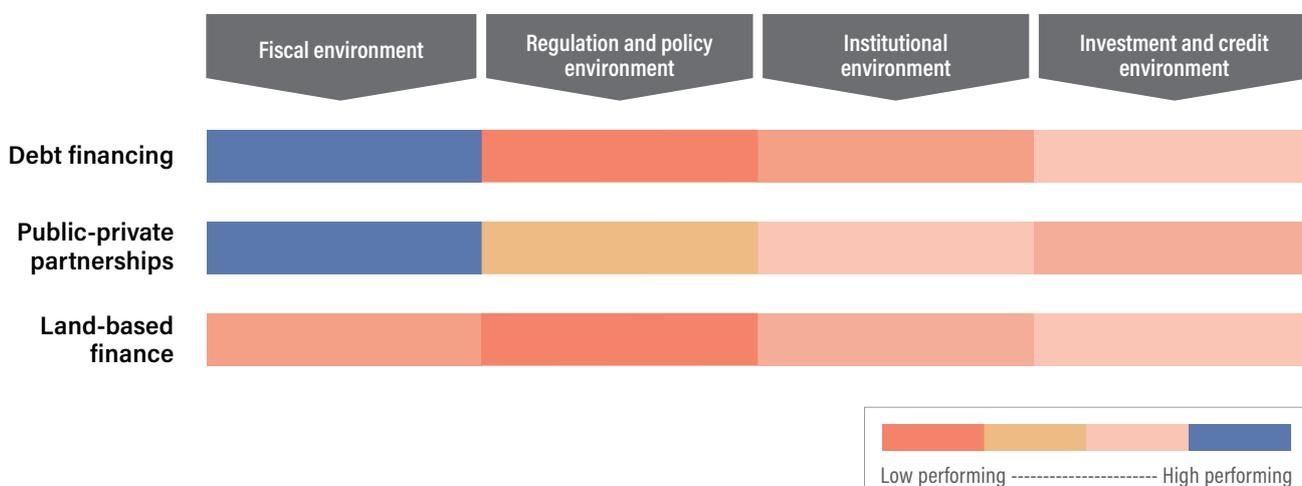
This subsection presents a framework for evaluating the preconditions for the successful deployment of debt financing, PPPs and land-based financing instruments at scale. It defines each mechanism, identifies some of the instruments that included in each broad category, presents a set of implementing principles for deploying each mechanism effectively, and presents criteria for governments to consider to help them unlock the full potential of each mechanism.

The preconditions are grouped into four categories:

- *Fiscal environment.* Preconditions focus on how the government manages and monitors its spending levels, tax rates, and liabilities with respect to the financing instrument.
- *Regulation and policy environment.* Preconditions relate to legislative requirements (for example, whether a clear legal and regulatory system is in place to authorize and govern subnational borrowing) and the effectiveness of the land and property system.
- *Institutional environment.* Preconditions relate to the skills and capacity needed to structure and implement a financing instrument (for example, whether civil servants can evaluate and design the contracts that underpin PPPs) and whether government bodies are effectively coordinated across levels and sectors through clear assignment of responsibilities.
- *Investment and credit environment.* Preconditions relate to the credit ratings needed to attract financing from capital markets, the capacity to plan large capital projects, currency risk, and interest rate volatility.

Together these preconditions indicate whether a financing instrument is fiscally sustainable, legally acceptable, technically feasible, and potentially scalable in a country or city. This framework helps assess a country’s ability to deploy the three instruments and reveals areas where the national government could usefully undertake reforms and build capacity. The results for a country could be summarized in a matrix highlighting weaknesses and strengths (figure 2). There is no “natural progression” toward maturity; many advanced countries lack the preconditions for some financial instruments, especially PPPs.

Figure 3
Sample assessment of a country’s strengths and weaknesses in ability to access private financing



DEBT FINANCING

Box 2

Debt financing

Debt financing or borrowing for infrastructure projects involves repaying the principal and interest at specified dates. The interest rate typically depends on the opportunity cost of a project (which in turn is a function of the supply of and demand for finance), expected inflation, and the risk to the lender. The risk to the lender is a function of the credit history of the borrower, project-specific risks, the currency in which the debt is denominated, and the loan tenor or bond maturity. In practice, most investment is guided by the prevailing interest rate, which is set by a national agency. Subnational governments typically face higher rates than the sovereign government.

Long-term assets benefit future citizens, who should therefore help fund them.⁷² Borrowing provides a way to distribute the public costs of infrastructure investment equitably over time. Sustainable levels of borrowing are determined by current revenues and the projected increase in that revenue base, often with the presumption that infrastructure will help deliver future growth and additional government revenues. Debt finance tends to favor brownfield projects (existing assets) rather than new-build greenfield projects, which have higher risks, especially during the construction phase.

A loan is taken out in exchange for periodic repayments of parts of the principal plus interest. Loans are usually provided by individual lenders or small number of lenders working together, typically commercial banks and development banks/agencies, depending on the country and project. *Project finance* is a short-term loan used to finance project development and construction. This type of loan carries higher risk for lenders and thus generally has a higher interest rate than permanent finance. Repayment is usually based on a structured take-out (the debt rolls from project to permanent finance based on terms/lending conditions met) or refinanced at the end of the term. *Permanent finance* is longer-term debt used to finance an asset during its operational life. Risks are more predictable during this period. Permanent loans therefore tend to have lower interest rates than project finance. Repayment is based on the operating revenue/income generation from the asset.

Sources of capital for debt financing include commercial banks; infrastructure funds; and institutional investors, such as insurance companies, pension funds, and sovereign wealth funds. Each type of investor favors a different form of debt finance. Commercial banks are more likely to provide project finance, and institutional investors typically favor permanent finance. Multilateral development banks, bilateral development agencies, and municipal development funds often play a critical role by supporting project preparation and providing concessional (lower-than-market) rates, which reduces the cost of debt finance.

A bond is a promise by the borrower or issuer to pay the principal to the holder of the security by a specified date, usually with regular interest repaid throughout the life of the bond. The bonds in any single issuance may be purchased by a large number of lenders, including the public. The market price of bonds can fluctuate, but the interest is typically fixed. A bond is typically linked to specific sources of finance under the control of the issuer, such as property taxes or user fees that can be used to repay the debt. A *general obligation bond* (the more common option) is not tied to specific projects and is typically serviced from government revenues. A *project bond* funds specific investments and is repaid from the revenue streams generated by those investments. It can also draw on general revenues, depending on public sector pricing and risk-management decisions.

Green bonds are bonds used to finance green assets and projects. The Climate Bonds Initiative defines a bond as green if at least 95 percent of its proceeds are dedicated to green assets and projects, as listed in the climate bonds taxonomy, and sufficient information on the financed projects is available to check this alignment.⁷³ Eligible urban projects include bus rapid transit systems, metro and light rail, resilient water infrastructure, efficient lighting, sustainable waste management, cycling schemes, and energy-efficient buildings. In 2018 the global green bond market was worth about US\$1.2 trillion. Issuance was dominated by China, followed by India, the Republic of Korea, Japan, and Australia.⁷⁴

The cost of servicing bond debt is lower than the interest on commercial bank loans, particularly for general obligation bonds, because bonds tend to be issued at the operational stage of a project or entity, when revenue streams are stable. Loans tend to finance riskier phases, such as construction. Investors may also receive favorable tax treatment for buying bonds, which can further lower the cost of capital. The transactions costs associated with issuing bonds are high, however, so bonds are better suited to large projects or project pipelines.

National governments and corporations use both loans and bonds to secure finance. Subnational governments may also use these instruments if the national policy and regulatory framework allows them to do so.

One of the most important but difficult tasks in managing private finance for public investments is to establish and enforce the overall debt limit across levels of government. This total needs to be apportioned across subnational entities, so that the overall limit is not exceeded. Each level of government must account for its own debt and be capable of repayment. To do so, lower tiers must have own-source revenues that can be increased if needed to pay for liabilities and provide full information and transparency on the magnitudes of their liabilities over time.

Implementing principles

1. Solid legal frameworks outlining borrowing rights and conditions are necessary to instill confidence in lenders and capital markets.

A transparent, robust legislative and regulatory framework can give financial institutions the security they need to invest in long-term capital projects. Such a framework must ensure that all contracts are enforced and all financial obligations upheld across the market. National governments can help strengthen and deepen debt markets through a wide range of measures, including improving financial oversight, fostering greater transparency, and establishing clear standards for the preparation and reporting of financial information.⁷⁵

To facilitate subnational borrowing, national frameworks also need to provide legal clarity about who can borrow, the legitimate purposes of borrowing, debt limits, collateral, and enforcement in case of default. Limits or incentives on financial institutions and sources of institutional capital to invest in infrastructure may also be part of such a framework.⁷⁶

A global study of 160 countries finds that 88 national governments forbid any borrowing by local governments and 22 countries allow local governments to borrow without restriction.⁷⁷ Local borrowing rules are typically more accommodating in Europe and Latin America. In contrast, subnational entities in most African countries are not permitted to issue debt. South Africa is the only country in Sub-Saharan Africa that explicitly and constitutionally enshrines the right of municipalities to issue municipal bonds. This right is grounded in one of the most effective property tax systems in emerging economies, a system that generates more revenues as a proportion of GDP than Germany.⁷⁸ The national government in South Africa limits municipalities to long-term borrowing for capital expenditures and clarifies that no higher levels of government will guarantee the debt. This framework provided the legal certainty that enabled South Africa to issue the first green municipal bond in the global South.

2. The ability of government agencies to secure debt finance depends on the bankability of the project or the creditworthiness of the borrower.

The borrower's ability to repay determines the viability of any borrowing. A government agency that wants to borrow must thus have access to a revenue stream, either from the project the debt will finance or from local taxes, fees, charges, or other sources. Particularly in the global South, many essential infrastructure projects are not bankable, because of a combination of factors, including high interest rates and low incomes, which mean users cannot afford to pay tariffs at rates that allow cost recovery.⁷⁹

Many subnational government agencies are unable to mobilize long-term debt finance because they are not creditworthy, in some cases because they have no credit history or credit rating. As of 2013, only 20 percent of the largest 500 cities in developing countries were deemed creditworthy in domestic markets, and just 4 percent were deemed creditworthy in international markets.⁸⁰

Creditworthiness is measured by a set of fiscal and institutional indicators, including the revenue base, the revenue-expenditure balance, the autonomy and stability of revenue streams, total liabilities, and the entity's financial management.⁸¹ To address each of these issues and improve their creditworthiness, government agencies can develop an efficient and effective revenue collection system, improve their budgeting and forecasting, and build their credit history through small projects with diverse lenders.

In Uganda, local governments struggle to collect property tax efficiently. This source of revenues accounts for only 0.1 percent of total revenues.⁸² To address the problem, the Kampala Capital City Authority (KCCA) implemented a system for online payment of business licenses, hotel taxes, ground rents, property rates, and other charges. It abolished cash payments at government offices; all payments not paid through the electronic system are collected at local banks. It also undertook internal reforms, reducing the number of bank accounts it held from 151 to 16. These efforts dramatically improved tax administration and collection, enabling the city to triple its own-source revenue in three years⁸³ and achieve an A long-term credit rating in domestic markets.⁸⁴ A higher rating is necessary to access capital markets, but—as Kampala discovered—it is not sufficient without an enabling regulatory and legislative environment.

3. Clear delineation of institutional responsibilities by different levels of governments can strengthen fiscal discipline and enhance coordination across infrastructure projects.

Delineating the responsibilities of different levels of government and agencies is desirable, because it can enable much better decision-making about whether their respective resource envelopes are appropriate to their mandates. However, it is politically difficult to impose hard fiscal rules on subnational governments if doing so constrains spending on basic public services that are critical to low-income and other marginalized groups (the rich often live in gated communities and benefit from private education and health care and are hence immune from spending cuts). A challenging political game across levels of government arises, exacerbated by overlapping responsibilities.

The city of Dakar highlights the competing perspectives and political agendas of different levels of government. The city faces severe fiscal constraint because of multiple factors, including fragmented governance (the city of 3 million people has 19 municipalities); the absence of any effective tax handles at the municipal level (even the property tax is handled by the national treasury); and inadequate, unreliable fiscal transfers from the central government. With the aim of issuing a municipal bond, the metropolitan government undertook a number of small initiatives to build the expertise of key staff, professionalize the city administration, and develop a credit history by borrowing from domestic banks. It secured a 50 percent guarantee from the US Agency for International Development (USAID) and a “no objections” letter from the central government. Given the weak remit of the metropolitan government, and even weaker municipalities, however, the central government then decided to block the municipal bond issue, as it became clear that its liabilities could eventually fall on the central government.⁸⁵

National governments can both manage fiscal risks and improve access to finance through pooling mechanisms, which bring together many individual projects or many borrowers that are smaller or whose creditworthiness is less than investment grade. Pooling helps spread risk across many small entities and creates a larger debt offering. It therefore has the potential to attract more investors and lower borrowing costs. Pooling can also improve coordination in infrastructure planning, although it means that each unit has less flexibility in how resources are allocated and deployed.⁸⁶ Pooling can also create incentives for irresponsible financial behavior at the local level, as risks are shared with other agencies. National or regional/provincial agencies (particularly municipal development funds) can take the lead in pooling and attracting debt on behalf of local governments while ensuring oversight of fiscal risk. This strategy has been a popular in the Nordic and Baltic states, where public subnational entities have high levels of fiscal autonomy and account for 48 percent of the region's green bond market.⁸⁷

Preconditions for unlocking the full potential of debt finance

Table 1 provides questions that can help national policymakers assess and better understand the conditions for and constraints on deploying debt finance.

Table 1
Questions to ask to determine whether a government is ready to use debt finance

Environment	Questions to ask
FISCAL	
Fiscal policy	Is there an accurate record of built-up liabilities across all levels of government, including liabilities that may be hidden off balance sheet? Are systems in place to ensure that the total level of liabilities across all government levels is sustainable?
	How are total national resources shared with local governments? How are sustainable debt limits established and apportioned across subnational governments? Do local governments have own-source revenue handles?
	What are total government liabilities, in both absolute terms and as a share of GDP? Are local debts and liabilities recorded in local and general government balance sheets?
	What are individual subnational government liabilities, as a share of own-source revenues and a share of local GDP?
	Are national policies and programs in place to permit subnational governments to set rates for own-source revenues?
	Are national policies and programs in place to support subnational governments in taking out loans or issuing bonds?
REGULATORY AND POLICY	
Legislative requirements	Does national legislation establish standards for the preparation and reporting of financial information?
	Does national legislation permit subnational governments to borrow from banks? Does it permit subnational governments to issue bonds?
	Does national legislation outline the terms and conditions for government borrowing, including what currencies they can borrow in, the type of collateral they can pledge to secure borrowing, and what types of spending can be funded by debt?
	Does national legislation set hard borrowing limits for national and subnational governments?
	Does national legislation enable cross-border commercial loans and bond purchases?
	Does national legislation stipulate the terms of recourse in the event that subnational governments default? Are these stipulations credible?

Table 1
Questions to ask to determine whether a government is ready to use debt finance (Cont.)

Environment	Questions to ask
INSTITUTIONAL	
Institutional coordination	Is there a national regulatory body to ensure that investors and traders have enough information about securities to make decisions and to prevent fraud? Does this body have the power to conduct investigations and inspections, and to enforce its recommendations?
	Is there a national mechanism to collect and disseminate information on bond issuance, trading, and pricing?
	Is the lead government agency required to consult with different sectors and levels of government throughout project planning and implementation?
	Is there a project preparation facility that can provide support for local governments as they seek debt financing?
	In the case of default, is the national government able to enforce compliance on subnational debt?
Government capacity and skills	Has the national government taken out and repaid loans in the local currency? Has it issued sovereign bonds in the local currency?
	Have subnational governments taken out and repaid loans in the local currency? Have they issued bonds in the local currency?
	Are government agencies able to navigate the risk-return profiles of different capital sources in order to tailor projects to appropriate investors?
	Is there a trusted intermediary (such as an investment or development bank) that can provide advice on structuring the loan/bond, the issuing price, and the maturity or tenor? Can it link the government agency issuing the securities to prospective investors?
	Does the lead government agency have the expertise to prepare the legal documentation and settlement procedures? Can it secure this expertise from national government or other partners?
	Is the lead government agency able to structure and prepare sustainable bankable projects that can underpin the prospectus?
INVESTMENT AND CREDIT	
Capital investment planning	Are government agencies able to identify potentially bankable projects?
	What adjustments are made to market prices to reflect environmental and distributional concerns? Are these adjustments managed effectively and consistently across levels of government?
	Are government agencies able to conduct prefeasibility assessments that effectively evaluate a range of financing/funding options?
	What sustainability criteria (environmental or social) are applied in the preparation and evaluation of projects?
	Is the lead government agency able to ensure continued operation, maintenance and collection of revenues from the project?

Table 1
Questions to ask to determine whether a government is ready to use debt finance (Cont.)

Environment	Questions to ask
Credit environment	What is the national credit rating of the country?
	What is the credit rating of the entity that would access loans/issue bonds?
	Does national legislation establish clear creditor rights and insolvency regimes?
	Is there a clear credit information system? Is this supported by external auditing systems?
	Has the inflation rate been stable over the past five years?
	Has the interest rate been stable over the past five years?
	Has the currency in which the bond would be issued been stable over the past five years?
Private sector capability	What is the scope for domestic commercial banks to provide loans? What is their risk appetite?
	What is the scope for domestic investors to purchase bonds?
	What portfolio restrictions do different investors have that may constrain their ability to allocate resources to debt financing?
	Are national governments making efforts to expand the supply of long-term finance (by increasing the issuance of long-term instrument, for example)?
	Are national governments making efforts to develop long-term debt markets (through incentives for securitization, for example)?
	What is the appetite of international commercial banks to provide loans in the local currency?
	What is the appetite of international investors to purchase bonds issued in the local currency?
Are there legislative or regulatory restrictions on foreign investors?	

PUBLIC-PRIVATE PARTNERSHIPS

Box 3

Public-private partnerships

A PPP is a contract to use a combination of public and private sector capabilities in the design, financing, construction, and operation and maintenance of public infrastructure assets. Investors participating in PPPs generally expect market-rate returns, making PPPs well-suited for projects that will generate sufficient revenue to ensure cost recovery plus profits. Energy and road infrastructure projects, which generate clear revenue streams (from tariffs or tolls), have attracted the vast majority of global PPP finance.

PPPs are intended to increase the efficiency of project management by both introducing a profit motive and bringing private sector capabilities in design, construction, and operation. PPPs may also offer a means to share risk as well as returns. In lower-income countries, PPPs offer a way to develop local private sector capabilities through joint ventures and subcontracting opportunities with large international firms.

PPPs also produce challenges. They create liabilities that are often not fully recorded on balance sheets, allowing government agencies to circumvent budget constraints, with undesirable long-term fiscal consequences. If contracts are poorly designed, the project may face higher administrative costs or the private partners may enjoy windfall profits. The risk of such problems is high, because information is asymmetric (with project costs generally known only to the private partner) and significant incentives exist on both sides to renege on contracts.⁸⁸

The institutional and contractual arrangements underpinning PPPs are critical to realize their potential benefits while minimizing the risks. Contracts should be structured to incentivize cost efficiencies in construction and operations. Risks and obligations need to be explicitly identified and apportioned among private investors, private operators, and public agencies.⁸⁹

Different PPP models are suited to different projects and different stages of the project lifecycle, as well as to wider regulatory and political economy considerations. The selection and design of a contract can be complex, requiring government (or development) agencies with experience in the operational, legal, and regulatory arrangements as well as dispute resolution. Dedicated PPP units may be established to provide these skills to different levels and sectors of government, or governments can establish procedures, guidelines, and standards to be applied during different phases of the project lifecycle (feasibility, procurement, operations, transfer/close-out).

Three types of PPPs are common:

- *Management contract*: The private partner has a contract to operate the asset or conduct specific operational tasks. The asset remains in private ownership; the private partner is paid a fee for its services.
- *Operation and maintenance concessions (also known as a lease or franchise model)*: The private partner has a contract to operate the asset or conduct specific operational tasks. The asset remains in private ownership; the private partner has the right to collect a fee for its services from users.
- *Build-operate or build-operate-finance*: The private party has a contract to design, build/refurbish, and finance an asset and to manage and maintain it for a fixed term before transferring ownership to the public sector. This model involves much more involvement of the private partner than the first two models. The private party is supposed to recover its costs by generating profits while managing the asset. From a public sector perspective, this model has the advantage of using private finance and transferring risk to the private sector. However, it can increase the cost for users. The high initial investment required from the private sector and the long concession period make the distribution of risk and returns between the parties a key element of success.

Successful PPPs rely heavily on access to national and international capital markets—and consequently on wider macroeconomic conditions and policy frameworks. National governments typically establish the legislation and regulation that governs PPP projects, although state or provincial governments may have their own legal frameworks.

Implementing principles

1. Governments need to determine whether PPPs are the right option to finance an infrastructure project, given the risks involved.

The global evidence on the effectiveness of PPPs has been mixed. It is therefore important that governments carefully evaluate whether a PPP offers significant advantages over other financing modes. Governments should compare PPP procurement to public procurement to test assumptions about market appetite, risk transfer, and costs.⁹⁰

The main advantage of a PPP contract lies in the risk-sharing with a private partner. But the public party is typically unable to monitor the effort put into the project by the private contractor. This information asymmetry opens up a host of problems in the design and management of PPPs. *International Public Sector Accounting Standards (IPSAS) Rule 32* requires that the assets and liabilities of PPPs that revert to the state be on the public balance sheet, but the rule has been avoided even in advanced countries like the United Kingdom. Following the collapse of the British construction and services company Carillon in 2017, with £7 billion in outstanding liabilities, the UK government accepted that too many liabilities had been kept off balance sheet. It is essential that governments be able to reliably identify, measure, and transfer risks and that private parties be willing to accept that risk.

PPPs are also politically sensitive, as they outsource the financing, operation, and charging for public infrastructure. An understanding of political implications and risks is therefore also important.⁹¹ Officials in China, who are often promoted based on aggregate growth numbers or service delivery outcomes, have incentives to hide liabilities in PPPs, as they will not appear until after they have moved on to higher responsibilities.⁹² In India the sharp rise in nonperforming loans of the banking system and the rise in discovered PPP liabilities has become a source for concern.⁹³ China is making an effort to establish consistent balance sheets at all levels of government. In both China and India, ministry of finance approvals for PPPs have been sharply cut back.

2. The credibility of underlying funding sources and an accurate record of liabilities are critical to the sustainable long-term use of PPPs.

The development of bankable projects depends on having enough end users who are willing and able to pay at levels that cover the full costs, including sufficient profits to attract a private partner. Alternatively, a government agency can subsidize the project.

PPPs can create liabilities that are not necessarily recorded in balance sheets. The costs and revenues associated with a PPP may be on the books of a special purpose vehicle, for example, even though the lead government agency may ultimately be responsible for covering any deficits. Subnational governments have incentives to enter long-term contracts where the expenses are not seen after the political term of the incumbent administration. Despite the fiscal risk, only about a third of all countries have regulatory provisions regarding the budgetary treatment of PPPs, and only a fifth require PPPs to be approved by the ministry of finance (or equivalent body).⁹⁴

National legislation should introduce and enforce good budgeting, accounting, and reporting standards aimed at achieving full and transparent disclosure of all future costs and risks from PPPs. The impact of PPPs on future government spending should be incorporated in debt sustainability analysis and medium-term budgetary frameworks.⁹⁵ With relatively weak monitoring mechanisms in most developing countries (and many OECD countries, including Spain and Mexico), implementing such measures is difficult.

*3. Governments must have the capacity to design and manage complex legal, regulatory, and commercial contracting arrangements. Long-term partnerships and dispute resolution processes are critical.*⁹⁶

It is essential to strike the right balance between risk and reward when structuring a PPP.⁹⁷ Private partners will not be interested in a project in which the rewards are not commensurate with the risks. Simultaneously, public partners should ensure that they capture a reasonable share of the returns. Contracts thus need to both manage and align the interests of both the public and private partners.

Among developing and emerging economies, South Africa performs particularly well in terms of the preparation, procurement, and management of PPPs. It has developed a range of standard methodologies and criteria for appraisal processes and clear public disclosure policies to enhance transparency.⁹⁸

Designing contracts is difficult, because PPPs often involve asymmetric information. In very large infrastructure projects, it can be difficult to transfer full risk to the private sector, because failures have wider macroeconomic implications beyond simply not generating a commercial return. The contracts underpinning PPPs may need to include some flexibility in order to ensure that costs and benefits are shared appropriately. Risk mitigation instruments such as guarantees and insurance can be used to improve the risk-return profile of a prospective PPP,⁹⁹ although central government guarantees for PPPs managed by local governments can create problems of incentive compatibility and require tighter monitoring than is sometimes possible.

Contracts must also be drafted to both protect the equity of private partners and prevent renegeing by either party.¹⁰⁰ Reliable third-party arbitration systems and separation of powers can ensure the sanctity of contracts. Since the contractor for the upgrading of the London Underground upgrade walked away in 2003, it has become standard practice globally to require private contractors to put up a significant equity stake.¹⁰¹ The sanctity of contracts is difficult to establish, especially at the subnational level, given the increasingly complex financial products that make it difficult to distinguish equity from debt. Once contracts clearly delineate risks, it becomes harder to persuade the private sector to take up projects.

Uncertainty regarding climate change increases the difficulty of crafting a credible PPP contract.¹⁰² It is difficult to price uncertainty. It may be necessary to resort to “unbundling” of the project life cycle into the preparation and development stage (which has significant risks and uncertainty) and the more bankable operational stage (during which there is a clear revenues stream).¹⁰³ Unbundling is the appropriate way to develop climate change–resilient technologies (such as solar energy). For other contracts, unbundling loses the risk-sharing aspects that are the most attractive part of PPPs and may preclude innovation and more efficient outcomes, in some cases forcing the state to take the risks and the private partner to reap the profits.

Contracts for PPPs are complex and costly to prepare. Clear national (or state) procedures, guidelines, and standards to be applied during different phases of the project lifecycle can help reduce these costs. Many countries have dedicated PPP units that design and implement these contracts. The PPP Center of the Philippines, for instance, provides technical assistance in contracting, implementing, monitoring, and evaluating PPPs and serves as a repository of relevant information, skills, and contracts. PPPs in the Philippines also benefit from clear legislation governing their use.

Preconditions for unlocking the full potential of public-private partnerships

Table 2 provides questions that can help national policymakers assess and better understand the conditions for and constraints on using PPPs.

Table 2
Questions to ask to determine whether a government is ready to use public-private partnerships

Environment	Question to ask
FISCAL	
Fiscal policy	Is there a requirement that all PPP assets and liabilities be recorded in the relevant public balance sheets at the subnational and general government levels? Is there an accurate record of built-up liabilities across all levels of government, including those that might be hidden off balance sheets? Are systems in place to ensure that the total level of liabilities across all government levels is sustainable?
	Does the national tax system favor debt financing over equity financing?
	How are debt limits (including PPPs) apportioned across subnational governments? Are mechanisms in place to deal with the nonperforming loans of the banking system, including loans that arise from PPPs?
	What are total government liabilities, in both absolute terms and as a ratio of GDP?
	What are average subnational government liabilities, as a share of own-source revenues and a share of the relevant subnational GDP?
	Are national policies and programs in place to permit subnational governments to set rates for own-source revenues?
	Are national policies and programs in place to support subnational governments in taking out loans, issuing bonds, or tracking total debt and rates of debt repayment?
REGULATORY AND POLICY	
Legislative requirements	Does national legislation establish standards for the preparation and reporting of financial information?
	Does national legislation permit subnational governments to undertake PPPs?
	Does national legislation set hard limits for total liabilities for national and subnational governments? Are these limits credible?
	Are PPP procurement practices codified in national regulations? Does this codification include the need for competitive PPP selection, with clearly outlined criteria?
	Do national regulations require the publication of bidding documents and contracts in a transparent and timely manner?
	Are policies and procedures in place for unsolicited PPP proposals?
	Do PPP guidelines include explicit environmental, social, and gender requirements?
Does national legislation permit foreign investment in and ownership of urban infrastructure projects?	
INSTITUTIONAL ENVIRONMENT	
Institutional coordination	Is the lead government agency required to consult with different sectors and levels of government throughout project planning and implementation?
	Is there a national spatial and infrastructure plan that can underpin a pipeline of possible PPP projects?
	Is there a project preparation facility with adequate budget and staffing? Is there a dedicated PPP agency?
	Do these dedicated facilities have the engineering expertise to appraise project feasibility, the financial expertise to assess commercial viability, and the legal expertise to draft contracts that incentivize cost efficiencies and appropriately apportion risk among partners?

Table 2
Questions to ask to determine whether a government is ready to use public-private partnerships (Cont.)

Environment	Question to ask
Government capacity and skills	What public sector skills are needed to oversee asset operations?
	Has the national government undertaken PPPs? Does it have experience with management contracts, operation and maintenance concessions, and build-operate PPPs?
	Have subnational governments undertaken PPPs? Do they have experience with management contracts, operation and maintenance concessions, and build-operate PPPs?
	Is there a national public registry of all PPPs?
	If there is no dedicated facility for PPPs, is the lead government agency able to appraise project feasibility and commercial viability?
	If there is no dedicated facility for PPPs, is the lead government agency able to structure contracts to incentivize cost efficiencies and apportion risks appropriately between the partners?
	Can the quality and quantity of service output by the private partner be clearly measured?
INVESTMENT AND CREDIT	
Capital investment planning	Are government agencies able to identify potentially bankable projects? Is demand sufficient to make user charges the basis for repayment? What are the contractual consequences of a demand shortfall?
	Do environmental considerations require prices to be set at levels below full cost recovery? If so, are these considerations reflected in the relevant budgets?
	Are government agencies able to conduct prefeasibility assessments that effectively evaluate a range of PPP configurations?
	Are sustainability criteria (environmental or social) applied in the preparation and evaluation of projects?
	Is the lead government agency able to design bid processes that are attractive in a competitive market, incentivize low life-cycle costs, and allow for physical and financial innovation? If not, can it secure this expertise from the national government or other trusted partners? Is the lead government agency able to assess bids in a transparent way, setting and using predefined criteria?
Credit environment	Is the currency in which the PPP would be issued stable?
Private sector capability	How many PPPs have been successfully initiated in the country? How many private sector partners have been involved in these PPPs?
	Are PPPs structured in ways that involve and develop local firms?
	What portfolio restrictions do different investors have that may constrain their ability to allocate resources to equity financing?
	How much competition is there in the market?
	What is the financial sector's appetite for providing substantial funding for PPPs?

LAND-BASED FINANCING INSTRUMENTS

The term *land-based financing* is used to describe a set of instruments and mechanisms that can be deployed so that governments capture some of the increases in real estate values associated with public infrastructure projects. The resources secured through this process may be treated as revenue or repayment for capital investment. Land-based financing theoretically ensures that the costs of infrastructure investment are substantially borne by those who benefit from it.

Land-based instruments are widely used to fund urban transport infrastructure projects. They may lead to more compact urban development, thanks to the interrelationships between better connectivity, more intensive use of land, and rising land values. However, if land sales are involved (as they have been of China), urban sprawl can also result. Land sales can also result in the capture of rents by the well-connected. Very careful urban planning is therefore needed.

There are four main types of land-based financing instruments:

1. *Tax-based instruments.* Tax-based instruments are linked to an underlying property tax, with additional taxes imposed on households or businesses that are considered beneficiaries of the new infrastructure. Tax-based instruments include the following mechanisms:
 - *Betterment levy/tax:* Ideally, a betterment levy or tax is integrated into municipal fiscal systems through regular valuation of land and properties, especially for businesses, and an automatic increase in taxes or levies. Where this is not possible, local governments can introduce a surcharge on land and property taxes to defray local infrastructure investments. This tax can be assigned to a specific subset of properties based on measurable features, such as area or frontage.
 - *Tax increment financing:* The lead government agency borrows money for capital expenditure, typically by issuing bonds. The increases in tax revenue from the new infrastructure are then earmarked by the government agency to repay the loan.¹⁰⁴ The increment in taxes results from higher land values, higher property prices, or new business activity.
 - *Stamp duties on property sales:* This instrument is particularly important in countries that use flat-rate or band systems, because it allows the government to capture a proportion of rising land and house prices. The United Kingdom applies a higher surcharge on high-end property sales.
2. *Fee-based financing.* Fee-based financing takes two forms:
 - *Impact fees or development charges:* A government agency imposes a one-time charge on property developers to cover the costs of connective infrastructure and other public facilities. Impact fees use a consistent and transparent formula to calculate the cost of the development on the infrastructure network, obviating the need for individual negotiations with each property development.¹⁰⁵
 - *Transportation utility fees:* A transport improvement is paid for by user fees. These fees are not based on the value of the property, but on the number of trips made from that property using the improved transport system
3. *Development-based financing.* Development-based financing takes two forms:
 - *Development rights:* Government agencies can raise revenues for public infrastructure investment by selling development rights to developers. These rights can include the right to increase densities (notably by selling air rights above existing developments), convert rural to urban land, or convert residential to commercial land. The sale of development rights can also be used to encourage higher density and mixed land use around new transport nodes.
 - *Joint development:* Joint development can take the form of a PPP or other contractual arrangement in which the costs and risks of constructing and operating new developments (such as real estate) around new infrastructure are shared by public and private actors. The advantage of joint development is that it bypasses

the need to evaluate the impact of the infrastructure on land and property values, as there is cooperation between the public agency and private developers.

4. *Private management of public assets.* This option has proved useful for cities.¹⁰⁶ It is crucially dependent on accurate balance sheet information.

For greenfield development, instruments that capture value within the project (such as impact fees) may be most suitable. For projects seeking to rehabilitate degraded areas of the city, instruments that capture rising values in a broader area around the project (such as betterment levies) may be more appropriate. For projects seeking to increase the density of people and economic activity in a specific area, usually around a transport hub, development rights are an effective tool.¹⁰⁷

Land-based financing tools require efficient management of public assets, enabling regulatory frameworks, and robust land and property markets. They benefit from government capacity to value the impact of public investments on real estate values. For these reasons, they are more common in higher-income countries than lower-income ones. Yet opportunities for land-based financing are arguably greater where urban population and economic growth is taking place, as it creates demand for transport infrastructure and a resulting increase in the value of land near transport nodes.

Implementing principles

1. *Reliable, transparent, and fair land records and valuation structures are critical for deploying land-based financing instruments.*

Land-based financing requires a robust method for quantifying and apportioning the increase in land prices resulting from infrastructure investments and clear land and property records, so that the revenues can be collected from the appropriate source. It depends on a functioning property tax system, which provides much of the essential information and administration systems for all other land-based financing instruments. Ideally, governments would have access to cadastral records and detailed, digitalized real estate data to assist with administration and valuation. Most low-income countries lack such information. Even in countries with up-to-date property data, recorded land values often account for no more than two-thirds of the observed variation in the prices of land parcels.¹⁰⁸ It is even harder to identify the portion of value increase attributable to infrastructure investments.

To ensure the political feasibility of land-based financing, it is important to demonstrate the nexus between payments made to support the new infrastructure and benefits received from that infrastructure. If instruments are not tailored to local dynamics, they can distort both financial and land markets. For instance, the loss of private returns could tip the balance of risk relative to return for private developers, causing them to abandon a project or shifting development away from areas where these taxes apply.¹⁰⁹ Inappropriately designed instruments may skew infrastructure provision toward higher-income property owners who can absorb the costs rather than ensuring development for the wider urban area.¹¹⁰

It is important that costs be shared in a fair way that prevents the displacement of low-income residents or the exclusion of people who might seek access to urban markets, services, and spaces. Infrastructure in major cities and hubs provides benefits to the national economy and the region, as well as to the local authority or city council. Transport projects can expand the supply of well-located urban land available and therefore help control urban house prices.¹¹¹ There are thus good economic and political reasons to share costs across the city's hinterland. New York City's mayor was reluctant to rely exclusively on land-based financing to finance the upgrading of the metro system, as the costs would fall entirely on local residents while the benefits would be reaped more widely. The mayor therefore argued for both state and federal support to improve New York's subway system.

It is therefore important that governments identify prospective beneficiaries early in the planning process and collaborate with them to maximize local ownership of an infrastructure project.¹¹² Participatory processes can help

ensure that land and property records are accurate and valuation methods considered fair. Bogota, Colombia has done this well, mobilizing more than US\$1 billion to finance public works between 1993 and 2013 through betterment levies.¹¹³ The city adopted an innovative approach in which property taxes were based on self-declaration and the threat of purchase at the declared values. Its property tax strategy was facilitated through comprehensive and systematic national legislation. Such innovations are not always transferable. Only two other cities in Colombia have replicated Bogota's success.¹¹⁴

2. Land-based financing instruments should be underpinned by an integrated approach to land use, transport, and housing policies to create productive, high-density hubs around transport nodes.

Land-based financing opportunities are greatest where governments integrate spatial planning policies with infrastructure investment, particularly large public transport projects. Doing so can help create pockets or corridors of highly productive (and therefore high-value) land, fostering agglomeration economies while reducing environment impacts.

Most governments struggle with policy siloes and specialization, which can make a coherent approach to spatial, infrastructure, and investment planning difficult. Governance structures typically reflect historical administrative boundaries and sectoral decisions, with skills and budgets assigned accordingly.¹¹⁵ Siloes can make it difficult for governments to establish plans and policies that favor compact, connected urban growth, let alone integrate land-based financing strategies into their planning and investment strategies. Poor institutional coordination has constrained effective financing for many infrastructure projects.¹¹⁶

Development rights are a feasible way of raising revenue where there is appetite to use land more intensively because it has desirable attributes, such as proximity to services or transport hubs. A city in Brazil has successfully sold development rights, allowing property developers to either increase the total floor area of a plot or convert the use on a particular parcel of land (from residential to commercial, for example). The sale of development rights has proven an important financing instrument in Brazil, where municipalities often lack fiscal space or creditworthiness. The sale of development rights allows local governments to accrue revenues before the investment is made.¹¹⁷ São Paulo alone raised more than US\$1 billion by selling development rights between 2006 and 2010 (significant investment challenges remain).¹¹⁸ An integrated approach to land use planning and infrastructure investment would increase both the viability and value of development rights (as well as other financing options).

3. The design of land-based financing depends on the design of property taxes.

Property taxes (particularly on business properties) serve as a base for betterment levies and many other land-based financing instruments. Recurrent property taxes capture some proportion of rising land values, as taxation levels are adjusted annually in response to changing land and property markets. General property taxes can ensure that the sale of development rights or land leasing does not just generate a one-off windfall but rather enables a long-term increase in local revenues.¹¹⁹

General property taxation and betterment levies are often the main sources of revenue for cities in middle- to high-income countries. However, from the perspective of the taxpayer, tax-increment financing and betterment levies may seem like higher property taxes rather than two separate taxes. To increase support for such mechanisms, governments need to make clear the linkages between property tax, land-based finance revenues, and local service quality.

Where valuation or even ownership of land is problematic, a flat tax on land and housing can be linked to occupancy under the alternative model described above. The tax can be linked to the cost of public services, as it is in the United Kingdom. This approach sidesteps problems with ill-defined property rights—a problem in China and much of Africa. It can play a major role in the scaling-up agenda, because it can be put in place quickly and used to unlock local borrowing and municipal bond financing.

Preconditions for unlocking the full potential of land-based financing instruments

Table 3 provides questions that can help national policymakers assess and better understand the conditions for and constraints on using land-based financing instruments.

Table 3
Questions to ask to determine whether a government is ready to use land-based financing

Environment	Questions to ask
FISCAL	
Fiscal policy	Do subnational governments have a recurrent (US-style) property tax model? Is the cadastre complete? Are clear valuation systems in place to ensure that property taxes reflect changing market prices separately for land and built up property?
	Do subnational governments operate a nonrecurrent property tax option (such as stamp duties on sales)?
	Is there a possibility of using a simple system linked to occupancy and registration of properties linked to the cost of service delivery in localities?
	What complementary fiscal measures are used to capture increases in land and property values (for example, betterment levies and capital gains taxes)? Is there a consistent and transparent formula to calculate the increased value associated with new infrastructure investments?
	If government agencies use tax increment financing or joint development approaches, is there an accurate record of built-up liabilities across all levels of government? Are systems in place to ensure the total level of liabilities across all government levels is sustainable?
REGULATORY AND POLICY	
Legislative requirements	Does national legislation currently permit government agencies to use property taxes, betterment levies, or development charges?
	Are there integrated, long-term land use, infrastructure and planning policies at the national level?
	Are land and/or property rights and ownership clearly defined? In case of traditional property rights, what arrangements can be made to replace risk-sharing for natural disasters and calamities that communal arrangements typically provide?
	Does the relevant level of subnational government have the right to access or charge fees for use of the land?
	Is the ownership of land and property clearly defined with proper titles and valuations held in the cadastre? How often is the cadastre updated?
Land and property system	Is there a registration system for the use/occupation of land and property?
	Is there a fair, efficient, and transparent process for determining ownership and use of land and property?
	Are clear protections in place for low-income and other marginalized groups that may live on or use land and might be in danger of eviction as a result of land-based financing to finance the upgrading of the metro system?
	Is there timely and accurate tracking of land and property prices?
	Are there publicly available data on the value of the stock of land and buildings (from a cadastral database, for example)?

Table 3
Questions to ask to determine whether a government is ready to use land-based financing (Cont.)

Environment	Questions to ask
INSTITUTIONAL	
Institutional coordination	Does the appropriate level of government have authority to establish and collect property taxes and adjust the tax base and tax rates?
	Is there a national spatial and infrastructure plan that can be used to identify areas where public investments will contribute to rising land prices?
	Are national policies on land use, housing, and transport aligned to create areas with high economic density and value?
	Do sectoral agencies (particularly for land use, housing, and transport) routinely collaborate to design and deliver large urban projects? Are systems in place to incentivize and facilitate coordination?
	Is there a project preparation facility with adequate budget and staffing? Is there a dedicated land-based financing agency?
Government capacity and skills	Is a modern land information system or registry in place? Does it use satellite data to define property locations with additional verification of occupancy? Is blockchain technology used to track land-based transactions?
	Does the land registry have operational independence? Is it accountable to stakeholders, including customers?
	Do government agencies have the information and skills necessary to estimate the impact area of a new infrastructure project (using a real estate appraisal or spatial analysis, for example)?
	Are there an adequate number of specialist surveyors who have the capacity to estimate the impact of new infrastructure projects on land and property prices?
	Has the government reviewed the impact of land-based financing approaches on low-income and marginalized groups? Are safeguards and compensation mechanisms sufficient? How is their adequacy verified?
INVESTMENT AND CREDIT	
Capital investment planning	Are government agencies able to identify and plan infrastructure projects that would generate significant increases in the value of surrounding land?
	Are government agencies able to conduct prefeasibility assessments that evaluate a range of land-financing options?
	Are sustainability criteria (environmental or social) applied in the preparation and evaluation of projects?
	Are government agencies able to manage and maintain projects at a sufficient standard to maintain the political feasibility of land-based financing?
	Are land-based financing projects structured to achieve an efficient and fair allocation of benefits and costs?
Private sector capability	Is there land and property in the city that is underutilized?
	Can the level of market demand for developable land from private investors be reliably assessed?
	Is the land and property market transparent, predictable, and stable?
	Are land-based financing mechanisms designed to involve local firms in planning, constructing, and purchasing new developments?

5. Conclusions: Prospects for scaling up financing for sustainable urban transitions

Achieving the SDGs, generating inclusive employment growth, and delivering on the Paris Agreement on Climate Change requires coordinated policy actions at the national and subnational levels. The creation of clean, connected, and compact cities will play a major role in these efforts, as the sustainable growth agenda largely involves decisions about investments and financing at the subnational—particularly the city—level. Although many decisions will be made at lower levels of government, the enabling conditions, coordination, and financing decisions are made at the national level.

Much attention has focused on mechanisms to access the significant pools of global private finance, including through bank borrowing, bonds, PPPs, and land-based financing instruments. All of these sources of financing can help fund towns' and cities' massive infrastructure needs. But these instruments can also add to local liabilities and the overall government debt. Fiscal sustainability thus has to be assessed, not just for the relevant subnational government but for the country as a whole. Total liabilities are determined by total public revenues. They need to be distributed appropriately across tiers of government.

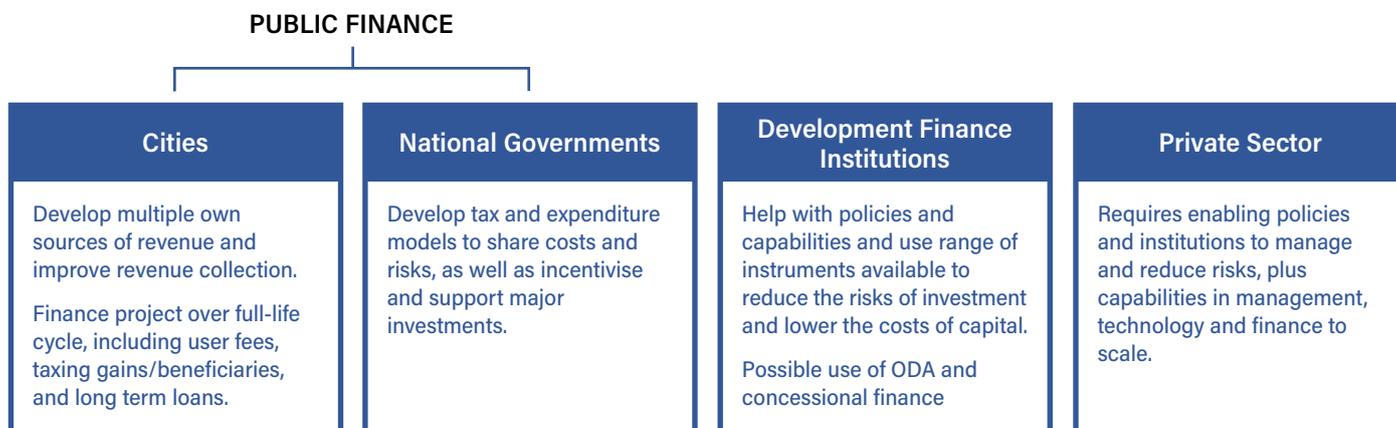
This paper has set out a two-step framework to help national governments consider how to reform national fiscal and finance systems to raise the scale of financing needed for sustainable urban infrastructure. This paper has:

- underscored the importance of “getting the basics right” in terms of tax and spending choices to ensure an effective, fair and sustainable fiscal policy; and
- identified many of the preconditions for deploying key financing instruments at scale: debt, public-private partnerships and land-based financing options.

National governments are ultimately responsible for crafting a complementary set of tax and public spending instruments that create self-reinforcing incentives and achieve efficiency, equity, and environmental goals. A VAT, income tax, and carbon tax can collectively form the bedrock of the national tax system, with a unified administration. These taxes should be complemented by efforts to build the abilities of subnational governments to collect and manage own-source revenues. An integrated approach to raising and spending public funds encourages accountable behavior and unlocks access to private finance for sustainable infrastructure investment. The key issue for subnational governments is the ability to set tax rates at the margin. Although piggy-back options are feasible, the most urgent priority is to implement a robust and efficient property tax. Meanwhile, public liabilities need to be tracked consistently within and across jurisdictions, using international standards that generate consistent balance sheets for each level of government. Without these twin requirements, there are incentives for city and local governments to “pass the buck” and make irresponsible investment decisions.

The private sector has an important contribution to make in filling the investment shortfall and providing capabilities for sustainable urban infrastructure. The state can deploy a wide range of instruments to crowd in private investment. Debt financing offers a way to distribute the public costs of infrastructure investment equitably over time. Public-private partnerships can secure private sector capabilities in the design, construction and management of large capital projects, and incentivize greater efficiencies and innovation. Land-based financing instruments can harness the interrelationships between more productive use of land and rising land values, as well as strengthening land and property markets. These instruments need to be designed in ways that maximizes their wider benefits beyond just expanding the resource envelope for capital investment, and ensure that the right incentives are in place. And it is important to recognize dangers of urban-sprawl, leakages from off-budget operations, and land-grabs from vulnerable households.

Figure 4
A systemic approach to sustainable infrastructure financing for cities



National and subnational governments need to consider a wide range of “preconditions” for the successful implementation of these financing instruments. This requires a closer attention to the fiscal, regulatory and policy, institutional, and investment and credit environments. For example, national governments need to oversee capital and risk management, and local governments need to address land and property markets to ensure that they function in a fair and transparent way. National governments need to clearly establish regulatory and legislative frameworks, depending on constitutional arrangements, that explicitly articulate which government agencies can use specific financing instruments and under what terms. National governments can assist agencies at all levels to access the technical capacities necessary to design and implement financing mechanisms, such as the legal expertise to draft suitably tight contracts or the financial expertise necessary to structure a bankable project.

In summary, a country’s ability to invest in sustainable urban infrastructure is a function of its fiscal systems, regulatory and policy frameworks, institutional quality, and investment environment. National and city governments can scale investment by systematically addressing the preconditions to mobilizing high-potential financing instruments. This requires strategic, far-sighted reforms and coordinated actions. Packaged reforms that recognize policy interrelationships are likely to bring the greatest and most sustainable impact. Designing a successful urban finance agenda will depend on looking beyond specific financing instruments and fully recognizing the wider economic opportunities associated with a sustainable urban transition.

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ABOUT THE COALITION FOR URBAN TRANSITIONS

The Coalition for Urban Transitions - launched in 2016 at the Climate Leaders' Summit in New York - is a major new international initiative to support decision makers to unlock the power of cities for enhanced national economic, social, and environmental performance, including reducing the risk of climate change. The Coalition provides an independent, evidence based approach for thinking about 'well managed' urban transitions to ensure that the growth of urban areas, and the accompanying process of economic, social, and environmental transformation, maximises benefits for people and the planet.

The initiative is jointly managed by the **C40 Cities Climate Leadership Group (C40)** and **World Resources Institute (WRI) Ross Center for Sustainable Cities**. Members include over 20 major institutions spanning five continents, including research institutions, city networks, international organizations, infrastructure providers, and strategic advisory companies. The initiative will be overseen by a Global Urban Leadership Group to steer and champion the work.

STEERING GROUP

This work was guided by a Steering Group comprising representatives from the Brookings Institution, the C40 Cities Climate Leadership Group, the Climate Bonds Initiative, the Climate Policy Initiative, Deutsche Bank, the Lincoln Land Institute, the UK Department for International Development, the UN Environment Finance Initiative, and the World Bank.

ABOUT LSE

The London School of Economics and Political Science (LSE) is one of the foremost social science universities in the world. LSE Cities is an international centre at the LSE that carries out research, graduate and executive education and outreach activities in London and abroad. Its mission is to study how people and cities interact in a rapidly urbanising world, focusing on how the physical form and design of cities impacts on society, culture and the environment. This research was commissioned via LSE Enterprise.

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