The Development Dimension

Road and Rail Infrastructure in Asia

INVESTING IN QUALITY

OECD DEVELOPMENT CENTRE

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Foreword

By connecting suppliers and markets, improving efficiencies and fostering indirect economic benefits, roads and railways, along with other kinds of transportation infrastructure, play fundamental roles in driving growth and development. While Emerging Asia (the ten ASEAN Member States, China and India) is expected to see continued strong performance in the future – with real GDP growing by an average 6.3% per year over 2018-22, according to the *Economic Outlook for Southeast Asia, China and India 2018* – the demand for infrastructure remains high and additional investment is needed to support sustained economic expansion. At the same time, new approaches to infrastructure investment are also needed that prioritise the quality of these projects, addressing issues including effective governance, economic efficiency and resilience, empowerment of local communities, consideration of social and environmental impacts, alignment with economic and development strategies, and resource mobilisation.

Road and Rail Infrastructure in Asia: Investing in Quality discusses the challenges facing the region and possible policy options to be considered, including those that have been or are being used in Emerging Asian countries and with reference to the experiences of OECD member countries and others. Case studies of recent road and rail infrastructure projects in Asia are used to illustrate ways in which quality infrastructure principles have been applied in practice. In addressing deficiencies in infrastructure, this report outlines some of the key considerations to be made regarding the responsibilities of local governments in infrastructure development and management, public and private financing instruments, and the alignment of infrastructure and development planning.

This publication, in focusing on infrastructure challenges in Asia, is intended to provide analysis and recommendations that are relevant for policy makers in the region to consider in their efforts to ameliorate the quality of infrastructure.

The OECD Development Centre is committed to working alongside the governments of developing and emerging economies and regional actors to identify key areas of intervention in order to address challenges in infrastructure investment and other policy areas. The Centre enjoys the full membership of three Southeast Asian countries, namely Indonesia, Thailand and Viet Nam, as well as India and China. Committed to supporting Asian countries in their efforts to promote economic and social well-being through rigorous analysis, peer learning and the sharing of best practices, we hope that this report will highlight the importance of investing in quality road and rail infrastructure and contribute to discussions on its role in the region's development.

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Executive summary

The *Road and Rail Infrastructure in Asia: Investing in Quality* report addresses the need for greater attention to be paid to investing in quality infrastructure in Asian countries. It includes an introduction to the main issues, illustrated through case studies on recent road and rail infrastructure (Chapter 1) and discussions of three key policy areas to be addressed in developing and implementing quality infrastructure: the roles and responsibilities of local governments (Chapter 2), financing options for infrastructure projects (Chapter 3), and the alignment of transport infrastructure planning with development strategies (Chapter 4).

The need for quality road and rail infrastructure

Additional investments are needed in transport, energy, communications and other kinds of infrastructure in many Asian countries and these gaps are likely to grow in future in response to economic growth, population increases and the need to respond to climate change. At the same time, new approaches to infrastructure investment are needed to promote quality in infrastructure investment.

Quality infrastructure is designed and implemented while taking into account a life-cycle perspective, employment creation, social and environmental impacts, alignment with broader development strategies, and resource mobilisation. It boosts economic activity, creates employment opportunities and expands the tax base; improves well-being and promotes inclusive growth; and also addresses environmental impacts. To develop quality infrastructure, a comprehensive perspective of infrastructure impact evaluation is important. This does not simply consider the financial feasibility of an individual project, but attempts to judge the full extent of the externalities. These externalities are often strongest at the local level, but can also be far-reaching. Moreover, a comprehensive perspective also needs to be adopted at high levels of government, to achieve sufficient political support, and to institutionalise practice within government.

Sixteen case studies on road and rail projects in India, Indonesia, Lao PDR, the Philippines, Sri Lanka, Thailand and Viet Nam illustrate some of the ways in which the concept of quality infrastructure has recently been put into practice in the region. These include the establishment of new institutions or development of capacities to improve governance, investing in maintenance, and the adoption of designs and construction practices to limit projects' environmental impacts.

Local governments and infrastructure investment

Across Asia, local governments play important roles in the development and maintenance of road and rail infrastructure. Some of the challenges associated with local level investment in infrastructure are explored through the cases of Indonesia, the Philippines and Viet Nam; three unitary states with local governments that take considerable responsibility for infrastructure. In these three countries, access to land transport

infrastructure varies among communities, but is associated with economic growth and development, as well as poverty reduction and other social benefits.

The ways in which local governments participate in infrastructure investment and the sources of financing for these investments differ between countries. The central government retains most of the responsibility for raising revenues in Indonesia, which are then transferred to local governments. In the Philippines, the Local Government Code of 1991 granted local governments the authority to use a number of sources of financing, including loans and credits with banks and other lending institutions, for the development and infrastructure projects. However, local governments in the Philippines have relied mostly on locally-sourced revenues and fiscal transfers to finance local infrastructure investment. Viet Nam is allocating funds under its medium-term investment plan for PPP and ODA projects, for the repayment of construction capital, and for unfinished and new projects, with more than a third of investment capital managed by local authorities.

Improving the efficiency and effectiveness of local governments in developing and implementing infrastructure projects will require improvements to planning and co-ordination, the development of institutional capacities, the use of broader sources of financing, and the incorporation of ongoing maintenance and monitoring costs in project budgeting.

Financing options for quality infrastructure investment

Addressing the need for increased investment in infrastructure and the development of quality infrastructure will require that new sources of financing be explored, and that consideration be given to their suitability to project needs. The public sector still bears much of the burden in financing infrastructure and is likely to continue to do so in Asian countries in the future. Public revenues can be increased through improvements to tax yields generally and the implementation of taxes specifically for financing infrastructure, such as vehicle taxes and road-use charges, energy taxes and taxing project beneficiaries. Various forms of these targeted taxes are being used to finance road and rail projects in OECD member countries and in Asia.

While the public sector will remain as the primary source of credit in the near term, the large infrastructure gap in Emerging Asia requires the use of new approaches to financing involving the private sector. Public-private partnerships have been used for a long time, but their use did not gain traction in many Asian countries as quickly as in Europe. Specific-purpose borrowing could also be used more often. Fostering greater private involvement in infrastructure finance will require, in many countries, the development of effective governance mechanisms and of financial markets.

The alignment of transport and development planning

A key component of quality infrastructure investment that could be developed further in many Asian countries is the use of complementary and co-ordinated development strategies and infrastructure planning. This includes the use of public investment management (PIM) systems to prevent many forms of resource waste through bad practices that are economically and socially costly. The alignment of plans is also supported through the use of effective systems for the appraisal of infrastructure projects and the institutionalisation of infrastructure governance. Appraisals can provide checks and balances that reduce the risk of excessive construction and operation costs.

Viet Nam, which has adopted many principles of quality infrastructure through its planning system, offers an interesting case study on the alignment of socio-economic development plans with transport infrastructure plannings. Further work could be done, however, to strengthen the connections between these two in the country. Detailed budgeting, time-specific targets, and clearer criteria, would be particularly helpful in addressing these challenges.

Overview

Chapter 1: Introduction and case studies: Creating quality infrastructure in Asia

While there is significant demand for infrastructure in Asian countries, and with economic growth and climate change making the case for considerable investments in this regard, too little is currently being invested in much of the region. In addition to expanding transport, energy and communications networks, and developing other kinds of infrastructure, countries in the region also need to ensure the ongoing maintenance of their existing networks, and to make improvements to the overall quality of their infrastructure.

Quality infrastructure is designed and implemented while taking into account a life-cycle perspective, employment creation, social and environmental impacts, alignment with broader development strategies, and resource mobilisation. Emphasising quality in infrastructure can require changes in how infrastructure is perceived and, in particular, in how benefits of infrastructure are measured. Investment decisions should be made with consideration of the full externality effects of these projects over the long term. To develop quality infrastructure, a comprehensive perspective of infrastructure impact evaluation is important. This does not simply consider the financial feasibility of an individual project, but attempts to judge the full extent of the externalities. These externalities are often strongest at the local level, but can also be far-reaching. Moreover, a comprehensive perspective also needs to be adopted at high levels of government, to achieve sufficient political support, and to institutionalise practice within government. Indeed, quality infrastructure can boost economic activity, creating employment opportunities and expanding the tax base; improves well-being and promotes inclusive growth.

Sixteen case studies describe recent and ongoing infrastructure projects in Asian countries. These projects include road and rail transportation projects in India, Indonesia, Lao PDR, the Philippines, Sri Lanka, Thailand and Viet Nam (Table 1). While these projects are not necessarily model examples of quality infrastructure, these case studies illustrate some of the ways in which the concept of quality infrastructure has been incorporated into recent infrastructure projects in the region.

Table 1. Infrastructure project case studies

Project	Location	Infrastructure type
Delhi mass rapid transport system	Delhi, India	Urban railway
National Highways Development Project (NHDP)	India	Highway
Gujarat state highway project	Gujarat, India	Highway
Railway double tracking on Java's south line	Java, Indonesia	Railway
Construction of a mass rapid transit system in Jakarta	DKI Jakarta Province, Indonesia	Urban railway
Champasack road improvement project	Champasack, Lao PDR	Road
Project to improve the transport network in the northern part of the Greater Mekong Subregion	Louang Phrabang and Xaignabouri, Lao PDR	Road
Enhancing the capacity of mass transit systems in Metro Manila	Manila, the Philippines	Urban railway
Southern transport development project	Southern Sri Lanka	Highway
Regional road-improvement project	Central and southern Thailand	Highway
Mass Rapid Transport Authority (MRTA) initial system (Blue line)	Bangkok, Thailand	Urban railway
Bangkok urban transport project	Bangkok, Thailand	Highway
Mass transit system in Bangkok (Purple Line)	Bangkok Metropolitan Area, Thailand	Urban railway
Construction of a tunnel at the Hai Van pass	Central Viet Nam	Highway tunnel
Third rural transport project	Viet Nam	Road
Construction of the Nhat Tan bridge (Viet Nam-Japan Friendship Bridge)	Hanoi, Viet Nam	Road bridge

Source: OECD Development Centre.

Delhi mass rapid transport system. The Delhi mass rapid transport system project is an urban railway being developed to address traffic congestion and air pollution in Delhi, India. In the first three phases, which ran from 1997 to 2017, the project set out to complete 351 kilometres of railway; an additional 100 km is expected by 2021. Delhi Metro Rail Corporation Limited (DMRC) was incorporated by the government in 1995 to implement the project. The DMRC made a number of efforts to develop a work culture that emphasises both timeliness and worker safety. It was possible to mitigate the project's environmental impact by using rolling stock with regenerative brakes, which save around a third of the energy that conventional systems would consume. The project also took steps to address its social impact with regard to workers' living and working conditions.

National highways development project. In 1998, India initiated a national highway development project to improve the quality of highways and to upgrade two-lane single carriageways into four-lane divided highways. The first phase of the project made improvements to highways in the Golden Quadrilateral (5 846 km). It increased the efficiency and safety of the highway network, as wider roads have improved transport capacity, and have reduced both travel time and the cost of operating vehicles. Local-level benefits have included the creation of jobs, both as a direct result of the project itself and from the indirect effects of communities' improved access to transport infrastructure. The project took account of environmental and social considerations by incorporating measures such as planting ten trees for each tree cut down, building adequate drainage measures into the road design, not allowing labour camps in forests, and implementing resettlement action plans and other measures for compensation and assistance.

Gujarat state highway project. Following an increase in vehicle ownership that put additional strain on the road network, Gujarat's state highway project – which ran from 2002-07 – set out to widen roads, and to improve them in a number of ways. The project also pursued institutional reform within the Gujarat government's roads and buildings department by developing and implementing an action plan for institutional

strengthening. Gujarat also set up an environmental management unit in order to address environmental and social issues. This unit has taken actions on compensatory forestation, measures to protect wildlife, and resettlement.

Railway double tracking on Java's south line. The double-tracking project on Java's southern railway line ran from 1996 to 2007, at a total cost of 16.4 billion yen (JPY). Increasing use of the line's single track had affected traffic, particularly in the congested stretch between Kroya and Yogyakarta, and had raised safety concerns. The project included the rehabilitation of existing lines and the construction of new ones. It succeeded thanks to effective governance on the part of the implementing agency. Moreover, it aligned with goals from the country's national development plans that targeted the rehabilitation of the railways and an increase in transport capacity.

Construction of a mass rapid transit system in Jakarta. The aim of developing mass rapid transit infrastructure in Jakarta was to improve transport capacity, and to make the metropolitan area of Indonesia's capital city more attractive to investors, by building a combination of subways and elevated railways. The first phase of the project runs from 2009-19. It is aligned with national goals – both the national mid-term development plan and the transport ministry's national railway master plan of 2011 have noted the need for a mass transit railway system in the capital city's metropolitan area. Measures taken to mitigate the negative environmental impact of construction have included the use of noise barriers and vibration-isolation mats.

Champasack road improvement project. In Lao PDR, the Champasack road-improvement project set out to rehabilitate and improve 200 km of basic road infrastructure in the southern part of the country, improving the connection between Chong Mek, on the Thai border, and Veun Kham, on the Cambodian border. The project is part of a north-south national road link developed by the government of Lao PDR and the Asian Development Bank (ADB). Although the project faced challenges with regard to equipment, its outcomes were judged to be highly satisfactory. Plans for periodic maintenance were incorporated into the project, and were mostly decentralised to provincial institutions. In turn, these institutions appointed villagers to take responsibility for certain roles. The project also made use of local labour in construction, thus generating employment in the local economy. The improvements in terms of road access delivered a range of benefits for the region, including boosting both tourism and the development of new businesses. It also facilitated the establishment of electricity distribution systems.

Project to improve the transport network in the northern part of the Greater Mekong Subregion. Also in Lao PDR, a project addressed relatively under-developed roads in the northern part of the Greater Mekong Subregion. This situation had hitherto limited economic opportunities in the region. This project, which ran from 2008-16, improved the quality of roads and linked rural roads to upgraded highways. Given its proximity to northern Thailand, northern Viet Nam, and the southern provinces of China, improving roads in this region also supported subregional goals of improving connectivity and developing strategic corridors. Moreover, the use of design-build contracts for civil works increased the project's overall efficiency. In 2002, a road maintenance fund was established. Furthermore, mobile scales and permanent weigh stations were constructed to detect overloaded vehicles and to improve sustainability.

Enhancing the capacity of mass transit systems in Metro Manila. In the Philippines, a project running from 2012-17 sought to enhance the capacity of Metro Manila's mass transit systems. In order to address the increasing strain that the city's Light Rail Transit

(LRT) system had been facing, this project set out to enhance the capacity of the system's LRT 1 and LRT 2 lines. The project matched up with the goals of the country's overall development plan for 2011-16, one of which was to reduce traffic congestion in the capital. Financing from various sources was used for the project. These included the World Bank's International Finance Corporation, the government of the Philippines, official development assistance (ODA) from Japan, and private sources. Moreover, the project incorporated anti-pollution measures, including facilities for treating effluent. The project also made use of sound-proof walls and vibration-proofing sleepers in order to reduce noise and vibration. Furthermore, there was a resettlement action plan for people who had been displaced by the project.

Southern transport development project. Sri Lanka's southern transport development project was the largest greenfield road initiative the country had ever implemented. It included the construction of a four-lane expressway over 126 km, as well as access roads and other components. Road safety measures included the establishment of institutions to promote it, the use of special safety equipment, and the creation of a road safety fund. The Sri Lankan authorities also adopted a mechanism for redressing grievances under the committee for land acquisition and resettlement. Furthermore, an income restoration programme was set up to re-establish home gardens, and to provide training to people who had been negatively affected by the project. The ADB, The Japan International Co-operation Agency (JICA), and the Export-Import Bank of China provided technical, financial, and other forms of assistance.

Regional road-improvement project. Thailand carried out a regional road-improvement project in two phases (1994-2001 and 2000-05) to widen and improve major national highways in the centre and south of the country. The project, for which the highways department in the transport ministry took the lead, aimed to address the need for additional transport capacity. Several versions of Thailand's national economic and social development plan had called for this. Efforts to improve road safety in the project included installing extra traffic lights, street lights, and reflective plates. Changes were also made to road design to improve safety, such as by reducing the number of U-turn points. The establishment of weighing stations to control overloaded vehicles also made it possible to extend the lifespan of the roads.

Mass rapid transport authority initial system. From 1996-2004, the Mass Rapid Transit Authority of Thailand built the first subway line in Thailand, the Blue Line in Bangkok. Environmental considerations were an important factor in selecting bidders for the construction work. The project also featured detailed countermeasure plans for air pollution, dust, water pollution and noise. Indeed, air pollution on major roads in Bangkok decreased following the project’s completion. The subway line also introduced barrier-free guidelines in order to increase accessibility for disabled and elderly people. The operation and maintenance of the line were awarded to a private concessionaire for a 25-year period.

Bangkok urban transport project. Earlier in the development of transport infrastructure in Thailand's capital city, the Bangkok urban transport project extended a three-lane highway to the central business district by 5.1 km, in order to relieve bottlenecks in the city. At the beginning of the project in 1992, Thailand set up the Office of the Commission for Management of Land Traffic. In turn, this new body benefitted from technical supports to use analysis tools for transport and traffic and to plan more effectively, and from staff training programmes.

Mass transit system in Bangkok. Later, the project to develop the Purple Line in Bangkok's mass transit system ran from 2009-16, and at a total cost of JPY 455.5 billion. This project was part of the Thai government's mass transit investment plan for 2005-12, which set out to develop seven rail lines in the metropolitan area of Bangkok. Unlike other lines, it also operates in outer Bangkok, alleviating air pollution by replacing buses. The project's anti-pollution measures included noise-blocking walls and planting new trees.

Construction of a tunnel at the Hai Van pass. In Viet Nam, the Hai Van Pass tunnel project eliminated a tight bottleneck on a narrow and steep segment of National Highway No.1. This segment is important both in north-south transport within Viet Nam and as part of the east-west economic corridor that passes through Viet Nam, Lao PDR, Thailand and Myanmar. By removing a road-transport bottleneck, this project supported the development of Viet Nam's central region. Viet Nam's national socio-economic development plan (SEDP), as well as those of the province of Thua Thien Hue, and the city of Da Nang, had identified this as a priority, as had the country's national master plans for transport. During the project's implementation, staff received training regarding tunnel operation, maintenance, and emergency measures. Successful communication between the executing agency and the operations and maintenance contractor during the construction period contributed to the smooth operation of the tunnel.

Third rural transport project. Also in Viet Nam, the country's third rural transport project, which affected 33 provinces in northern and central Viet Nam, followed on from the work of two previous rural road projects in improving connectivity. This matched up with the goals in Viet Nam's SEDPs for 2006-10 and 2011-15, and also with the transport ministry's five-year plan. Rural Road Surfacing Trials (RRST) were conducted in an adaptive approach to road design and maintenance, with road surface selected for their appropriateness to the local environment. Under a pilot programme, women from ethnic minorities took maintenance jobs on rural roads, under the guidance of the Vietnam Women's Union.

Construction of the Nhat Tan bridge. Between 2006 and 2015, the Nhat Tan bridge (Viet Nam-Japan Friendship Bridge) construction project was carried out with loans from JICA. Viet Nam's transport ministry carried out this construction project, which also included new approach roads allowing the bridge to serve as an important new crossing over the Red River, and to reduce traffic congestion in Hanoi. The planning for this project matched up with Viet Nam's five-year SEDP for 2006-10, which prioritised the repair and new construction of roads, as well as other development plans and strategies. The bridge used construction methods that limited the environmental impact while also reducing costs.

Chapter 2: Investing in infrastructure at the local level

Across Asia, local governments play a significant role in the development and maintenance of infrastructure. The experiences of Indonesia, the Philippines and Viet Nam – three unitary states with local governments that take considerable responsibility for infrastructure – help to illustrate the local economic consequences of infrastructure projects, the roles and responsibilities of local governments, the means of financing investment, and the benefits and challenges of local governments' involvement in the sector.

In Indonesia, the Philippines and Viet Nam, access to land-transport infrastructure varies among communities. In Indonesia, for example, unequal access to infrastructure at the local level is a greater challenge in some provinces than others. According to recent statistics, only 19.4% of villages and sub-districts in Papua had asphalt or concrete surfaced roads as their widest road, and only 29.6% had access to roads that are passable all year round. By contrast, more than 99% of Bali's villages and sub-districts both had asphalt or concrete roads as their widest thoroughfares, and enjoyed access to roads that are passable throughout the year.

Several studies have found that investments in infrastructure have increased employment and output in rural Indonesia. In the Philippines, meanwhile, other studies have pointed to positive relationships at the local level between infrastructure and economic growth, and between income levels and tax revenues. Similarly, there is a positive association in Viet Nam between investment in infrastructure and multiple indicators of local economic development. The development of infrastructure also helps to reduce poverty at the local level, thanks to the economic activity it induces, and the impact – both direct and indirect – that this has on poor people's lives. For example, research has confirmed that Viet Nam's national poverty-reduction programme, which included significant investments in rural roads and other infrastructure, has had a positive impact on the incomes of poor households.

Local governments in Indonesia, the Philippines and Viet Nam (Table 2) have considerable responsibilities for developing and managing land-transport infrastructure, such as local and regional rail and road networks. Indeed, through decentralisation initiatives in these three countries, new responsibilities were passed to these levels of government and divisions of responsibility with the central government were clarified. In Indonesia, for example, although railway infrastructure is primarily the responsibility of the central government, Law No. 23 of 2007 opened up additional roles for local governments to contribute to such projects. In addition, central, provincial and local governments in Indonesia divide up responsibility for the construction and maintenance of Indonesia's road network. By length, most roads in Indonesia are district roads (80% of the total in 2015), followed by provincial roads (11%) and national roads (9%). Decentralisation in the Philippines, meanwhile, has resulted in a two-track delivery system for infrastructure. Local governments take the lead in devolved areas of responsibility, such as providing local roads and municipal ports, while the central government plays a role in augmenting or complementing local delivery. Urban and rural transport networks, and urban railways, are among the six main types of infrastructure that come under the mandate of local governments in Viet Nam, a country in which infrastructure investment planning is also decentralised.

Table 2. Tiers of local governance in Indonesia, the Philippines and Viet Nam

	Regional or state level	Intermediate level	Municipal level
Indonesia	34 provinces (*provinsi*)	-	508 regencies (*kabupaten*) and cities (*kota*)
Philippines	81 provinces	1 489 municipalities and 105 cities	42 028 villages (*barangays*)
Viet Nam	63 provincial-level entities, including 5 city-provinces	710 districts (cities/towns)	11 145 communities

Source: OECD/UCLG (2016), *Subnational governments around the world: Structure and finance*.

Different combinations of local and central government revenues and private financing are used in local infrastructure investments in Indonesia, the Philippines and Viet Nam. Despite increased responsibilities at the local level, and the allocation of specific taxes to provincial and local governments in Law No. 28 of 2009, the central government retains most of the responsibility for raising revenues in Indonesia, which it then transfers to local governments. Transfers from the central government include the Dana Alokasi Umum, an equalisation transfer, the Dana Bagi Hasil, a fund of shared revenues from taxes and natural resources, and the Dana Alokasi Khusus, a special allocation grant for national priority projects. Moreover, taxes and other revenues are becoming relatively more important as sources of revenue, despite starting out from a small base. In the Philippines, the Local Government Code of 1991 granted local governments the authority to tap various sources of financing for development and infrastructure projects. These include loans and credits with banks and other lending institutions. They also include bonds and other long-term securities, and loans between local governments, as well as grants, subsidies, and loans from foreign sources through the national government (i.e. ODA). Moreover, they also extend to contracts with the private sector, including PPP arrangements. However, local governments in the Philippines have relied mostly on locally-sourced revenues (local taxes) and fiscal transfers (internal revenue allotment and other transfers) to finance local infrastructure investment. For 2016-20, Viet Nam allocated funds in five areas for its medium-term public-investment plan. These include counterpart funds both for PPP and ODA projects, funds for the repayment of construction capital, and funds both for unfinished projects and for new ones. Investment capital managed by local authorities reached 44.2% of total infrastructure investment in 2009, but declined to 35.7% in 2011 due to multiple factors, including capacity limitations on the part of local authorities.

Countries vary in the extent that they use PPPs and other forms of private-sector involvement in the development of local infrastructure. Still, Indonesia, the Philippines and Viet Nam have all taken steps to encourage greater private participation. In Indonesia, the contracting agencies for PPPs can be central government ministries or local government authorities. Steps towards decentralisation in Indonesia, and the state finance law of 2002, passed numerous responsibilities for managing PPPs from the national development planning ministry (Bappenas) to local authorities, as well as to the finance ministry. In the Philippines, meanwhile, local governments can use PPP arrangements for investments in local infrastructure. They may do so both under the country's build-operate-transfer law and its implementing rules and regulations (IRRs), and under section 302 of the Local Government Code of 1991. The relevant local and national approving bodies evaluate project proposals in the approval phase according to their nature, scope and cost. In Viet Nam, capital for local transportation infrastructure can be mobilised through bond issuance, loans from commercial banks, local funds for development investment, auctions of land use rights, and construction project bidding.

The decentralisation of responsibilities for the development and maintenance of infrastructure can produce gains in productive efficiency thanks to lower-cost local inputs and labour, to streamlined bureaucratic oversight and reduced corruption, and to the gains in allocative efficiency that come from improving the alignment of investments with local priorities. On the other hand, a range of factors can also limit the efficiency gains that decentralisation can generate. These include limited capacity within local government, the need to manage spillover effects, economies of scale, equity considerations, distortions to internal trade, and unproductive competition between regions. In Indonesia, the Philippines and Viet Nam, it may be possible to achieve further gains while also

helping to address gaps in access to land transport infrastructure. Potential ways of doing this include improving co-ordination and planning, helping local governments to develop their capacity, considering new financing mechanisms, and integrating monitoring and maintenance in infrastructure planning. The lessons offered by the experiences of these three countries are also likely to apply more widely to other emerging economies in the region.

When it comes to infrastructure planning and co-ordination, there is certainly scope to make some improvements. Moreover, while effective planning is essential for the development of quality transport infrastructure, this can be complicated by the need for co-operation between various actors and across multiple levels of government. Therefore, enhancing the co-ordination between central and local governments on infrastructure issues can improve planning, project selection and allocations.

Wherever a lack of experience constrains local governments' ability to plan and implement infrastructure projects, capacity building will be an important response. Moreover, unlocking all of the benefits that local-level infrastructure development can bring also requires transparency and accountability. Furthermore, even where perceptions of corruption in local governments are less serious than those of the central government, addressing corruption and promoting transparency have an essential role to play in capacity development.

Expanding the development of infrastructure, and covering its life-cycle costs is also likely to require a greater mobilisation of financing on the part of local governments. Public authorities can also seek further private sources of finance, especially when it comes to the kinds of long-term financing for infrastructure assets that is currently available on the market. Furthermore, PPPs will continue to play an important role, both in the development of local infrastructure, and as a means of attracting investment and external expertise. Still, effective governance is a prerequisite for managing PPPs properly.

Regardless of the level of government that takes the lead in infrastructure projects, officials should pay attention to maintenance and monitoring throughout the project life-cycle. Indeed, project planners should estimate maintenance costs for a piece of infrastructure, add them to the initial cost and adequately allocate them during later periods. In addition, governments may also need to find better ways of mobilising contributions from the private sector and other sources for the maintenance of transport infrastructure.

Chapter 3: Financing quality infrastructure

Continued economic growth in Emerging Asian countries will place increasing strain on existing infrastructure, and financing will be needed not only for the development of new infrastructure, but also for the improvement, upgrading, and maintenance of existing infrastructure. Considering the magnitude of infrastructure investment that the region requires, government revenues – historically the main source of financing in the region – are likely to be insufficient. In order partially to plug the gap, aid agencies and donor countries have been actively pursuing infrastructure-related projects in the region. In addition, PPPs and other forms of private sector involvement are becoming more important. The experiences of OECD member countries offer examples for Emerging Asian countries of some of the available options to be considered for diversifying sources of financing.

At present, the public sector still bears much of the burden in financing infrastructure, and using general budgets to pay for infrastructure projects makes it necessary to improve tax-collection capacity. For example, Indonesia's ratio of tax to gross domestic product (GDP) stood at 11.8% in 2015, with Malaysia's at 15.3%, 17% in the Philippines, and 13.6% in Singapore. All of these fell below the OECD average of 34.3%, 32% in Japan (2014), and 25.3% in Korea.

Energy-related taxes can play an important role in financing infrastructure investments. For example, some countries channel fuel tax – or at least a part of it – into the financing of infrastructure, notably into the construction and maintenance of roads. In other countries, these revenues flow into the general revenues. Countries like Switzerland and the United Kingdom apply a carbon tax, which is linked directly to the level of carbon dioxide (CO2) emissions, and a petroleum tax – an excise duty on fuels used for vehicles and heating purposes. Some countries earmark fuel-tax revenues directly for infrastructure investment. Moreover, some Emerging Asian countries also use fuel taxes. These include China, which implemented a fuel-tax reform in 2009. Energy-related taxes are often applied not only for their capacity to generate revenue – which can then provide financing for infrastructure – but also for environmental reasons.

Another option is to use vehicle taxes and road-use charges to raise revenues for investments in infrastructure. Some OECD countries, including the United Kingdom, Sweden, Germany, and Italy apply taxes on vehicle ownership – as excise duties on registered vehicles – based on the vehicle's CO2 emissions. Countries apply road-use charges in several different forms, including toll-road charges, heavy-vehicle fees, congestion charges, or motorway vignettes. Switzerland, for example, levies a performance-related heavy-vehicle fee at the federal level, and also requires vehicles on motorways to display vignettes. Moreover, some European cities use congestion charges to manage traffic congestion or to raise revenue. Some Emerging Asian countries have also implemented use charges to raise revenue. In this regard, Singapore applies registration fees and excise duty for car ownership. Moreover, India proposed in its 2016 budget to introduce an infrastructure cess charge on car purchases. The Philippines applies expressway tolls and other user charges.

It is also possible to capture revenues from the indirect and proximity benefits that transport infrastructure can generate. These include the increase in the value of real estate that can occur around new infrastructure developments. Tax increment financing (TIF) is among the tools that can capture such increases. It is usually applied so that local authorities can fund regeneration projects by borrowing against the increase in tax revenue that is likely to result. The United States has used TIF, as have local-level administrations in the United Kingdom. In Japan, Fukuoka City applies a city-planning tax, a spa tax, and a business office tax, while Osaka's municipal taxation system applies two special-purpose taxes: a fixed-asset/city planning tax and a business-facility tax.

While the public sector will remain as the primary source of credit in the near term, the large infrastructure gap in Emerging Asia requires the use of new approaches to financing. From 2007 to 2016, the extent of private involvement in publicly awarded projects in these Emerging Asian countries was comparable to that in Europe, Central Asia, Latin America, and sub-Saharan Africa. The ratio of investment commitments to project count reflects the scale of infrastructure projects in which the private sector can participate. Relative to projects in India and Southeast Asian countries, moreover, private sector involvement in China is generally limited to smaller-value infrastructure projects (Table 3).

Table 3. Infrastructure projects with private sector participation in Emerging Asia

Average investment by project, USD billion (2005 constant prices)

	All projects		Transport		Land transport	
	1997-2006	2007-16	1997-2006	2007-16	1997-2006	2007-16
Cambodia	0.04	0.18	0.04	-	0.05	-
China	0.13	0.08	0.21	0.46	0.21	0.71
India	0.37	0.22	0.13	0.16	0.07	0.16
Indonesia	0.81	0.29	0.49	0.22	0.17	0.24
Lao PDR	0.46	0.50	0.005	-	-	-
Malaysia	0.62	0.37	0.38	0.32	0.44	0.32
Myanmar	0.73	0.17	-	0.06	-	-
Philippines	0.59	0.31	0.30	0.22	0.54	0.32
Thailand	0.21	0.17	0.18	-	0.48	-
Viet Nam	0.29	0.07	0.11	0.12	0.00	0.00

Note: Calculation only included projects with investment data. Headline CPI was used to adjust for inflation. Year refers to financial closure year as defined in the World Bank PPI database.
Source: OECD Development Centre's calculations based on World Bank PPI database (World Bank, 2017).

Public-private partnerships have been used for a long time, but their use did not gain traction in Emerging Asian countries as quickly as in Europe. Despite a number of countries introducing a range of PPP-related statutes in 1990s, institutional weaknesses, capital market inadequacies, insufficient technical expertise, and a number of other factors, made these agreements less attractive. However, governments in Emerging Asian countries such as the Philippines have been more aggressive in creating business environments suitable for PPPs in the last decade or so.

Some OECD countries, particularly in North America, have made widespread use of specific-purpose borrowing to finance infrastructure. This means issuing debt instruments such as bonds in the capital market in order to finance a particular project. The income that the investments then generate usually helps to repay the bonds. In general, the use of infrastructure bonds in Emerging Asian countries has picked up since early 2000, especially in China and Malaysia, although there has recently been a pullback in issuances. In OECD member countries and elsewhere, a rising awareness of the importance of environmental issues has led to an increased use of green bonds to fund environmentally friendly infrastructure projects.

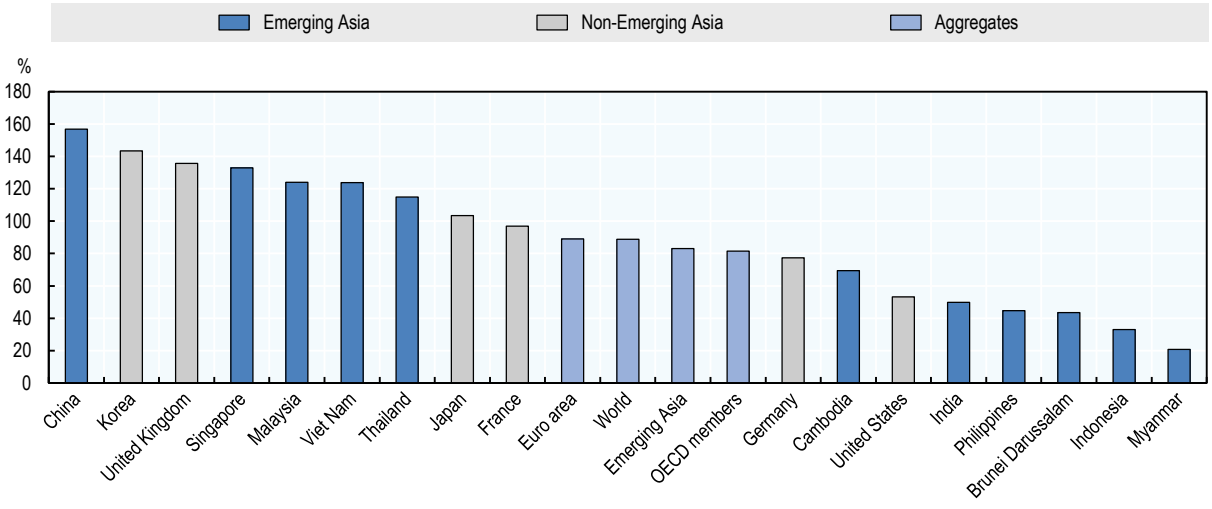
Increasing private-sector participation in infrastructure investment makes it necessary to develop financial markets. In many Emerging Asian countries, financial systems are bank-based. For example, China, Singapore, Malaysia, Viet Nam, and Thailand have higher ratios of bank lending-to-GDP than the OECD average, although the relative sizes of equity markets, and the scale of outstanding local currency bonds, tend to be smaller than in more advanced economies (Figure 1). It is also important that governments implement mechanisms that reduce the likelihood that infrastructure spending will contribute to financial-market risk, which is partly related to capital use efficiency, to the strength of due-diligence frameworks, and to regulatory stability.

In order to ensure an efficient administration of earmarked taxes, fees, and other non-tax revenues, such as proceeds from privatisation or mineral extraction, many OECD countries have infrastructure funds. These are seen as the most practical way of keeping earmarked revenues separate for special expenditures. Among the Emerging Asian

countries, Thailand and the Philippines, for example, already use infrastructure funds, in addition to the ASEAN Infrastructure Fund.

Figure 1. Banks' provision of domestic credit to the private sector, 2016

Percentage of GDP



Source: World Bank (2018), *World Development Indicators* (database).

StatLink http://dx.doi.org/10.1787/888933841786

Chapter 4: Aligning infrastructure planning with development strategies

While complementary and co-ordinated development strategies and infrastructure planning at the national and local levels can contribute to the effectiveness of infrastructure investment, many Emerging Asian countries could do more to bring these into closer alignment. Three important issues in this regard are the development of efficient management mechanisms for public investment, effective processes of project appraisal and institutions for infrastructure governance.

In the absence of an efficient management of public investments, investment spending is unlikely to be fiscally sustainable or to promote growth and development. In many Emerging Asian countries, public investment management (PIM) systems are either weak or non-existent. In turn, the lack of solid PIM capacity leads to many forms of resource waste through bad practices that are economically and socially costly. In order to be efficient and comprehensive, PIM systems should cover a number of key areas. These include investment guidance, project development, and preliminary screening. They also include formal project appraisals and independent reviews of appraisals. Other key factors to take account of are project selection and budgeting, project implementation, project adjustment, facility operation, and basic completion review and evaluation.

An effective system of appraisal of infrastructure projects is key to ensuring that they will support a country's economic and development strategies. Appraisals can provide checks and balances that reduce the risk of excessive construction and operation costs. Meanwhile, a rigorous system of project identification and selection screens inappropriate and inefficient projects from getting into the project cycle and gaining the kind of

political support that may result in white elephant projects. There are several issues and key challenges in implementing an effective appraisal system, including the institutional arrangements for project appraisals, the clarity and coherence of guidelines, capacity issues, and the demand for high-quality project appraisals.

Political pressures can distort infrastructure investment and raise the costs of implementing approved projects. For example, political considerations may affect the prioritisation of projects in the planning phase, and project costs may be increased because of the risks to investors and developers arising from political uncertainty. These challenges can be addressed by institutionalising the management of infrastructure through the use of stable regulatory frameworks and long-term planning anchored in central agencies of government.

Viet Nam offers up an interesting case study, because officials have accepted many quality-infrastructure principles, incorporating these into the development of infrastructure projects. Still, further work could be done to strengthen the connections between socio-economic development plans and transport plannings. Infrastructure investment in Viet Nam is affected by the five-year and annual Socio-economic Development Plans (SEDPs) – themselves based on the ten-year Socio-economic Development Strategy (SEDS), transport development strategies and plannings (Table 4).

Table 4. Summary of documents on SEDS, SEDP and transport plannings in Viet Nam

Document type and name		Timeframe	Issued/Approved by
SEDS	National SEDS	Ten years	Central Party Executive Committee.
SEDP	Five-year SEDP	Five years	Drafted by the government, and approved by the National Assembly.
	Annual national SEDP	One year	Drafted by planning and investment ministry, and approved by the National Assembly.
	Annual provincial SEDP	One year	Provincial People's Council.
Planning or master plan	Master plan for the socio-economic development of special territories.	Ten to fifteen years and beyond	Drafted by the planning and investment ministry, and approved by the prime minister.
	National or provincial planning for the development of sectors and products.	Ten to fifteen years and beyond	Line ministries approve national plans and the provincial People's Council approves provincial plans.
	Transport development plans by key economic region, province and district.	Ten to fifteen years and beyond	The prime minister approves national plans, and the chairperson of the People's Committee approves plans at the provincial or district level.
	National/provincial plans for roads, railways, inland waterways, aviation, seaports and highways.	Ten to fifteen years and beyond	The prime minister approves national plans.

Source: OECD Development Centre's compilation based on national sources.

The five-year and annual SEDPs set out Viet Nam's investments in transport infrastructure, ideally as approved in the country's ten-year SEDS. Indeed, the SEDS acts as a framework for the development of the shorter-term SEDPs. Local governments elaborate their own SEDPs, which they base on those from higher levels of government. Annual SEDPs detail specific actions to take under the five-year plan of the locality or sector. Transport plannings, meanwhile, have their basis in transport development strategies. These look ahead ten years for the development for transport networks, as well

as setting out a broad twenty-year vision. Plannings can differ both between territories and in their modalities.

In Viet Nam, a seven-step process defines the relationships between SEDSs, SEDPs, and transport plannings. While the intention is to make sure SEDPs align with transport plannings, the latter tends to be more directive than obligatory, because the implementation of the SEDP depends on the availability of resources. It is possible to improve the connections between SEDPs and transport plannings by using an up-to-date database to formulate a national transport master plan. Improvements to the assessment process for infrastructure projects can also ensure that the projects that feature in infrastructure plannings and SEDPs are aligned and form a coherent part of the broader policy framework.

Furthermore, including detailed specifications for individual infrastructure projects listed in the five-year SEDPs would increase relevance to infrastructure planning. These specifications would include specific financial and physical measures, such as the length of roads or the scale of ports. It is also important to incorporate measurable objectives to help governments in prioritising among projects. Moreover, uncertainty about the availability of necessary financing, as well as its allocation among projects, makes it impossible to set out plans in more specific details other than the annual SEDPs. Detailed budgeting, time-specific targets, and clearer criteria, could be helpful in this regard. While attracting domestic and foreign private investors would be essential to improve the delivery of infrastructure projects in Viet Nam, stable regulatory arrangements would be additionally beneficial.

Chapter 1. Introduction and case studies on road and rail infrastructure in Asia: Creating quality infrastructure

There is a considerable need for additional infrastructure investment in many Asian economies, and future increases in population, economic growth and climate change will result in additional demand for infrastructure. As well as increasing investment in infrastructure, policy makers will need to work to ensure the quality of these investments. Quality infrastructure is designed and implemented taking into account a life-cycle perspective, employment creation, social and environmental impacts, alignment with broader development strategies, and resource mobilisation. Quality infrastructure generates positive externalities benefiting economic development and well-being. Examples of the incorporation of these principles in recent road and rail projects in seven Asian countries are discussed in this chapter through 16 case studies.

Introduction

Road and rail infrastructure – along with other transport, energy, telecommunications and water and sanitation infrastructure – is essential for development. Investments to improve access strengthen connectivity, allow for the expansion of economic activity and can help to reduce rates of poverty. While additional investment in infrastructure is needed in much of Asia, enhancements to the quality of infrastructure projects are also needed to foster sustainable development in the region. This chapter outlines broadly the state of infrastructure in the region and the relevance of investing in quality infrastructure. Some of the possible ways in which the principles of quality infrastructure have been implemented in practice are illustrated with case studies on recent road and railway projects in Asian countries.

The infrastructure demand in Asia is very large. Asia and the Pacific will need USD 1.7 trillion annually from 2016 to 2030 to cope with climate change and maintain its strong rates of economic growth, according to ADB estimation (ADB, 2017[1]). Using a sample of 25 economies, it is estimated that the climate-adjusted need is about 1.34 trillion annually from 2016-2020. Nevertheless, only USD 881 billion has been invested in the region in 2015 amounting for about 66% of the needed amount.[1] East Asia is by far the leader in infrastructure spending and Southeast Asia is lagging behind. Spending in East Asia accounted for 80% of the region's total investment in 2011, followed by South Asia with 14% and Southeast Asia with 6%.[2] While the spending in East Asia and South Asia was close to 6% and 5% of subregional GDP respectively, it only represented 2% of subregional GDP in Southeast Asia. At the country level, while considering Emerging Asian countries (the ten ASEAN Member States, China and India), the spending in China, Viet Nam and India reached over 5% of GDP in infrastructure, while that of Malaysia or Thailand was relatively low. In particular, climate-adjusted estimates between 2016 and 2030 show that 56.3% of investment needs are for power, 31.9% for transport, 8.7% for telecommunications and 3.1% for water and sanitation. While this might be aligned with Asia's effort to increase connectivity, ADB further mentioned that maintenance and rehabilitation will gain more importance as the infrastructure stock increases. The ratio of new investment to maintenance and rehabilitation costs is estimated to be 3:2 with climate adjustment.

Improving Asia's infrastructure means not only constructing new roads or energy plants but also ensuring their quality. The rankings of the World Economic Forum (WEF)[3] demonstrate the need in Emerging Asia for both more and better infrastructure. For example, despite their growing economies, Viet Nam and the Philippines are ranked 79 and 95 respectively out of 138 countries in terms of infrastructure in 2016, though they did improve from 90 and 105 in 2011 out of 142 countries. Looking specifically at road quality, the same countries are also lowly-ranked, though Viet Nam has improved its road quality.

Similar conclusions emerge from the sub-index of the Logistics Performance Index (LPI) of the World Bank (2017[2]) in 2016 on the quality of trade- and transport-related infrastructure. On a scale of one (low) to five (high), infrastructure's quality in Lao PDR scored 1.76, Cambodia 2.36, the Philippines 2.55 and Viet Nam 2.7, which is below the world average of 2.75. Malaysia, Thailand, Indonesia and India scored higher than the world average but lower than the average of the OECD member countries, which scored 3.69. Singapore (4.2) and China (3.75) both scored higher than the OECD member country average.

The quality of infrastructure varies considerably within Emerging Asia (Table 1.1). While Singapore and Malaysia have high rankings in terms of the quality of roads, for example, there is much room for improvement in Cambodia and the Philippines. The quality of railways also varies significantly across the region. When considering other infrastructure measures, countries also differ in terms of how much electricity is lost during transmission. Less output is lost in East Asia and Pacific[4] as a whole than in the OECD member countries. The number of secure Internet servers relative to population is lower in Emerging Asia than the world average, and differences across the region are considerable. As it is the case in general, urban areas have better access than rural areas to electricity and to improved sources of water and sanitation facilities.

Table 1.1. Measures of key infrastructure in Emerging Asia in 2014

	Road		Rail	Telecom	Electricity			Water and sanitation			
								Improved water source		Improved sanitation facilities	
	Roads paved [1]	Road quality [2]	Rail quality [2]	Secure Internet servers [3]	Power losses [4]	Rural access to electricity [5]	Urban access to electricity [6]	Rural [5]	Urban [6]	Rural [5]	Urban [6]
Brunei Darussalam	82.3	41	..	153.0	6.4	100.0	100.0	..	..	..	..
Cambodia	6.3	93	98	3.0	23.4	49.2	96.9	67.1	97.8	29.1	86.0
Indonesia	57.0	75	39	6.2	9.4	94.3	99.7	78.7	94.0	47.5	72.3
Lao PDR	13.7	91	..	2.1	..	68.1	94.7	69.4	85.6	56.0	94.5
Malaysia	80.9	20	15	87.6	5.8	100.0	100.0	93.0	100.0	95.9	96.1
Myanmar	45.7	..	..	0.5	20.5	49.0	85.5	74.4	92.7	77.1	84.3
Philippines	20.0	106	89	10.8	9.4	82.5	97.3	89.7	93.6	69.8	77.5
Singapore	100.0	2	5	822.3	2.0	100.0	100.0	..	100.0	..	100.0
Thailand	97.5	90	96	23.1	6.1	100.0	100.0	98.0	97.6	96.1	89.9
Viet Nam	47.6	89	52	11.9	9.2	98.9	99.9	95.2	98.7	68.1	93.2
China	63.7	39	14	7.0	5.5	100.0	100.0	91.5	97.5	62.8	85.9
India	53.8	51	23	5.5	19.4	70.0	98.3	92.6	97.1	28.5	62.6
East Asia & Pacific	65.0			131.4	5.4	94.9	99.6	89.0	97.3	63.6	86.7
South Asia	45.1			4.7	18.9	71.8	97.8	90.8	95.3	34.7	64.4
OECD members	79.3			992.0	6.3	99.7	100.0	98.4	99.5	95.4	98.4
World	57.0			188.7	8.3	73.1	96.4	83.9	96.4	49.8	82.0

Notes:
.. Not available
1 Percentage of total roads; data have different years depending on availability: 2004 for Cambodia, 2009 for Lao PDR, 1999 for the Philippines, 1999 for Thailand, 2007 for Viet Nam, and 2011 for the rest.
2 Ranking out of 138 countries; quality of infrastructure is based on Executive Opinion Survey.
3 Number per 1 million people.
4 Electric power transmission and distribution losses as a share of output.
5 Percentage of rural population with access.
6 Percentage of urban population with access.
Source: World Bank (2018[3]), WEF (2016[4]).

Quality infrastructure is needed in the region

There is a need for not only new infrastructure investment in Asian countries, but also improvements in its quality. Given the rapid development of technology in design and construction, the definition of quality infrastructure can also evolve over time. Nonetheless, quality infrastructure should include several key elements; it needs to achieve value for money over the full project life-cycle by supporting the procurement

process; adopting life-cycle costs; using scenarios/options with rated criteria where non-price attributes are assessed with merit points and available to stakeholders; ensuring better management of infrastructure projects and service delivery; enhancing flexibility; improving planning and co-ordination, leading to economies of scale, proper mobilisation, channelling and management of PPPs. At the same time, quality infrastructure needs to be resilient against natural disasters through appropriate design and adequate systems for disaster preparation and response. Quality infrastructure also needs to achieve physical and operational safety and durability through improved construction standards, use of management information systems and smart design (World Bank and Government of Japan, 2016[5]; Mori, 2017[6]).

In addition, quality infrastructure minimises harmful environmental impacts; improves welfare of the society, with attention to the needs of traditionally excluded groups; takes account of gender and accessibility, particularly for the elderly and disabled; incorporates citizen engagement in planning; and uses a robust risk-assessment framework. Quality infrastructure will also be conducive to small and medium enterprise development; facilitates local job creation and productivity growth through efficient trade logistics; and supports enhanced competitiveness through technology transfer and human capital development.

These definitions of quality infrastructure are embodied in the Ise-Shima Principles (Box 1.1). Goals and initiatives related to the development of quality infrastructure were also included in the 2030 Agenda for Sustainable Development adopted in September 2015, and in the Leaders' Declarations adopted in recent G20 and APEC Summit meetings.

Box 1.1. The G7 Ise-Shima Principles for Promoting Quality Infrastructure Investment

On 26 and 27 May 2016, G7 leaders met in Ise-Shima, Japan, to address major global economic and political challenges. The G7 Ise-Shima Summit (ISS) was the first summit since the adoption of the 2030 Agenda for Sustainable Development, at the core of which are the Sustainable Development Goals (SDGs). The leaders reaffirmed the crucial importance for stakeholders to work coherently to bridge the existing global demand-supply gap in infrastructure investment by promoting quality infrastructure investment to ensure strong, sustainable and balanced growth, to enhance resilience in our society and to contribute to global SDG efforts.

The summit's communique on the G7 Ise-Shima Principles for Promoting Quality Infrastructure Investment outlined five principles for promoting quality infrastructure investment. These principles set out a coherent and organised framework for bridging the global infrastructure gap. Though the principles, set out below, are far from comprehensive, they do serve as a starting point for any conversation on quality infrastructure development, moving forward.

- Principle 1: Ensuring effective governance, reliable operation and economic efficiency in view of life-cycle cost as well as safety and resilience against natural disaster, terrorism and cyber-attack risks. Quality infrastructure investment should ensure effective governance, economic efficiency, sustainability and reliable operation during the life span of a project as well as safety and resilience against natural disaster, terrorism and cyber-attack risks.

- Principle 2: Ensuring job creation, capacity building and transfer of expertise and know-how for local communities. Quality infrastructure investment should seek to contribute to job creation for local work forces and to transfer of expertise and know-how to local communities.
- Principle 3: Addressing social and environmental impacts. Quality infrastructure investment must consider the social and environmental impacts of infrastructure projects and duly address such impacts including by applying social and environmental safeguards that are in line with international best practices as reflected in the most relevant standards including those of existing MDBs (multilateral development banks).
- Principle 4: Ensuring alignment with economic and development strategies including aspect of climate change and environment at the national and regional levels. Quality infrastructure investment should be aligned with economic and development strategies at the national and regional levels, through dialogues with stakeholders from the project preparation and prioritisation phases. Relevant elements of economic and development strategies to be considered include the development of a global supply chain through enhanced connectivity; use of latest technology such as information and communication technology; promotion of private investment and attraction of new industries; medium and long-term plans based on a long-term and cross-sector demand forecast and other relevant information; and debt sustainability and fiscal outlook. Climate change resilience, energy security and sustainability, conservation of biodiversity, disaster risk reduction should be considered including through further promotion of ecosystem-based approaches and green infrastructure.
- Principle 5: Enhancing effective resource mobilisation including through PPP. Quality infrastructure investment should effectively mobilise resources including from the private sector through PPP (public-private partnership) and other forms of innovative financing, including through MDBs. To this end, joint efforts among stakeholders including host country governments to strengthen the enabling investment environment at national and subnational government levels, as well as to enhance due process and transparency, are essential.

The full externality effects of infrastructure should be considered in investment decisions

Emphasising quality in infrastructure projects can require changes in how infrastructure is perceived and, in particular, in how benefits of infrastructure are measured. A comprehensive perspective of infrastructure impact evaluation does not simply consider the financial feasibility of an individual project, but attempts to judge the full extent of the externalities – positive and negative economic, social and environmental effects over different time periods – of planned investments. A potentially useful framework outlined by Oosterhaven and Knaap (2003[7]) identifies the direct and indirect effects of transport infrastructure investment over temporary and permanent periods. During construction, infrastructure projects provide stimulus to the local and wider economy. Over the longer term, transportation infrastructure can lead to local efficiency gains, increased demand

and induced economic activity, while also producing a combination of positive and negative health, environmental and other effects.

These positive externalities generated by transport and other forms of infrastructure are often strongest at the local level. Improved connectivity through quality infrastructure investments can boost economic activity, creating employment opportunities and expanding the tax base and improving well-being and inclusive growth while also addressing environmental impacts. Rural road improvements in Viet Nam have, through reduced travel costs and induced relocations, contributed to market development in poorer areas in particular, along with transitions away from agriculture-based employment and higher primary school completion rates at the commune level (Mu and Van de Walle, 2011[8]). Similarly, efficiency gains were seen by firms in cities affected by the highway upgrades made under India's Golden Quadrilateral Program, which reported decreased obstacles to transportation, began keeping reduced input inventories and were more likely to switch suppliers (Datta, 2012[9]). Infrastructure investments may require complementary actions to create real opportunities for local communities, however (Box 1.2).

Box 1.2. Stimulating local development through infrastructure investment

Thilawa Special Economic Zone (SEZ) is considered one of the successful SEZ development cases in the region. The Myanmar government reserved 2 400 ha (hectare), 25 km southeast of Yangon for the development of Thilawa SEZ. The construction of Zone A, covering 405 ha and which is mainly industrial, started in January 2014 and ended in September 2016. Construction of Zone B, which includes industry, logistics, residential and commercial areas in its 700 ha, started in February 2017 and its first development phase is expected to be completed by mid-2018. As of April 2018, foreign investment in the SEZ totalled over USD 1.374 billion and more than 40 factories were operational according to the Thilawa SEZ Management Committee, the site's governing body. Investments are being made in a number of sectors, including the manufacturing of garments, toys, radiators, steel products and aluminium cans; food processing; packaging; and logistics.

Approximately 8 000 people were employed during the construction phase of Zone A and the government estimated that 30 000 to 50 000 jobs will be created with the development of Zones A and B. Considering that, article 75 of SEZ law in Myanmar requires that at least 25% of skilled labour for the first two years of operation and 75% after four years of operation are to be hired locally, jobs created for the local community will not be limited to low-skilled works. Furthermore, vocational training will help to improve skills to meet demands. Improved skills and technological transfers should help to generate positive spillovers to local industries outside of the SEZ. Existing roads and power supplies were also upgraded, improving the investment climate and contributing to the well-being of the local community.

Exporting products to the international market requires meeting higher quality standards. To participate in the production process by providing raw materials or intermediate inputs to firms inside the SEZ, local industries will need to learn better practices and become more efficient producers. Important practices to adopt include

the effective management of inventories for the smooth supply of goods. An initial performance evaluation conducted by International Growth Centre in partnership with Thilawa SEZ Management Committee estimated that the share of input sourced locally for products destined for the domestic market is less than 20% and is lower than 10% for products destined for the international market (Khandelwal et al., 2018[10]). This suggests that local industries need to increase quality and productivity to meet the expectations of foreign firms. Though linkages to the local economy are still weak in some industries, food processing is estimated to source 50% of its inputs from local suppliers. Continued efforts will be needed to increase domestic linkages in other sectors as well.

More widely, quality infrastructure investment has positive spillover effects that range from job creation and increased foreign direct investment (FDI) to improved tax revenues. Hulten (1996[11]) found that effective use of infrastructure resources explains more than 40% of the growth differential between economies with high and low growth rates. According to a study of spillover externalities by the Asian Development Bank Institute (2018[12]), the STAR highway in the Philippines had "a significant impact not only on business taxes, but also on property taxes and regulatory fees". In a similar study on the Tashguzar–Boysun–Kumkurgon railway line in Uzbekistan, ADBI identified a 2% increase in the growth rate of regional GDP in affected regions, 5% value added in industry and 7% value added in services because of the project. In contrast, low-quality infrastructure imposes lasting costs, even when the up-front price is significantly lower. Poorly planned and constructed infrastructure may not function as intended and can lead to long-term public debt, accidents and environmental damage.

To develop quality infrastructure, a comprehensive perspective needs to be adopted at high levels of government, to achieve sufficient political support, and institutionalise practice within government, including at the local level (OECD, 2015[13]). While the ideal roles for and the division of responsibilities between local, regional and national authorities on any given project are shaped by a number of factors, including the respective capacities of the different levels of government and the need to consider projects' wider spillovers and synergies, new forms of co-ordination may need to be developed over time. New approaches may also be needed to finance quality infrastructure. A variety of revenue and financing tools are available to governments that need to raise fund for infrastructure investment. These tools should be used to not only allow for the needed increase in infrastructure investment, but also to match financing to the needs for projects throughout their life-cycle. Finally, in ensuring that they remain at the forefront of investment decisions, quality infrastructure principles should be integrated into development planning – including at local and regional levels and through the alignment with budget priorities.

Case studies on delivering high-quality transport infrastructure

The 16 case studies in this chapter describe recent and ongoing infrastructure projects in Asian countries. They include road and rail projects in India, Indonesia, Lao PDR, the Philippines, Sri Lanka, Thailand and Viet Nam (Table 1.2). While these projects are not necessarily model examples of quality infrastructure, these case studies illustrate some of the ways in which the principles of quality infrastructure have been incorporated into recent infrastructure projects in the region.

Table 1.2. Infrastructure project case studies

Project	Location	Infrastructure type
Delhi mass rapid transport system	Delhi, India	Urban railway
National Highways Development Project (NHDP)	India	Highway
Gujarat state highway project	Gujarat, India	Highway
Railway double tracking on Java's south line	Java, Indonesia	Railway
Construction of a mass rapid transit system in Jakarta	DKI Jakarta Province, Indonesia	Urban railway
Champasack road improvement project	Champasack, Lao PDR	Road
Project to improve the transport network in the northern part of the Greater Mekong Subregion	Louang Phrabang and Xaignabouri, Lao PDR	Road
Enhancing the capacity of mass transit systems in Metro Manila	Manila, the Philippines	Urban railway
Southern transport development project	Southern Sri Lanka	Highway
Regional road-improvement project	Central and southern Thailand	Highway
Mass Rapid Transport Authority (MRTA) initial system (Blue line)	Bangkok, Thailand	Urban railway
Bangkok urban transport project	Bangkok, Thailand	Highway
Mass transit system in Bangkok (Purple Line)	Bangkok Metropolitan Area, Thailand	Urban railway
Construction of a tunnel at the Hai Van pass	Central Viet Nam	Highway tunnel
Third rural transport project	Viet Nam	Road
Construction of the Nhat Tan bridge (Vietnam-Japan Friendship Bridge)	Hanoi, Viet Nam	Road bridge

Source: OECD Development Centre's compilation.

Improving mass rapid transport system in Delhi

Project description

- Site: Delhi, India.
- Components: Construction of 351 km of lines, plus electrical, signalling and telecommunications systems; procurement of rolling stock; consulting services.
- Total amount: approximately 1.5 trillion Japanese Yen (JPY) (loan: JPY 642.6 billion).
- Project period: 1997-2006 (phase 1), 2006-11 (phase 2), 2012-17 (phase 3).
- Agency in charge of project execution: Delhi Metro Railway Corporation.
- Lender: Japan International Cooperation Agency (JICA).

Elements of quality infrastructure

- Alignment with economic and development strategies
- Effective governance, particularly through the establishment of the DMRC
- Addressing social and environmental impacts

Along with economic growth, the population of Delhi has increased, rising from 6.2 million in 1981 to 16.8 million in 2011. In parallel with such growth, traffic on the city's transport networks increased, even as the number of buses did not increase sufficiently rapidly. Buses became overcrowded, and the number of automobiles and motorcycles rose on average by 11% a year as of 1997. Traffic congestion worsened and emissions of carbon dioxide rose. In Delhi, people tended to use trains for long-distance journeys and cargo transportation rather than for a short commute. The Delhi Mass Rapid Transport System project that forms the basis of this case study aimed to improve the urban environment and address both congestion and air pollution by building an urban railway in Delhi. By the end of phase three of the project, its organisers had planned to build 351 kilometres of railways. In the fourth phase of this project, they expect to add another 100 kilometres by 2021. This case study covers this project's first three phases.

In addition to addressing the pressing needs of Delhi's transport system, eliminating poverty was one of the Indian government's important goals in pursuing this project. Indeed, upgrading transport infrastructure has been a key part of the government's bid to deliver a response to poverty through industrialisation. India's ninth five-year plan, which ran from 1997-2002, and its eleventh five-year plan, which ran from 2007-12, put strong emphasis on improving the transport sector. The country's tenth plan, which ran from 2002-07, aimed to introduce a safe, efficient, and socially and environmentally friendly public transport system. Overall, the rapid mass transport project in Delhi was relevant to India's development needs, and it matched up well with the government’s strategies.

The project has a long life span, making effective governance all the more crucial for successfully implementing it. In 1995, the government set up Delhi Metro Rail

Corporation Limited (DMRC) for this purpose. In recruiting its personnel, the DMRC has placed emphasis not just on technical qualifications but also on strong motivation and on an ability to help build, and to play a constructive role within, the organisation's unique culture. In India, public projects were rarely completed on time, but the DMRC has promoted a work culture of meeting deadlines and taking responsibility (Takaki and Hayashi, 2010[14]). Furthermore, the DMRC required workers to wear helmets and safety shoes before this was an established practice in India. The corporation adopted these practices to ensure an effective, efficient and safe implementation of the project. Doing so also improved the work culture in local communities by promoting safety in the workplace.

Railway projects tend to be on a large scale, which makes taking steps to mitigate their impact on the environment and society all the more important. As part of efforts to minimise the project's environmental impact, rolling stock uses regenerative brakes that save power by changing kinetic energy into electricity, and then saving it to be used when needed. These can yield energy savings of up to a third of the energy that the trains would otherwise need. Indeed, the transit system reduced carbon dioxide emissions by 35 295 tonnes in 2008, and by 43 751 tonnes in 2009, according to Delhi Metro's monitoring report for phase one. To mitigate the social impact, meanwhile, and to help boost welfare, DMRC monitored the living conditions of people who were relocated and who were employed for the project.

Upgrading India's national highways

Project description: Surat-Manor tollway

- Site: State of Maharastra, India.
- Components: Widening to four lanes over 180 km of the NH 8 road from Surat to Manor, plus capacity building for private participation and toll operations.
- Total amount: USD 247 million, including a loan of USD 158 million.
- Project period: 2000-05.
- Agency in charge of project execution: National Highways Authority of India (NHAI).
- Lender: Asian Development Bank (ADB).

Project description: Western transport corridor

- Site: State of Karnataka, India.
- Components: Widening to four lanes over 232 km of the NH 8 road from Tumkur to Haveri, plus corporate finance capacity building through piggyback technical assistance.
- Total amount: USD 460 million, including a loan of USD 296 million.
- Project period: 2002-12.
- Agency in charge of execution: National Highways Authority of India (NHAI).
- Lender: Asian Development Bank (ADB).

Elements of quality infrastructure

- Alignment with economic and development strategies
- Safety through design
- Job creation in construction works and toll plazas
- Addressing social and environmental impacts
- Effective resource mobilisation and capacity building

Although national highways account for just 2% of India's road network, they carry about 40% of the country's total traffic. Given the vital importance of this network, degraded road conditions would hamper economic growth. In 1998, therefore, the Indian government developed the National Highways Development Project to upgrade its national highways to a higher standard. The project not only aimed to improve road conditions overall, but also to upgrade two-lane single carriageways into four-lane divided highways. Two-lane carriageways are usually more dangerous, and the speed is slow, leading to higher economic and social costs. India is rolling out the NHDP in seven

phases, in a bid to strengthen 46 635 km of national highways. This includes the Golden Quadrilateral, accounting for 5 846 km of road; the north-south corridor for 4 000 km of road; and the east-west corridor for 3 300 km of road. The Surat-Manor tollway (SMT) and the Western transport corridor (WTC) come under phase one of the NHDP. They are in the busiest transport corridors in the Golden Quadrilateral.

Both the SMT and WTC projects have increased the safety and economic efficiency of the network. Widening the roads removed capacity constraints on the highways, helped traffic to flow without interruption, and cut both journey times and the cost of operating vehicles. To increase safety, the design included underpasses, overpasses, and additional service roads. In addition, both projects provided a boost in terms of job opportunities. Local participation in construction works and toll plazas was encouraged in order to create jobs. Moreover, the improved highways translated into better connectivity. This encourage tourism and business to develop along the corridor, resulting in further increases in jobs (ADB, 2014[15]; 2007[16]).

The projects also mitigated their environmental and social impact. Before cutting down a tree, ten others were planted. Also, the design of the projects included adequate drainage measures. For the SMT project in particular, a summary initial environmental examination (SIEE) was conducted to identify environmental impacts of the project. This raised issues including the destruction of forests and vegetation, disruptions to utility lines, and interference to existing traffic. Officials then set up an environmental mitigation and monitoring programme to address and monitor these issues. In a further initiative to keep the environmental impact to a minimum, the project did not allow labour camps to settle in the forest. In the case of the WTC project, meanwhile, the national highways authority's staff, consultants and contractors received training in environmental management from experts in the field. To address their social impacts, both projects included a resettlement action plan, as well as micro plans for compensation and assistance with the support of a non-governmental organisation.

As mentioned above, the two projects were both part of a bigger initiative rather than being isolated initiatives. Therefore, each project reinforced the other. The government had a mandate to increase the efficiency of the highway system, and the participation of the private sector in operations and maintenance was an essential part of this. To boost private participation, the SMT project included studies on the toll system and on creating comprehensive concessions in operations and maintenance. Subsequently, operations work was awarded under the WTC project to private entities by applying concepts from the SMT project. It would not have been possible for the WTC project to have undertaken such extensive research on its own, as this would have required a bigger budget. Thanks to the SMT project, however, concessions of operations and management and toll operation were awarded to private operators under the WTC project. In one instance it did so with a build-operate-transfer scheme. In two other cases, schemes based on contracts with the NHAI were used.

In order to develop a project effectively and sustainably, the agency that implements it has to have sufficient capacity. A component of the East-West Corridor project enhanced the NHAI’s capacity to deal with social issues. Additionally, NHAI received in conjuncture with the loan, technical assistance for capacity building in improving its financial management. Resources were effectively mobilised from different projects in order to improve the implementing agency's overall ability. This can serve as a good illustration of how to ensure the quality of an infrastructure investment. Being part of a bigger initiative encompassing a range of individual projects made this possible.

Improving Gujarat's state highways

Project description

- Site: Gujarat State, India.
- Components: Widening, strengthening, and periodic maintenance of state highways; institutional strengthening; consulting services.
- Total amount: USD 408 million (loan: USD 280 million).
- Project period: 2002-07.
- Agency in charge of project execution: Roads and buildings department of the state government of Gujarat.
- Lender: World Bank.

Elements of quality infrastructure

- Institutional strengthening
- Addressing social and environmental impacts

This project was approved when demand for road transport was expected to double in a decade, reflecting the 6-8% annual economic growth of Gujarat – a state in Northwest of India. This project won approval against a backdrop in which vehicle ownership in Gujarat had been increasing by 14% a year for 15 years. Gujarat already had some of the most developed roads in India, but traffic congestion was getting worse as investment and maintenance failed to keep up with rising demand. Secondary networks such as state highways and district roads lacked proper budget allocations. By contrast, government initiatives, such as the national highway development programme in 1998 and the rural roads programme in 2000, had helped to improve primary and tertiary networks. Gujarat's state highway project addressed such issues, and expanded the capacity of the state network.

One successful feature of the project concerns institutional strengthening within the executing agency. An institutional strengthening action plan was developed and implemented to improve the agency's governance of road transport projects. This comprised organisational reforms such as streamlining staffing, preparing annual performance reports, establishing a comprehensive staff training programme, and setting up several new units. One of these was a policy and planning unit to prepare departmental budget plans using the computer-based system for road management that came out of the state highways project. In the past, insufficient data constrained budget planning. Establishing the new unit made the planning and management of road projects more effective (World Bank, 2008[17]).

A new unit for environmental management was established to ensure compliance with social and environmental safeguards. Environmental damage has been mitigated by adjusting route details, and by planting trees to compensate for those that make way for new development. Some other interesting measures have included the construction of underpasses to allow animals access to water sources, and a "food garden" of plants to minimise the movement of animals and the impact on wildlife. Earth excavated to de-silt or deepen ponds has created mounds that now serve as nesting areas for birds.

A resettlement action plan was prepared to mitigate the social impact of road development. It was also possible to lessen impacts on the society by making adjustments to the route and the width of the corridor. In addition, affected people got better housing and training, which improved their living conditions. The capacity-strengthening component of the project included the local community. It also made project planning and management more effective, and boosted compliance with environmental and social safeguards.

Doubling the tracks on Java's southern railway line

Project description

- Site: Java Island, Indonesia.
- Components: Construction of double track; rehabilitation of existing tracks and bridges; development of the signalling system; consulting services, including a detailed design for double tracking.
- Total amount: JPY 16.4 billion (loan: JPY 15.1 billion).
- Project period: 1996-2007.
- Agencies in charge of project execution: Directorate-General of Land Transport (Directorate-General of Railways since August 2005); Ministry of Transport.
- Lender: JICA.

Elements of quality infrastructure

- Alignment with economic and development strategies
- Effective governance, particularly in managing construction

The railway network in Java – an island where Indonesia's capital Jakarta is located and which is between Sumatra and Bali – encompasses the North Line, the South Line, and the Bandung Line (Figure 1.1). As the economy grew, double tracking gradually expanded on some sections. However, the entire South Line remained limited to a single track. Railway traffic congestion in that area was rising, with trains travelling in both directions sharing a track. This led to safety issues and severe congestion between Kroya and Yogyakarta. Forecasters estimated that demand would outstrip the line's capacity by 2004. In response to this situation, the track-doubling project in southern Java aimed to improve safety and to meet the rising demand for rail transport.

The project matches up with Indonesia's national strategies, which include several plans that emphasise the importance of track rehabilitation and the need to expand transport capacity. At the time of the project's approval, Indonesia's sixth five-year development plan (1994-98) recommended the rehabilitation of tracks as a way to meet railway demand. At the time of the project's completion, meanwhile, the country's medium-term national development plan (2010-14) continued to recognise the vital importance of increasing transport capacity by rehabilitating tracks and building new tracks, including double tracking.

The success of this project can be attributed to effective governance on the part of the implementing agency. The project included both the rehabilitation of existing lines and the construction of new ones. Such work is highly complicated as it is necessary to switch between working on existing tracks and the new ones without interfering with the normal operation of trains. Accumulated knowledge – in particular the experience acquired through the implementation of former projects – appear to have been strong assets while carrying out construction work. This project became a reference for effective governance, with the country planning many other investments in double-tracking and rehabilitation (Haraguchi, 2010[18]).

Figure 1.1. Project location of railway double tracking on Java south line

Source: Haraguchi, T. (2010[18]), "Ex-post evaluation of Japanese ODA loan project: Railway double tracking on Java south line", report commissioned by the Japan International Cooperation Agency, https://www2.jica.go.jp/en/evaluation/pdf/2010_IP-469_4.pdf.

Building mass rapid transit infrastructure in Jakarta

Project description

- Site: province of DKI Jakarta, Indonesia.
- Components: Construction of a mass rapid transit system (15.7 km); electrical and mechanical systems; procurement of rolling stock; consulting services.
- Total amount: JPY 137.4 billion (loan: JPY 123.4 billion).
- Project period: 2009-19 (Phase I).
- Agencies in charge of project execution: Provincial government of DKI Jakarta; railways Directorate-General in the Ministry of Transport.
- Lender: JICA.

Elements of quality infrastructure

- Alignment with economic and development strategies
- Addressing environmental impacts

Congestion was severe in Jakarta's metropolitan area – an urban agglomeration that includes Jakarta, Bogor, Depok, Tangerang and Bekasi. Its population already stood at 21 million in 2000, and reached 28 million in 2010. The increase in population was especially rapid in Jakarta's suburbs, and the population commuting from these areas to the city centre increased from around 743 000 in 2002, to around 1 105 000 in 2010. It is estimated that 97% of these commuters were using roads. The volume of traffic grew steadily, with the number of registered vehicles increasing from 3.26 million in 2000, to about 8 million in 2006. In 2010, it reached about 10 million.

In order to address traffic congestion and air pollution, the Indonesian government developed plans for a mass rapid transit system – a combination of subways and elevated rails – that would enhance Jakarta's transport capacity and improve the investment climate across the metropolitan area. In Indonesia's mid-term national development plan, the government added weight to the need for a railway mass transportation system in the Jakarta metropolitan area. The transport ministry's 2011 national master plan for railways also backed the project as a way to cope with increasing demand. The project in question links Lebak Bulus to Bundaran Hotel Indonesia. Starting in 2019, there are plans to extend the line through to Kampung Bandan.

Air pollution and noise problems are the typical issues that arise during and after construction. To mitigate these environmental impacts, the project included noise barriers and vibration-isolation mats (JICA, 2008[19]).

Improving roads in Champasack, Lao PDR

Project description

- Site: Champasack, Lao PDR.
- Components: Rehabilitation and improvement of around 200 km of roads; periodic maintenance of 400 km of roads; consulting services.
- Total amount: USD 52 million (loan: USD 40 million).
- Project period: 1995-2001.
- Agency in charge of project execution: Lao PDR's Ministry of Communication, Transport, Post and Construction.
- Lender: ADB.

Elements of quality infrastructure

- Alignment with economic and development strategies
- Improved sustainability through periodic maintenance
- Job creation in construction, maintenance works and tourism

In the mid-1990s, 85% of the road network in Lao PDR remained unpaved (ADB, 2005[20]), hampering economic growth. As part of its response to this situation, the country's government rolled out the Champasack project to provide all-weather access roads, stimulate rural economies and promote regional integration. The project consisted of rehabilitating and improving 200 kilometres of basic road infrastructure in the southern part of Lao PDR, stretching from Thailand to Cambodia.

The main road in this case study connects Chong Mek, which is on the Thai border, to Veun Kham on the Cambodian border. It is part of a national north-south road link developed by the government in partnership with the ADB. Moreover, the project road is also part of what officials have identified as high-priority road number six. It links the southern part of Lao PDR to Sihanoukville in Cambodia, thus falling within the scope of co-operation initiatives for the Greater Mekong Subregion. The project was consistent with the government's development priorities, which aim to increase connectivity and to support economic growth across the region.

Some initial difficulties emerged during the implementation of the project. For example, there was a long delay with the civil construction work due to a lack of sufficient equipment. Despite these initial difficulties, the project went well overall. A partial explanation for this may lie in its periodic maintenance component. At the time, maintenance funding in the region consistently fell short of requirements. Against this background, adding periodic maintenance boosted the sustainability of the project.

Furthermore, periodic maintenance was mostly decentralised to provincial institutions. In turn, these institutions recruited local villagers, including women, on an annual basis for the related works. Villagers also worked as labourers during the construction phase. As a result, the project created jobs, and improved levels of local participation. Moreover, allocating road maintenance work to local contractors tends to improve their capacity, as they gain experience thanks to the project.

It is also worth mentioning that better connections promoted tourism in the region by providing easier access for tourists. While agriculture remains the predominant occupation in the area, new businesses also flourished along the project road, thus diversifying jobs in the region. Lastly, because of better access, electricity distribution systems came to the area soon afterwards, bringing with them widespread improvements to well-being.

Improving transport network in the north of the Greater Mekong Subregion

Project description

- Site: Seven districts of Louang Phrabang and Xaignabouri provinces, Lao PDR.
- Components: Improvement of roads and rural access roads within route number four; construction of a bridge over the Mekong River; consulting services.
- Total amount: USD 107 million (Loan: USD 100 million).
- Project period: 2008-16.
- Agency in charge of project execution: Lao PDR's Ministry of Public Works and Transport.
- Lender: ADB; OPEC Fund for International Development; the governments of Australia and Korea.

Elements of quality infrastructure

- Alignment with economic and development strategies
- Improved economic efficiency through linking rural roads to highways
- Improved sustainability by addressing overloading and establishing a maintenance fund
- Effective resource mobilisation through borrowing from different lenders

Previously, the development of road networks in Lao PDR had been concentrated in the south of the country, while major gaps remained in the northern part of the country. These gaps deepened poverty by preventing the local community from accessing social services and markets. For example, the provincial capital of Xaignabouri had no paved access to the national road network. Considering that about 70% of freight and 90% of passengers were using roads, increasing road access was a key means of eradicating poverty. Indeed, Lao PDR's strategy for national growth and poverty eradication emphasised this very point, and the project contributed to this. Furthermore, Lao PDR has a central position between northern Thailand, northern Viet Nam, and the southern provinces of China. Improving the condition of roads in the area had the scope, therefore, to improve connectivity and to boost transactions across the region, aligning this part of Lao PDR with the Greater Mekong Subregion programme, which aimed to develop strategic corridors in the area.

As well as matching up with national and regional priorities, the project set out to efficiently reap the fruits of the infrastructural improvements it rolled out. The design went beyond simply improving road conditions because it linked rural roads to upgraded highway roads, allowing for improved market access as well as for the delivery of social services to deprived people (ADB, 2015[21]). Thanks to the project, people could now sell agricultural commodities in the city and go to school, having previously had only limited access to the city. In other words, the project not only reduced travel time and cost, as

would be the case for any regular road upgrade, but it also managed to be more inclusive in that it rebalanced rural and urban development.

Furthermore, using design-build contracts for civil works also helped to increase the project's efficiency. In a design-build contract, a single contractor takes care of design and construction work. Otherwise, contractors only do the construction work, while consultants take charge of the design.

In order to get the best results from a project, it is also important to take good account of sustainability. Several aspects of the project contributed to this objective. By providing mobile scales, and constructing permanent weigh stations to detect overloaded vehicles, it was possible to increase the project's overall sustainability. The authorities in charge of the project established a dedicated road maintenance fund in 2002. Furthermore, hiring experts in safety helped to improve the safety component of the project. Overall, the implementing agency, which had accumulated experience on similar projects, demonstrated its ability to manage this project effectively.

Upgrading the capacity of mass transit systems in Metro Manila

Project description

- Site: Manila, Philippines.
- Components: Procurement of 120 rolling stocks; extension and construction of depots for line one of the city's light rail transit system (LRT); improvement of the railway system on line two; consulting services.
- Total amount: JPY 60.8 billion (loan: JPY 43.3 billion).
- Project period: 2012-22.
- Agency in charge of project execution: Department of Transport and Communications.
- Lender: JICA.

Elements of quality infrastructure

- Alignment with economic and development strategies
- Effective resource mobilisation involving different lenders for different project components
- Addressing social and environmental impacts

Line one of Manila's light rail transit system (LRT 1) began full operations in 1985, connecting the northern and southern reaches of Metro Manila. In 2004, a second line, LRT 2, opened to connect the east and west of the agglomeration. Still, Manila's population grew from 7.95 million in 1990 to 11.86 million in 2010, putting great strain on the existing system. At the same time, the number of registered vehicles increased by around 5% a year, exacerbating traffic congestion and air pollution in the area.

The Capacity Enhancement of Mass Transit Systems in Metro Manila project aimed to address these issues by enhancing the capacity of the light rail transit system's two lines. Moreover, the project matched up with the overall development strategies of the government of Philippines. Indeed, the country's development plan for 2011-16 specifically underscored the need to decongest traffic in Manila. Expanding the rail-based mass transit system was one solution, and the administration of President Aquino prioritised this project as one of ten public-private partnerships (PPPs) that it wanted to implement.

A number of parties made resources available in an effective manner in order to enhance the capacity of the existing lines. For LRT 1, the World Bank's International Finance Corporation (IFC) supported a feasibility study for extending the line to the south by 11.7 km. Meanwhile, the Philippine government funded development of the railway system. For civil works, excluding depots and operations and maintenance, the government tapped private sources of funding. In addition, Japanese official development assistance (ODA) funded the procurement of rolling stocks, as well as new constructions including the extension of existing depots. For LRT 2, the Philippines' national economic and development authority approved extension projects to the east and the west, while

Japanese ODA funded further works on the railway system that included electricity, mechanics, signals and communication.

Furthermore, policy makers conceived of measures to mitigate the project's impact on the environment and on society. For example, they incorporated anti-pollution measures in order to mitigate the project's impact on the environment. They chose to use effluent treatment facilities to treat discharge water once operations began. Furthermore, they deployed sound-proof walls, and the vibration proofing of sleepers, in order to prevent noise and vibration. As for the project's social impact, a resettlement action plan was prepared so that displaced people would be better off compared to their previous status (JICA, 2013[22]).

Developing the transport network in southern Sri Lanka

Project description

- Site: Southern Sri Lanka.
- Components: Construction of a four-lane southern expressway of around 126 km from Kottawa to Godagama; access roads; road safety; consulting services.
- Total amount: USD 907 million (loan: USD 697 million).
- Project period: 1999-2013.
- Agency in charge of project execution: Sri Lanka's Ministry of Highways, Ports and Shipping.
- Lender: ADB; Export-Import Bank of China; JICA; Nordic Development Fund; Swedish International Development Co-operation Agency.

Elements of quality infrastructure

- Effective resource mobilisation
- Improved safety, particularly through the establishment of institutions including a road safety fund and technical assistance
- Addressing social impacts

As the largest greenfield road project ever implemented in Sri Lanka, this initiative aimed to promote balanced growth and safety. While the metropolitan region of Colombo was generating almost half of Sri Lanka's gross domestic product (GDP), and the western province was economically more advanced compared to the south, the southern province's regional GDP fell below the country's average. The poor quality of infrastructure in this province was one of the factors contributing to this disparity. It was necessary to provide deprived populations with better access, and to improve Sri Lanka's road safety record to help ensure steady growth in the country.

The project achieved its objectives, yet this success would not have been possible without the effective mobilisation of resources from different parties. It took seven years to formulate the project, including conceiving of the master plan, the feasibility study, and the engineering works. The ADB provided additional technical assistance, while JICA assisted with engineering works. Finally, ADB, JICA and EXIM bank of China provided funding for civil works. The collaboration of all of these parties combined to make all of this possible.

One characteristic feature of the project came from its road safety component. To enhance road safety, traffic safety institutions were established, and technical assistance was given. This assistance related to the establishment of emergency rescue services and to revision of traffic laws and regulations. The project also extended to implementing civil works to reduce black spots, providing road safety equipment such as computers and software for an accident data system, and furnishing the traffic police with key equipment. Furthermore, a revision of the traffic laws and regulations paved the way for the establishment of a road safety fund. This fund's goal was to support road safety

programmes, and to provide financial assistance to the victims of accidents. In this connection, the fund received 1% of the insurance premium for third-party motoring risks (ADB, 2015[23]).

Another interesting feature of this project relates to the measures it took to mitigate its social impact. As part of these efforts, it included a grievance redressing mechanism through a land acquisition and resettlement committee. This was the first such scheme in the country, and authorities subsequently applied it to other sectors. Meanwhile, an income restoration programme was set up to re-establish home gardens, and to provide skills training to people affected by the project. Furthermore, a project communication plan was established in 2005, while public awareness campaigns sought to manage public relations.

Improving regional roads in Thailand

Project description

- Site: Central and southern Thailand.
- Components: widening and improvement of major national highways; consulting services.
- Total amount: JPY 66.8 billion (loan: JPY 40.3 billion).
- Project period: 1994-2001 (Phase I), 2000-05 (Phase II).
- Agencies in charge of project execution: Thailand's Highways Department and Transport Ministry.
- Lender: JICA.

Elements of quality infrastructure

- Alignment with economic and development strategies
- Improved safety, particularly through roads design
- Improved sustainability by addressing overloading

Roads play a critical role in Thailand's transport system. Amid such massive use, the overall road conditions for main highways were improved, with a pavement rate of 78% in 1993 and 97.9% in 1999 (Fujino, 2004[24]; Miyazaki, 2009[25]). However, traffic volume on two-lane roads kept increasing year by year, amounting to an average traffic volume of over 8 000 vehicles per day. This was threatening the quality of the roads, and was exceeding their capacity to accommodate current and future transport demands. There was a need to expand the transport capacity of existing roads.

Thailand's national development plans emphasised this need. For example, the country's seventh national economic and social development plan (1992-96) underlined the need to increase road capacity by developing the transport sector and improving its efficiency. This was the plan that led to the implementation of phase one of the project in this case study. Later, the country's eighth plan (1997-2001) announced the establishment of a rapid transport system between major cities. Phase two of the project in question was part of this. Indeed, both phases shared the objective of increasing the capacity of the road network by widening and rehabilitating existing roads.

Moreover, the project was also relevant to regional development strategies. It fits, for example, with the ADB's economic co-operation programme for the Greater Mekong Subregion. This initiative is intended to develop spillover effects in the region, with the aim of boosting welfare and economic growth. Thailand hosts six out of the nine economic corridors linking Thailand to Myanmar, China, Lao PDR and Viet Nam. The target sections of the project in question link up with such initiatives. Moreover, better access to roads will reduce income disparities between metropolitan areas and the provinces, as well as promoting economic exchanges with neighbouring countries.

One interesting feature of the project lies in its safety component. This included installing more traffic lights, street lights, and reflective plates, in order to prevent traffic accidents. There were also changes to road design. For example, there was a reduction in U-turn points. Local governments and police promoted traffic safety campaigns. Furthermore,

Thai authorities added weighing stations across the national highway network to check for overloaded vehicles. These measures boosted sustainability and thus extended the life of the roads.

Developing the first line of a mass rapid transit system for Bangkok

Project description

- Site: Bangkok, Thailand.
- Components: construction of 20 km of subway; 18 stations; subway-related infrastructure including a train depot; consulting services.
- Total amount: JPY 358.9 billion (loan: JPY 186.7 billion).
- Project period: 1996-2004.
- Agency in charge of project execution: Mass Rapid Transit Authority of Thailand (MRTA).
- Lender: JICA.

Elements of quality infrastructure

- Alignment with economic and development strategies
- Addressing environmental impacts
- Effective resource mobilisation through PPP
- Capacity building through training programmes

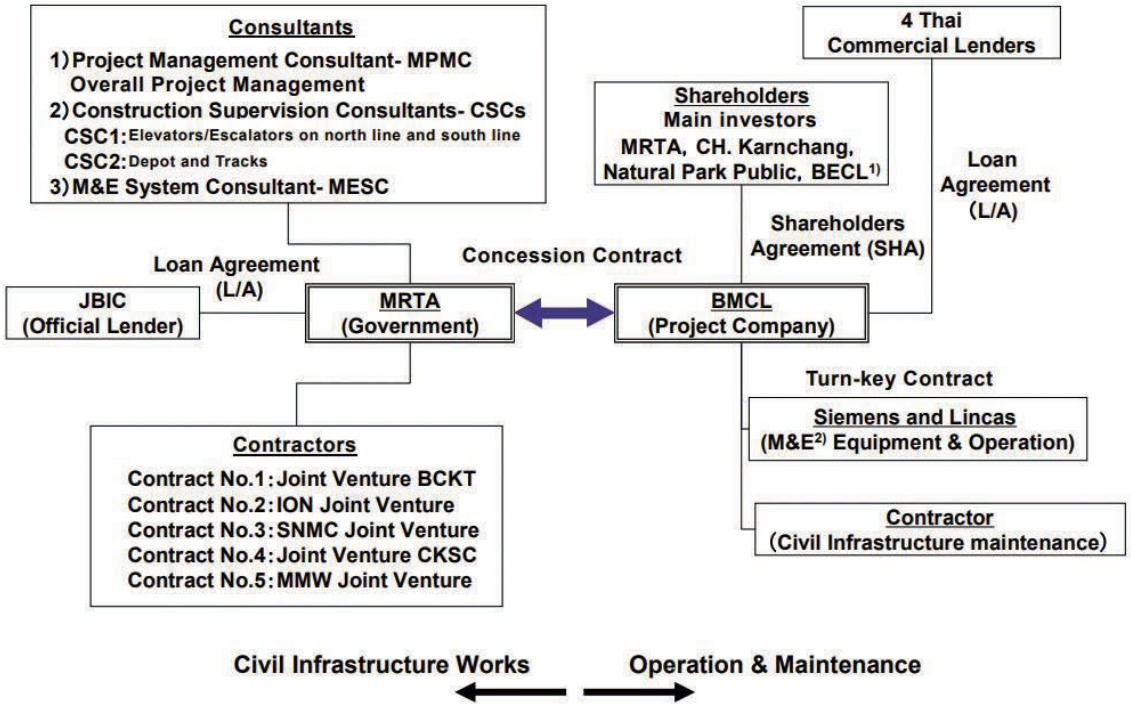
Rapid economic growth starting in the 1990s accelerated traffic congestion and air pollution in Bangkok, hindering long-term economic growth. In response, and in line with Thailand's seventh national economic and social development plan (1992-96), the government drew up a plan in 1995 to develop a mass transit network that would eventually feature five lines: green, red, blue, orange and purple. The blue line, which is the subject of this case study, was Thailand's first subway construction project. Initially, the plan was to build it as an elevated line, but planners then made changes to how it would pass through central Bangkok. The project aimed to mitigate traffic congestion, to improve the urban environment, and to contribute to the steady economic growth of the country.

The project placed a strong emphasis on mitigating its impact on the environment. As noted above, railway projects tend to have a very considerable impact because they include big construction works that require digging up the earth or cutting down trees before laying tracks. In order to keep the environmental impact to a minimum, the MRTA made this a major criterion for evaluating bidders. Furthermore, the MRTA also required contractors to haul the earth they removed to a designated location. Planners also prepared detailed countermeasures for air, water and noise pollution. As a result, air pollution on major roads decreased. For example, carbon monoxide in Sukhumvit decreased from 7 parts per million in 2003 to 3.4 parts per million in 2005. The project also managed to be more inclusive. Indeed, it went beyond existing legal provisions by introducing guidelines for making the infrastructure more accessible for disabled or elderly people (Otsu, 2008[26]).

During the project's implementation phase, it was the MRTA itself that carried out the civil works. However, a private concessionaire then took over operations and

maintenance for a period of 25 years (Figure 1.2). If it had been necessary to include operations and maintenance in the project's overall budget, instead of doing it separately, the loan would have been insufficient, and the scope of works too large. Therefore, engaging the private sector as a partner in the form of a PPP made it possible to deliver a mass rapid transit that benefited the local community. Furthermore, the concessionaire included international players in the transport sector.[5] As a result of this, the local community was able to learn new skills by taking part in training, and by learning from practices on the ground.

Figure 1.2. System chart for construction and O/M of MRTA initial system project in Thailand



Note:
1. O/M refers to Operation and Maintenance.
2. BECL stands for Bangkok Expressway Public Company Limited.
3. M&E stands for Mechanic and Electricity.

Source: Otsu, H. (2008[26]), "Thailand: MRTA initial system project", report commissioned by the Japan International Cooperation Agency, https://www.jica.go.jp/english/our_work/evaluation/oda_loan/post/2008/.

Relieving traffic congestion in Bangkok

Project description

- Site: Bangkok, Thailand.
- Components: Thonburi road extension (5.1 km of dual three-lane highway); institutional support for the office of the land-traffic management commission (OCMLT); regional structural plan for Bangkok; training.
- Total amount: USD 149 million (loan: USD 30 million).
- Project period: 1992-2002.
- Agencies in charge of project execution: Public works department (now part of the rural roads department); OCMLT; National Economic and Social Development Board (NESDB).
- Lender: ADB.

Elements of quality infrastructure

- Alignment with economic and development strategies
- Transfer of expertise and know-how, particularly in the development of an analysis model and establishment of a body dealing with conflicts
- Capacity building through training programmes
- Effective resource mobilisation, particularly for planning studies and technical assistance

The NESDB's seventh five-year plan (1992-96) stated the necessity of improving the efficiency of Bangkok's transport system in order to support economic growth. One of the objectives in this plan was to relieve infrastructure bottlenecks in the metropolitan area of Bangkok. The project in question, which was relevant to this five-year plan, aimed to increase the efficiency of the road network in general, and, in particular, to relieve daily traffic congestion in Bangkok by extending Thonburi road, which leads to the central business district.

Thailand had set up the OCMLT in 1992 as a supervisory institution. A number of important tools were developed, notably a model for analysing transport and traffic, in order to make transport assessment and planning more effective. Its latest incarnation is the Bangkok Extended City Model (BECM). Still, the conflicting objectives of some eleven agencies dealing with urban transport plans weighed on the efficiency of the policies they came up with. However, a body called Megaprojects Technical Support (MTS) focused on points of conflict within megaprojects, helping to resolve them within a framework that integrates railway and expressway networks. Furthermore, training programs were organised for the staff of executing agencies and other related transport institutions (ADB, 2005[27]).

The OCMLT used its own budget to continue training programmes and the development of urban transport models and databases. It also provided trainings and skill development

for practitioners with links to transport planning. As a result, the office was able to contribute to an overall increase of know-how in the transport sector. Moreover, a number of additional resources were mobilised too. For instance, the Canadian International Development Agency supported the NESDB in preparing a strategic planning study. The study proposed that the Bangkok region should develop multiple centres, and should link them up with fast transport systems. In addition, two technical assistance grants complemented the project. One of these aimed to establish an environmental unit inside the public works department. Another such grant helped to prepare a further extension of the project, including an adequate network of distributor roads. This convergence from different sources in support of this project is an example of an effective mobilisation of resources towards achieving a common goal.

Building a new line for Bangkok's mass transit system

Project description

- Site: Metropolitan area of Bangkok, Thailand.
- Components: civil works; procurement of mechanical and electrical facilities; procurement of rolling stock; consulting services.
- Total amount: JPY 455.4 billion (loan: JPY 79.1 billion).
- Project period: 2009-16.
- Agency in charge of project execution: Mass Rapid Transit Authority of Thailand (MRTA).
- Lender: JICA.

Elements of quality infrastructure

- Alignment with economic and development strategies
- Improved sustainability, particularly through the maintenance contract
- Transfer of expertise and know-how, particularly for maintenance work
- Addressing environmental impacts

As of the 1990s, rapid economic growth accelerated traffic congestion and air pollution in Thailand's capital. In order to improve this urban environment, in 2004 the MRTA completed an initial line – the blue line – passing through central Bangkok. Thereafter, the population of Bangkok and its metropolitan area continued to grow, rising to around 9.79 million in 2005, and to 10.07 million in 2008. In addition to this increase in population, the number of vehicles on the roads was rising following the economy's recovery from the Asian financial crisis. This aggravated traffic congestion and air pollution in the area (JICA, 2008[28]).

The project in this case study was part of the government's mass transit investment plan for 2005-12, which aimed to expand to seven the number of lines in the Bangkok metropolitan area. Moreover, the project also matched up well with Thailand's national economic and social development plans – notably from the seventh (1992-96) to the tenth plans (2007-11). These plans stressed the importance of an urban transportation network in the area. This great emphasis in the plans demonstrated that the project in question – to add a line to Bangkok's rapid mass transit system – was a priority for the government in its bid to find solutions to the issues outlined above. Furthermore, compared to other lines, the new, purple, line also extended the system's reach into outer Bangkok. In these outer reaches of the urban area, buses are the main means of transport. Given the large quantities of emissions that buses create, this extension helped to further alleviate air pollution.

A distinguishing figure of this project stems from the ten-year contract with companies for the maintenance of the railway system. This means that the Thai authorities expect appropriate maintenance and management. Moreover, this arrangement included the

dispatch of technical experts to work on the project and, in turn, to transmit maintenance skills to local employees. As a result of all of this, this project looks set to be sustainable and beneficial to the society.

Nonetheless, and as noted above with regard to other projects of this kind, railways or subways are big construction works that affect their surroundings, and it is important to mitigate this impact. Anti-pollution measures included erecting noise-blocking walls and tree planting.

Getting rid of a bottleneck by building a tunnel at the Hai Van pass

Project description

- Site: between central Hue and Da Nang City in central Viet Nam.
- Components: construction of tunnels and related facilities; approach roads; resettlement areas; consulting services.
- Total Amount: JPY 17.5 billion (loan: JPY 15.3 billion).
- Project period: 1997-2005
- Agency in charge of project execution: Ministry of Transport.
- Lender: JICA.

Elements of quality infrastructure

- Alignment with economic and development strategies
- Capacity building and transfer of expertise and know-how, particularly on training regarding tunnel operation
- Consideration of maintenance and emergency measures
- Safety measures regarding means of transport
- Improved sustainability due to the operation and maintenance plan

The Hai Van Pass segment of Viet Nam's national highway number one is a narrow and steep mountain road that becomes even more dangerous during rainy seasons. Located in central Viet Nam, it was a bottleneck that impeded vehicles from passing smoothly from north to south. Furthermore, the road is part of an east-west economic corridor that runs through Viet Nam, Lao PDR, Thailand, and Myanmar. Therefore, this particular bottleneck hampered traffic not just inside Viet Nam but between all of these countries. Indeed, the segment in question was seen as impeding the development not just of central Viet Nam, but that of the whole country.

Viet Nam's national socio-economic development plan, as well as those of the province of Thua Thien Hue and the city of Da Nang, and also the country's national transport master plans, all prioritised the development of the country's central region. The construction of the Hai Van Pass tunnel was crucial to do so.

The most characteristic feature of the project was the way it succeeded in transmitting know-how. The technical team in Viet Nam benefited from capacity building on topics including environmental considerations and technology. During implementation, staff members received significant training regarding tunnel operation, maintenance, and emergency measures. Furthermore, the executing agency further disseminated the knowledge it acquired, transmitting know-how extensively to the local community. For example, it invited university researchers and lecturers to attend training sessions (Vietnam-Japan Joint Evaluation Team, 2009[29]).

This knowledge was put into an operations and maintenance manual, and was revised in line with the executing agency's experience. Another practical tweak was found to organise the passage of trucks and buses in order that motorcycles could also safely take advantage of the tunnel. In this way, it was possible to include all means of transport, and to increase the overall safety of the tunnel. The maintenance manual and the practical tweak increased the sustainability of the project.

Thanks to the well-prepared operations and maintenance plan, it was also possible to increase the project's overall sustainability. Although building the tunnel relied upon new and advanced technology, the operations and maintenance plan was prepared in advance. This covered the construction phase and the preparation of various on-site, local and overseas training programmes. The communication between the executing agency and the operations and maintenance contractor during the construction period also contributed to the smooth management of the tunnel. It is also worthy of note that a tunnel at the Ngang pass in the province of Ha Tinh also was constructed using knowledge and technology learned during the implementation of this project.

Improving Viet Nam's rural roads

Project description

- Site: 33 provinces in northern and central Viet Nam.
- Components: rehabilitation of the core network of rural roads; maintenance of the network of district roads; institutional and capacity building.
- Total amount: USD 308 million (loan: USD 250 million).
- Project period: 2006-14.
- Agency in charge of project execution: Ministry of Transport.
- Lenders: World Bank; the UK government's Department for International Development (DFID).

Elements of quality infrastructure

- Alignment with economic and development strategies
- Improved sustainability, particularly through maintenance
- Job creation for ethnic minorities
- Effective resource mobilisation, particularly in funding maintenance
- Capacity building, particularly through training programmes and technical assistance

Since 2000, Viet Nam has invested significantly in basic access to roads, particularly in rural areas, in order to promote equitable growth throughout the country. The idea was that better access to markets and social services would alleviate poverty and foster economic growth. However, without proper maintenance, roads will not make significant contributions to further development. This is especially relevant to Viet Nam because rural roads serve 75% of the national population and 90% of rural people living in poverty. Thus, it is crucial not only to increase the accessibility of the roads, but also to keep them in good condition. This project aimed to increase rural communities' access to markets, social services and non-farm economic opportunities, while also improving the condition of rural roads. Therefore, the project is in line with the development priorities of Viet Nam.

This can be shown through government plans. The key objective of the socio-economic development plans for 2006-10 and 2011-15, as well as of the transport ministry's five-year plan, was to provide universal rural access. These plans also placed strong emphasis on the continuous reform of the transport sector, with the aim of modernising road maintenance and, in turn, giving further legitimacy to the transport project in this case study.

Indeed, the project is a continuation of two previous rural transport projects. Still, it is unique in its own way as it contributes to the local community through a pilot initiative called “Ethnic Minority Women’s Rural Road Maintenance”. Funding from the World Bank's gender action plan, coupled with DFID assistance from the United Kingdom,

supported the initiative, which took place in the provinces of Lao Cai, Thanh Hoa and Quang Binh.

Under the guidance of the Viet Nam Women's Union, many women from ethnic minorities took on maintenance jobs on rural roads. As well as helping to improve the condition of roads in rural areas, this also increased the awareness of the need for road maintenance (World Bank, 2014[30]). These jobs improved local livelihoods by providing off-season jobs, and they also enhanced local skills in road maintenance thanks to the training programmes. This effective mobilisation of resources not only created jobs, but also made it possible to perform the maintenance works in a cost-effective manner. It may well not have been possible to achieve these results for such a low cost by relying upon private contractors alone.

Furthermore, a study of rural road-surfacing trials paved the way for a more adaptive approach to managing and maintaining roads. Concerning pavement types, for example, gravel surfaces were changed to sealed surfaces, because flooding patterns were too damaging in the area. Indeed, careful consideration of the local climate conditions, in addition to using local materials, helped to increase the project's overall sustainability. Furthermore, technical assistance was given for the establishment of a vital road maintenance fund.

Constructing the Nhat Tan bridge (Viet Nam-Japan friendship bridge)

Project description

- Site: Dong Anh and Tay Ho districts, Hanoi City, Viet Nam.
- Components: construction of bridge (3.1 km); approach roads (6.1 km); consulting services.
- Total amount: JPY 207.9 billion (loan: JPY 54.2 billion).
- Project period: 2006-15.
- Agency in charge of project execution: Ministry of Transport.
- Lender: JICA.

Elements of quality infrastructure

- Alignment with economic and development strategies
- Improved economic efficiency, particularly through design
- Addressing environmental impacts
- Job creation through domestic manufacturing
- Capacity building through construction works

As is the case all around the world, roads play an important role in Viet Nam's transport system. In 2008, 70% of cargo and 90% of passengers in the country were transported by roads. However, despite such extensive use, and despite Viet Nam's strong economic growth, budget constraints continued to limit the proper development of the country's road network. These same considerations apply to the city of Hanoi, which enjoyed a burgeoning period of economic development from 2008 to 2010. In Hanoi, with an average GDP growth rate of 9.2% a year (2008-10), the number of registered vehicles was increasing drastically. However, the city's roads could not accommodate the transport needs that the city's growth path called for. This led to traffic congestion, and deteriorated the urban environment. The existence of a limited number of bridges across the Red River was also a factor. Freight vehicles had to pass through the centre of Hanoi to pass on to either side of the river, thereby increasing urban congestion (JICA, 2006[31]).

Building the Nhat Tan bridge and its approach roads was about tackling these issues. Moreover, its design reflected the government's long-term development strategies for the transport sector. Indeed, the 2006-10 five-year socio-economic development plan prioritised the repair and new construction of roads. Viet Nam's development strategy for transport and traffic through to 2030 also emphasised the importance of arterial roads. Furthermore, Hanoi's integrated development and environment programme also saw the bridge as a priority.

The bridge's design was also cost-efficient. In this connection, its foundations featured a steel pipe sheet pile wall structure, a soft-ground construction method to reduce the environmental burden, and, overall, a number of savings on the cost of construction. Finally, the project not only improved conditions in the urban area of Hanoi, but also contributed to enhancing the skills of local people, with skilled Japanese engineers transferring knowledge to engineers in Viet Nam. Moreover, Vietnamese workers

manufactured a range of parts and materials for the bridge. In addition to adding to the viability of the country's economy, a high-quality piece of new infrastructure should indeed create jobs and build capacity in local communities in order to have a real and lasting impact.

Policy discussions on quality infrastructure investment in this publication

Governments in Asian countries recognise the need to invest more in quality infrastructure. However, the development of such projects will require considerable reforms to the policy environment in most of the region. In light of this need, the following chapters address three important aspects of infrastructure investment related to Ise-Shima Principles: the role of local governments (Chapter 2), financing (Chapter 3), and the alignment between infrastructure planning and development strategies (Chapter 4). These chapters also include recommendations for addressing common challenges in these areas. Naturally, policy challenges will vary between countries and regions. Indeed, it is always of paramount importance to take account of local priorities, and to find adaptable solutions that are appropriate to the local context.

- Across Asia, local governments play a major role in investing in infrastructure. They do so either as the direct or indirect implementers of projects, or in partnership with central governments and the private sector. On the one hand, local delivery can bring gains in terms of productivity and allocative efficiency. On the other hand, however, local governments may struggle to muster the capacity necessary for managing a project successfully. Reforms at the local level can help to overcome such limitations.
- Although governments are the main source of infrastructure financing in Asian countries, public-private partnerships (PPPs), and other forms of private-sector participation, are likely to play increasingly important roles in the future. Moreover, the involvement of private partners often translates into a more complete appraisal of costs over the whole life of a project. Furthermore, matching up projects with the appropriate sources of financing, building up infrastructure funds, and fostering the development of financial markets, all help to improve the overall financial sustainability of the infrastructure sector.
- Making sure that investment in infrastructure is fiscally sustainable, and that it promotes growth and development, requires proper management. Indeed, an efficient delivery of infrastructure projects requires strong systems for the management of public investment. In order to illustrate such considerations, a case study of Viet Nam discusses the alignment of infrastructure planning and development plans more generally.

Notes

[1] Calculating infrastructure spending is not easy as expenditures are not tagged according to their objectives. Asian Development Bank (ADB) used budget spending data on infrastructure and PPI data for information on private investment to construct expenditures on infrastructure. 45 Developing Member Countries (DMC) of ADB were taken for assessing the overall need in infrastructure investment, while 25 DMCs with adequate data representing 96% of the region's population, were selected for measuring the spending on infrastructure. Infrastructure includes transport (road, rail, air and ports), energy, water and telecommunication. Countries include Afghanistan, Armenia, Bangladesh, Bhutan, Cambodia, China, Fiji, India, Indonesia, Kazakhstan, Kiribati, Kyrgyz Republic, Malaysia, Maldives, Marshall Islands, Federated States of Micronesia, Mongolia, Myanmar, Nepal, Pakistan, Papua New Guinea, Philippines, Sri Lanka, Thailand, and Viet Nam.

[2] Regional breakdown was made available for 2011 on 22 DMCs. East Asia includes China, Korea, Hong Kong, China and Mongolia. South Asia includes Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka. Southeast Asia includes Indonesia, Malaysia, Philippines, Singapore, Thailand and Viet Nam.

[3] Surveyed CEOs estimate the quality of roads, rails, etc. in their country.

[4] The World Bank's aggregate of East Asia & the Pacific includes ASEAN countries and China, while South Asia aggregate includes India.

[5] Despite being highly evaluated, there were some issues related to the financial status of the concessionaire, BCML. Although BMCL's total income is increasing, it is doing so by less than initially expected, due to lower demand and fares. Moreover, other lines were still under construction, resulting in fewer synergies. Thus, BMCL is in deficit. In 2015 it merged with BECL (expressway care) to become BEM (Bangkok Expressway and Metro Public Company Limited), and its work is ongoing.

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Chapter 2. Building up local governments' capacity to implement infrastructure investment

The experiences of Indonesia, the Philippines and Viet Nam are used in this chapter to illustrate the local economic consequences of infrastructure projects, the roles and responsibilities of local governments, the means of financing investment, and the benefits and challenges of local governments' involvement in the sector. While local governments can be important actors on infrastructure projects, they can face challenges related to financing constraints, limited capacities and co-ordination difficulties with higher levels of government and other partners. Improving the efficiency and effectiveness of local governments in developing and implementing infrastructure will require improvements to planning and co-ordination, the development of institutional capacities, the use of broader sources of financing, and the incorporation of ongoing maintenance and monitoring costs in project budgeting.

Introduction

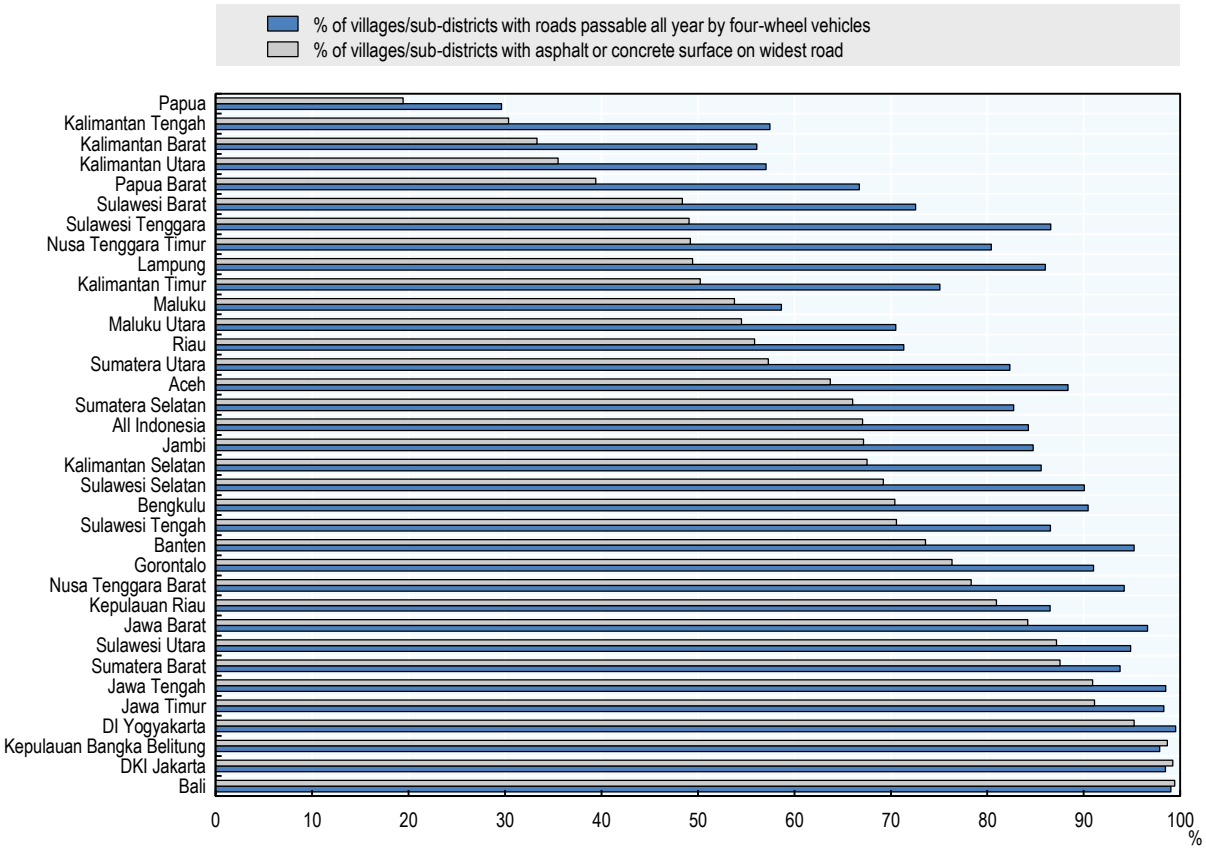
Local governments around the world play a significant role in developing and maintaining infrastructure.[1] In a sample of 95 countries in 2013, a simple average of 39.1% of total public investment came from local governments (OECD/UCLG, 2016[1]). This chapter examines the local economic impact of infrastructure, the role of local governments in infrastructure development and the benefits and challenges of their involvement. It also looks into the modes of financing utilised at the subnational level, such as transfers from the central government, raising revenues locally, public-private partnerships (PPPs), and other forms of private-sector involvement. Case studies covering Indonesia, the Philippines and Viet Nam are used to identify prominent policy issues (for instance, planning and co-ordination, capacity building, financing, and maintenance and monitoring) in practice.

Measuring the local economic consequences of infrastructure investment

While the positive externalities associated with infrastructure investment can be far-reaching, they are often strongest at the local level in the communities directly affected (See Chapter 1). Investments in quality transport infrastructure can directly generate employment opportunities related to construction, operations and maintenance; indirectly improve opportunities for individuals and firms and improve the efficiency of existing forms of economic activity; and generate various social and environmental benefits. Affected communities benefit from spillover externalities such as lower input costs, increased choice in input supplies, expanded local trade and access to new markets for output (White and Raitzer, 2017[2]).

Access to quality infrastructure differs considerably across regions in Indonesia, the Philippines and Viet Nam. In Indonesia, for example, only 29.6% of the villages in the province of Papua had access to roads that are passable throughout the year in 2014 and only 19.4% of the villages had their widest road either in asphalt or concrete (Figure 2.1). This condition is far off compared to that in the province of Bali, which has a proportion of above 99% in both measures. Not all villages and sub-districts in Indonesia have access to transportation infrastructure, for instance only 67 701 out of the 80 337 (84.3%) of the villages have roads where four-wheel-drive cars can pass all year, while only 53 883 (67.1%) of the villages had their widest road paved.

Figure 2.1. Villages and sub-districts in Indonesia with access to quality roads by province, 2014



Source: BPS (2014[3]), *Village Potential Statistics of Indonesia*.

StatLink http://dx.doi.org/10.1787/888933841805

While it is clear that appropriate infrastructure development can provide many economic benefits, the local consequences of infrastructure investment are often complex. Transport infrastructure provide stimulus to the local economy, but could also crowd out other investment, and can produce negative externalities such as environmental and social issues.

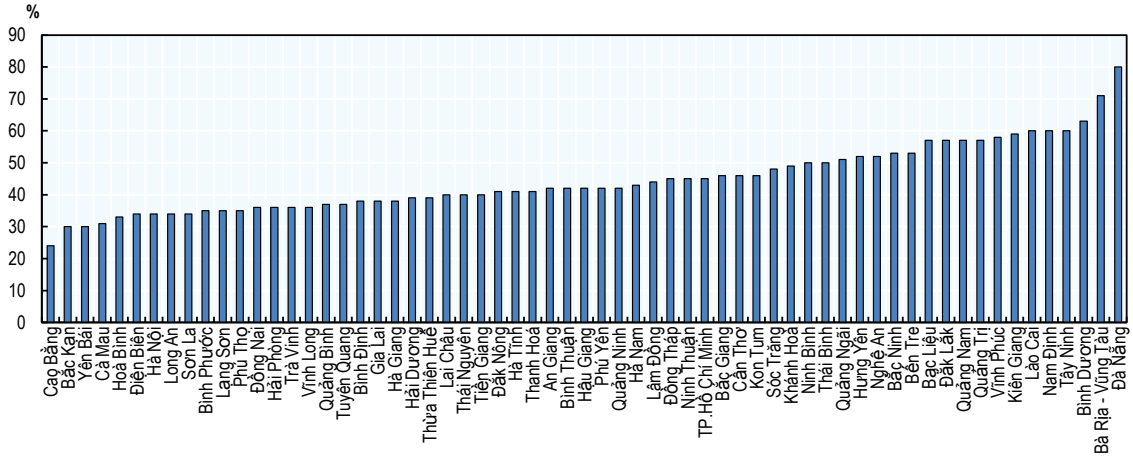
Indeed, infrastructure projects play an important role in developing local areas. Empirical studies have strongly tied infrastructure with local development. Using data from 4 000 households in rural Indonesia, Gibson and Olivia (2010[4]) showed that improved access to roads and electricity positively affected both employment and income for non-farm enterprises. The Program Nasional Pemberdayaan Masyarakat (PNPM) Mandiri Rural Infrastructure Support helped villagers of Trimulyo to develop the local economy by constructing an all-weather road. The new road lowered transportation costs, which allowed greater use of fertiliser and increased outputs.

In the Philippines, Llanto (2007[5]; 2007[6]) indicated a critical link between infrastructure and regional growth. The authors' findings support the view that infrastructure stock and growth potential are positively correlated. Earlier studies of Basilio and Gundaya (1997[7]) and Manasan and Chatterjee (2003[8]) also showed that inequitable access to

infrastructure and growth are negatively correlated. Similarly, Reyes (2002[9]) showed that regions with the least access to basic infrastructure are also the ones with the lowest gross domestic product, such as roads while Cuenca (2004[10]) and Llanto (Llanto, 2007[5]) indicated that infrastructure could be a key variable in helping poorer regions to converge with richer ones. Furthermore, Evenson and Quison (1991[11]) found that roads had a significant impact on input use and output, with substantial net-profit effects, even if rural electrification had minimal effects on output. Urea fertiliser was more expensive in areas with poor roads, owing to higher transport costs. Llanto (2014[12]) found that access to electricity and paved roads had a positive and significant impact on the productivity of agricultural labour while Yoshino and Pontines (2015[13]) found that the Southern Tagalog Arterial Toll Road in Batangas province has contributed to increases in tax and other revenues in municipalities through which it passes. Lastly, Francisco (2017[14]) provided evidence that roll-on-roll-off transport system stimulated both agricultural and non-agricultural activities, resulting in higher incomes for agricultural households, which in turn increased likelihood that these households would send their children to school.

In Viet Nam, Dao Thong Minh and Le Thi Mai Huong (2016[15]) found that increases both in the consumption of electric energy and in the length of roads in 13 provinces in the Mekong delta from 2009 to 2013, helped increase economic growth. Despite its clear importance, many people in Viet Nam perceive their access to local infrastructure as insufficient. According to the country's provincial competitiveness index for 2016, in 44 out of the country's 63 provinces fewer than half of business owners stated that they were satisfied with the quality of the transport infrastructure (Figure 2.2). Across all provinces, meanwhile, the median approval rate was only 42%.

Figure 2.2. Percentage of business owners satisfied with transport infrastructure in Viet Nam by province, 2016



Source: OECD Development Centre's calculations based on VCCI (2016[16])

StatLink http://dx.doi.org/10.1787/888933841824

Chung (2015[17]), which analysed data for Viet Nam's 63 provinces over 2006-10 likewise showed that investment in infrastructure helped reduce poverty rates. Moreover, a number of benefits for poor households have been observed, arising through several channels. For instance, infrastructure development directly increases wages and employment of the

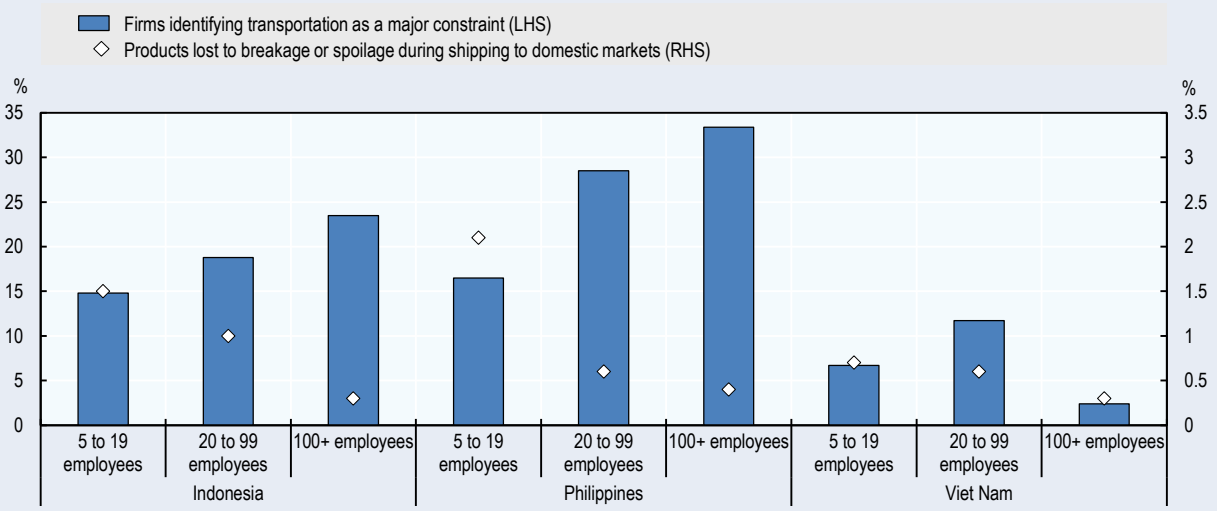
poor and indirectly ameliorates the poor's well-being induced by economic development. Infrastructure development is also an essential component in national poverty reduction programme as well as in enhancing business environment (Box 2.1).

Box 2.1. Infrastructure, household income and business environment in Viet Nam

Viet Nam launched its national poverty-reduction programme in 1998. In its latest incarnation, this programme has an estimated total budget of VND 48.4 trillion for the period of 2016-20, of which 43% is for infrastructure. This category includes rural roads, health and education facilities, clean water and irrigation. An evaluation of the programme for the period 2006-10 found that the income of poor households residing or working in agriculture and rural areas had increased though remained much lower than the national average. This finding supports the conventional wisdom that positively links infrastructure investment and welfare through improvements in productivity and market access. However, issues concerning income inequality within the target group remained a concern. Other issues such as the lack of transparency and accountability, an ineffective land acquisition framework and insufficient expertise of local firms also persisted (Giang and Low, 2015[18]).

The development in infrastructure in Viet Nam, particularly transport, has also translated into better business environment. Based on the data from the World Bank Enterprise Survey, firms in Viet Nam identify transport as less of a constraint compared with the firms from Indonesia and the Philippines regardless of the firm size (Figure 2.3). The problem related to products lost due to breakage or spoilage during transit is also less extensive in Viet Nam than in the other two neighbouring Southeast Asian economies.

Figure 2.3. Firms identifying transport as a major constraint and products lost to damage during domestic shipping, 2015



Source: World Bank (2017[19]), *Enterprise Surveys* (database), http://www.enterprisesurveys.org.

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Reviewing local governments' infrastructure responsibilities

Indonesia, the Philippines and Viet Nam are unitary states with multiple levels of local government (Table 2.1). Indonesia is divided into provinces and municipal-level regencies and cities. Meanwhile, the Philippines has provinces, intermediate-level municipalities and cities, and municipal-level villages. Viet Nam divides up into provincial-level entities, intermediate-level districts, and municipal-level communities. These levels of government often have considerable responsibilities – through local and regional rail and road networks – for developing and managing land-transport infrastructure. Moreover, decentralisation initiatives in Indonesia, the Philippines and Viet Nam have passed new responsibilities to these levels of government, or have clarified the division of responsibility with the central government.

Table 2.1. Local governance tiers in Indonesia, the Philippines and Viet Nam

	Regional or state level	Intermediate level	Municipal level
Indonesia	34 provinces (provinsi)	-	508 regencies (kabupaten) and cities (kota)
Philippines	81 provinces	1 489 municipalities and 105 cities	42 028 villages (barangays)
Viet Nam	63 provincial-level entities, including 5 city-provinces	710 districts (cities/towns)	11 145 communities

Source: OECD/UCLG (2016[1]), *Subnational Governments around the World: Structure and Finance*.

Decentralisation accompanied Indonesia's democratisation beginning with Law No. 28 of 1999, and then with additional reforms, particularly those in Law No. 32 of 2004. The 34 provinces and 508 regencies and cities now have elected governments. In 2014, the country's villages – numbering more than 83 000 – gained more autonomy under a new village law. Central government has passed on considerable responsibilities to local governments subsequently. These include responsibilities for public works, healthcare, education, culture and social affairs, labour, environmental protection, land, citizenship, and investment. Local governments also account for a large, if declining, share of general government expenditure. Local governments spent 904 trillion rupiah (IDR) in 2015, or 28.0% of the general government total, down from 39.1% in 2008.

Railway infrastructure in Indonesia is primarily the responsibility of the central government, and the country's railway systems are operated by the state-owned Indonesian Railways Company (PT Kereta Api Indonesia) and its subsidiary, PT KAI Commuter Jabodetabek. Only Sumatra and Java have major rail lines. Notwithstanding this organisational structure, additional roles for local governments to work on rail infrastructure have opened up. For instance, Law No. 23 of 2007 defined a number of potential roles for local governments in the development, regulation, and operation of railways in the country. These included the potential for them to take the lead if there was an absence of an enterprise to operate public railway infrastructure or rolling stock. Local governments also have the right to develop and operate specialised railways within their jurisdictions, as long as they first obtain approval from the central government. Indonesia's national master plan for railways serves as a guide in co-ordinating local infrastructure development plans.

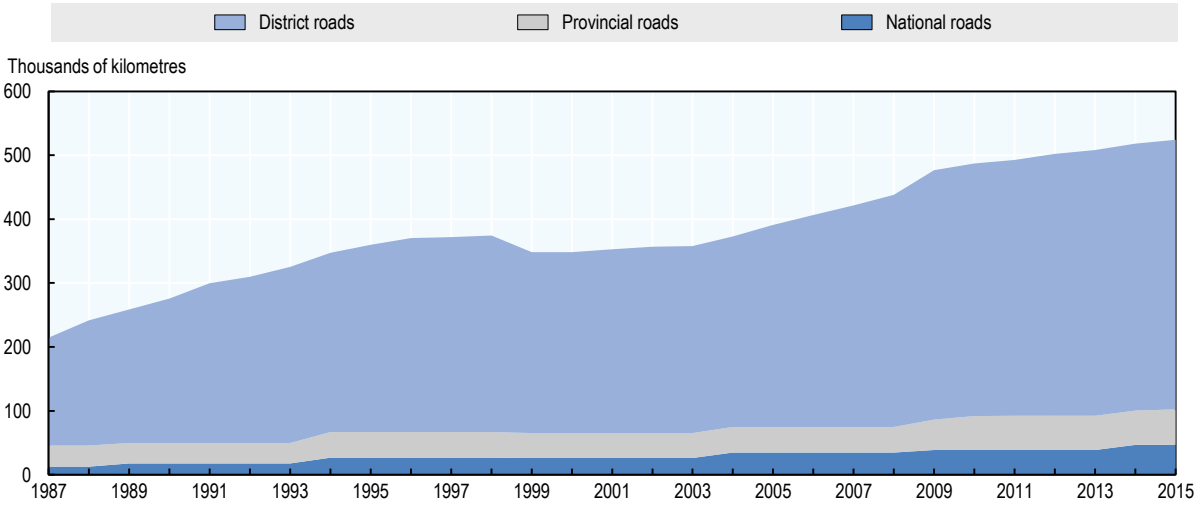
Participation of local governments in rail infrastructure development in Indonesia is important. This is relevant in the context of major urban areas, such as Jakarta, Bandung, Yogyakarta–Solo, Surabaya and Semarang where commuters make extensive use of rail

systems. Local governments are currently helping to develop rail transport as part of urban public transit systems in Jakarta and Palembang. Broad details of the aforementioned projects are enumerated in the following bullets.

- The Jakarta Light Rail Transit system is currently under construction. Upon completion of its second phase, it will eventually cover 130.4 km, with four lines and 41 stations. The provincial government is implementing the project within Jakarta, with the central government responsible for sections extending beyond Jakarta.
- Jakarta Mass Rapid Transit is a two-line rapid transit system that will initially cover 15.7 km with 13 stations. Construction began in 2013 and the system should open to the public in 2019. The government of Jakarta is implementing the project, with funding from the Japan International Cooperation Agency (JICA).
- Palembang Light Rail Transit is under construction in Palembang, and should enter service in time for the 2018 Asian Games, which the city is co-hosting along with Jakarta. The line will run from Sultan Mahmud Badaruddin II International Airport to Jakabaring Sport City. While Indonesia's central government is taking the lead in this project, it is co-ordinating with the local government on issues such as land acquisition, financing and spatial planning.

Responsibility for the construction and maintenance of Indonesia’s road network is divided between central, provincial and local governments. By length, local district roads – which covered 421 541 km in 2015 – account for 80.5% of Indonesia's road network (Figure 2.4). Provincial roads accounted for 55 416 km, or 10.6% of the total, while national roads covered 47 017 km, or 9% of the total. The length of national roads has the grown fastest since 1987, with average annual growth of 4.8%. Over the same period, district roads have grown by 3.3% a year on average, while provincial roads have grown by an annual average of 1.8%. In terms of quality, national roads set the standards while district roads tend to be in worse condition. In 2015, 91.9% of national roads and 79.1% of provincial roads had asphalt surfaces, compared to only 50.9% of district roads. Similarly, 91% of national roads and 74.9% of provincial ones were rated as being in a good or moderate state, but only 61.4% of district roads received similar scores (BPS, 2016[20]).

Figure 2.4. Length of national, provincial and district roads in Indonesia, 1987-2015



Source: BPS (2017[21]), "Length of road by level of government responsibility Indonesia, 1987-2015 (Km)", https://www.bps.go.id/linkTableDinamis/view/id/808.

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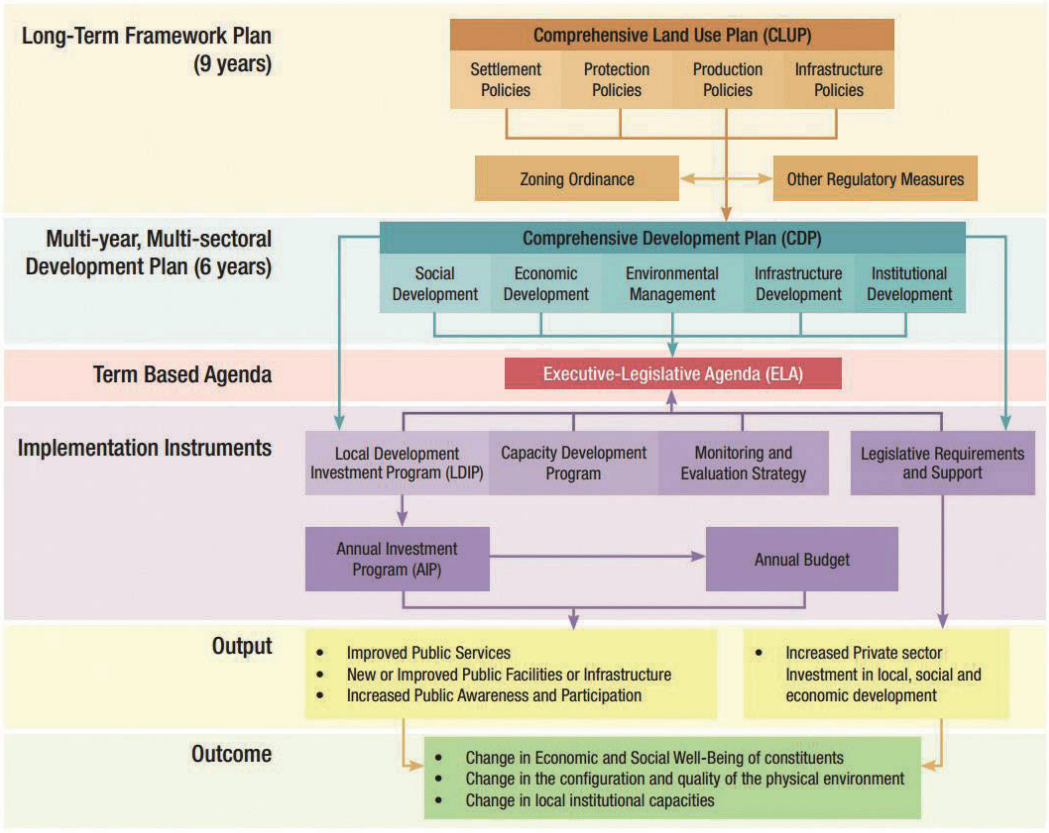
In the Philippines, the 1991 Local Government Code (Republic Act No. 7160) is the key instrument of decentralisation and devolution of central government functions. The code transferred powers and functions from the central government to local levels of government. These include the country's provinces, cities, municipalities and villages, or *barangays*. The World Bank has hailed this as "one of the most far-reaching decentralisation reforms in the developing world" (World Bank, 2003[22]). Part of the 1991 reform was to devolve the provision of local infrastructure to local governments. As per section 17 (b) of the code, local infrastructure includes a broad range of installations. These are: public markets, public buildings, areas of public assembly, roads and bridges, school buildings and other facilities for basic education, health facilities, fish ports, water-supply systems, seawalls and dykes, drainage and sewerage, flood-control systems, and traffic signals and road signs. Meanwhile, section 17 (f) of the code also granted the national government the option of itself providing the basic services and facilities assigned to a lower level of government, or to add to local efforts in this regard. This has resulted in a two-track delivery system in infrastructure, with local governments mainly responsible for devolved responsibilities such as providing local roads and municipal ports, and the central government augmenting or complementing local delivery.

The 1991 reform also stipulated the institutional mechanism for formulating and implementing local plans. It mandates local governments to prepare two plans: the comprehensive land-use plan (CLUP), and the comprehensive development plan (CDP) (Figure 2.5). The CLUP is about the spatial aspects of local development. It identifies areas where development projects may or may not be located, and directs public and private investments accordingly. The 1991 reform made the local legislative council, or sanggunian, responsible for approving the CLUP.[2] Another body, the local development council, formulates the CDP for approval by the sanggunian. This body also has the task of appraising and prioritising programmes and projects, and coordinating, monitoring and evaluating the implementation of development plans and projects. There is also a local

development investment programme, which translates the CDP into programmes and projects for the next three years. It includes an annual investment programme, which identifies the projects that the local government will fund through its annual general-fund budget, or through special fund-generation schemes.

Figure 2.5. Local development and investment plans in the Philippines



Source: DILG (2016[23]), *Local Planning Illustrative Guide: Preparing and Updating the Comprehensive Development Plan*.

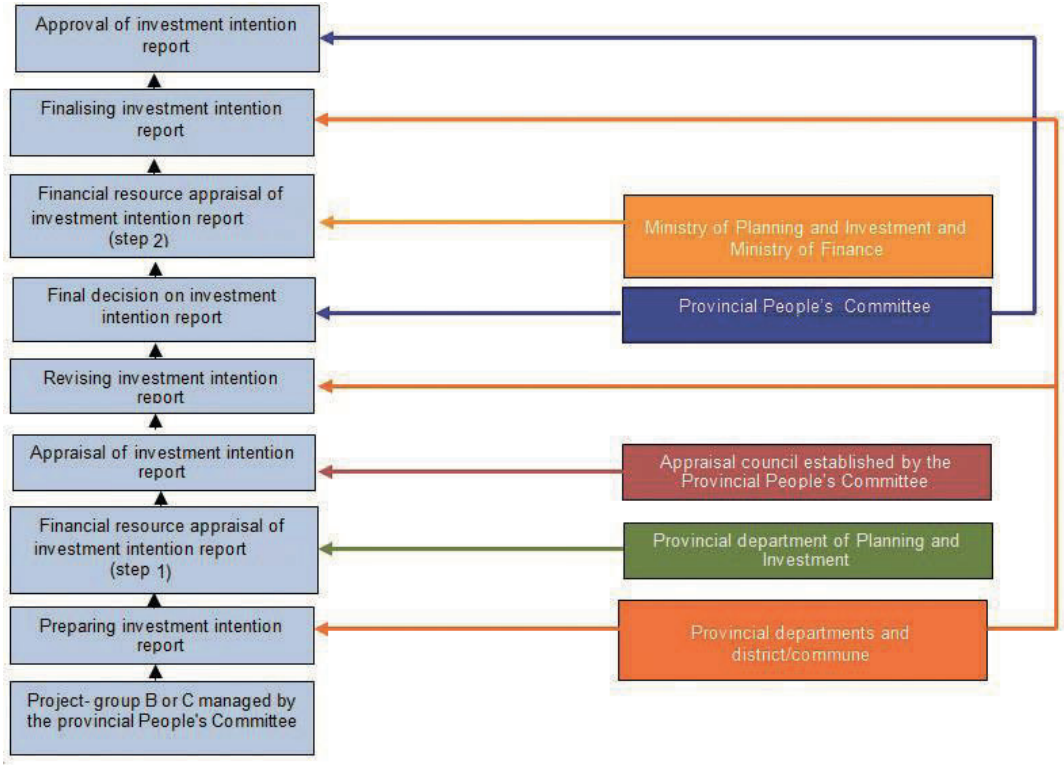
In Viet Nam, there are six main types of infrastructure investments that are under the mandate of local governments. The first of these is transport, which includes provincial roads, urban and rural transport networks, urban railways in Hanoi and Ho Chi Minh City, and waterways, including sea ports and river ports. The second type encompasses systems of water supply and drainage, including water treatment plants, transmission pipeline networks, and drainage systems. The third type of infrastructure investments for which local governments are responsible concerns the collection and treatment of waste. Fourth, power-supply systems also come under the local government's mandate, as does a fifth area, post and telecommunication systems, and also a sixth area of infrastructure systems for health and education. The responsibility for infrastructure management is divided between the central and local governments according to the location of a particular project. The transport ministry manages national highways, radial expressways, national railway systems, inter-provincial transport, airway transport, and sea and river transport. On the other hand, the local People's Committees are responsible for the

management of provincial roads, inter-district roads, rural transport, urban railways, parking lots, local sea and river ports, and water-supply and drainage systems.

Infrastructure investment planning is also decentralised in Viet Nam. The medium-term public investment plan is designed based on the provincial five-year socio-economic development plan (SEDP). This itself stems from Viet Nam's national SEDP, and also from the provincial-level master plan for socio-economic development. Plans that identify project portfolios and call for the mobilisation of investment capital have to be approved by the People's Councils (see Chapter 4 for details).

There is a clearly-defined process for approving the public investment projects that come under the management of the provincial People's Committees (Figure 2.6). As part of this, a report on an investment intention undergoes appraisal in terms of its content and financial feasibility. An appraisal council established by the provincial People's Committee is responsible for evaluating the contents of the report. There are two steps to implementing the appraisal of financial resources. In the first step, the provincial planning and investment department reviews the project's financial implications before submitting it to the appraisal council. In a second step, Viet Nam's Ministry of Planning and Investment and Ministry of Finance appraise the project's financing before finalising the investment intention report. Lastly, the provincial People's Committee approves the investment intention report.

Figure 2.6. Approval process for investment projects in Viet Nam



Source: OECD Development Centre's compilation based on Regulations of the Law on Public Investment, 2014 (No. 49/2014/QH13).

The appraisal of investment intention reports on projects managed by the People's Committees at the level of districts or communes does not require the establishment of an

appraisal council. The planning and investment department of the provincial government reviews a project's financial resources and then submits it to the national Ministry of Planning and Investment and Ministry of Finance for further evaluation. Although the process for approving the investment intention report is quite clear in practice, specific criteria for project selection are not defined in the regulations and legislation.

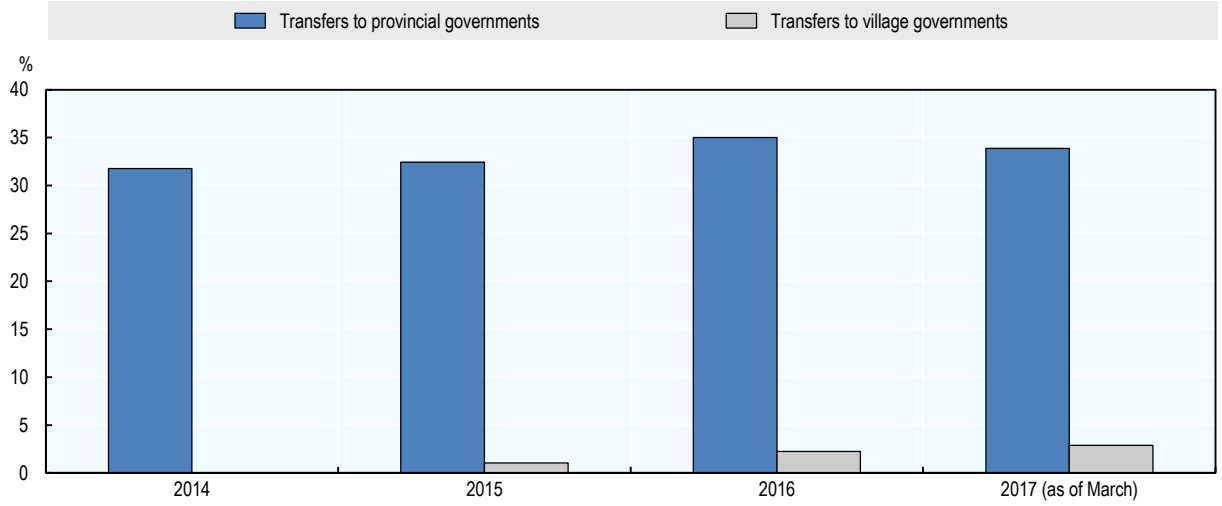
Financing local infrastructure projects

Local infrastructure projects can be financed through transfers from the central government in the form of targeted or block grants, or through revenues raised locally. Increasingly, the private sector is called upon to participate in infrastructure projects as well, both financially and through PPPs. Various combinations of government and private financing are used in local infrastructure investments in Indonesia, the Philippines and Viet Nam.

Central government transfers and the mobilisation of local revenue account for most of the financing for local infrastructure

Indonesia's central government retains most of the responsibility for raising revenues, despite an increase in responsibilities at the local level and the allocation of specific taxes to provincial and local governments under Law No. 28 of 2009. The central government then transfers funds to local governments. In the 2017 budget, allocations for transfers to provincial governments totalled IDR 704.9 trillion, or 33.9% of the budget. Meanwhile, transfers to village governments totalled IDR 60 trillion, or 2.9% (Figure 2.7). These shares have remained fairly stable in recent years. From 2014-17, transfers to provincial governments accounted for 31.8% to 35% of budgets. From 2015-17, meanwhile, transfers to village governments accounted for 1% to 2.9% of the budgets. Local governments' revenues came to a total of IDR 68.8 trillion in 2015, or 51.9% of general government revenues, up from 34.6% in 2008.

Figure 2.7. Budget transfers to provincial and village governments as a share of the central government's total budget in Indonesia, 2014-17



Note: Based on annual state budget (APBN). Transfers to village governments are not available for 2014.
Source: MOF (2017[24]), Realisasi Anggaran, https://www.kemenkeu.go.id/en/node/34644.

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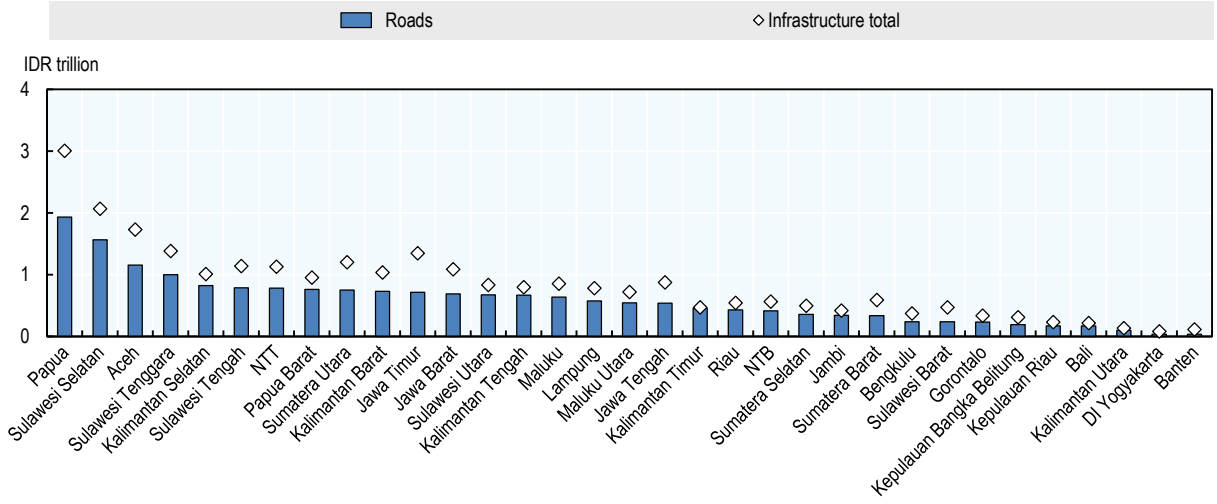
Transfers from Indonesia's central government include an equalisation transfer, the Dana Alokasi Umum, a fund of shared revenues from taxes and natural resources, the Dana Bagi Hasil, and a special allocation grant for funding national priority projects, the Dana Alokasi Khusus (DAK). In 2015, budget allocations for road infrastructure projects made under the DAK ranged from IDR 1.9 trillion in Papua, to IDR 34.2 billion in Banten (Figure 2.8). Expenditure on roads as a share of total DAK spending was highest in Kalimantan Timur, where it accounted for 96.8% of funds, and lowest in Banten, where it accounted for only 29.3% of funds.

Figure 2.8. DAK allocations to highway infrastructure in Indonesia by province, 2015

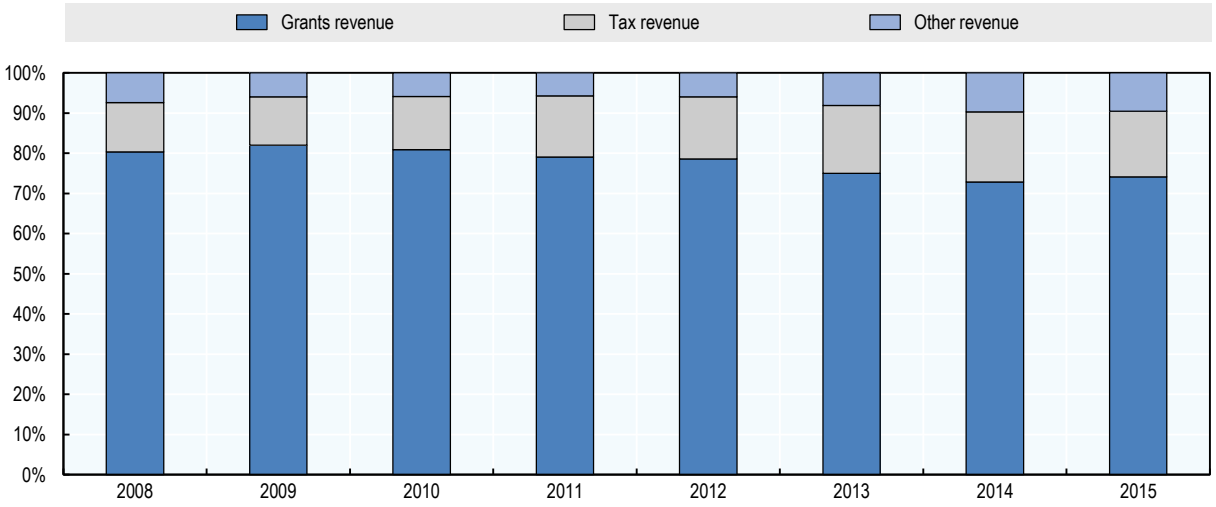


Source: PUSDATIN (2015[25]), *Informasi Statistik Infrastruktur*.

StatLink http://dx.doi.org/10.1787/888933841900

Grants account for the largest share of local-government revenues in Indonesia, though their share is declining. They fell from 82% of local-government revenues in 2009, to 72.9% in 2014 (Figure 2.9). At the same time, tax and other revenues have become relatively more important. From 2008 to 2015, tax jumped from 1.3% of local-government revenue to 16.4%. Over the same period, sources of revenue other than grants and tax rose from 7.4% to 9.5%. While the central government was largely responsible for implementing infrastructure projects in the past, the central government's budget has, in recent years, increasingly delegated infrastructure funds to provincial and local governments.

Figure 2.9. Local government revenue in Indonesia by type, 2008-15

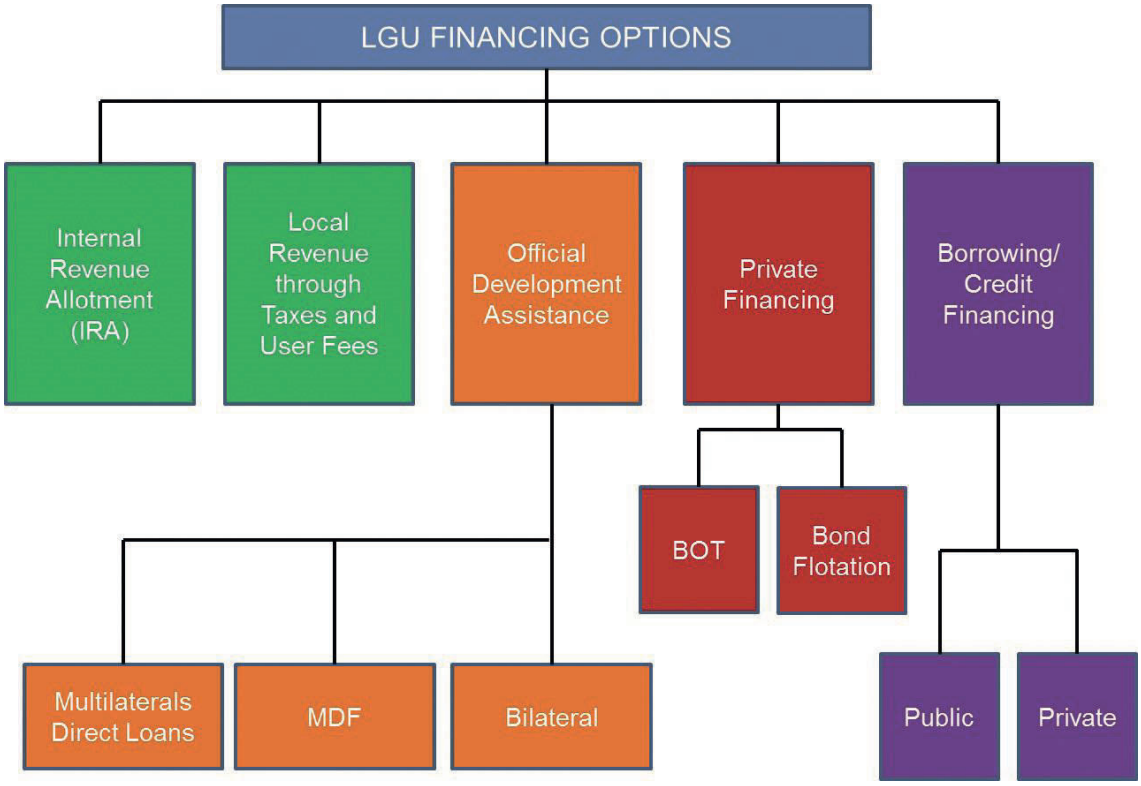


Note: "Other revenue" excludes social contributions, for which no revenues were recorded.
Source: IMF (2017[26]), *Government Finance Statistics* (database), http://data.imf.org/?sk=a0867067-d23c-4ebc-ad23-d3b015045405.

StatLink http://dx.doi.org/10.1787/888933841919

In the Philippines, financing from the central government is one of many sources of revenue available to local governments. The Local Government Code of 1991 gave local governments the authority to tap various sources of financing for development and infrastructure projects. These include loans and credits from any government, domestic private bank, or other lending institution. They also include bonds and other long-term securities, subject to the rules and regulations of the Bangko Sentral ng Pilipinas (Central Bank of the Philippines), and the country's Securities and Exchange Commission. Some of the other sources of financing that local governments may tap are loans between local governments, as well as grants and subsidies, and loans from foreign sources through the national government (official development assistance). Finally, local governments may enter into contracts with the private sector, including PPP arrangements (Figure 2.10).

Figure 2.10. The financing options of local governments in the Philippines



Source: DILG (2016[27]), "Guidelines for the implementation of Public-Private Partnership for the people infinitive for local governments (LGU P4)".

To augment local resources, the 1991 reform code stipulated fiscal transfers to local governments in the form of a so-called Internal Revenue Allotment (IRA). This has been a major source of revenues, especially for smaller local governments. The allocation formula across different levels of local government (province, city, municipality and *barangay*) is based on population size, land territory and equity, with a bias towards large cities and rapidly urbanising areas. Under current rules, 20% of the annual IRA transfer will constitute a Local Development Fund, which may be used for investment planning on local programmes and projects. The central government's budget and management department monitors the use of the Local Development Fund to ensure that it goes to projects in the local development plan.

To some extent, the IRA has acted as a disincentive to local governments in using their own revenue-raising powers more fully. The high degree of dependence on the IRA as well as limits to their own taxation powers have curtailed the amount of resources that local governments have raised to finance infrastructure. Moreover, the provinces and municipalities that are most dependent on the IRA tend to demonstrate the weakest performance in revenue mobilisation (Manasan, 2007[28]). In addition to these problems of fiscal capacity, a weak administrative capacity and the perceived political cost of raising local taxes have also hampered revenue performance. Currently, local taxes constitute only around 36% of total local revenues.

In any case, local governments in the Philippines have relied mostly on locally-sourced tax revenues and fiscal transfers – consisting both of the internal revenue allotment and

other transfers – to finance investment in local infrastructure. Local governments with the ability to borrow source their financing from government financial institutions such as the Land Bank of the Philippines, the Development Bank of the Philippines, and also the Municipal Development Fund, a bureau under the aegis of the finance department. These institutions dominate the local-government credit market. Local governments also obtain long-term loans for infrastructure projects from government financial institutions that are able to tap sources of ODA. However, the 1991 code does not allow local governments to borrow on international credit markets.

As already noted, the 1991 Local Government Code in the Philippines did devolve certain tax and spending powers to units of local government. The decentralisation improved local governments' financial capacities by granting them powers over taxation and revenue raising (Section 129 of the code), by increasing their shares of internal revenue taxes (Section 284), by allowing them to share in the national wealth exploited in their area (Section 290), and by broadening their credit financing powers (Section 295). While the code has broadened local governments' scope to generate revenue to support devolved expenditure assignments, these devolved taxes do not yield as much revenue as those taxes retained by the national government, such as value-added taxes or corporate income taxes (Table 2.2). The limits that the 1991 code placed on increasing local tax rates, and the national government's retention of the more productive taxes, have constrained local fiscal capacity.

Table 2.2. Selected sources of tax revenues for local governments in the Philippines

	Provinces	Cities	Municipalities	Barangays
Real property tax	✓	✓	40% of provincial collections	25% of provincial collections, or 30% of city collections
Transfer of real property	✓	✓	-	-
Sand, gravel & other quarry resources	✓	✓	30% of provincial collections	40% of provincial collections
Amusement tax	✓	✓	50% of provincial collections	-
Business tax	-	✓	✓	✓
Franchise tax	✓	✓	-	-
Community tax	-	✓	✓	50% of collections by barangay

Source: OECD Development Centre's compilation based on Local Government Code 1991 (R.A. 7160).

From 2016 to 2020, Viet Nam is allocating funds for its medium-term public investment plan in five areas: counterpart funds for PPP projects, counterpart funds for ODA projects, repayment of construction capital, funds for unfinished projects, and funds for new projects. Moreover, with the capital that is available, the government has prioritised leveraging the participation of partners in ODA and PPP projects, and financing unfinished projects from previous periods. Before 2011, local governments and ministries tended to decide to invest more than their available budgets, and many projects remained unfinished due to shortages of capital. Furthermore, contractors became indebted when public investors failed to repay them. In order to solve this problem, the prime minister issued Instruction No.1792/CT-TTg 2011, requiring public investors to prioritise available capital for the repayment of construction capital and for unfinished projects. Now, only once local governments have allocated funds to the first four of the five categories outlined above can they then allocate money to new projects.

However, many provinces faced difficulty in following these instructions directly. In 2015, Viet Nam's inspectorate of government reviewed the work of the 63 provinces and 15 ministries with regard to tightening up their management, and resolving unpaid debts from the state budget and government bonds. The report showed that 1 527 out of the 12 990 projects that were inspected had derogated from their construction-capital debts, and many provinces had not followed the prime minister's instruction from 2011.

Investment capital managed by local authorities reached 44.2% of total infrastructure investment in 2009, or VND 64.8 trillion. However, it fell to only 35.7%, or VND 54.6 trillion, in 2011. Multiple factors account for this decline, including the capacity limitations of local authorities (Table 2.3). Up to 50 out of 63 provinces are unable to balance their budgets, and have to receive extra funding from the central government. Moreover, provinces have the right to decentralise revenue sources and budget expenditure to districts and communes, which leads to differences in the fiscal management.

Table 2.3. Investment capital for development of transport infrastructure in Viet Nam by level of government, 1994-2011

	Capital (VND trillion)			Share (%)		
	Central	Local	Total	Central	Local	Total
1994	2	1	3	60.8	39.2	100
1997	4	2	6	68.1	31.9	100
1998	5	2	7	68.6	31.4	100
1999	5	3	8	63.1	36.9	100
2000	6	3	9	62.8	37.2	100
2001	8	6	14	58.0	42.0	100
2002	9	7	16	56.4	43.6	100
2009	36	28	64	55.8	44.2	100
2010	39	22	61	63.5	36.5	100
2011	35	19	54	64.3	35.7	100

Source: Tuong. P. V. (2015[29]); plus collected from World Bank data from 2005, and from Viet Nam's transport ministry from 2012.

In 2014, Viet Nam's general statistics office provided data for 2012-12 on public investment for 63 provinces. These revealed very high demand for capital construction. In 2012, 46 out of 63 provinces and cities used more than 90% of their development-investment capital for capital construction, while the number in 2013 was 38 out of 63. Investment in transport usually accounts for the highest proportion of the total investment in infrastructure.[3]

For the roads that the central government manages and operates, maintenance funds come from the road conservation fund, the state budget, ODA, and also revenues from the exploitation of existing transport infrastructure.[4] Provincial roads are maintained using funds from the provincial budget, the road conservation fund, and other official funds. Districts and communes manage the roads for which they are responsible from their official budgets, and through the mobilisation of local resources, the road conservation fund, supplementary funds from provincial budget, and other official funds. The road conservation fund comes from annual allocations in central and local government budgets, revenues from road-usage fees, and other official revenues. Businesses allocate

maintenance funds for roads that provide access to their sites, with the costs of road maintenance determined in the dossier for the project that built them.

Governments are also seeking PPPs and other forms of private-sector involvement in the development of local infrastructure

In Indonesia, the contracting agencies for PPPs can be central government ministries or local government authorities. Indonesia's decentralisation and the state-finance law of 2002 passed numerous responsibilities regarding the management of PPPs from the national development-planning ministry, or Bappenas, to the finance ministry and to local authorities. As a result, regional planning agencies reporting to local authorities now play a bigger role in implementing PPP projects, with Bappenas largely responsible for promoting local-level PPP projects (OECD, 2012[30]).

In Bappenas's 2017 plan for infrastructure projects in Indonesia, seven out of the 22 registered PPP projects have local-level government contracting agencies or implementing units. The Bappenas document includes projects for which the planning ministry has received proposal submissions stating that the contracting agency will be responsible for the planning, preparation and transactions of the project. The local-government projects in Bappenas's 2017 plan cover many sectors of infrastructure, including transport, utilities, and sport.

In the Philippines, private commercial banks have a very limited presence in the credit market for local government. Moreover, the market for local government bonds is in something of a hiatus, after an attempt to promote municipal bond finance more than a decade ago failed. Under this initiative, the Local Government Unit Guarantee Corporation (LGUGC) offered guarantees backing up municipal bonds. A few local governments did then issue bonds, but the nascent municipal bond market fizzled out when government financial institutions offered loans with better terms and conditions.

The construction of a public marketplace in a major city in 1991 that forms part of Metro Manila was the first PPP project in the Philippines for which a local government took the lead. In 2016, the Asian Development Bank (ADB) reported that local governments in the country have implemented 13 projects using build-operate-transfer (BOT) and other similar schemes. These have either been turned over to local governments already, or are still being operated by the private-sector partner. Many local governments find PPPs to be attractive arrangements to leverage their limited funds to address infrastructure gaps. However, a lack of technical expertise and financial resources for the preparation, monitoring, and implementation of projects is a major drawback for local governments undertaking PPP projects (ADB, 2016[31]). In particular, local governments often lack sufficient capacity both in identifying viable PPP projects, and in managing the tendering process. They also have limited access to long-term funds because of under-developed domestic capital markets.

In the Philippines, local governments have the right to use PPP arrangements for investing in local infrastructure, both under the country's law on BOT projects, and under Section 302 of the 1991 local government code. Articles 62 and 66 of the implementing rules and regulations of this code authorise local governments to enter into joint ventures with the private sector in infrastructure projects. However, the guidelines and procedures for entering into joint-venture agreements between government and private entities, which the National Economic and Development Authority (NEDA) issued in April 2008, do not cover local governments. Depending on their nature, scope, and cost, project proposals are evaluated by the local and national approving bodies in the approval phase,

in line with Rule 2, Section 2.7 (b) of the implementing rules and regulations of the amended BOT Law (Table 2.4).

Table 2.4. Levels of approval required for local PPP projects in the Philippines

Approval level	Project description
President	All build-operate-own projects and other schemes not defined in Section 2 of Republic Act No. 7718, that are subject to the recommendation of the NEDA board's investment co-ordination committee.
Investment Co-ordination Committee	Local projects costing above 200 million pesos (PHP), and all unsolicited proposals regardless of the cost of the project.
Regional Development Council	Local projects costing over PHP 50 million and up to PHP 200 million.
City Development Council	Local projects costing up to PHP 50 million.
Provincial Development Council	Local projects costing above PHP 20 million and up to PHP 50 million.
Municipal Development Council	Local projects costing up to PHP 20 million.

Source: PPP Center (2012[32]), *A PPP Manual for LGUs Volume 2: Developing PPP Projects for Local Government Units*, https://ppp.gov.ph/wp-content/uploads/2012/03/Volume-2-LGU-PPP-Manual.pdf.

Local governments in the Philippines have access to guidance in developing and implementing PPP projects. The Philippine government's interior and local government department, or DILG, has produced a set of guidelines for local governments when implementing PPPs. This set of guidelines, which is known as LGU P4, serves as a template for any contractual arrangement between local governments and the private sector to deliver local services and provide infrastructure (DILG, 2016[27]). Local governments are encouraged to adopt a so-called LGU P4 code in order to establish an open and transparent process for the identification and implementation of projects that is coherent with local development plans and investment programmes. Local governments may customise these LGU P4 codes according to the needs of their constituents, as long as it remains consistent with law.

The PPP Center, the central co-ordinating and monitoring agency for PPP projects across the Philippines, is primarily responsible for monitoring and evaluating local governments' PPP programmes. Specifically, it has the task of assisting local governments in preparing projects, clarifying procedures, and evaluating PPP projects, while also providing training and capacity-building activities, and funds for pre-investment activities for potential PPP projects. In 2013, it launched a PPP strategy for local government, which included the preparation and dissemination of a PPP manual for local governments. In line with a recent instruction from DILG – Memorandum Circular No. 2011-16 – the PPP subcommittee assists the local development council in formulating action plans and strategies related to the local government's implementation of PPP programmes and projects. Furthermore, these governments also have access to the LGUGC, which plays the role of a private risk guarantor for PPP undertakings in the Philippines.

In Viet Nam, the pressure of rising public debt and budget deficits means that capital from the private and foreign sectors is a very important resource for capital investment. By the end of 2015, the structure of funding for capital construction for transport was as follows: state budgets, including ODA, accounted for 39%, while 26% came from government bonds and non-state sources financed 35%. Moreover, the proportion of state budgets in this mix is declining, while the contribution of the non-state sector is rising. Still, further capital mobilisation from the private sector will be needed in the future, even though the high deposit interest rate in the banking sector may imply that there is limited idle capital in the private sector. Furthermore, PPPs in transport infrastructure are often

not very attractive to the private and foreign sectors due to the high risks and uncertainty typically involved.

Table 2.5. Build-operate-transfer and build-transfer investment in Viet Nam's road infrastructure, 2011-15

	2011	2012	2013	2014	2015	Total
Under Ministry of Transportation management						
Number of Projects	2	1	24	16	9	52
Value (VND billion)	6 316	2 434	68 562	38 790	45 599	161 701
Under Provincial People's Committee management						
Number of Projects	1	0	1	1	2	5
Value (VND billion)	685	0	1 391	7 388	13 988	23 452

Source: MPI (2013[33]), "Report on Adjusting and Supplementing Mechanisms and Policies to Reduce Wastefulness of Investment Projects Using State Capital".

The private sector has shown little interest in participating in infrastructure projects in Viet Nam, as these often require large amounts of financing and take long time to break even. As a result, most projects require government subsidies to be able to reimburse investors. However, the appropriate extent of government financial support for these projects has not yet been clearly defined. Currently, capital for local transportation infrastructure can be mobilised through bond issuance, loans from commercial banks, local development investment funds, auctions of land-use rights, and construction-project bidding. Challenges and limitations persist in the use of all of these forms of raising revenue.

Though bonds could potentially be an important source for infrastructure projects locally, the bond market in Viet Nam is underdeveloped and is largely composed of government bonds. By the end of 2006, only three provinces and cities (Hanoi, Ho Chi Minh City and Dong Nai) issued local government bonds, with a combined value of VND 16 trillion. In 2012, Ho Chi Minh City and Da Nang were the only two provinces or cities issuing bonds, with a total issuance value of VND 4.81 trillion. More local governments have joined the bond market, but central-government bonds continued to overwhelm the market for local bonds. The total value of local-government bonds until 2014 was only VND 17 000 billion, much lower than the VND 234 067 billion in central-government bonds mobilised in 2014.

Loans from commercial banks to local governments are still very limited. These loans are mostly steered into place by the central government using implicit guarantees. Recently, commercial banks showed some interest in funding PPP projects in transport infrastructure. However, Viet Nam's government inspectorate recently detected errors in implementing PPP projects in transport infrastructure. Among others, these included excessive cost increases in implementing projects, and an excessive time lag in collecting fees. This means investors have to trim the costs and fee-collecting periods in these projects. As a result, the interest on the part of the commercial banks appears to have waned.

Setting up local development investment funds (LDIFs) has helped to marshal a significant amount of capital for infrastructure investment in Viet Nam. These are special financial institutions that mobilise capital to invest in local infrastructure. Following the successful experience of the Ho Chi Minh City's LDIF, at least 28 provincial governments have established funds of their own. In 2011, the total chartered capital of

LDIFs, which comes mostly from state budgets, was estimated at approximately USD 450 million (World Bank, 2013[34]). So far, these funds have failed to raise significant additional capital from non-government sources.

Current regulations allow land to be used to finance infrastructure investments in two ways. The first of these is to auction land-use rights to generate cash to finance the construction project directly. The second is to associate land use rights with the construction phase starting from the bidding stage, as a means of generating extra capital for construction. Still, the exchange of land for infrastructure is on the decline in many big cities due to the malfunction of the real estate market. In small cities, meanwhile, the value of land is not attractive enough for private investors. This approach also raises concerns about the transparency of the land valuation process, as well as the extent to which local governments actually benefit from increased land values thanks to improved infrastructure.

Efficiencies in implementing local infrastructure projects

The decentralisation of responsibilities for developing and maintaining infrastructure can produce economic gains. One of the ways is when decentralised implementation makes it possible to use lower-cost local inputs and labour. Other ways in which this can happen include the streamlining of bureaucratic oversight and reductions in opportunities for corruption. Meanwhile, it is possible to achieve gains in efficiency by improving the alignment of investments with local priorities. However, a number of other factors limit the efficiency gains from decentralisation, and even point to certain advantages of pooling of resources at the national level. These include limited capacities at the level of local government. There are also factors that are external to local government itself, such as the need to manage spillover effects, the existence of economies of scale, equity considerations, distortions to internal trade and unproductive competition between regions (Peterson and Muzzini, 2005[35]).

In Indonesia, the implementation of some infrastructure projects at the local level has resulted in a number of productive efficiencies. For example, the evaluation of PNPM-Rural, a core programme of Indonesia's PNPM-Mandiri, found that locally-implemented infrastructure projects were significantly less expensive than those led by line ministries or district administrations. However, these cost advantages were found to decrease as a project became more complex. Cost savings are greater in building gravel roads than concrete roads or bridges, for example (PSF, 2012[36]).

In order to realise the potential economic gains that result from developing the kinds of infrastructure that reflect local priorities, some degree of local input or autonomy is necessary. In Indonesia, decentralisation and other local development programmes have been designed to encourage greater community participation in decision making. Indonesia has used community-driven development programmes since the beginning of the Kecamatan Development Project (KDP) in 1997, with the goal of empowering communities and reducing poverty. To this end, the country's government has provided locally-managed block grants for small-scale infrastructure. In 2007, Indonesia launched the PNPM-Mandiri initiative, aiming to reach a greater number of communities. As noted above, this initiative included the PNPM-Rural programme. The committees and project-proposal processes in this programme included measures to foster engagement from all citizens, including women, poor residents, and representatives of remote hamlets. In 2014, moreover, Indonesia enacted its new village law to give greater autonomy to local communities.

Notwithstanding the potential gains from decentralisation, there are also a number of factors that work in the opposite direction, potentially justifying larger roles for the central government in infrastructure projects. In fact, it is necessary to strike an appropriate balance of local and central government involvement for each project. A lack of economies of scale, or insufficient consideration of a project's spillover effects on neighbouring regions, for example, may raise costs or produce sub-optimal investments in projects pursued at provincial or local levels. As noted above, cost efficiencies in the local implementation of infrastructure projects through the PNPM-Rural programme in Indonesia tended to shrink with more complex projects.

More generally, capacity limitations at the level of local government may act to impede the decentralisation of responsibility for infrastructure in Indonesia, and indeed to show the advantage of pooling resources in certain areas. Other factors that have a similar effect include resource constraints and regional inequalities. While unequal access to infrastructure across Indonesia's regions remains a concern, fiscal measures help to finance projects in poorer parts of the country. In 2016, the DAU, a general-purpose grant, accounted for 50% of total transfers to the country's regions and rural funds. Allocations are determined through a complex formula using the wage bill, as well as a calculation of the difference between the needs of different governments, and their capacity to raise revenue.

In the Philippines, public investments in local infrastructure are based, at least ostensibly, on local development plans. The comprehensive development plan and the local development investment programme thus form part of the basis for the annual investment plan and budget. In practice, however, the linkage between planning and budgeting at the local level is poor, and the local development investment plan has practically no effect on actual investment decisions and budget allocation.[5]

There are several reasons for the poor linkage between planning and execution. First of all, institutionalised planning in local governments is weak. Not all local governments have local development councils or development plans to begin with. In fact, only 30%-50% of local governments have local development councils, while only 48.7% of local governments had devised their own comprehensive development plans as of 2015. Notwithstanding the absence of these, local governments prepare annual investment plans in order to comply with the reporting requirements of the country's budget and management department, with a view to Congress endorsing the local annual budget.

The second reason for the poor linkage between planning and execution is that local governments have a limited capacity for investment planning. Even if they craft their development plans and pipeline of projects, they still face problems in translating these plans into operational terms (World Bank, 2004[37]). For example, many lack the financial resources and technical capacity to prepare feasibility studies for local investment projects, such as water and wastewater facilities.

Third, investment programming is not transparent, and does not follow a bottom-up process. In a number of cases, the selection and prioritisation of projects becomes a political process that is carried out independently of the local development plans. The lack of analysis results in sub-optimal investment decisions, and in capital expenditures with unfunded mandates. This is exacerbated by the short-term perspectives of local officials, and an ad hoc approach to planning (World Bank, 2003[22]). In the past, this was also compounded by the practice of congressional insertions, where budget allocations to government agencies included funds intended to finance the pet projects of legislators, even if these were not consistent with local development and investment plans.

In Viet Nam, the planning and investment ministry carried out a survey in 2017 on planning capability in five of the country's provinces. According to this report, state agencies at the provincial level, such as, among others, the planning and investment department and the transport department, face human resource constraints in preparing plans and strategies. Provinces do not have planning specialists working for them, and officials usually hold multiple responsibilities. In general, people working in planning may not have the required skills. Consequently, most plans lack detailed roadmaps, consistency, implementing conditions, and criteria for monitoring and review.

The project selection process in Viet Nam includes the preparation, in a pre-feasibility study, of the investment intention report. It also includes in-depth analysis in the full feasibility study, and an appraisal process that focuses on assessing a project's economic benefits. This appraisal takes into account factors that will affect the effectiveness and feasibility of the project. However Viet Nam's law on public investment does not clearly establish the criteria for assessing these factors. The process can neglect to take into account connections with other social and economic goals, and complementarities between different modes of transport.[6] A lack of compatibility between selected projects and future development plans can also cause duplication and waste in transport infrastructure investment.

Viet Nam continues to face a number of challenges with regard to transparency and accountability. For example, there have not been regular inspections and examinations of bidding. Moreover, a report on the requirements of the bidding process has not been taken seriously. According to a study in 2013, the examination of bidding was implemented independently and intensively when it did take place, but the inspections were insufficient in number, with several provinces having had only one inspection in the previous year (MPI, 2013[33]). In addition, bidding inspections were still combined with the overall supervision of public investment, or the inspection of construction investment. Moreover, because of limitations in terms of manpower and funding, inspections were implemented on the basis of reports. As a result, the overall effectiveness of these inspections was low.

The degree of transparency in the selection of contractors declines along a spectrum that stretches from open tendering, to limited bidding, and on to direct contracting. Current regulations clearly stipulate that public investment projects must use the open tender approach, and that direct contracting may only be accepted for projects that are small in scale or have a high degree of socio-economic urgency.[7] In practice, however, many local governments do not meet the requirements in these regulations. For example, when submitting the proposal for direct contracting, local leaders in Ninh Binh province committed to completing the projects in question by the end of 2010. However, the government inspectorate found that four out of five of these projects remained unfinished in 2011. Moreover, many localities have applied for limited bidding, with some provinces taking this approach in over 90% of cases.

Key issues for improving the implementation of local infrastructure investments

Overall, the decentralisation of responsibilities for infrastructure has benefitted local communities, and has provided opportunities to make the development and maintenance of infrastructure more efficient. However, as seen in all three countries – Indonesia, the Philippines, and Viet Nam – central governments still play a large role planning, financing and implementing infrastructure projects. The involvement of local governments can improve the efficiency of infrastructure projects, though there are also limitations to the benefits of decentralisation in this area, as discussed above. Social,

environmental and geographic, and economic factors can affect the appropriate degree of decentralisation in developing and maintaining infrastructure, which should be determined by countries in deciding how projects should be pursued. Local governments should nevertheless have the capacities to implement their responsibilities effectively and efficiently. To this end, efforts can be focused on addressing disparities in access to land transport infrastructure through improved co-ordination and planning, by developing the capacity of local governments, by looking at new financing mechanisms, and by integrating the monitoring and maintenance aspects of infrastructure planning. The lessons offered by these three countries' experiences are also likely to apply more broadly to other emerging economies in the region.

Improvements can be made to infrastructure planning and co-ordination

In order to develop quality transport infrastructure, effective planning is essential. However, the need for co-operation between various actors, and across multiple levels of government, can make this complicated. Therefore, enhancing the co-ordination between central and local governments on infrastructure issues can improve planning, project selection, and allocations. In Indonesia, for example, a clarification of the division of responsibilities between different levels of government would make it easier to develop future infrastructure projects, and to prevent project overlap. This would be of particular salience in the rail sector, where increased space has been made for local governments to operate in partnership with the central government (OECD, 2012[30]).

In Viet Nam, provincial infrastructure plans could be made more effective and more feasible by improving their alignment with provinces' future development needs and their capacity to mobilise local resources. Consistency could also be improved between provincial plans and the national infrastructure master plan by strengthening co-ordination between local authorities and the central government. Establishing clear criteria for project selection could also play a useful role. Local authorities in Viet Nam could start by implementing Directive No. 1792/CT-TTg, which requires the project-selection agency only to approve projects once the funding sources have been identified. Open bidding may also help to improve transparency in the selection of contractors.

Community-led programmes for the development of infrastructure have helped to strengthen the engagement of communities in the sector. However, reforms such as choosing appropriate consultation times, providing assistance in finding necessary information, developing a legal framework that requires public authorities to respond to comments, raising awareness of rights to participate in the supervision of provincial infrastructure projects, and strengthening the capacity of social organisations, could improve community consultation.

Local governments may benefit from capacity-building assistance

Wherever a lack of experience and insufficient scale limit local governments' ability to plan and implement infrastructure projects, capacity building will play an important role in overcoming these issues. In the Philippines, the shortcomings of local development planning and local development investment plans in driving local-level economic growth highlight the need for capacity building in local governments. While local governments have already undergone numerous training programmes, including on local fiscal management, and provided by institutions including DILG's Local Government Academy and the PPP Center, the scope for building local capacity in the preparation of local development and investment plans is certainly very large. This is especially the case

when it comes to linking planning, programming and budgeting to the implementation of projects or programmes.

In Indonesia, the creation of new local units has further complicated local capacity constraints. The number of provinces in the country increased by over 30% from 1999 to 2015. Over the same period, regencies and cities expanded in number by 55%, districts by 77%, and villages by 20% (OECD, 2016[38]). Administrations at the provincial and district levels, meanwhile, could benefit from capacity-development programmes focusing on technical aspects and on human resources. These could include support in adopting new tools and technologies, technical assistance, and mentoring and training programmes.

Realising the full benefits of local-level infrastructure development also requires transparency and accountability. While perceptions of corruption in local governments in Indonesia tend to be less serious than those regarding the central government, addressing corruption and promoting transparency will be an essential part of capacity development. Indonesia's Komisi Pemberantasan Korupsi – a commission to eradicate corruption – remains fairly centralised. It could do more work in the regions by providing training programmes for local governments, for example (OECD, 2016[38]).

Broadening sources of financing will help to fund infrastructure investments

The need to balance autonomy with considerations of fairness and equality make it more complicated to finance the development and maintenance of infrastructure at local levels. In Indonesia, the general-purpose DAU grant, which accounts for a large share of local governments' revenues, does function as equalisation mechanism, although its design could be improved upon. Indeed, the DAU has faced criticism both for its complexity (Shah, Qibthiyyah and Dita, 2012[39]), and for the role of the wage bill in calculating grants, which can encourage the hiring of additional civil servants and a diversion of funds away from infrastructure (OECD, 2016[38]). Increasing the use of infrastructure-specific capital grants may be appropriate. Similarly, in Viet Nam, the ask-give mechanism for capital allocation to the provinces could be eliminated, at least for the time being.

It is likely that developing more infrastructure, and covering its life-cycle costs, will also require a greater mobilisation of financing on the part of local governments. Private sources of finance can also be further developed, especially the kinds of long-term finance that are currently available in the market to finance infrastructure assets. Moreover, attracting more private investors points to the need to widen and deepen domestic capital markets. Furthermore, real estate taxes, idle land taxes, and other tax measures not fully exploited by local governments may be used more effectively, as well as infrastructure bonds, and other new ways of raising revenues for the public sector. Governments can also facilitate the creation of credit enhancements for infrastructure bonds, and can pursue reforms to allow pension funds and insurance companies to include infrastructure investments in their respective asset portfolios. In Viet Nam, as elsewhere, enhancing the transparency of regulations on exchanging land for infrastructure is important in encouraging additional private-sector participation in local infrastructure projects.

PPPs will continue to play an important role in local infrastructure development, as well as providing a means of attracting investment and external expertise. However, they require effective governance to be managed properly. Consultation and transparency remain important with PPPs, as with other forms of infrastructure projects. Competitive bidding plays a role in this, as well as improving efficiency by identifying better-matched

private partners. Attracting these partners requires assurances of repayment from project revenues. Timely and appropriate regulatory responses to tariff-adjustment proposals are critical for the successful implementation of any PPP project. At the same time, the division of responsibilities between the contractor and the transport infrastructure manager requires certain commitments of responsibility in order to avoid the manager taking responsibility for risks caused by the builder.

PPP arrangements will not be the appropriate mode of infrastructure procurement for all projects. The political environment is a critical factor as decisive, transparent, and committed local leadership is crucial to the success of any PPP. Local governments are likely to need expert advice on technical and financing options, project packaging, the preparation and evaluation of bidding documents, and on the kinds of project monitoring and evaluation that will meet the legal requirements and expectations of private-sector investors. In the Philippines, the PPP Center, and the expertise of donors, may be of use in preparing local PPP strategies. Moreover, while local governments in Indonesia have some autonomy in that they do not have to follow central government rules regarding PPPs if they are not seeking guarantees or fiscal support, governments that lack the capacity or experience for managing PPPs should definitely seek support.

Ongoing maintenance and monitoring should be incorporated in infrastructure planning and budgeting

Regardless of the level of government that takes the lead in an infrastructure project, it is important, in developing these projects, to pay attention to maintenance and monitoring throughout the project life-cycle. The costs of infrastructure maintenance should be estimated, and then added to the initial cost of transport infrastructure projects, and allocated for later periods. In addition, governments may also need to find better solutions to mobilise contributions from the private sector and other sources for the maintenance of transport infrastructure.

A lack of funding for the maintenance of an infrastructure project results either in the accelerated deterioration of the asset, or in fiscal challenges. In Viet Nam, shortfalls in maintenance budgets are most commonly addressed either by passing on the management of some facilities to higher levels of authority in order to reduce the burden on the local budget, or by directing user fees directly into the maintenance of the asset. In 2016, Viet Nam's transport ministry permitted Nghe An province to transfer 620.45 km of local roads to the national highway network. At the same time, the province transferred 470 km of district roads to the provincial network. The province of Nghe An also earned VND 140 billion in road tolls, of which VND 94.14 billion was allocated to the renovation and repair of 45 transport works in the province (six by the transport department, and 39 by the District People's Committee).

Finally, limited capacities on the part of governments that are responsible for local infrastructure projects make it harder to monitor their performance. Viet Nam has a system for monitoring and evaluating investment that requires lower tiers of the country's administration to report back to the planning and investment ministry, but compliance is not universal. In 2016, only 79.5% of projects were reported on. Community-level monitoring has been similarly neglected in many cases. According to the planning and investment ministry, only 23 of the country's 63 provinces compiled community monitoring reports in 2016.

Notes

[1] In this chapter, all sub-national levels of government are included under the category of "local government". These include regional and state governments, intermediate-level government, and municipal government).

[2] The local chief executive (mayor) and other officials are elected for a three-year term. They can be re-elected for a second term.

[3] According to the World Bank (2013[32]), the shares of investment for transport in overall infrastructure investment in Ho Chi Minh City, Quang Ninh and Quang Nam province, are 50%, 92% and 47% respectively.

[4] Financial resources for the maintenance of road infrastructure funded by official development assistance are estimated in the financial plan for the project. However, funds and policies on maintenance differ between projects, depending on negotiations with donors.

[5] However, the actual implementation of local infrastructure projects may be mayor- or governor-centric, that is, subject to the preferences of the local chief executive.

[6] The criteria and procedures for project selection, notwithstanding the Law on Public Investment (Articles 60-64) and associated regulations, are not sufficiently clear and detailed (World Bank, 2013[32]).

[7] The relevant rules are: Resolution 30/2008/NQ-CP (11 December 2008) on urgent solutions to prevent economic recession, maintain economic growth, and ensure social security; and Document No. 229/TTg-KTN from the prime minister (16 February 2009) on applying direct contracting for urgent projects.

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Chapter 3. Improving infrastructure financing

Required investments in road and infrastructure in Asian countries will require governments to consider a broader range of sources of financing than have been used in the past. The public sector still bears much of the burden in financing infrastructure and is expected to continue to play a major role in future. Public revenues can be increased through improvements to tax yields generally and the implementation of taxes specifically for financing infrastructure, such as vehicle taxes and road-use charges, energy taxes and taxing project beneficiaries. Public-private partnerships and private investment in infrastructure projects are expected to continue to become more important as sources of financing. Fostering greater private involvement in infrastructure finance will require, in many countries, the development of effective governance mechanisms and of financial markets.

Introduction

The countries of Emerging Asia continue to register robust economic growth. The OECD forecasts an average growth rate of 6.3% for Southeast Asia, China, and India in 2018-22 (OECD, 2018[1]). In turn, this strong growth across the region will fuel an increasing demand for infrastructure. Indeed, the demand for infrastructure in Emerging Asia is already very large. However, the region is facing significant challenges in financing the infrastructure investments it needs in order to meet this surging demand. Moreover, countries across the region need to find funding not just for new projects, but also to improve and maintain existing infrastructure. Both of these types of investment will contribute to inclusive and sustainable growth in the region. It is necessary, therefore, for countries to secure more infrastructure financing.

Traditionally, and particularly in Emerging Asia, infrastructure financing has relied heavily on public spending, both from national governments and from lower tiers of administration. However, considering how much infrastructure funding these countries require at the moment, government revenues alone are insufficient. The private sector is also becoming a crucial part of the equation. PPPs for infrastructure construction and maintenance have gained traction of late. These partnerships between private investors and public authorities create investment opportunities for private investors, while at the same time easing the fiscal burden for the public sector. They also aim to spread credit risk, and to capitalise on the private sector's ability to manage projects. The experiences of OECD member countries offer examples for Emerging Asia of ways of diversifying sources of funding.

In addition, considering the long duration of infrastructure projects, optimal financing depends on the type and phase of the project that is being covered. Infrastructure projects typically run through three stages: pre-construction, construction and post-construction. The latter is also sometimes referred to as the operations and maintenance phase. These stages have varying risk profiles and potential returns, and this matters a great deal in financial planning, particularly if the private sector gets involved. The differences in characteristics of each stage mean that equity-sharing arrangements with the private sector, and the stage of the project cycle at which a private partner enters it, have strong implications for its financial viability.

Ideally, projects with long gestation periods like roads, bridges and railways require long-term instruments. Securing long-term capital mitigates the credit risks associated with a mismatch between revenues and debt maturity. Moreover, the flexibility of a project's financing instruments is another key consideration. The ease with which financing can be rolled over or restructured is important, especially if there is a high degree of regulatory uncertainty hovering over an infrastructure project. Uncertainties come in the form of unexpected changes in the terms of the agreements, or sharp shifts, midway through the project cycle, in regulations, the political orientation of the government, or other socio-economic factors.

This chapter examines the different infrastructure financing options, including funding from public sector, private sector participation and effective use of PPP. It also looks into some challenges that need further attention such as taking better care to match the needs of a project with the most appropriate methods of financing, and developing infrastructure funds. This chapter outlines some of the tools used in raising public sector revenues and explores ways of involving the private sector in financing infrastructure available for Emerging Asian countries to consider.

Though beyond the scope of this chapter, infrastructure investments in emerging economies may also be financed in part or in full through international bilateral and multilateral flows of development assistance funds in addition to public and private sources of financing. Moreover, in addition to the floating of government securities on the international market, foreign borrowing can also include official development assistance (ODA) loans. Foreign grants from multilateral and bilateral partners have also been used to provide infrastructure in countries in Emerging Asia. In general terms, ODA falls into the two main categories of direct bilateral aid for developing countries, and multilateral aid from international organisations such as the World Bank, or the newly-developed Asian Infrastructure Investment Bank. Bilateral aid consists of co-operation in terms of finance and investment (ODA loans and private-sector investment finance), and grants (grant aid and technical cooperation).

Funding from the public sector

The public sector bears much of the burden in financing infrastructure. In 2017, the Asian Development Bank (ADB) estimated that the public sector accounted for roughly 90% of the infrastructure spending in Asia based on recent data (from 2010-14), albeit with considerable variations across regions and industries.[1] Moreover, the public sector's share of infrastructure financing in emerging economies – including those in Asia – is generally higher than in developed economies (Inderst, 2016[2]).[2] This section discusses various financing options of public sector, including: mobilising tax revenue through i) fuel and carbon taxes, ii) vehicle and road user charges, and iii) land value capture tools.

Tax and non-tax revenues, as well as bonds from governments and state-owned enterprises, are the primary sources of financing for the public sector. In addition to general resources from the budget, experience both in OECD member countries and those in the region in question here, shows that a combination of specific infrastructure-related taxes can help to fund infrastructure. These include taxes on fuel and vehicles, road-use charges, and land-value capture tools. These revenues may either be earmarked for infrastructure investment or directed into the general budget.

Countries in Emerging Asia still have considerable scope to improve their tax collection capacity, which can be pursued through improvements in tax administration and using alternative revenue sources, such as taxing fuel and vehicles. The ratio of tax to gross domestic product (GDP) in countries in Emerging Asia is much lower than in the member countries of the OECD. In 2015, for example, the tax-to-GDP ratios in Indonesia, Malaysia, the Philippines and Singapore respectively stood at 11.8%, 15.3%, 17% and 13.6%. This was well below the OECD average of 34.3%, and also below recent ratios of 32% in Japan and 25.3% in Korea (OECD, 2017[3]).

Taxing fuel

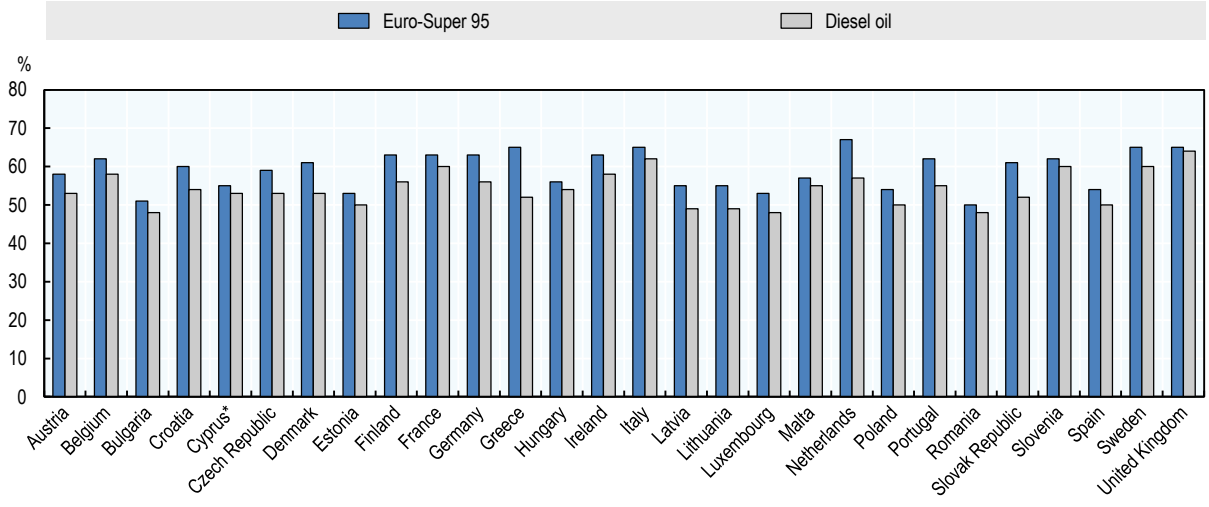
Energy-related taxes can play an important role in financing infrastructure investments. Some countries dedicate fuel tax to funding infrastructure, notably for building and maintaining roads. Meanwhile, some other countries collate fuel tax with other excise taxes, from which road funding then comes. Countries like Switzerland and the United Kingdom apply both a carbon tax, which is directly linked to the level of CO2 emissions, and an excise duty on fuels used for vehicles or heating.

In the United Kingdom, there is an excise duty of 0.5795 pounds (GBP) per litre on petrol, diesel, biodiesel and bioethanol, and of GBP 0.3161 per kilogram on liquid

petroleum gas. Fuel duty also applies if people wish to use heating fuels or natural gas as fuel for vehicles. Furthermore, a charge of GBP 0.2470 per kilogram is imposed on natural gas. Moreover, fuel oil used for non-road use (i.e. heating) is charged at GBP 0.1070 or GBP 0.1114 per litre, depending on the type of fuel. In 2012, the United Kingdom's direct taxation of motoring, excluding value-added tax (VAT), raised GBP 30.7 billion. Of this sum, GBP 24.8 billion came from fuel duty, and GBP 5.9 billion came from vehicle excise duty (Bayliss, 2014[4]). The UK government levies fuel taxes nationwide, depositing them into the treasury department's general consolidated fund. In recent years, the central government has allocated around 50% of its funding to capital improvements in the rail network, including the Crossrail project in the London area (Eno, 2014[5]). Indeed, the United Kingdom has one of the highest rates of fuel tax in the whole of the European Union, when expressed as a share of the end-consumer price. This is particularly the case for diesel (Figure 3.1).

Meanwhile, Iceland and Sweden also charge duties on petroleum and electricity. Indeed, Iceland charges a general excise tax of 23.86 krona (ISK) per litre on petroleum products. It also applies a special excise tax – which it keeps for road maintenance – to transport fuels, with rates of ISK 38.55 per litre for gasoline, and ISK 54.88 per litre for diesel, as of April 2012 (OECD, 2013[6]). Gasoline tax is also one of the main sources of revenue in Germany. The revenues from Germany's gasoline tax flow into the country's general fund.

Figure 3.1. Total taxation share in the end consumer price for Euro-Super 95 and diesel oil, end-2017



Note: EU Weighted Average = 62% (Euro-Super 95), 57% (Diesel Oil).
* The information in this document with reference to "Cyprus" relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of the United Nations, Turkey shall preserve its position concerning the "Cyprus issue".
* The Republic of Cyprus is recognised by all members of the United Nations with the exception of Turkey. The information in this document relates to the area under the effective control of the Government of the Republic of Cyprus.
Source: EU (2018[7]), The European Commission's Oil Bulletin.

StatLink http://dx.doi.org/10.1787/888933841938

Earmarked fuel taxes may be used to raise revenues specifically for infrastructure investment. For instance, Japan has previously implemented a system of earmarking tax revenues – particularly from gasoline and vehicle-related taxes – for road construction. However, the Japanese government abolished the earmarked taxation system in 2008. In 2009, Japan incorporated into the general account all of the tax revenues it had previously earmarked. Having made this change, the Japanese government then switched to covering road-development expenditure from the general account. Switzerland, however, does use earmarked taxation, particularly when it comes to revenues from the country's petroleum tax surcharge. Indeed, Switzerland earmarks this, together with half of the revenues from the petroleum tax itself, to finance transport infrastructure. The United States, meanwhile, provides an example of earmarking tax revenues from road transport for specific use in the transport sector, particularly for highways. Over the past 20 years, the US system of earmarked taxes has been able to fund sufficient growth in highway spending and capacity, and some improvements in service (OECD/ITF, 2008[8]).

Fuel taxes are also used in Emerging Asia. For instance, China implemented a reform of fuel taxation in 2009. Before making this change, China had maintained its roads through the road-maintenance fees that local governments collected from road users. However, there had been some issues about this approach, including local governments charging different fees, the continuing prevalence of environmental issues such as pollution, and concerns about the quickly rising demand for oil. In order to address these issues, the country significantly increased the rate of the consumption tax on oil products. There is also a fixed amount of fuel tax per litre that manufacturers and importers of oil products have to pay. Moreover, it is the central government that collects these taxes, thereby increasing the efficiency of their eventual allocation, as well as equalising levels across the country. China uses this new tax arrangement as a substitute for the road-maintenance fees and other road-use surcharges that it has abolished. The country also uses these revenues to make up for certain toll revenues, having removed some toll authorisations on class II highways and provided subsidies for grain producers and the poor in order to enhance public welfare. Having implemented these reforms to its fuel-tax system, China now manages the financing for its road sector centrally. In so doing, it draws on resources from fuel taxation, from a tax on the purchase of new vehicles, and from central-government budgets. However, there is a room for improvement about roles and responsibilities of local government agencies, or that it should create an independent administrative body for national roads and funding to manage its national road programme.

Energy-related taxes are often applied not only to generate revenue for infrastructure, but also due to environmental considerations. One example of this is applying a carbon tax – a tax directly linked to the level of CO2 emissions, and often expressed as a value per tonne of CO2 equivalent – alongside other taxes on energy products (OECD, 2013[9]). Some OECD countries, such as Australia, Canada, Denmark, Finland, Iceland, Ireland, Norway, Slovenia, Sweden, Switzerland, and the United Kingdom, have explicit carbon taxes. In OECD countries, the effective tax rates on carbon range from around EUR 2.8 per tonne of CO2 in Mexico to EUR 107.3 per tonne in Switzerland. The simple average for all OECD countries stands at EUR 52 per tonne of CO2, while the weighted average is EUR 27 per tonne (OECD, 2013[9]).[3] However, the concern about using a carbon tax usually relates to consumers. This is because a carbon tax can translate into higher prices for electricity, gasoline, home-heating fuels, and other fossil-fuel sources of energy.

Vehicle use taxes and road-use charges

Taxes on vehicles are an important source of tax revenue for most governments in OECD countries (OECD, 2014[10]). Taxes and charges on vehicles include taxes on the purchase of a vehicle (including VAT and retail sales taxes), a one-off levy on the registration of motor vehicles, periodic taxes payable in connection with the ownership or use of a vehicle, and also a number of other taxes and charges, such as insurance taxes, road tolls, and congestion charges, in addition to taxes on fuels. Indeed, countries including the United Kingdom, Sweden, Germany and Italy tax the ownership of vehicles at higher rates if they emit more CO2. Moreover, some countries – including the United Kingdom and Germany – also have road-use charges, with local authorities usually charging these fees. Charges can take several different forms, such as tolls, a heavy-vehicle fee, congestion charges, or a motorway vignette. Some Asian countries have also implemented use charges to raise revenue.

One of the most common ways of raising this kind of tax revenue can be to base vehicle tax on carbon-dioxide emissions. Direct taxation of motoring in the United Kingdom, for example, includes vehicle excise duty (VED), an ownership tax on every registered, mechanically propelled vehicle. For cars, the level of carbon dioxide that they emit helps to determine the tax rate their owner will pay. The first-year rate varies depending on the level of emissions, ranging from no charge at all for vehicles that emit less than 100g of CO2 per kilometre, to GBP 2 000 for vehicles that emit more than 255 grams of CO2 per kilometre. After the first year, there is a flat standard rate of GBP 140, except for zero-emission cars. Moreover, owners of cars whose initial purchase price exceeds GBP 40 000 also pay an additional GBP 310 per year (based on the new VED system, for cars registered from 1 April 2017).

In Germany, for cars registered from 1 July 2009, the motor vehicle tax is also based on CO2 emissions. For cars registered after 31 December 2013, this CO2 tax stands simply at EUR 2 for every gram per kilometre emitted above 95 g/km, while cars with CO2 emissions below 95 g/km are exempt from this tax. Additionally, drivers of vehicles with petrol engines have to pay a base amount of EUR 2 for every 100 cubic centimetres (cc) of engine size. On the other hand, drivers of vehicles with diesel engines have to pay EUR 9.50 for every 100 cc.

Sweden introduced vehicle tax in 1922 in order to pay for road maintenance. According to Sweden's tax agency, there were 6.9 million vehicles subject to vehicle tax in 2014, including 4.6 million passenger cars, 593 000 lorries, and 1 045 000 trailers. The country now taxes a wide range of vehicles according to how much pollution they create. The tax rates include a basic rate of 360 kronor (SEK), plus SEK 20 for each gram of CO2 the vehicle emits over 117 g/km. If the vehicle uses diesel, this sum is multiplied by 2.33. For vehicles that use alternative fuels, the basic rate is the same, but each extra gram costs less, at SEK 10 (OECD, 2014[10]).

In Italy, where the registration tax is calculated according to the type of vehicle, the power of the engine, and the weight and number of seats, as well as the pollution that the vehicle emits. The rates are EUR 151 for a car with an engine over 53 kilowatts, and EUR 3.5 per kilowatt for lower-powered engines. In addition, motorists have to pay an annual ownership tax ranging from EUR 2.58 to EUR 4.95 per kilowatt, depending on the engine's capacity and emissions. There is also a surtax of EUR 20 for each extra kilowatt in excess of 185 kilowatts in engine power. This surtax falls by 40% five years after the vehicle's construction, by 70% after ten years, and by 85% after fifteen years (OECD, 2014[10]).

In Switzerland, a performance-related heavy vehicle fee (HVF) is levied at the federal level. The basis for determining this tax is a mixture of emission levels, total weight, and the number of kilometres driven in Switzerland. It applies to all vehicles and trailers that are over 3.5 tonnes, used for the carriage of goods, licensed in Switzerland or abroad, and that drive on Switzerland's public road network.

Japan charges owners a national motor-vehicle tonnage tax, both at the time of registration, and also after periodic compulsory inspections. For a new non-business passenger car, the tax rate is 12 300 yen (JPY) per 500 kilograms. After an initial period of three years following registration, a compulsory inspection is undertaken every two years. Up to the fifth inspection, the owner must pay JPY 8 200 per 500 kilograms of the vehicle's weight. Moreover, the tax rate for acquiring a car is 5% of the purchase price for non-business users, and 3% for business users. However, the government plans to phase out this tax, once the rate of the consumption tax raises to 10%, from 8%.

In many cases, sub-national governments collect road user fees in order to finance infrastructure investment and to manage congestion at the same time. Some countries, including Sweden and the United Kingdom, apply road user charges – another form of direct motoring taxation – at the level of city government. In 2006, Stockholm introduced a congestion tax to help finance a ring road around the city of Stockholm. The Swedish city of Gothenburg followed suit, introducing its own congestion tax in 2013. In the United Kingdom, meanwhile, the London congestion charge requires drivers to pay to enter the charging zone between 7:00 a.m. and 6:00 p.m., Monday to Friday. The congestion charge is GBP 11.50 per day, or GBP 10.50 if using the automated payment system. In 2008, the London congestion charge generated net annual revenues of GBP 137 million, 82% of which went into bus improvements, and with a further 9% financing roads and bridges and another 9% providing funding for road safety, pedestrian and cycling facilities, borough plans, and environmental improvements (FHWA, 2010[11]). The London congestion charge also helps to fund Transport for London, a local government organisation responsible for most aspects of London's transport system (Eno, 2014[5]). A number of cities around the world apply congestion charges (Table 3.1). In Osaka Prefecture, Japan, a car acquisition tax contributed JPY 193.4 billion, or 1.3% of prefectural taxes, in the fiscal year of 2013. Meanwhile, a tax on deliveries of light oil contributed JPY 943.1 billion, or 6.4% of the prefecture's total tax revenue.

Table 3.1. Revenues from congestion charges in selected cities

London	Singapore	Stockholm	Milan	Gothenburg
USD 352 million/year (in 2014)	USD 60 million/year	USD 94 million/year (2013), plus USD 12 million in penalty charges	USD 28 million/year	USD 99 million/year, plus USD 9.6 million/year in fines

Source: Amelsfort, D.V. (2015[12]), "Introduction to congestion charging: a guide for practitioners in developing cities"

Road-user charges are also applied in the form of a motorway vignette, as is the case in Switzerland. All users of the Swiss motorways, including motor vehicles and trailers up to a total weight of 3.5 tonnes each, and motor vehicles and trailers with a total weight of over 3.5 tonnes each that are not subject to the heavy vehicle charge, are taxed. In 2016, the price of the Swiss motorway vignette was CHF 40. Failure to correctly acquire and set up the vignette led to a fine of CHF 200.

Vehicle taxes and road-user charges have been also implemented in some countries in Emerging Asia. For example, Singapore applies registration fees and excise duties for car ownership, a system of road tax for cars, a special tax on diesel cars, and a road-tax surcharge for vehicles over ten years old. In January 2018, Singapore also rolled out a new vehicle emissions scheme. The country first implemented its congestion-charging and road-pricing system in 1975, in the form of an area license system. This scheme charged drivers a flat rate for unlimited entries into the city's central area. In 1998, Singapore replaced this with an electronic road-pricing system. The implementation of this new system cost about 200 million dollars (SGD), half of which was allocated to the free installation of in-vehicle units. Users then inserted a card into the unit to make a payment while passing through the gantries. In 2003, the system raised annual revenue of approximately SGD 80 million, and its annual cost in terms of operations and maintenance was around SGD 16 million. In 2009, the system collected SGD 149 million, and SGD 159 million in 2010. The revenue generated from the system goes into the government's consolidated fund to pay for government expenditures, including the construction and maintenance of roads, and public transport.

In its 2016 budget, India planned to introduce a so-called infrastructure cess, which is similar to an excise duty. The rate was to be 1% for small cars no longer than four metres, with an engine capacity no greater than 1 200 cc, and that use petrol, LPG, or compressed natural gas. This rate rises to 2.5% for diesel cars that are four metres long or less and have an engine capacity no greater than 1 500 cc. For cars with higher engine capacities, the rate rises further, to 4%. In addition, India planned a further 1% luxury tax on cars costing over a million Indian rupees (IND).

Capturing increases in land value to help pay for infrastructure

Finding ways to capture some of the value that new infrastructure creates along its path – such as increased real estate value – can help to fund transport infrastructure projects. Tax increment financing (TIF) is one example of a tool that can capture such increases in land value. Its usual application is to allow local authorities to fund regeneration projects. It starts with a new development project that is expected to attract new businesses and, in turn, to boost locally-collected business taxes. The local authorities will then source funds for a specific infrastructure project against the predicted additional tax revenues, with or without a private-sector partner. The TIF tool is, however, often considered risky. Even though high demand for property and high land values in large cities make it feasible to apply TIF, it is not a scheme that would work for all cities, especially not smaller ones.

In the United States, TIF was first introduced in California in the 1950s, and its use has expanded significantly since the 1970s. Almost all US states now have legislation in place allowing them to use TIF to promote urban renewal. New York City is deploying its first TIF scheme to fund an extension of subway line seven to the west side of Manhattan. The project is a key part of the Hudson Yards development programme. The city is financing the Hudson Yards subway line extension through the issuance of bonds to be repaid by future tax revenues from the anticipated increases in the value of land and property.

The United Kingdom is another country that applies TIF at the local level. By using TIF, local authorities can raise finance from the Public Works Loan Board to fund infrastructure projects, with the private-sector partner funding the subsequent commercial development. The local authorities will then use the increased business rates from the resulting development to repay the debt. One example is the Nine Elms redevelopment

project in London, the first project in the United Kingdom to be funded through the TIF tool. In a first step, the Greater London Authority (GLA) takes out a loan of up to GBP 1 billion to fund the Northern Line underground network extension project, with a repayment guarantee provided by the UK government. Loan repayments will be paid back partly through future growth in business rates revenue within the Nine Elms Enterprise Zone. In addition, a community infrastructure levy, and revenues from so-called "Section 106" agreements (private agreements between local authorities and developers), will also be used to pay back the loan. A case-study analysis of the Northern Line extension project, found that the advantages of TIF appear to exceed the associated disadvantages, though it should be applied wisely since it is considered as a new tool in the United Kingdom (Roukouni et al., 2014[13]).

Another good example of using specific taxes to fund infrastructure comes from the Japanese city of Fukuoka, which applies a city planning tax, a spa tax, and a business-office tax. Firstly, the city authorities collect the city-planning tax from owners of land and property within designated urban areas in Fukuoka. This amount collected goes into city-planning projects such as building streets, bridges, parks, and sewerage, and also into land-readjustment projects. Secondly, the city authorities collect a spa tax from users of mineral spring baths. This covers the costs and expenses of building facilities for environmental sanitation, mineral-springs management, tourism, and fire-control, and also promoting tourism. Thirdly, there is a business-office tax whose purpose is to cover the costs of projects to manage and improve the urban environment. The base for this tax extends to corporations or individuals who operate businesses in Fukuoka with a total office-floor area of at least 1 000 square metres, or at least 100 employees.

Similarly, Osaka's municipal tax system applies a fixed-asset/city-planning tax, and a business-facility tax. The first of these is imposed on owners of fixed assets, including land, housing, and depreciable property. Additionally, those who pay taxes related to land and housing also pay a city-planning tax, which helps to finance city-planning projects. The base of Osaka's other special-purpose tax – the business-facility tax – extends to corporate or individual operating businesses in general. In 2015, the city-planning tax contributed JPY 1.2 trillion, or 6% of the total municipal taxes in Japan (MIC, 2015[14]).

Private sector participation in infrastructure financing

The large infrastructure gap in Emerging Asia requires the use of new approaches to financing. The public sector will remain as the primary source of credit in the near term. Nonetheless, maximising private participation will be vital in closing the financing gap. The private sector can participate in infrastructure financing by investing in infrastructure projects and by participating in PPP projects. Institutional investors such as banks, pension funds and insurance companies are the largest source of private sector capital. Evidently, banking sectors and local capital markets in the region are generally still maturing in terms of depth, human resource expertise, and regulations. While Asian economies have arguably broadened their offshore capital market linkages over the years, factors such as low credit ratings for foreign currency debt, exchange rate risks, and the cost of compliance with the requirements of offshore markets, also hamper cross-border capital-raising activities.

This section will discuss the potential and challenges to increase private sector participation in infrastructure financing, including: i) deepening capital pooling mechanism in particular, infrastructure bonds, and ii) developing capital market, after the brief overview of recent trends of financing from the private sector.

Financing from private sector increases in the region, though varies between countries

From 2007 to 2016, the private sector invested almost USD 353 billion in infrastructure in Emerging Asia.[4] The outlay during this period exceeded by more than 60% the USD 217 billion injection from 1997 to 2006 in current prices. Still, the amount actually fell as a proportion of GDP – from 0.8% to 0.3%. In the ten years running up to 2016, roughly USD 118.9 billion was allotted to transport projects, of which land transport accounted for USD 108.1 billion.[5] On both counts, investment levels were substantially higher than in the preceding decade, by factors of 2.1 and 3.1 respectively. The number of projects with private sector participation also rose, from 1 038 projects in 1997-2006 to 1 594 projects in 2007-16, according to the World Bank PPI database. Transport was the focus of 399 projects in the most recent decade. Of these, 340 dealt with land transport in particular (Table 3.2).

Table 3.2. Private ownership and number of projects by geographic cluster, 2007-16

Infrastructure projects with private-sector participation, by region

Number of projects	All projects	Transport	Land transport
Emerging Asia	1 594	399	340
Europe and Central Asia	390	51	18
Latin America and the Caribbean	1 014	250	165
Middle East and North Africa	84	13	1
Sub-Saharan Africa	226	23	6
Investment, USD billion	**All projects**	**Transport**	**Land transport**
Emerging Asia	352.9	118.9	108.1
Europe and Central Asia	198.1	74.4	28.2
Latin America and the Caribbean	339.9	150.6	107.4
Middle East and North Africa	27.2	4.1	0.2
Sub-Saharan Africa	51.0	11.1	1.5
Average private ownership, %	**All projects**	**Transport**	**Land transport**
Emerging Asia	94.7	94.9	97.0
Europe and central Asia	93.5	92.6	84.1
Latin America and the Caribbean	95.6	98.6	99.9
Middle East and North Africa	89.8	86.9	100.0
Sub-Saharan Africa	94.1	93.7	87.0

Note: Not all projects have data on investment level and/or private ownership. Average private share pertains to simple average of private ownership in documented infrastructure projects where data are available. Year refers to financial closure year as defined in the World Bank PPI database.
Source: OECD Development Centre's calculations based on World Bank PPI database (World Bank, 2017[15]).

The extent of private ownership in publicly awarded projects in Emerging Asia from 2007 to 2016 is comparable to that of Europe and Central Asia, Latin America, and sub-Saharan Africa.[6] As regards ownership in transport projects, the private sector's share in Emerging Asia is lower than in Latin America, but higher than in Europe, Central Asia, sub-Saharan Africa, the Middle East, and North Africa. Meanwhile, private ownership in land transport projects in the region is middling relative to other geographic clusters, with projects in the Middle East, North Africa and Latin America either fully, or almost fully, privately owned.

From 2007 to 2016 in Emerging Asia, the sub-category of land transport accounted for more than 85% of transport projects, and more than 90% of investment pledges. Country-

level data show that India hosted most of these projects, i.e. about 85.6% of the total projects in the region, and almost 70% of the commitments for Emerging Asia. Meanwhile, about 8.5% of the projects, and 24% of the investment commitments, were in China, with ASEAN accounting for the remainder. Between 1997-2006 and 2007-16, project count in India grew by 157.5%, while investment pledges rose more than nine-fold. In China, the project count slid by 65.9%, but pledges increased by 57.5%. In Southeast Asia, meanwhile, project count and investments decreased by 28.6% and 21.2%, respectively, even though Indonesia and the Philippines recorded increased activity.

The ratio of investment commitments to project count helps to delineate the scale of infrastructure projects in which the private sector can participate. Generally speaking, it appears that private-sector involvement in China is limited to infrastructure projects with smaller overall values than is the case in India and Southeast Asia (Table 3.3). Compared to the period from 1997 to 2006, project involvement and total investment commitments in current prices broadened from 2007 to 2016 in India and all ASEAN economies except Malaysia although holding the level of prices constant shows that investment commitment in Emerging Asian countries fell between the two periods with the exception of Cambodia, Lao PDR and Thailand. The bulk of these projects and investment commitments in the most recent decade were in the Philippines, Indonesia, Thailand and Lao PDR. Nonetheless, the picture changes if transport projects are isolated. In this case, average investment per project from 2007 to 2016 is much higher in China compared with India and Southeast Asia. The scale of average project investment for transport projects in China has more than doubled from the previous decade. Data for China show that the private sector infuses more capital into each land transport project than it does into transport projects generally.

Table 3.3. Infrastructure projects with private sector participation in Emerging Asia

Average investment by project, USD billion (2005 constant prices)

	All projects		Transport		Land transport	
	1997-2006	2007-16	1997-2006	2007-16	1997-2006	2007-16
Cambodia	0.04	0.18	0.04	-	0.05	-
China	0.13	0.08	0.21	0.46	0.21	0.71
India	0.37	0.22	0.13	0.16	0.07	0.16
Indonesia	0.81	0.29	0.49	0.22	0.17	0.24
Lao PDR	0.46	0.50	0.005	-	-	-
Malaysia	0.62	0.37	0.38	0.32	0.44	0.32
Myanmar	0.73	0.17	-	0.06	-	-
Philippines	0.59	0.31	0.30	0.22	0.54	0.32
Thailand	0.21	0.17	0.18	-	0.48	-
Viet Nam	0.29	0.07	0.11	0.12	0.00	0.00

Note: Calculation only included projects with investment data. Headline CPI was used to adjust for inflation. Year refers to financial closure year as defined in the World Bank PPI database.
Source: OECD Development Centre's calculations based on World Bank PPI database (World Bank, 2017[15]).

Investing in infrastructure through various channels

In terms of investment channels, market participants can either invest in equity, debt or hybrid instruments (Table 3.4). As discussed in the subsequent paragraphs, debt financing

like bank loans and bond issuance is the most common mechanism to support infrastructure projects in many countries including those in Emerging Asia. Capital placement in fund pools like infrastructure funds, when available, is also used to attract investors who prefer to expose themselves only indirectly to corporations and special-purpose vehicles (SPV) that are working on infrastructure projects (OECD, 2015[16]). Alternatively, Islamic financing options have likewise been utilised and appear to have considerable potential to contribute to infrastructure financing in Emerging Asia in the coming years (Box 3.1).

In terms of risk management, the financing practice in recent years has tilted towards project financing as opposed to corporate financing, mainly due to considerations of credit flexibility and credit risk. As an aside, raising capital through corporate-listed equity, corporate-listed bonds, or corporate loans is referred to as corporate financing, whereas raising capital through SPV equity sales, SPV bond floats, and SPV bank loans, is referred to as project financing. This is preferred because corporations are generally not inclined to hold obligations on their balance sheets that will only start to pay out after several years, but this is a typical characteristic of an infrastructure investment. And while financial products such as bullet bonds, which only pay at maturity, are available to corporates, there is still a very limited market for these instruments in Emerging Asia.

Table 3.4. Taxonomy of instruments and vehicles for infrastructure financing

Modes		Infrastructure Finance Instruments		Market Vehicles
Asset Category	Instrument	Infrastructure Project	Corporate Balance Sheet/ Other Entities	Capital Pool
Fixed Income	Bonds	Project Bonds	Corporate Bonds, Green Bonds	Bond Indices, Bond Funds, ETFs
		Municipal, Sub-sovereign bonds		
		Green Bonds, Sukuk	Subordinated Bonds	
	Loans	Direct/Co-Investment lending to infrastructure project, Syndicated Project Loans	Direct/Co-Investment lending to infrastructure corporate	Debt Funds (GPs)
			Syndicated Loans, Securitized Loans (ABS), CLOs	Loan Indices, Loan Funds
Mixed	Hybrid	Subordinated Loans/Bonds, Mezzanine Finance	Subordinated Bonds, Convertible Bonds, Preferred Stock	Mezzanine Debt Funds (GPs), Hybrid Debt Funds
Equity	Listed	YieldCos	Listed infrastructure & utilities stocks, Closed-end Funds, REITs, IITs, MLPs	Listed Infrastructure Equity Funds, Indices, trusts, ETFs
	Unlisted	Direct/Co-Investment in infrastructure project equity, PPP	Direct/Co-Investment in infrastructure corporate equity	Unlisted Infrastructure Funds

Source: OECD (2015[16]), "Infrastructure financing instruments and incentives".

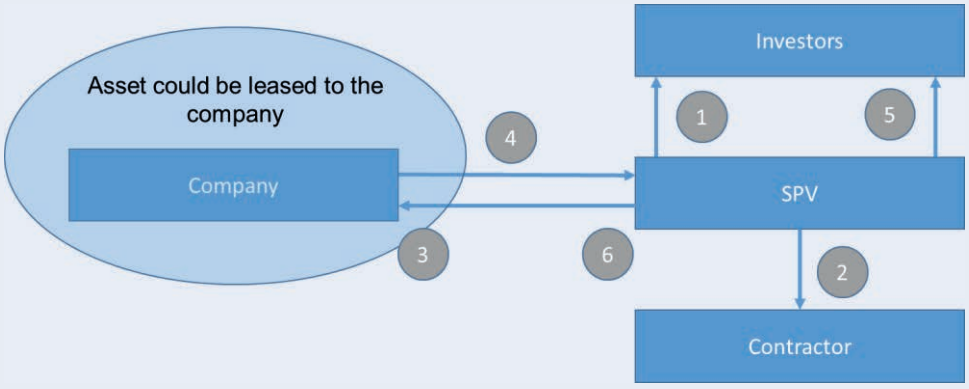
Box 3.1. Islamic finance

Islamic financing vehicles are increasingly becoming an important source of infrastructure financing in some parts of the region. Although the issuance of Sukuk, or so-called Islamic bonds, remains modest, representing less than 1% of the USD 102.3 trillion of outstanding global bonds, Fitch Ratings expected it to grow by 26% in 2017. As of August 2016, Malaysia was the hub for around 41% of Sukuk issuances for infrastructural and corporate investments, and has issued 61% of the

world's Sukuk in support of infrastructure development (S&P Global Ratings, 2016[17]). Indonesia trails behind with 26% of all the issuances. Sharia-compliant private-equity funds, although still largely underdeveloped, are also being explored as a potential source of capital.

In general, Sukuks have underlying assets from which income is generated. For infrastructure use, one mode is the Istisna'a Sukuk, which is "a contract of sale of specified items to be manufactured or constructed, with an obligation on the part of the manufacturer or builder (contractor) to deliver them to the customer upon completion" (Reda, 2017[18]) (Figure 3.2).

Figure 3.2. Sukuk Istisna'a example simplified structure



Note:
1. The Issuer (SPV) issues Sukuk to raise funds from investors.
2. SPV uses the proceeds to pay the contractor under the Istisna'a contract to build and deliver the project.
3. SPV sells the assets to the company under another Istisna'a contract.
4. The company makes periodic payments.
5. SPV distributes payments to investors.
6. Upon completion, the asset is delivered to the company.
Source: Abdelkafi, R. and H. Bedoui (2016[19]), "Challenges in infrastructure financing through sukuk issuance", http://www.irti.org/English/Research/Documents/WP/449.pdf.

However, Abdelkafi and Bedoui (2016[19]) argued that structuring Sukuk for infrastructure presents a number of challenges, particularly for developing countries. Aside from complying with Sharia law, other concerns include the payment of benefits, the tradability of Sukuk during the design and the construction phases of the project, and coming up with a pipeline of bankable projects that take into account an array of risks. Even in Istisna'a, the authors noted that differentiating the ownership of the infrastructure project and the ownership of the land where the project is constructed, can be a problem in the absence of well-founded Islamic securitisation statutes.

Developing infrastructure bonds

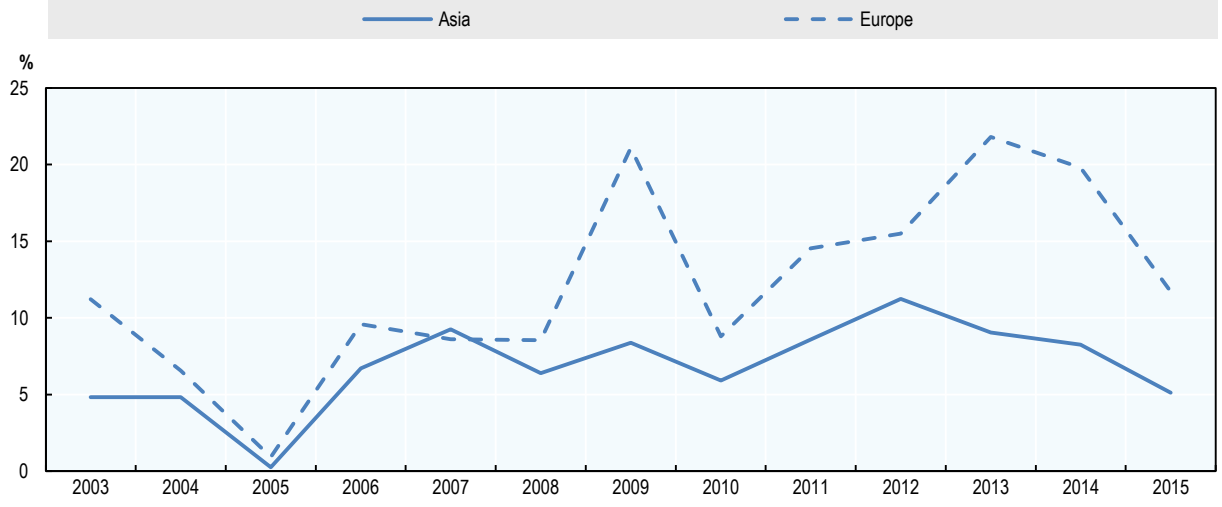
Specific-purpose borrowing – the issuance of debt instruments such as bonds to finance a particular project, where the income that the investment generates can then repay the debt – has commonly been used to finance infrastructure in some OECD countries, particularly in North America. Revenue bonds are one of the main sources of debt financing for

public infrastructure in the United States and Canada (Chan et al., 2009[20]). Public sector borrowing at the sub-national level, which has been used in many OECD countries – is another potential tool to explore in Emerging Asian countries. In the United States, municipal bonds are largely used to fund infrastructure projects including schools, hospitals and transport infrastructure. Although some countries in Emerging Asia, such as the Philippines and India, have already started using municipal bonds, the potential to further explore this tool in the region is still large.

The issuance of infrastructure bonds in Emerging Asia has generally picked up since early 2000, especially in China and Malaysia, although a pullback in issuance has been apparent of late (ADB, 2016[21]). Bond floats markedly increased between 2010 and 2012. Ehlers, Packer and Remolona (2014[22]) posited that the improvement in financial-market confidence beginning in 2009, and the increased interest of investors in bond markets in emerging economies, contributed to the rise in the use of bonds to finance infrastructure projects. Notably, between 2009 and 2013, infrastructure bonds in China soared to over three times the value of outstanding syndicated infrastructure loans in the country, which likely related to the large scale growth stimulus intended to spur the economy.

Issuances have generally slowed down in many economies since 2012-13, presumably due to the ongoing structural reforms in some countries (i.e. reducing growth reliance on investment in favour of consumption in China). A marginal deterioration in growth prospects and banking sector health as well as political certainty in other countries in the region may also have contributed to this. By end-2015, outstanding infrastructure bonds in Asia stood at roughly 5% of GDP (ADB, 2016[21]), about half as big as in Europe, indicative of the relative underdevelopment of the region's capital markets (Figure 3.3).

Figure 3.3. Infrastructure bonds outstanding as share of gross domestic product in Asia and Europe, 2003-15



Note: Simple average values for the gross domestic product of all economies in each region are used.
Source: ADB (2016[21]), Asia Bond Monitor, https://www.adb.org/publications/series/asia-bond-monitor.

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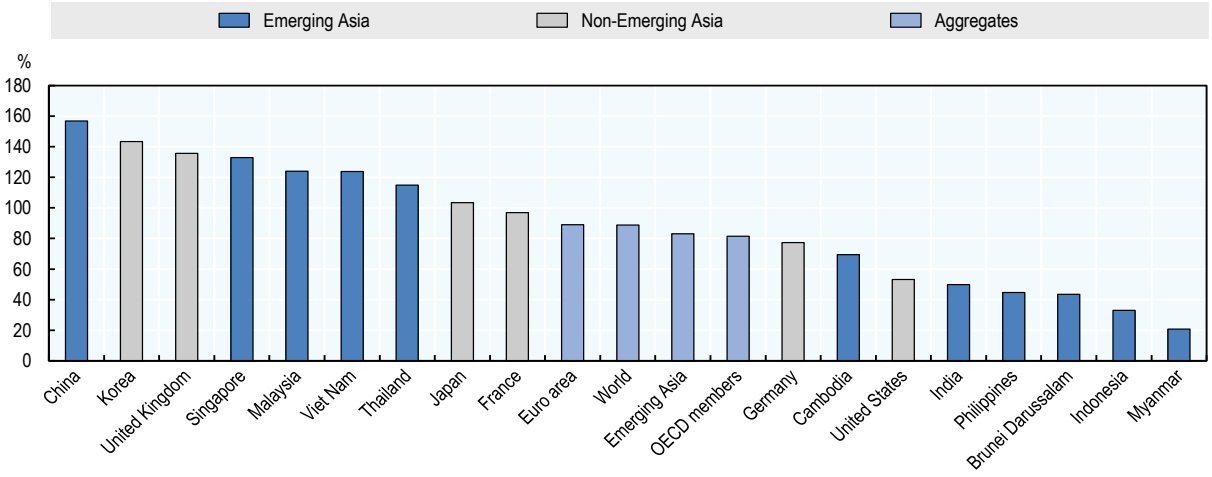
Developing capital markets

Increasing the private sector's participation in infrastructure investment in Emerging Asia means developing financial markets, as countries in the region generally tend to be bank-

centric. In terms of the bank-lending-to-GDP ratio, a number of economies in Emerging Asia stand above the average levels for the OECD and the world. Such countries include China, Singapore, Malaysia, Viet Nam and Thailand (Figure 3.4). In terms of outstanding local currency bonds, the depth of markets in countries in Emerging Asia relative to the size of their economies is shallower than in OECD countries such as Japan and Korea (Figure 3.5). In terms of the ratio of equity market capitalisation to GDP, Singapore, Malaysia and, to a certain extent, Thailand, have markets that are just as developed as many advanced economies. Still, despite the substantial increase in capital placements over the years, the other economies in Emerging Asia appear to lag behind in this respect (Figure 3.6).

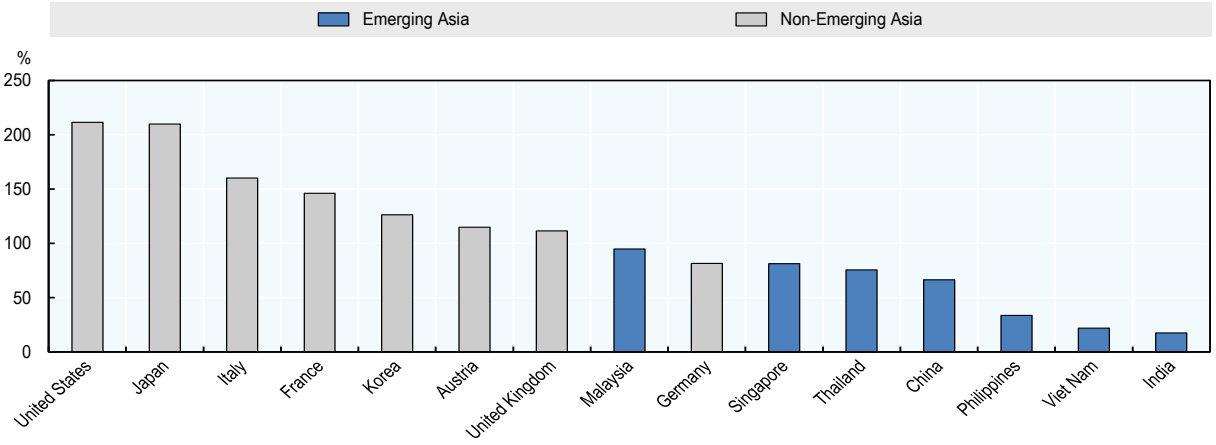
Figure 3.4. Banks' provision of domestic credit to the private sector, 2016
Percentage of GDP



Source: World Bank (2018[23]), World Development Indicators (database).

StatLink http://dx.doi.org/10.1787/888933841786

Figure 3.5. Outstanding local-currency bonds, 2016
Percentage of GDP

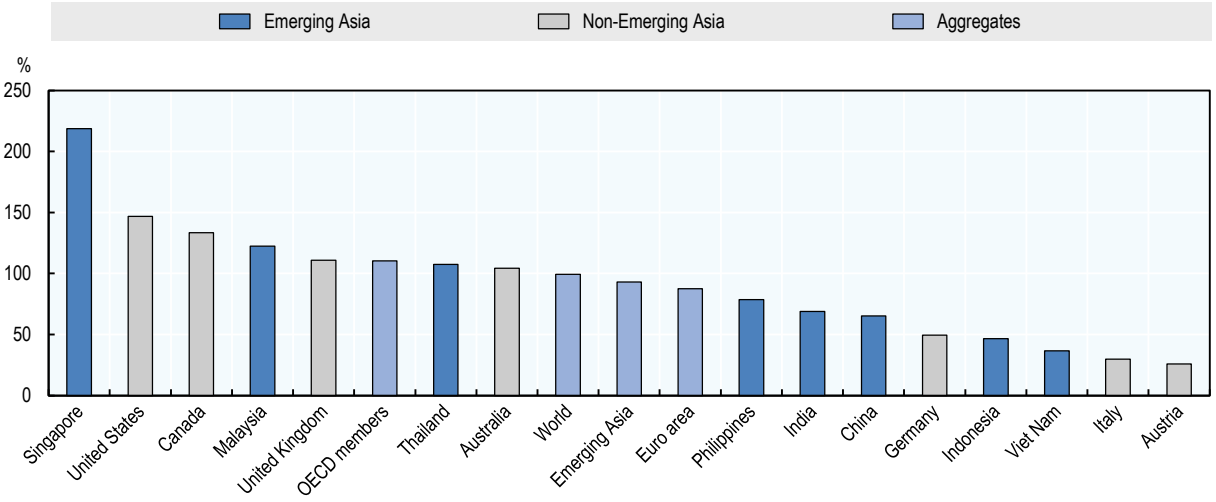


Source: OECD Development Centre calculations based on data from the European Central Bank, the US Securities Industry and Financial Markets Association, and the IMF; ADB AsianBondsOnline.

StatLink http://dx.doi.org/10.1787/888933841976

Figure 3.6. Capitalisation of domestic equity exchanges, 2016

Percentage of GDP



Source: OECD Development Centre calculations based on data of World Federation of Exchanges and IMF. Aggregates were taken from World Bank World Development Indicators Database.

StatLink http://dx.doi.org/10.1787/888933841995

A comparison of the assets under management of non-bank financial institutions (NBFIs), and the assets of deposit-taking institutions, indirectly implies that households' savings preferences have been gradually shifting towards the services of NBFIs and away from banks. Based on the World Bank's Global Financial Development database, the ratio of bank assets to NBFI assets has shrunk from more than 5.0 in 2000 to below 1.7 in 2015 in the developing countries in East Asia and the Pacific. The same trend can be observed in the developing countries in Latin America and the Caribbean, even if the ratio there still stood at over 6.5 in 2015. Openness among households to invest in fund pools, insurance policies, and other products outside of traditional deposits can be a catalyst in developing Asia's capital markets in the coming years.

As it stands, syndicated loans have remained as the primary funding mechanism for infrastructure both in Emerging Asia just like in advanced economies, even if bonds have been used with increased frequency in recent years. The PPP Center of the Philippines, for instance, commented in 2017 that while bonds and equity have been used to bankroll some PPP infrastructure projects, domestic capital markets have not been a significant source of PPP infrastructure finance. Data show that about PHP 67 billion (14%) of the almost PHP 488 billion raised on the local stock exchange between 2013 and 2016 was for infrastructure projects while PHP 115 billion, or 18% of the outstanding PHP 646 billion of non-government bonds at year-end 2016 was for energy, telecommunications and toll roads.

Nonetheless in the process of developing the capital markets and harnessing a fund pool for big ticket projects, it is equally important that oversight is not compromised. In the case of infrastructure, mechanisms that reduce the likelihood that projects end up contributing to financial-market risk have to be enhanced. These mechanisms are partly related to the efficiency of capital use, the strength of due-diligence frameworks, and

regulatory stability. To this end, the OECD provides a useful set of governance guidelines that may be applicable in certain country contexts (Table 3.5).

Table 3.5. Delivery modes and governance mechanisms for infrastructure

Delivery modes	Direct provision	Traditional public procurement	SOEs	PPPs	Regulated privatisation	Privatisation with liberalisation
Role of government	Planner, manager, producer	Planner and manager	Owner and planner	Planner and regulator	Regulator	Referee
Responsibility for project selection	Government	Government	SOEs and government	Government	Private firms with government influence	Private firms
Governments mechanisms	Command and control	Public procurement law	Corporate governance	Contractual agreements	Sector regulation	Competition policy
Relevant guidelines	OECD Draft Principles on Budgetary Governance	OECD Principles for Integrity in Public Procurement	OECD Guidelines on Corporate Governance of State-owned Enterprises	OECD Principles for the Public Governance of Public-Private Partnerships	OECD Recommendation of the Council concerning Structural Separation in Regulated Industries	OECD Recommendation of the Council concerning Structural Separation in Regulated Industries

Source: OECD (2015[24]), "Towards a framework for the governance of infrastructure", www.oecd.org/gov/budgeting/Towards-a-Framework-for-the-Governance-of-Infrastructure.pdf.

Using PPPs effectively

An important feature of PPPs is that, in addition to bringing in capital from the private sector, the involvement of private partners can also make infrastructure projects more efficient. Agreements to proceed with an infrastructure project in the form of a PPP usually take the form either of a build-operate/maintain-and-transfer (BOT) deal, a design-build-and-operate/maintain (DBO) arrangement, a design-build-finance-and-operate (DBFO) plan, or a build-own-and-operate/maintain (BOO) contract. In DBO models, the private partner does the work from the design stage through to operations, but the public sector finances the pre-construction and construction costs. In this model, private contractors usually receive transfers of funding in tranches, according to the outcomes they deliver. Given this set-up, the financing risk that the private partners in DBO-type contracts take on is minimal (World Bank, 2016[25]). In the other models, however, private sector partners take on a greater degree of financial risk, reflecting the need to secure financing for a project cycle that stretches over a longer period of time – from either the pre-construction or the construction phase right through to the post-construction phase. A variety of external and project-specific risks face public and private partners (Table 3.6). Among other factors, these risks differ according to whether the base infrastructure already exists and the government intends to privatise it – in which case it is akin to a brownfield investment – or if everything has to be built up from scratch, in the manner of a greenfield investment (ASIFMA/ICMA, 2016[26]).

Table 3.6. Three categories of risks for PPP

Risk	Agent	Macroeconomic Risk	Commercial Risk	Legal and Political Risk
External/ Exogenous	Private	Aggregate demand	Force majeure	Different investment preferences of alternating governments
		Interest rate risk		
		Liquidity risk	Demand risk	Expansionary anti-crises policies raising the cost of financing
		Exchange rate risk		Risk of expropriation
	Public	Aggregate demand	Force majeure	
		Interest rate risk		
		Liquidity risk		
		Exchange rate risk		
Project specific/ Endogenous	Private		Project design and construction risk	
			Project operation risk	
			Project maintenance risk	
			Project input and output quality and quantity risk	
			Project residual value risk	
			Contractor failure risk	
			Project renegotiation risk	
			Project early termination risk	
			Project security risk	
			Project technology risk	
			Idiosyncratic interest rate risk	
			Idiosyncratic liquidity risk	
			SPV credit risk	
			Constructing and operating credit risk	
			Financial institution credit risk	
	Public		Sovereign risk	Different investment preferences of alternating governments
			Demand risk	Expansionary anti-crises policies raising the cost of financing
				Risk of expropriation

Source: OECD (2015[24]), "Towards a framework for the governance of infrastructure", www.oecd.org/gov/budgeting/Towards-a-Framework-for-the-Governance-of-Infrastructure.pdf.

The investor can recover part of the costs of building the infrastructure, or of operating and maintaining it, by charging its users a cost of service. For example, operators may collect fees at toll barriers on roads, or charge users to access the water network. The fee is usually subject to regulations – such as caps on price, revenue or rate of return – in order to encourage efficient and fair charges. The regulatory asset base model is one of the methods that regulators can use in setting price or revenue caps in order to calculate the efficient cost of service provision. In the price-cap model, the regulator sets prices and then indexes them, usually against factors such as inflation, and may then also adjust for assumed improvements in efficiency. For example, toll roads collect user fees to recover construction costs, or to fund their maintenance. Nevertheless this means that the owner is exposed to demand risk. Prices are reviewed periodically – every one to five years, for example. That said, while the use of user fees in the region is well-documented, data on the amount this mechanism generates, and the scope it covers in financing infrastructure, are very scant.

Public-private partnerships have a long history, even if they have not gained traction in Emerging Asia as they did in Europe early in their development. Despite a number of countries seeking to lay the legal and administrative groundwork for PPPs in the 1990s, factors such as institutional weakness, inadequate capital markets, and a lack of technical expertise, took away from the attractiveness of such deals. However, over the past decade or so, governments in Emerging Asia have been more aggressive in creating business environments suitable for PPPs. Moreover, listed infrastructure funds are also becoming more common in the region (Box 3.2).

Box 3.2. Listed infrastructure funds in Emerging Asia

Inderst (2016[2]) estimated that the market capitalisation of infrastructure companies across Asia is roughly 2-2.5% of GDP – roughly half of the global average of around 4% of GDP. Likewise, listed infrastructure funds are not as common in Asia as they are in the OECD countries. The Macquarie International Infrastructure Fund (MIIF) was one such facility that focuses on infrastructure in Emerging Asia, particularly in China. However, the fund wound down in 2012, after being set up and listed on the Singapore Exchange (SGX) only a few years earlier, in 2005. Observations that the share price did not adequately reflect the value of MIIF's infrastructure businesses, and that MIIF's did not have the most appropriate structure to reflect the value of its businesses underpinned the divestment decision. By the time divestments began in December 2012, the group net asset value of the fund stood at a little less than SGD 830 million (USD 678.3 million), according to the MIIF annual report in 2013. Divestments, and a subsequent delisting from SGX, were completed in late 2015.

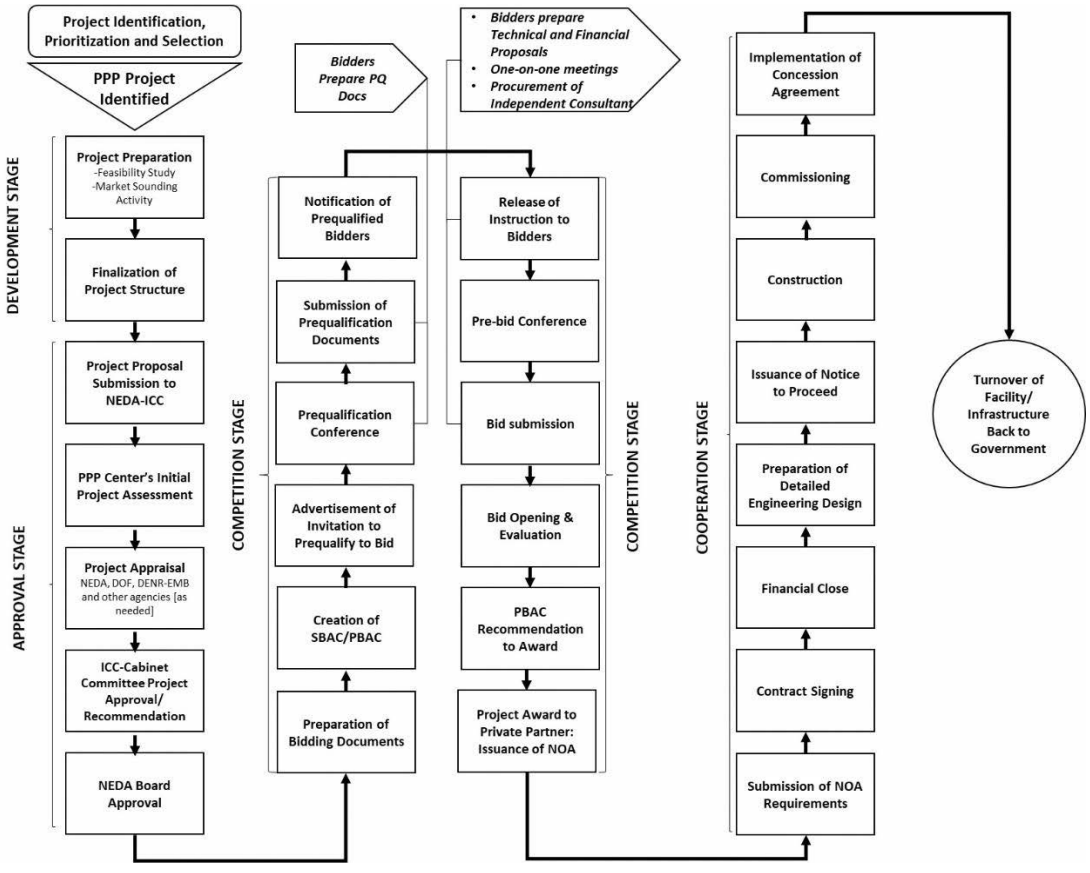
A similar vehicle was recently launched in India, and listed on the Bombay Stock Exchange. The IRB InvIT Fund, which hit the market in May 2017, became India's first infrastructure-investment trust fund (InvIT). The fund attracted more than IND 50 billion in equity investments (USD 782 million), and was oversubscribed by a factor of 8.6 (Oberoi, 2017[27]). The initial public offering of the IRB InvIT fund was possible in part thanks to the Securities and Exchange Board of India's implementation of regulations on infrastructure investments. Other infrastructure developers in India are expected to follow suit in the next few quarters. Apart from the two aforementioned funds, there do not appear to be any other notable listed funds dedicated to infrastructure financing in Emerging Asia at the moment.

Unlisted infrastructure funds seem to attract the interest of investors in the region more than listed funds. Between 2008 and May 2015, around 79 Asia-focused funds raised more than USD 24.6 billion in new capital, or roughly USD 3.3 billion a year (Preqin, 2015[28]). Combined, China; Chinese Taipei; and Hong Kong, China were the focus of ten of these funds, which raised over USD 5.3 billion during the period. The economies in Association of Southeast Asian Nations (ASEAN) were the beneficiaries of 13 funds, accumulating roughly USD 4.5 billion. Meanwhile, South Asia was the focus of another 13 funds that raised USD 3.8 billion – mostly bankrolling projects in India. Japan and Korea were the recipients of 28 funds that pooled more than USD 6 billion in capital over the period. The other 15 funds that attracted over USD 5 billion in roughly seven-and-a-half years focused on other parts of the region.

Deducing from the data of Preqin, the annual amount of fundraising in Asia has been increasing over the past few years. From about USD 5.2 billion in 2013, it declined to USD 4.3 billion in 2014, but has gone up since then to USD 6.6 billion in 2015 and to USD 7.6 billion in 2016. However, putting these numbers into global perspective suggests that infrastructure funds in Asia are still at a nascent stage. Asia's average of USD 5.9 billion between 2013 and 2016 is only about a third of the averages of Europe (USD 18.1 billion) and North America (USD 19.5 billion). That the biggest institutional investors are not domiciled in the region is a challenge in fundraising.

The Philippines, which has used PPPs as a mode of infrastructure procurement and financing, offers useful examples of how such infrastructure projects can be implemented in the region, and also points to some of the challenges. The Philippines adheres to the basic tenets of creating an enabling environment for PPPs. The first of these is to have a long-term policy and vision for the role of PPPs in infrastructure investment. The second is to have an appropriate legal and regulatory framework, including procurement rules and dispute-resolution mechanisms. The third tenet has been to build up institutional capacity – through the PPP Center – for shepherding projects along. Fourthly, there has been financial support, thanks to the establishment of a viability gap fund, and a so-called Project Development and Monitoring Facility (PDMF).

Figure 3.7. PPP project cycle



Source: PPP Center (2015[29]), "PPP Project Cycle", https://ppp.gov.ph/?infographics=ppp-project-cycle.

The creation of the PPP Center by way of Executive Order No. 8 as a central coordinating and monitoring unit for all PPP projects has boosted their use in the procurement and financing of infrastructure. The PPP mode of infrastructure procurement follows clear processes and procedures (Figure 3.7).

The weak capacity of government agencies to process PPPs is one of the problems that have caused delays in the tendering process. To address this, the PPP Center is pushing ahead with capacity-building activities, as do the units of government that implement projects, and the agencies that provide oversight. Moreover, to improve the monitoring of quality-at-entry and implementation, and as mentioned briefly above, the country set up the PDMF to provide support with project development and monitoring. The PDMF is a revolving fund for the preparation both of pre-feasibility and feasibility studies, and of tender documents for PPP projects. It also provides assistance with regard to the bidding process.

The PPP Center has issued several policy circulars to improve the PPP process. Policy Circular 03-2015 aims to institutionalise best practices in the PPP procurement process and in project implementation across government. These best practices include the following:

- Sounding out the market to assess the private sector's ability to assume risks through a PPP contract.
- One-on-one meetings with pre-qualified bidders to clarify any questions, comments, or concerns they may have, and to discuss the key terms and conditions of the draft PPP agreement.
- Conflict-management planning to ensure full disclosure of all of the firm's clients that are participating in a particular PPP project.
- Control testing to determine the bidder's compliance with the nationality requirement for PPP projects whose operation requires a public-utility franchise.
- The appointment of an independent consultant or engineer to ensure the successful and timely delivery of projects through the provision of efficient, fair, and transparent technical services to the contracting parties.
- A virtual data room to allow the implementing agencies to manage bidders' information requirements during the project-tender process in an efficient and timely manner.

The Philippines has also started to provide viability-gap funding for PPP projects for which user charges would not be sufficient to ensure their commercial viability. The PPP Center issued Policy Circular No. 04-2015 to institutionalise viability-gap funding for PPP projects. This financial support is only available for solicited, concession-based PPP projects. It takes the form of a cash subsidy – a contribution of the government to the project. One of the PPP characteristics currently seen in the region is that more of the weight of risk is put on the public side compared to the private side, suggesting that further participation of private sector in risks sharing will be needed in the long term.

Another policy in the Philippines sets out to assess PPP projects' value for money (Policy Circular No. 09A-2016) by institutionalising value-for-money analysis in all PPP projects. The circular enjoins implementing agencies to apply this analysis at the project-development stage, in order to assess the appropriateness of making projects into PPPs, and to assess whether they will provide better value for money than the traditional

procurement option. Meanwhile, Policy Circular 05B-2017, a very recent initiative, concerns the appointment of probity advisors for PPP procurement. The probity advisor acts as an independent observer and critic on all aspects of the procurement process, from the very beginning up to the signing of a contract with the selected bidder.

Development of infrastructure funds

In order to ensure the efficient administration of earmarked taxes, fees, and other non-tax revenues (such as proceeds from privatisation or mineral extraction), many OECD countries have infrastructure funds. These are seen as the most practical way of keeping earmarked revenues separate, and to save them for special expenditures (OECD, 2013[30]).

In Switzerland, revenues from different sources are deposited in three infrastructure funds. The most important of these funding instruments is the Special Financing of Road Traffic (SFRT) Fund. Switzerland introduced this fund in 1958 in order to finance the construction of the country's motorway network. Its main sources of funds are the petroleum tax and the motorway vignette. Furthermore, the SFRT fund contributes to the two additional Swiss transport funds that have been introduced more recently. The first of these is the Major Railway Projects Fund, which dates from 1998, and which funds major extensions to the railway network. Secondly, there is also the "Infrastructure Fund", which dates from 2008, and funds works to complete the motorway network and eliminate motorway bottlenecks, in addition to metropolitan road and rail transport projects. The railway projects fund also receives inflows from the heavy vehicle fee, as well as a small share of VAT (OECD, 2012[31]).

One of the advantages of the Swiss infrastructure funding system is that it guarantees reliable, long-term financing for transport infrastructure, unaffected by the imponderables of the budget process. This system has supported a range of ambitious transport infrastructure projects in Switzerland (OECD, 2011[32]).

Among the countries of Emerging Asia, Thailand and the Philippines make use of infrastructure funds, while, at a regional level, ASEAN Member States have access to the ASEAN Infrastructure Fund (Box 3.3). In December 2015, the Thai government approved the Thailand Future Fund (TFF) and slated it for launch as soon as possible, raising 100 billion baht (THB) (USD 2.8 billion) of initial capital for infrastructure projects. The plan is to list the TFF on the Thai stock exchange, with the finance ministry and the country's Vayupak Fund contributing THB 10 billion of seed capital. The fund will expect participation from domestic and foreign investors on a long-term basis. Several institutional investors have shown interest in investing in the TFF, including sovereign wealth funds (SWFs) from foreign countries.

Box 3.3. The ASEAN Infrastructure Fund (AIF)

Initial expectations are for the AIF to provide loans of up to USD 300 million a year, having a lending commitment through 2020 of up to USD 4 billion. The AIF was incorporated in April 2012, with equity contributions from nine ASEAN members (Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, the Philippines, Singapore, Thailand and Viet Nam) plus the ADB. For example, the Philippines' initial equity contribution was USD 15 million (Table 3.7).

AIF became operational in 2013. The first project that it funded was the 500 kilovolt Power Transmission Crossing Project between Java and Bali in Indonesia, in December 2013. The funding was distributed as follows: the AIF contributed USD 25 million, the ADB contributed USD 224 million, and the Indonesian government contributed USD 161 million (ASEAN, 2013[33]). AIF targets six infrastructure projects annually, to be selected according to economic and financial criteria and the impact they will have in terms of poverty reduction (Llanto, Navarro and Ortiz, 2016[34]).

Table 3.7. Structure of the ASEAN Infrastructure Fund

Equity	Debt	Lending operations	ADB's role
• USD 335.2 million from nine ASEAN countries. • USD 150 million from the ADB. • Around USD 162 million in hybrid capital (perpetual bonds).	• Debt issued to leverage 1.5 times the equity*. • High investment-grade credit rating targeted. • Central banks and other institutions, including from the private sector, to purchase the debt after the AIF has established a clear track-record and sufficient lending volume.	• Lending to relevant ASEAN countries. • Based on ADB's country partnership strategy, and regional pipelines. • Initially, only on sovereign and sovereign-guaranteed projects and the public portion of PPP projects; later also loans to private sponsors after a formal determination from the AIF.	• Generate the project pipeline. • Ensure that appropriate safeguards and due diligence are part of the project design and administration, and report to ASEAN. • Provide co-financing and act as the lender of record. • Administer the AIF (including financial management, loan servicing, accounting and financial reporting) during project administration and evaluation.

* In capital-adequacy terms, this means an equity-to-loan ratio of about 60% by 2020, and about 44% by 2025.
Source: ADB (2011[35]), "Proposed equity contribution and administration of ASEAN Infrastructure Fund", www.adb.org/sites/default/files/project-document/61053/45097-001-reg-rrp.pdf.

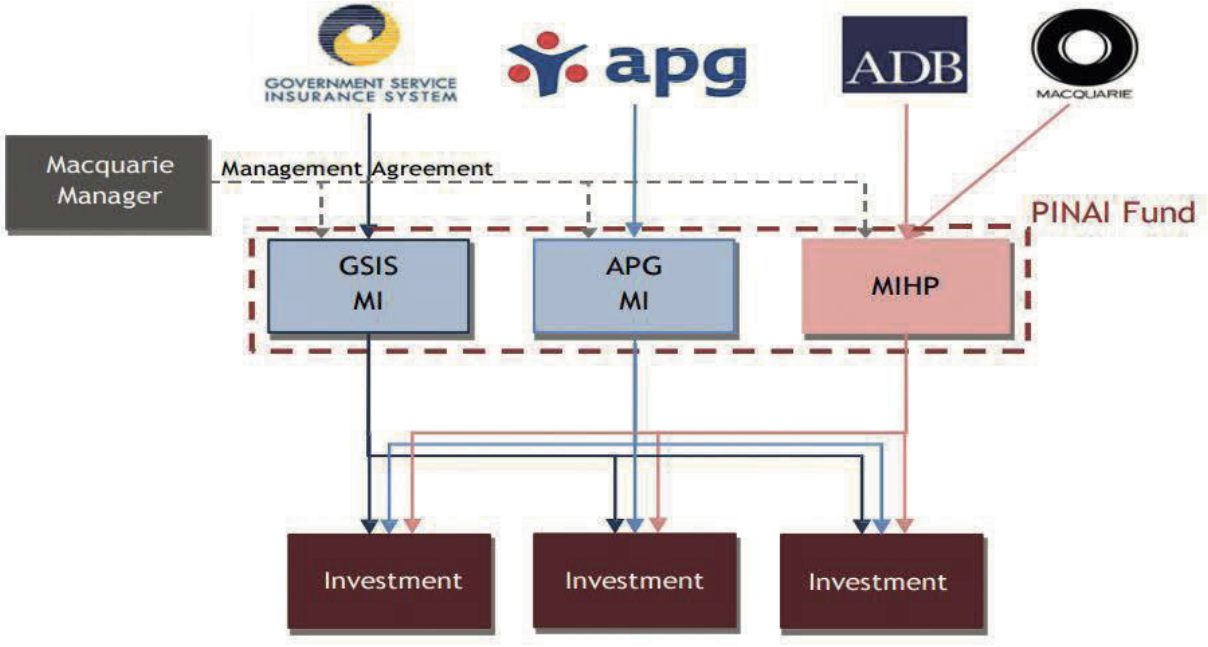
SWFs are increasingly investing in infrastructure. In 2016, they amounted to 62% of investment made in infrastructure globally and 48% of infrastructure investment made in Asia. Furthermore, SWFs' investment account for 95% of energy and 86% transportation investments (Preqin, 2016[36]). Advanced economies offer secure revenues but attention is also paid to emerging markets. For instance, the third largest SWF by assets under management, the Abu Dhabi Investment Authority (ADIA), agreed in October 2017 to invest USD 1 billion in India's National Investment and Infrastructure Fund (NIIF) set in 2015. This made possible the recent investment of NIIF in partnership with DP World to India's port infrastructure.

Emerging Asian SWFs are also investing in infrastructure elsewhere in the region. Singapore's two SWFs are good examples. Established in 1974, Temasek Holdings' asset amount to USD 197 billion as of March 2017. More than half of its portfolio is invested in Asia (excluding Japan and Korea), and in terms of sectors, 17% of assets are put into transportation and industrials. One of its investment themes involves infrastructure investments to growing economies including Emerging Asia, which could explain the active talks with NIIF for investments in India's infrastructure. The Government Investment Company (GIC) Private Limited, established in 1981, is the eighth largest

SWF by assets under management with a capital of USD 359 billion. It increased its exposure to infrastructure assets in emerging markets by investing in IFC Global Infrastructure Fund in 2013. Recently, it has invested in renewable energy in India, the Philippines and Japan. Other SWFs are also investing in infrastructure in the region to different extents, including China Investment Corporation (CIC) which is the second largest SWF with assets worth USD 900 billion, Khazanah Nasional Berhad of Malaysia worth USD 38.7 billion and State Capital Investment Corporation of Viet Nam worth USD 500 million as of February 2018 (SWFI, 2018[37]).

The Philippines Investment Alliance for Infrastructure (PINAI) fund is a private-equity fund co-financed by pension funds and the ADB. It is a closed-end fund with a time horizon of ten years, and it dedicates its activities to equity investment in infrastructure in the Philippines. The government came up with the concept of this fund with the aim of attracting and facilitating institutional investment. It had its first and final close in July 2012, raising PHP 26 billion (around USD 625 million). PINAI is managed by Macquarie Infrastructure and Real Assets. More precisely, its financial investors are: the Philippines' state-owned pension fund for government employees (the Government Service Insurance System, or GSIS), the Dutch pension fund asset manager Algemene Pensioen Groep, the Macquarie Group, and the ADB. The GSIS, contributed the largest equity share at 64%. The fund's overall structure is a combination of direct investors (GSIS and APG), and a pooling vehicle known by the acronym MIHP (Figure 3.8). One of the unique aspects of the PINAI fund is the close relationship between its manager and the investors, since the number of parties involved are small. The investors also have a good understanding of the market and investment climate.

Figure 3.8. Structure of the Philippines Investment Alliance for Infrastructure (PINAI) fund



Source: OECD (2014[38]), "Pooling of institutional investors' capital: selected case studies in unlisted equity infrastructure", https://www.oecd.org/finance/OECD-Pooling-Institutional-Investors-Capital-Unlisted-Equity-Infrastructure.pdf.

The PINAI fund seeks to invest in a portfolio of greenfield and brownfield infrastructure projects in the Philippines, notably in ports and airports, mass transit systems, rail and roads, water and waste, utilities, power generation and transmission, renewable energy, gas distribution, and telecommunication infrastructure projects. The fund's target is to invest between USD 50 million and USD 125 million in each project. In 2015, PINAI invested in solar plants acquiring majority stakes in San Carlos Solar Energy Inc., (SaCaSol) inaugurated in 2014 with a capacity of 45 megawatts, and in Negros Island Solar Power (islaSol) launched in 2016 with a capacity of 80 megawatts.

Notes

[1] The report is unclear whether explicit and implicit infrastructure project guarantees were incorporated in the calculation. Country-level definitions of infrastructure and reported expenditure on infrastructure tend to differ.

[2] Citing Wagenvoort et. al. (2010), Inderst noted that the public-to-private share in infrastructure financing in the member states of the European Union that joined before the enlargement of 2004 is 1:2, while it is 1:1 in the new member states. In the United Kingdom, calculations from HM Treasury in 2014 show the private share to be around 70%. Meanwhile, Inderst reported that, in Asia, the share of the public sector in the total burden of infrastructure investment stood at 90% in the Philippines, 80% in Thailand, 65% in Indonesia, and 50% in Malaysia. Inderst cited figures from Goldman Sachs in 2013.

[3] Tax rates are as of 1 April 2012 (except for Australia, for which they are as of 1 July 2012).

[4] The extent of private-sector involvement in infrastructure financing is just as difficult to pin down with accuracy. The World Bank's PPI database of private participation in infrastructure (World Bank, 2017) provides extensive information on private-sector investments in infrastructure that governments have agreed to, although this information is not exhaustive. The database features projects that are fully funded by private equity, and also those for which there was as public contribution. It covers 139 low- and middle-income countries, including 10 from Emerging Asia, and more than over 6 400 infrastructure projects in energy, telecommunications, transport, and water and sewerage sectors since 1990 (Brunei Darussalam and Singapore are seen as advanced economies). The dataset from the custom query option was used, since it is more updated than the Stata version, which only contains data up to the end of 2015 (as of 30 June 2017). For some projects, there is no information on investment levels and it is not explicitly stated that investment levels have been adjusted for exchange rates and/or inflation.

[5] Land transportation covers sub-sectors labelled under the following headings: “ports, railways”; “railways”; “railways, roads”; and “roads”. The annual data are based on financial closure, the definition of which can be found on the webpage of the PPI database, https://ppi.worldbank.org/methodology/ppi-methodology.

[6] Emerging Asia is a subset of the East Asia and Pacific and South Asia regions combined, as defined in the dataset. Projects in South Asia that were covered are mostly in India.

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Chapter 4. Bringing development strategies and infrastructure planning into closer alignment: A special focus on the case of Viet Nam

The quality of infrastructure cannot be judged entirely in isolation, and also requires that projects complement broader development strategies where they are implemented. However, weak public investment management systems can lead to investments that are less fiscally sustainable and unlikely to make effective contributions to growth and development. Similarly, appraisal systems are critical in identifying quality infrastructure projects, as are institutions for infrastructure governance. Viet Nam, which has adopted many principles of quality infrastructure through its planning system, offers an interesting case study, though further work could be done to strengthen the connections between socio-economic development plans and transport planning. Detailed budgeting, time-specific targets, and clearer criteria, could be helpful in addressing these challenges.

Introduction

By co-ordinating and directing action, and setting expectations for investors and other actors, well-aligned development strategies and infrastructure plans are important in pursuing infrastructure investments that have positive social and economic impacts. Many Asian countries could improve the outcomes of their infrastructure investments with complementary development and infrastructure planning. Three important issues to be addressed in this chapter in fostering improved alignment between national development strategy and infrastructure planning are the development of efficient public investment management mechanisms, effective processes of project appraisal and institutions for infrastructure governance.

Viet Nam's progress in developing infrastructure is partly due to its effective planning for the sector. Multiple socioeconomic and transport development plans are used in Viet Nam to diver infrastructure development. Despite the strengths of this arrangement, more could be done to strengthen the connections between plans, improve targets set in the plans and reduce uncertainties in financing infrastructure projects.

Implementing efficient public investment management mechanisms

In the absence of efficient management, investment spending is unlikely to be fiscally sustainable or to promote growth or development. Systems for the management of public investment (PIM), which are either weak or non-existent in many developing economies, can foster effective investment in infrastructure. The lack of good PIM capacities can lead to political influence in project planning and selection, delays in designing and completing projects, waste due to corruption, cost overruns and delayed or incomplete projects, lower-quality results, and less effective or efficient operation. In turn, all of these issues have negative impacts on a country's overall economic and development strategies.

Rajaram et al. (2010[1]) identified eight critical areas for developing an efficient PIM system. These cover the clarity and transparency of investment processes, the use of appraisal processes with clearly-defined criteria, the use of independent reviews in appraisals, the responsible review of funding options, defined roles of implementing agencies in awarding and monitoring projects, clear processes for managing adjustments to projects during their implementation, monitoring and responsibility during projects' operational periods, and what procedures are in place for auditing projects after their implementation and how are lessons learned identified and acted upon in future.

A subsequent study builds on this diagnostic approach in reviewing PIM systems in several countries, including Asian countries: China, Viet Nam, Korea and Timor-Leste (Rajaram et al., 2014[2]). China's investment on public infrastructure transitioned from the government giving full support to investing throughout the economy in 1979–83. This was followed by a series of incremental steps to decentralise control and create funding sources (state banks) to replace budget funding of investment over 1983–2003 and a number of clarifying reforms in 2004. Viet Nam also decentralised its investment, and modernised public investment through legislation in 2005. Additionally, significant efforts were placed to regulate appraisal, monitoring and evaluation in 2014 and reform procurements. In Korea, the Total Project Cost Management (TPCM) system was introduced in 1994 and the planning and budgeting ministries were merged in 1999, the same year that a cross-ministerial task force designed an action plan to strengthen PIM. Preliminary feasibility studies and an ex-post performance evaluation system were also

introduced. The TPCM system was strengthened by addition of Reassessment Study of Feasibility mechanism and under the National Finance Act in 2006. Reforms in Timor-Leste have helped to improve transparency by clarifying the relationship between the Petroleum Fund and the annual budget, preventing off-budget public investment and including most donor-funded projects in which the government is a partner in the budget.

Short-term political dynamics can create challenges for the long-term perspective needed in infrastructure investment. These challenges arise through multiple channels; political pressures may distort infrastructure planning, such as through the prioritisation of projects to fit electoral cycles, or project costs may be increased because of the risks to investors and developers arising from political uncertainty. Projects affecting politically sensitive issues such as equity, environmental and land use or national security considerations often entail further challenges. Among OECD countries with overall shortlists of priority projects, political interests and agendas are often the most important criteria in prioritising projects within shortlists (OECD, 2016[3]). The institutionalisation of infrastructure management can help to overcome or mitigate some of the challenges associated with political pressures in the infrastructure sector. Stable regulatory frameworks are important in supporting the credibility of long-term infrastructure planning. National strategic visions for infrastructure may exceed the periods of normal political mandates, and should be anchored in central agencies of government, with input from policy departments, other levels of government and other stakeholders (OECD, 2017[4]).

Improving project appraisal

The effective appraisal of projects is critical to ensuring that a planned piece of infrastructure will support a country's economic and development strategies. Project appraisal can help to screen out white elephant projects that draw heavily on a country's capital and current budgets without providing any significant social and economic benefits; ensure the financial viability of the project, proper costing and financing of the investment phase, and appropriate risk diversification; and help to ensure that economic gains are realised and broadly shared with consideration of environmental impacts and appropriate compensation for negatively-affected groups. Thus, project appraisals can improve the matching of infrastructure planning and economic and development strategies.

Effective project appraisals require clear institutional arrangements between fiscal management and economic planning. In many countries, these two functions are under different ministries. Institutional arrangements can also be complicated in countries with greater decentralisation, and in which sub-national governments have roles to play in economic planning. Similarly, clear and transparent guidelines are needed to help prevent political interference and capture of projects. In 2005, Ireland's Department of Finance published its Guidelines for the Appraisal and Management of Capital and Expenditure Proposals in the Public Sector, for example. These guidelines set out a range of appraisal methods to match the scale of potential projects. It classifies five groups of project proposals based on estimated costs and other criteria, with unique appraisal methods applied to each. Transparent processes and the publishing of appraisals results help to provide some checks and balances on officials involved in infrastructure decision making. Appraisals may also need to be continued during the operational phase of a project.

Capacity limitations may diminish the efficiency of process of project appraisals, though the outsourcing of some appraisal work may help to overcome this if governments retain oversight and decision-making responsibilities. The Gateway review process used in the

United Kingdom provides an example of independent peer reviews of project appraisals and monitoring. In the United Kingdom, once the business case for a project is approved, HM Treasury makes the final decision on whether to go ahead with the plan, as part of its spending review process. In its Green Book, HM Treasury sets out a framework for appraising all of the central government's projects and programmes. These guidelines clearly state that public bodies need to carefully consider which implementation method is likely to be the most effective. They also contain guidance for decision makers on how to undertake a project, including the degree of involvement from private sector. To achieve better value for money for public spending, HM Treasury has revised the project approval process, and the results of this revision have been effective since April 2011. The United Kingdom government has established the Major Projects Authority within the Cabinet Office's Efficiency and Reform Group to replace the Major Projects Directorate in the Office of Government Commerce.

Donors can also play a more active role in overcoming the insufficient appraisal of projects, and many are already demanding satisfactory project appraisals before they will release funds for projects. In addition, donors are increasingly demanding that projects be monitored and appraised after their construction.

Case study: Viet Nam

Viet Nam offers an interesting case study because officials have accepted many quality infrastructure principles, incorporating these in the development of infrastructure projects. Socioeconomic and transport development plans are used to set goals and plan future actions, though these two types of plans are not as complementary as they could be. Policy challenges to be addressed in strengthening development and infrastructure planning include the connection between these planning processes, infrastructure targets and financial plans.

Development strategies and infrastructure planning

Planning infrastructure investment in Viet Nam is affected by the five-year and annual Socio-economic Development Plans (SEDPs) based on the ten-year Socio-economic Development Strategy (SEDS), transport development strategies and plannings (Table 4.1).

Table 4.1. Summary of documents on SEDS, SEDPS and transport plans

Document type and name		Timeframe	Issued/approved by
SEDS	National Socioeconomic Development Strategy	Ten years	Central Party Executive Committee
SEDP	Five-year SEDP	Five years	Drafted by the government and approved by the National Assembly
	Annual national SEDP	One year	Drafted by the Ministry of Planning and Investment and approved by the National Assembly
	Annual provincial SEDP	One year	Provincial People's Council
Planning or master plan	Master plan for the socio-economic development of special territories	Ten to fifteen years and beyond	Drafted by the Ministry of Planning and Investment and approved by the Prime Minister
	National or provincial planning for the development of sectors and products	Ten to fifteen years and beyond	Line ministries approve national plans and Provincial People's Council approves provincial plans
	Transport development plans by key economic region, province and district	Ten to fifteen years and beyond	Prime Minister approves national plans and the chairperson of the People's Committee approves plans at the provincial or district level
	National/provincial plans for roads, railways, inland waterways, aviation, seaports and highways	Ten to fifteen years and beyond	Prime Minister approves national plans.

Source: OECD Development Centre's compilation based on national sources.

Socio-economic development plans in Viet Nam

Viet Nam's planned investments in transport infrastructure are detailed in its five-year and annual SEDPs, as approved in the country's ten-year SEDS. The SEDS is approved and enacted by the country's national assembly. It acts as a framework for the development of the shorter-term SEDPs.

In the 1990s, in the wake of Viet Nam's economic reforms of the late 1980s, the nature of the country's SEDPs evolved from bureaucratic plans into something more directive. From the late 1990s to the early 2000s, Viet Nam continued to transform its SEDPs into medium-term action plans for government, similar to the plans that new governments in other nations tend to put in place upon taking office. Based on the ten-year SEDS, the government charges the Ministry of Planning and Investment with the responsibility of developing the five-year national SEDP for submission to the national assembly for approval. The ministry chairs the process and plays a co-ordinating role with other parts of government and with local authorities. After two to three years, a mid-term evaluation of the five-year plan is conducted. Based on the results of this evaluation, policy makers may adjust the original objectives and indicators of the five-year plan to better suit the circumstances in the country, as well as the international economic context.

Local governments elaborate their own SEDPs, which they base on the SEDPs from higher levels of government, and which require approval from higher levels of government. At the level of the commune or ward, public servants prepare only annual plans instead of five-year programmes. Annual SEDPs flesh out in detail the objectives from the five-year plan of the locality or sector in question, with consideration of changes in the socio-economic situation of the country.

In practice, the design of the SEDPs and the process of their implementation can limit their usefulness as tools for development planning generally and infrastructure planning in particular. Rather than quantitative targets, SEDPs tend to include subjective goals on

topics without formal methods of measurement, and do not go into detail on how goals are to be achieved. This is particularly problematic in local government planning.

SEDP's goals are also not necessarily aligned with the adequate budget and resources, and do not have an adequate order of priority in budget allocations. Moreover, because Viet Nam has not yet fully applied a medium-term financial plan to the budget process, the five-year SEDPs of local authorities can only ensure funding for projects that policy makers deem to be especially important. In addition, more effective monitoring of SEDPs is needed; evaluation takes place primarily at the beginning of the new plan period, with little consequences in place when SEDP's goals are not achieved at the end of the plan period.

Transport development plan in Viet Nam

Transport development strategies in Viet Nam often encompass a ten-year period in covering the development for transport networks and a broad twenty-year vision. Viet Nam developed its first strategy of this kind in 2004, and has revised it every five years. Although there is this overall strategy for developing transport, there is no master plan on the issue. Instead, there are many different types of transport development plans, both at the central and the local level. Unlike the ten-year SEDSs and five-year SEDPs, they differ in their timeframe depending on the level of government and on the sector to which it relates, with periodic re-examination by policy makers.

There are two main types of transport development plans in Viet Nam. The first of these is plans related to special territories, such as key economic regions in the north, centre and south of the country, as well as in the Mekong Delta, and at the level of provinces, cities and districts. The second group consists of plans focusing on a particular mode of transport, such as road, rail, aviation, seaports, inland waterways or highways. For each mode of transport, plans are developed at different levels: nationwide; for specific regions such as key economic zones; for provinces, cities and districts.

The Prime Minister approves transport development plans at the level of the central government, proposed by the Minister of Transport. The presidents of Viet Nam's People's Committees approve plans for provinces and cities, following proposals by the directors of provincial or municipal transport departments. At the commune level, the presidents of the Provincial People's Committees are responsible for approving plans proposed by the transport department. Authorities responsible for transport development plans and policies also differ by the mode of transport and type of infrastructure (Table 4.2).

Table 4.2. Responsibilities for transport development plans and policies in Viet Nam

Type of infrastructure	Responsible authority	Regulations on functions and duties	Regulations governing multi-modal initiatives
Roads	Directorate for Roads of Viet Nam (DRVN), reporting to the Ministry of Transport	Decision No. 60/2013 / QD-TTg dated 21/10/2013	Ministry of Transport, as stipulated in Decree No. 12/2017/ ND-CP
Highways	Generally, the Ministry of Transport, although sometimes unclear		
Railways	Railway authority, reporting to the Ministry of Transport; Viet Nam Railways, reporting to the Prime Minister		
Inland waterways	Vietnam Inland Waterways Administration, reporting to the Ministry of Transport	Decision No.27/2008/ QD-BGTVT dated 2 September 2008	
Ports	Vietnam Maritime Administration, reporting to the Ministry of Transport and Vietnam National Shipping Lines (Vinalines), reporting to the Prime Minister	Decision No.1155/QD-BGTVT dated 3 April 2015	
Aviation	Civil Aviation Administration of Vietnam, reporting to the Ministry of Transport	Decision No.121/QD-BGTVT dated 14 January 2016	

Source: OECD Development Centre's compilation based on JICA (2010[5]).

Although national transport development plans are approved by the Prime Minister, they are not guaranteed the budgetary support from the National Assembly and are not binding. The division of responsibilities in planning and budgeting can further complicate matters; Ministry of Transport and the Ministry of Planning and Investment take the lead in planning new road projects and also plan funding for road maintenance with the Ministry of Finance as a third partner, with financing provided by both the transport and finance ministries. As a result of this arrangement, trade-offs between new roads and road maintenance may not be fully taken into account.

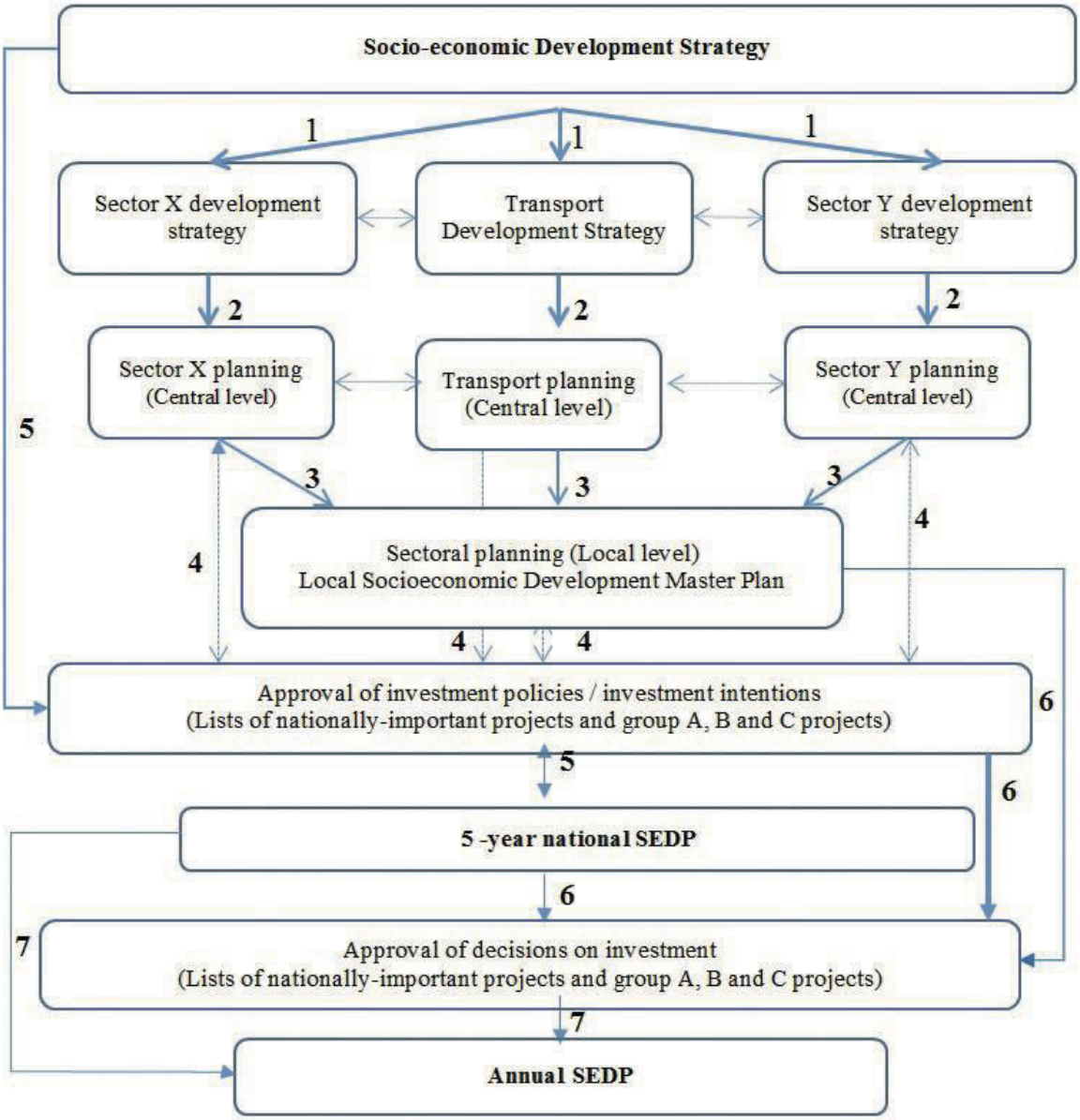
Transport infrastructure planning is further complicated by the spread of other responsibilities across multiple areas and levels of government, though the Ministry of Transport has a co-ordinating role in formulating transport development plans. More specifically, the ministry handles five key aspects of infrastructure development: formulating policy, planning and management of the national transport infrastructure, assisting local authorities in developing their own transport plans, developing medium and long-term plans for the sector, and prioritising among subsidiary departments focusing on individual sectors. Infrastructure projects that require a more multi-sectoral approach to planning are often broken down into sub-projects and assigned to relevant parts of the Ministry of Transport. This type of fragmented planning has led to bottlenecks such as the approach roads to new ports not being ready for the opening of the facility to cargo, or newly-built bridges slowing inland waterway traffic. Relatedly, the process of infrastructure planning does not always account for interactions and complementaries with other sector-wide and territorial plans in the country. Viet Nam currently has dozens of sectoral plans signed and issued by the prime minister, and hundreds issued by local authorities.

Data limitations and a lack of forecasts also pose challenges for infrastructure planning by increasing uncertainty. Reliable information on the country's road system, for example, would support future development and the maintenance of existing assets in a way that better matches the country's transport needs and keeps costs to a minimum (JICA, 2010[5]). Improved indicators would also allow plans to be developed with clearer targets.

Relationships between development and transport infrastructure plans

A seven-step process defines the relationships between SEDSs, SEDPs and transport development plans in Viet Nam (Figure 4.1). In the first step, the SEDS is reformulated for the coming period. Based on the SEDS, ministries and certain industrial and trade sectors, formulate and adjust the sector-wide development strategies for which they are responsible. In this way, the Ministry of Transportation develops transport infrastructure development strategy with the participation of ministries, sectors and provinces, though the extent of their participation is often limited. In the second step, sectoral plans at the national level are produced. The transport planning is one example.

Figure 4.1. Relationships between SEDSs, SEDPs and transport planning



Note: Bold lines signify strong connections, while dotted lines signify a weak connection.
Source: OECD Development Centre's compilation based on national sources.

In the third step, local authorities develop sectoral plans for the local level, along with local socio-economic development master plans, taking account of local development needs to estimate required investment capital. Socio-economic development master plans at the provincial level include infrastructure plans for transport, industry, agriculture, and services, though there is often a lack of complementarity in planning between provinces. This fragmentation has been exacerbated since 2008, when, according to Decree 04/2008/ND-CP, ministries, other branches of the government, and Provincial People's Committees have no longer had to report to the ministry on the implementation of the plans.

In the fourth step, investment policies and project plans are approved or rejected by responsible authorities. The National Assembly is responsible for approving projects of national importance, typically meaning that it would require more than VND 10 trillion of public investment, could substantially impact the environment, would use a large parcel of land or one that currently hosts wet rice agriculture with more than two crops, and would displace large numbers of residents. The necessary level of approval for other projects is determined by the type and amount of capital involved (Table 4.3). The Prime Minister is responsible for making decisions on group A projects, while heads of ministries and central agencies and People's Councils at all administrative levels have the authority to decide on projects under their administration in groups B and C.

Table 4.3. Project categorisation by type and amount of capital involved

Projects	Group A	Group B	Group C
Traffic infrastructure (includes wharfs in the sea or in rivers, airports, railroads, and national highways); power generation; oil and gas extraction; industrial projects in chemicals, fertilisers and cement; mechanical engineering and metallurgy; mineral extraction and processing; and residential construction	More than VND 2.3 trillion	From VND 120 billion to VND 2.3 trillion	Less than VND 120 billion
Traffic infrastructure; irrigation; water supply and drainage, plus technical infrastructure; electrical engineering; communication and electronic-device manufacturing; pharmaceutical chemistry; material production; mechanical construction; and post and telecommunications	More than VND 1.5 trillion	From VND 80 billion to VND 1.5 trillion	Less than VND 80 billion
Agriculture, forestry and aquaculture; national parks and wildlife sanctuaries; and technical infrastructure for new urban zones	More than VND 1 trillion	From VND 60 billion to VND 1 trillion	Less than VND 60 billion
Health care, culture and education; scientific research; information science; radio and television broadcasting; tourism and sport; and civil construction	More than VND 800 billion	From VND 45 billion to VND 800 billion	Less than VND 45 billion

Source: OECD Development Centre's compilation based on Law on Public Investment 2014.

In the fifth step, five-year SEDPs are developed on the basis of the SEDS, national and local sectoral plannings, and an estimation of the resources available for implementing the plan. Five-year SEDPs tend to list only the large and important projects that have won approval in the national assembly, along with allocations of investment capital for construction, due to limitations in estimating available budgets and the lack of a list of priority investment projects.

In the sixth step, officials decide on a list of projects that will receive investment resources, moving selected projects from investment policy to investment decisions. Following Directive 1972/CT-TTg of 2011, projects are required to have the backing of

firm funding commitments before approval, though the decision-making process can still encourage rent-seeking and non-transparent lobbying. In the seventh step, policy makers build an annual SEDP, taking account of the five-year SEDP and existing investment decisions (Table 4.4).

Table 4.4. Examples of objectives for transport infrastructure development in five-year and annual SEDPs

Five-year SEDP		Annual SEDP	
Years	Objectives for infrastructure development	Year	Objectives for infrastructure development
2006-10	• Making a breakthrough in infrastructure construction	2007	• Concentrating resources and ensuring the progress of important national projects and national target programmes.
2011-15	• Reviewing and evaluating projects on transport infrastructure development, especially in key economic regions • Prioritising a timely allocation of investment capital to ensure complete construction • Quickly developing urban transport systems, especially public transport • Step by step, and at the same time, developing and modernising the infrastructure systems of large urban areas, while restructuring production and distributing population. • Improving the integrated-services capacity of the three major seaports in the three regions	2012	• Reviewing and evaluating projects on transport infrastructure development, especially in key economic regions, in order to allocate investment capital in a timely fashion to projects to be completed and put into use in 2012-13. • Effectively exploiting the land fund for transport infrastructure development, linking up land-use planning and transport-infrastructure planning to increase non-budget capital.

Source: OECD Development Centre's compilation based on Resolution No. 75/2006/NQ-QH11, dated 29 November 2006, on the 2007 SEDP; Resolution No. 11/2011/QH13, dated 9 November 2011, on the 2012 SEDP.

Ideally, SEDPs should align with strategies and plannings including in transport infrastructure, by detailing their contents into specific objectives, including tasks, timeframes, sources of funding, implementers, and measures to monitor and evaluate projects. However, the implementation of the socio-economic development plan depends on resource availability, making plannings directive rather than implementary and SEDPs tend not to contain much detail on transport infrastructure.

Policy challenges and recommendations

Socio-economic development plans and infrastructure planning in Viet Nam help to direct future projects, set priorities and manage expectations about future developments. Improvements can be made to the planning process in Viet Nam, however, to make planning a more effective tool in infrastructure investment. In particular, additional work would be done in strengthening the connections between socio-economic development plans and transport plannings, formulating plans with more specific targets, and addressing uncertainties in financing.

Strengthening connections between socio-economic development plans and transport plannings

Disconnections between SEDPs and infrastructure plannings have consequences for the effectiveness of transport projects. Insufficient consideration is often paid to the economic interaction between projects, leading to situations such as the completion of an industrial park before connecting transport infrastructure. Furthermore, the five-year SEDPs that have been implemented for the periods 2001-05, 2006-10 and 2011-15 included little detail on transport infrastructure including its mode (Table 4.5).

Table 4.5. Specific modes of transport in Viet Nam's SEDPs

Type of infrastructure	2001-05 SEDP	2006-10 SEDP	2011-15 SEDP
Roads, highways, railways, aviation and inland waterways	N/A	N/A	N/A
Sea ports	N/A	N/A	Improving the capacity of the integrated services of the three major sea ports in three regions
Transport infrastructure in general	N/A	Transport infrastructure is not clearly defined but only referred to as "infrastructure" or "economic infrastructure".	"Transport infrastructure of the key economic region"; "Urban transport infrastructure"

Source: OECD Development Centre's compilation based on legal documents on plans and SEDPs

Transport infrastructure planning should be comprehensive, clear and achievable. A complete and up-to-date database of modes of transport infrastructure would allow planners better forecast future demand and respond accordingly. The Ministry of Transport and line ministries could also consider co-operating closely to formulate a national transport master plan to ensure the consistency and uniformity of the planning system throughout the country. Such an approach would allow for planning on connectivity between economic centres, provinces and regions, as well as between modes of transport. Policy makers should aim to create a unified development space, and to overcome conflicts between national-level plans on the one hand, and regional, sectoral and provincial plans on the other. Infrastructure project management should be linked to the overall institutional system and to economic management policies.

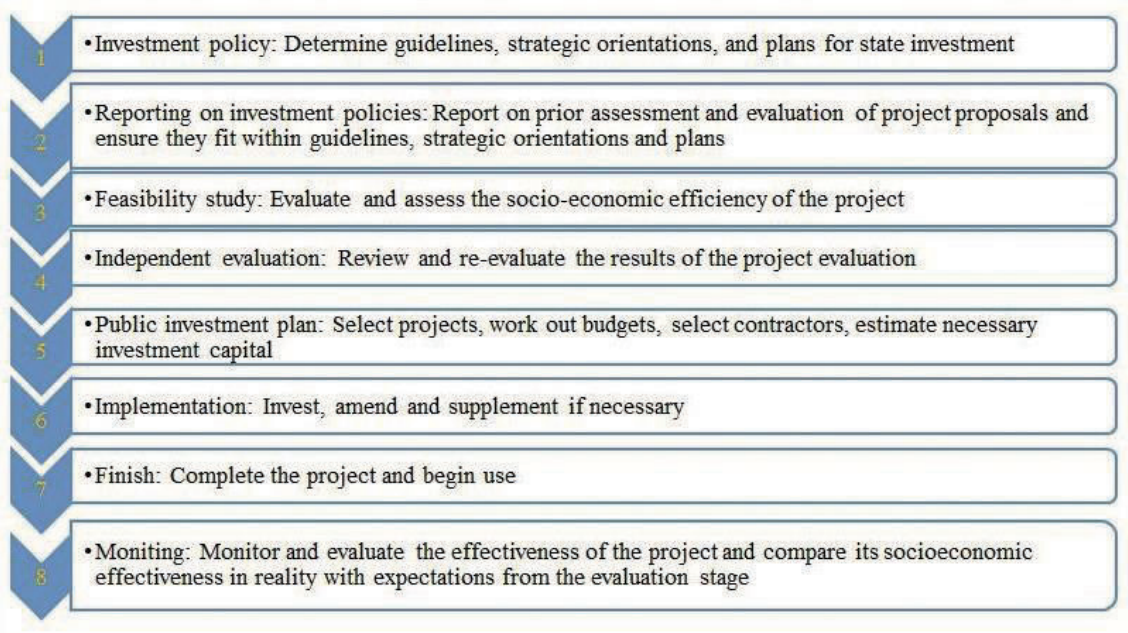
An improved process of assessment for infrastructure projects would support the alignment of projects that feature in infrastructure plans and SEDPs. Currently, projects are appraised in an eight-stage process (Box 4.1). The competency and capacity of project appraisal could instead be centralised into one agency, with international standards applied in evaluating all projects. Specialised staffs could manage this process. The development of guidelines and regulations for economic analysis would allow for the assessment and measurement of the social and economic costs and benefits of transport infrastructure projects.

Box 4.1. The assessment process of new transport infrastructure projects in Viet Nam

New transport infrastructure projects in Viet Nam should ideally go through an eight-stage process, all of which are important in projects' successful implementation (Figure 4.2). Following the determination of the major policies,

guidelines, and socio-economic development strategies for each period in question, ministries and municipalities develop their development plans, and their five-year and annual plans, which are the basis for carrying out transport infrastructure projects. Pre-assessments are then conducted by authorities including the national assembly, the planning and investment ministry and others. The capacity of the private sector to take part in the project is also evaluated at this stage. In the third phase, the socio-economic efficiency of the project is reviewed by a state appraisal council. In order to strengthen the evaluation results concerning the socio-economic efficiency of the project, in the fourth stage of the process, an independent agency to review and revaluate the results of the assessment previously carried out. In the fifth stage, the project and contractor are selected. The Ministry of Transport assists local governments in selecting projects, in establishing five-year public investment programmes, and in obtaining annual budget allocations from the state budget. The Ministry of Finance is responsible for assisting provincial People's Committees in setting the budget estimate and funding for activities of road management and maintenance, as well as the forecasts of road-traffic demand. Project implementation is monitored in the sixth stage and any necessary changes to the project are proposed. In the seventh stage of Viet Nam's process, the project is finalised and brought into use. In the eighth and final stage, the project's effectiveness is monitored and evaluated, with its socio-economic efficiency in reality compared with the expectations of the assessment. When a project does not meet expectations, a committee reviews the process through which it was initially appraised and implemented, in order to find out the cause of this discrepancy.

Figure 4.2. Investment process for infrastructural development projects using public investment capital, according to good international practices



Source: OECD Development Centre's compilation based on national sources.

Financial considerations should be among the criteria used to evaluate proposed projects. This, in turn, requires cost estimations and consideration of financing availability and allocations. The use of a medium-term budget plan framework both at central and local levels may be helpful in this regard. The Ministry of Finance may also have a role, in collaboration with the other relevant departments of government, in appraising the availability of capital to invest in infrastructure projects. Estimated costs could be compared with other domestic and international transport infrastructure projects in judging their accuracy, with proposers responsible for explaining any large discrepancies. In addition, Viet Nam could strive for greater transparency and accountability in selecting contractors and minimise the number of projects requiring direct contracting.

Developing plans with more specific targets

Details on the financial cost of planned infrastructure projects are not included in the five-year SEDP, which also lacks a timeline for progress in implementing these projects. Including greater specificity in development plans would help to enhance their relevance to infrastructure planning.

SEDPs could be strengthened by incorporating details on the size of infrastructure projects present in infrastructure planning, while setting out development plans for each mode of transport infrastructure. Specificity could be increased by including measurable objectives and eliminate immeasurable indicators in SEDPs. Relatedly, these plans could also note the development objectives that particular projects aim to achieve. Using information such as this, infrastructure projects could then be ranked in terms of priority.

Addressing uncertainty in financing

Providing measurable targets for checking the progress of SEDPS and infrastructure planning is complicated by the lack of details on budgeting for implementing projects. The national five-year SEDP does not include most approved transport infrastructure projects, except for some major transport projects of national importance, such as the Long Thanh Airport, though even these may not have specific details about investment capital. Uncertainty about the availability of necessary financing and its allocation among projects make it impossible to be more specific in plans other than annual SEDPs.

The five-year SEDP could include time-specific targets for infrastructure projects, as well as other details on the funding for meeting targets and implementing actors from the government or private sector. Clearer criteria could also be used in selecting the projects to be included in annual SEDPs, rather than relying on the ask-give mechanism between the agencies that request a project and those that approve it. In addition, required investments have not been included in recent infrastructure plans as they were in the past; both the railway plan from 2009 the seaports plan from 2013 mentioned in detail the scale of investment capital but the 2013 railways plan and the 2015 seaports plan did not.

Domestic and foreign private investors and partners also have a role to play in improving the delivery of infrastructure projects in Viet Nam, particularly given the extent of infrastructure investment needed. However, the private sector is not heavily involved in the infrastructure sector, and projects that receive full funding from the state tend to use state-owned contractors. Viet Nam lacks a strategy for attracting these investors to participate in public investment in general and in infrastructure in particular and SEDPs do not include details about potential investors and contractors (Table 4.6).

Table 4.6. Participation of private and foreign contractors in developing infrastructure

Infrastructure	Plan	SEDP
Sea ports	The plan from 2009 does not list the contractors	No content concerning the contractor
Railways	The plan from 2015 lists all projects in the category of "public/private" capital The 2009 plan does not specify state or private capital other than saying it is "90% state, 10% private"	No content concerning the contractor
Airways	There is data on total capital, but none concerning each project's capital in terms of whether it is state-budget capital, official development assistance (ODA) in the form of loans, enterprises' capital (including equity capital), mobilised capital (loans, project bonds), or capital from domestic and foreign investors.	There is no content on the contractor, though the conditions for the contractor are usually attached to the loan agreement with the partner in ODA loans

Source: OECD Development Centre's compilation based on national sources.

Viet Nam has taken steps, notably through Decree No. 30/2015/ND-CP and Decree No. 15/2015/ND-CP, towards attracting private domestic and foreign investors into public-private partnerships. More work is needed in making these efforts effective, however. Legislative changes could help to provide the stable regulatory arrangements expected by investors. Strong investment commitments from government on complementary infrastructure may also be needed where successful outcomes are dependent on other projects. Clearer goals and more effective implementation of SEDPs would increase the strength of government commitments.

Conclusions

The case of Viet Nam offers interesting lessons for the opportunities and challenges present in formulating socio-economic development plans and infrastructure plannings that are complementary and mutually supportive. Consideration of the efficiency of financing arrangements – such as through the use of PIM systems – and the use of effective means of project appraisal and infrastructure governance are, in general, likely to be useful in improving the prospects of planned infrastructure projects. As illustrated by Viet Nam's experience, improving the financing and appraisal of planning can require that other aspects be addressed as well, including the connections between different plans, the targets and measurements included in these plans, and the certainty of financial arrangements for proposed projects.

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