

Investor Ready Cities

How cities can create and deliver infrastructure value



Contents

About this report	Introduction <i>The importance of urban infrastructure</i>	The new urban dynamic
6. The objective of this report Siemens	10. How cities can create and deliver infrastructure value	14. The role of the city Working with the private sector
7. PwC Berwin Leighton Paisner		15. Vision and leadership Governance and financing



The role of governance

Creating investor confidence

- 18. Getting the investment basics right
- 19. Planning ahead – what cities can do
- 20. Land use and investment

23. Case study: Delhi

- 30. Formulating a vision
- 31. Creating a focal point for investors

33. Case study: Singapore

- 40. Contracting with the private sector for successful delivery
- 42. Establishing regulatory frameworks to attract private investment

45. Case study: Chattanooga

Finance and funding

Capturing value

- 54. Cities under pressure

Funding vs. financing

- 57. Models in context
- 58. Capturing value

61. Case study: Transport for London

- 68. Community infrastructure levy
- 70. Tax incremental financing (TIF)

73. Case study: Medellin

- 80. User charging

87. Case study: Rio de Janeiro

Is your city investor ready?

- 96. Is your city investor ready?

99. Case study: Thameslink





Section 1

About this report

About this report

The objective of this report

This report looks at the challenges for cities in delivering investor ready infrastructure projects. Focussing on the importance of infrastructure in our cities, and its role in sustainable development and effective delivery of services, the report starts with the importance of legal and governance structures that need to be in place to provide the necessary security and certainty to the investment community that will encourage them to invest in infrastructure projects. It then illustrates how cities with the appropriate foundations of institutional stability can leverage financial mechanisms to their advantage to help deliver the infrastructure that is so critical to their future. It looks at the steps that need to be taken to create a governance, legal and regulatory environment which will support harnessing the full range of potential sources of funding.

With a growing need for urban management, strategic planning and infrastructure efficiency, this report also illustrates through a set of case studies of catalytic infrastructure developments how the intelligent planning of cities helps make informed decisions about the correct choice of infrastructure and supporting technology.

The report has been delivered by three global businesses with a shared perspective and whose combined experience in delivering infrastructure projects across the world provides an insightful approach to a 'new urban dynamic' which puts cities at the forefront of infrastructure delivery.

Siemens, PwC and Berwin Leighton Paisner have joined forces to illustrate how successful urban infrastructure delivery can be driven by cities whose governance structures, legal and policy frameworks, and commercial planning provides new incentives for development and long term investment opportunities. The report seeks to provide city decision makers with the inspiration to create new approaches to private investment, and to make their cities investor ready.

Siemens

As the world's largest engineering company, Siemens provides innovative solutions to help tackle the world's major challenges across the key sectors of energy, industry, healthcare, and infrastructure & cities. It is a global powerhouse in electronics and electrical engineering, providing infrastructure solutions, primarily for cities and metropolitan areas. For over 165 years, Siemens has stood for technological excellence, innovation, quality, reliability and internationality. The company is one of the world's largest providers of environmental technologies. Around 43 percent of its total revenue stems from green products and solutions and is No.1 for the third consecutive year in the Dow Jones Sustainability Index. Today, Siemens operates in 190 countries, occupying leading market and technology positions worldwide with 362,000 employees worldwide.
www.siemens.com

SIEMENS

Julie Alexander
Director, Urban Development
Phone: +44(0) 2070 556 468
Email: julie.alexander@siemens.com
www.siemens.com

PwC

PwC helps organisations and individuals create the value that they're looking for. PwC is a network of firms in 158 countries with more than 180,000 people who are committed to delivering quality in assurance, tax and advisory services. Find out more by visiting pwc.com.

PwC refers to the PwC network and/or one or more of its member firms, each of which is a separate legal entity. Please see www.pwc.com/structure for further details.



Richard Abadie
Partner, Capital Projects & Infrastructure
Phone: +44(0) 2072 133 225
Email: richard.abadie@uk.pwc.com
www.pwc.com

Berwin Leighton Paisner

Berwin Leighton Paisner (BLP) is a leading international law firm which brings together extensive experience and a holistic approach when advising on major urban infrastructure and regeneration projects. Ranked as a UK market leader across 70 separate practice areas, BLP has a reputation for quality, breadth of knowledge and for delivering an unparalleled expertise to its clients. It has completed deals in more than 170 countries around the world for clients which include national governments, municipal authorities, IFIs, sovereign wealth funds, investors and private developers. With over 1,100 staff globally, BLP has the resources and expertise to meet even the most complex and sensitive requirements from designing new laws and governance through to creating charging regimes and delivering nationally and internationally significant urban infrastructure and development projects.
www.blplaw.com



Mukhtiar Tanda
Partner, Urban Development
Phone: +44(0) 2034 004 156
Email: mukhtiar.tanda@blplaw.com
www.blplaw.com



Section 2

Introduction

The importance of urban
infrastructure

Investor ready?

How cities can create and deliver infrastructure value

Cities are constantly changing, and evolving faster than at any point in their history, and managing this change is a hugely difficult task.

Faced with a wealth of challenges which are often elusive, cities are expected to manage and control the change to allow their communities to have a standard of living which meets modern day expectations.

City challenges can vary. Many cities are experiencing unprecedented rates of urbanisation and population growth, whilst others are experiencing a shrinking population. Many of the challenges, however, are omnipresent: people are living longer leading to increased demands on health care; the climate is changing resulting in extreme and often catastrophic weather events; and industrialisation is resulting in large scale pollution in many places.

Regardless of how a city is being affected by these changes, one thing remains constant – the need to provide critical urban infrastructure and deliver municipal services as efficiently and cost effectively as possible. Mature cities are experiencing the need to upgrade their failing and ageing infrastructure, and developing cities are now seeking to establish new infrastructure and city systems that will enable transition, and position them as global leaders and next generation city metropolises.

Cities today are motivated by their need to drive economic growth, increased investment and job creation, allowing for better standards of living, and the financial capability to manage the city infrastructure that serves the wider urban environment. In response to this, city competitiveness is a subtlety that is emerging across the world – how to attract financial investment and human capital, and how to deliver services more efficiently.

To do this, cities need to understand the fundamental concept of sustainable development to provide confidence to investors that the emerging challenges are understood and can be managed.

As technology drives mobility and connectivity in urbanised societies, mature cities are experiencing the need to upgrade their failing and ageing infrastructure, and high growth cities are seeking to establish new infrastructure and smart city systems that will position them as global leaders and next generation metropolises.

Cities do now need to operate in a global connected marketplace, competing with, and depending on other cities, optimising their greatest assets to best advantage whilst evolving to meet the needs of the digital generation.

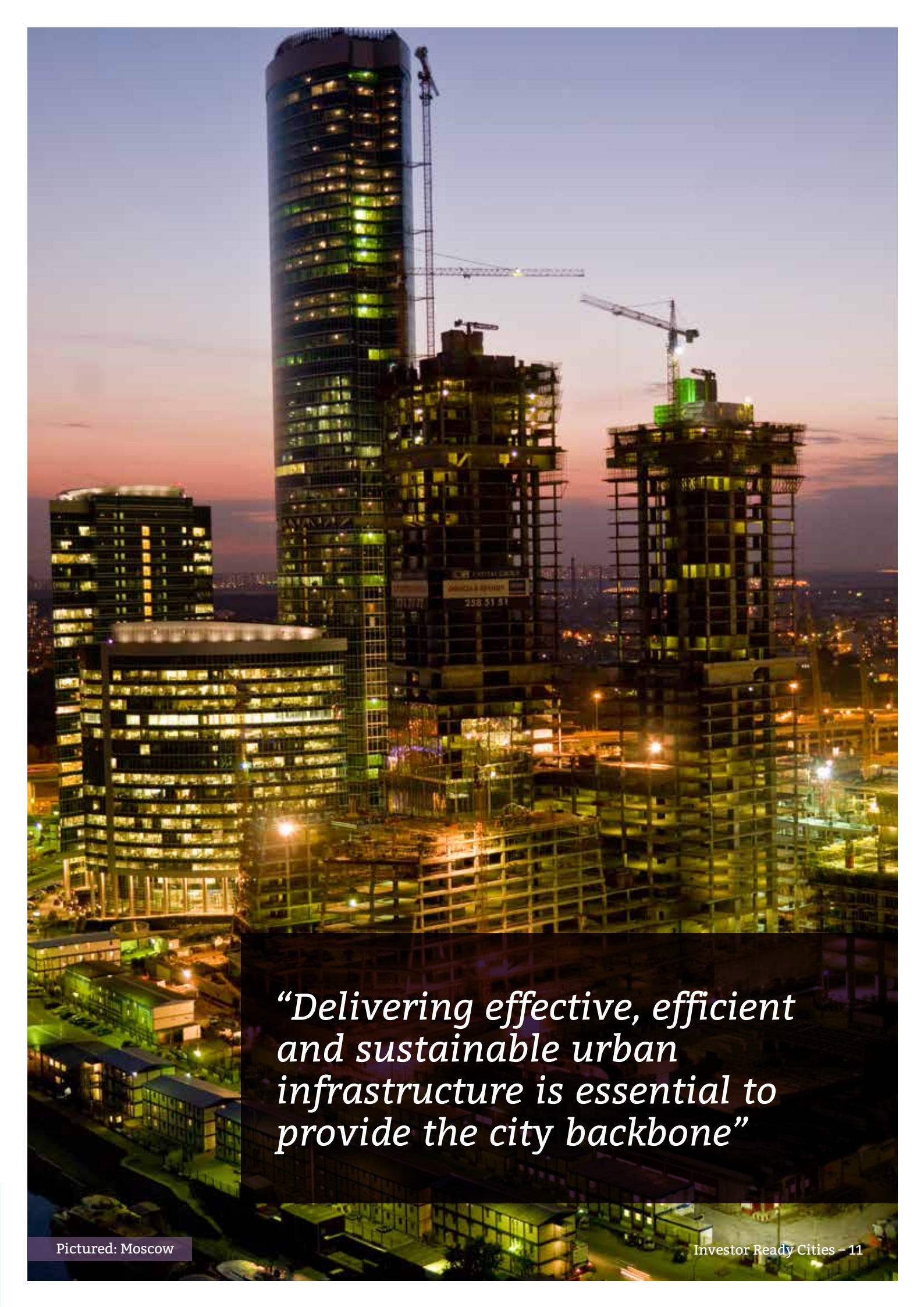
Delivering effective, efficient and sustainable urban infrastructure is essential to provide the city backbone, from which economic success and prosperity can grow – critical infrastructure such as:

- A fast and efficient transport and mobility infrastructure with sufficient capacity to cater for growing and changing populations
- A robust and reliable energy infrastructure providing power to meet the most critical needs
- A clean and plentiful water supply
- Sanitation to deliver modern standards of hygiene efficiently and sustainably
- A safe and secure environment in which people can live and work with confidence.

Dealing with these new challenges is becoming ever more complex – staying ahead of emerging trends and delivering a holistic approach to urban management is the new urban dynamic.

Cities need to show strong leadership in developing and selling their city vision, and ultimately cities need to create a quality of life proposition which exceeds that of its closest competitors and provides a tantalising offer that investors and prospective residents can't fail to ignore.





*“Delivering effective, efficient
and sustainable urban
infrastructure is essential to
provide the city backbone”*



Section 3

The new
urban
dynamic

Investment Needs

Nearly all cities have limited access to funds and ways of financing their plans. Some lack even the most basic legal and institutional frameworks to facilitate access to finance from the capital markets. So what is the best way to make cities attractive to investors and to enable the financing and delivery of the critical urban infrastructure needed for them to become cities of the future?

The role of the city

Increasingly, cities and municipalities are the tier of government being tasked with providing essential services to their populations, and for formulating the means of funding them.

To rise to these challenges, cities need to understand the fundamental concept of sustainable competitiveness and how to provide confidence to investors that the emerging challenges are understood, are being planned for and will be managed. In particular, investors need reassurance that the key pillars of competitiveness are in place, particularly institutional frameworks and financial market development¹.

Improvements in education, health care and in basic services have all led to population growth, increased urbanisation and higher demands for modern communications and service standards.

Dealing with these new challenges is becoming ever more complex, and staying ahead of emerging trends and delivering an holistic approach to urban management is the new 'urban dynamic'. The success of the city in meeting these challenges is often defined through their ability to attract and retain internationally mobile capital.

Working with the private sector

Whilst cities have to work ever harder to provide and renew essential infrastructure, public funds available for doing so remain limited. Grants from central government can only meet a small part of total needs for infrastructure and services. Concessionary loans and international donations rarely make up the shortfall, even for poorer nations.

Cities are also now more reliant than ever before on private sector support to scope, finance and deliver projects. It is becoming much more common to see private sector finance help to cover the cost of delivery with long term management contracts for maintenance and operation to secure the investment and provide confidence to the public sector in sustained delivery.

With public-private sector collaboration being one of the most effective approaches to major infrastructure delivery today, cities are having to operate differently and change their approach. Cities need to demonstrate visibly how infrastructure will deliver value to both users and investors. City authorities are therefore having to work harder to understand the private sector approach to doing business. Certainty in policy and legal regulation and long term planning are essential to attracting investment and creating joint working approaches.

1. The First and Eight Pillars of WEF's Competitiveness Index, World Economic Forum, 'The Global Competitiveness Report 2013–2014'.

Vision and leadership

Delivering urban infrastructure swiftly and economically requires a clear, well formulated vision of city growth and economic prosperity, underpinned by a set of well-defined strategic objectives and initiatives. It must guide development across the necessary range of critical infrastructure according to clearly articulated priorities. This vision must be owned by key stakeholders – politicians, businesses and residents.

Cities need to show strong leadership in developing and selling their city vision. The most successful cities recognise that they operate in a globally connected marketplace, competing with, and yet also depending on, other cities.

These changing times also mean that city authorities can no longer plan for what is known today. They also need to plan to meet the needs of future generations. The rate of growth is so great in some parts of the world that cities can no longer take 20 years to deliver single point interventions. Planning needs to be swift and cities need to be agile in response to changing circumstances and investors' needs.

Governance and financing

Cities are, however, complex, and the administrative environment in which they operate differs greatly. Political jurisdictions, overlapping administrative boundaries and joint working approaches across city-regions all provide opportunities and challenges. Cities need to master these to ensure progress is not hindered by bureaucratic hurdles. Engagement with federal or state bodies to address any underlying legal or regulatory barriers is also important.

Working in cities across the world to deliver critical infrastructure, it is evident that, particularly in uncertain economic times, city authorities above all else have limited public resources to fund the delivery of major infrastructure projects. Nevertheless some upfront public sector investment is often needed to create investor confidence in the commitment to an infrastructure development.

To achieve this, cities must be more and more innovative with how they raise finance: where domestic financial markets are insufficient, international finance often needs to be found. Investment therefore comes not only from domestic banks, institutions and capital markets, but also from overseas sovereign wealth, pension funds, bilateral and multilateral institutions, equipment suppliers and through public-private partnerships. However, major investors are increasingly conservative in their decision-making and there is greater competition for finite resources.

There is no universal blueprint that can be applied to urban development and the adoption of infrastructure solutions particularly with the onset of new and rapidly evolving technology. Each city will have to plot its own path based on its individual circumstances, its geopolitical context and an analysis of its own particular strengths and weaknesses. What is clear though is that infrastructure delivery will not be achieved without being joined up at the critical points, without being intelligently phased and sequenced and without addressing the underlying governance, legal and financing requirements.



Section 4

The role of governance

Creating investor confidence

Creating investor confidence

Putting in place the institutional enablers

Fundamental investor expectations of national constitution and legal systems are that:

- The rule of law and political stability are recognised and respected
- Property rights are clearly identifiable, transferable, recognised and enforceable
- Applicable laws will be stable in key respects for the duration of the investment
- Property and contract rights are recognised and enforceable
- Each party contracting to do something has the legal power to do so
- The investor is legally entitled to recover and take back the returns it is due on exiting the investment
- Laws and administrative procedures are transparent
- There are clear commitments to internationally recognised standards of enforcing against corruption and other forms of financial crime
- The national fiscal regime is settled, predictable and properly applied.

Getting the investment basics right

For all investors, confidence in local legal systems and the economic and fiscal regimes within which they sit is critical. So is the need for stability and certainty of the associated tax and regulatory arrangements (see what investors need). This confidence translates into an expectation that the returns from investment can both be generated as well as captured for investors and returned to their stakeholders.

If these conditions do not exist, however, cities will need to encourage national legislators to act swiftly and initiate the necessary reforms and new legislation if they are to gain investor confidence. Indeed, formal reassurance for investors from state bodies may in any case be needed to reinforce the level of confidence needed in the investment community before finance is committed.

What investors need

Of course, municipal financing traditionally comprises a mixture of cash transfers from national government, some grant funding and in some markets concessionary loans from bilateral and multilateral donor organisations in high growth markets. Increasingly, it is also supported by the devolved ability to raise local taxes and, where the credit rating is high enough, by recourse to debt and capital markets providing loan and bond based finance. When investors consider a particular project, they and their rating agencies will obviously pay close attention to the ability of the city to make its projected contribution to the project after allowing for its other financial commitments.

Planning ahead – what cities can do

Given these expectations, it is obviously important for city authorities to invest time in anticipating investors' demands and, where necessary, initiating the reforms needed to create the right local conditions for investment readiness. Specifically, investors will look to the credit-worthiness of the city, the finances of the project and any guarantors backing the city. Risk identification and management is of vital importance to investors – as is investment profitability, protection and the ability to exit an investment (see what investors want).

What investors want

Until there is a proven track record, cities will also often need to act to establish examples of successful public sector investment to create confidence that the city authority is capable of delivering. If its actions relate to early stages of the project to be financed, so much the better, but this would need to be done incrementally and without inhibiting scope for innovative financing solutions at a later date.

The ability of a city successfully to implement a particular delivery, funding or finance option will often correlate directly to the extent to which appropriate legal and regulatory structures have been adopted and established. Indeed, certain options such as bond financing will simply not be viable in markets which still have some way to go in terms of adopting the legal frameworks and principles that investors need.

Key factors to be addressed include:

- Ensuring that the appropriate legislative, regulatory and licensing regime is in place to inspire investor confidence in project feasibility and viability
- Formulating a city vision, the strategic objectives, the priorities and programmes for achieving the vision and developing an overall budget strategy for delivering the vision
- Putting in place objective, robust city governance procedures and vehicles to act as a focal point for investors and deliver the vision
- Securing support from stakeholders for the vision, priorities and programme
- Identifying the mechanisms for contracting for successful delivery of the project at each stage in its lifetime

In relation to the project itself, it will be far better for the project case to be stress tested and reinforced before approaching investors, than for investors to reject a proposal for lack of prior preparation. Key steps will include:

- Fully investigating the need for the project and the options for meeting that need
- Clearly defining the project, its scope, delivery programme and likely budget requirements
- Considering the feasibility and commercial viability of the project, possible funding options and review of applicable laws and deliverability within them
- Identifying the consents necessary for project delivery (especially regulatory permits and land rights) and being able to provide evidence that each will be forthcoming
- Preparing a fully worked through package that can be presented to prospective investors

Creating investor confidence

Putting in place the institutional enablers

Basic legal prerequisites are wide ranging and include:

- Powers to acquire, lease, charge and dispose of land, and interests in land, through a combination of voluntary and compulsory acquisition
- The ability to “clean” title deeds of land acquired to facilitate infrastructure development
- A regime for fixing values and compensation independently to compensate those whose land is acquired at an amount recognised by the city population as fair and equitable
- Transparent operation of powers in such a way that international standards of legality, probity, fairness and good governance are observed
- The ability to enter into joint ownership arrangements and create joint ownership vehicles with development and infrastructure providers and those providing finance
- The ability to ensure that the benefits of property can be given to a time-limited service provider only for as long as the service is contracted to be provided

Land use and investment

As a starting point, city authorities might maximise their ability to use land as a tool, both to deliver infrastructure and to facilitate the subsequent infrastructure benefits. Some city authorities have used land as a payment in kind in return for infrastructure construction or as an equity contribution towards a joint venture with a developer. In this latter scenario, the authority might enter into a partnership with private investors, putting property assets into the pot to be matched in cash from the private sector partner. The partnership then uses these joint assets as collateral to raise financing for regeneration or infrastructure projects.

Land is such an important element in many infrastructure projects that cities would always be wise to ensure that the system of land ownership transmission of land rights meets modern expectations such as set out to the left.

Land – the basic requirement

Infrastructure investments benefit the full range of stakeholders and landowners in a city, from the smallest to the largest. This creates both a willingness to contribute and the right atmosphere in which to implement user charges or land value capture schemes as contributors toward infrastructure costs. In the latter case, the earlier that legal frameworks and structures are put in place to capture the incremental benefits of infrastructure investments, the better (see Capturing the benefits). This will assist the city to maintain and afford its overall investment programme as well as providing reassurance to investors that the wider programme is deliverable and will increase investment values.

Capturing the benefits

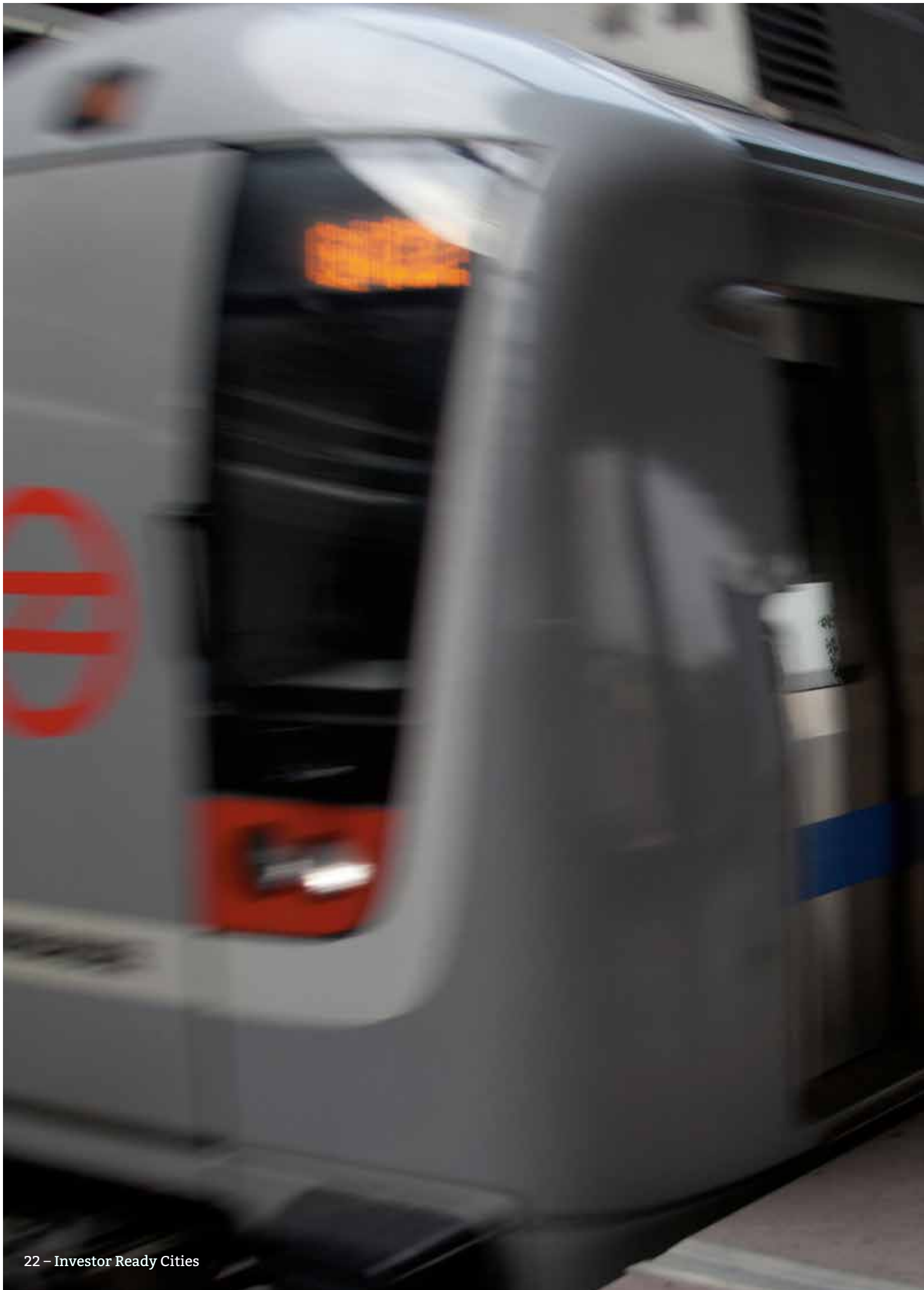
Similarly, where a funding structure requires a contribution from revenues raised locally by a city authority, investors will expect certainty with respect to the ability of the city to meet its contractual duties. If doubts exist, investors will look to receive third party guarantees, for example from the state or a national bank, or through the passing of suitable legislation by the national government. This inevitably increases the complexity of the process. Any third party reluctance to commit may undermine confidence and reduce the appetite to invest. It will therefore be important for city authorities well in advance to prepare the ground for wholehearted support from parties whose backing is likely to be needed.

Structures which need to be put in place include:

- Systems under which rights to develop are granted legally and regulated by city permissions
- The granting of development rights linked by development planning or consent processes
- The legitimate expectation that in order to receive development consents the investor will have to provide or contribute towards necessary infrastructure; contributions could take the form of lump sums or contributions in kind through to other more sophisticated cost sharing mechanisms

Formal infrastructure cost sharing regimes will require:

- Infrastructure needs to be projected
- The costs of providing infrastructure to be assessed
- The costs of infrastructure to be allocated on a unitised basis to new development; and
- Individual developments that are particularly dependent on particular infrastructure to be permitted to proceed if the landowner or developer commits directly to provide, or finance, a particular infrastructure element

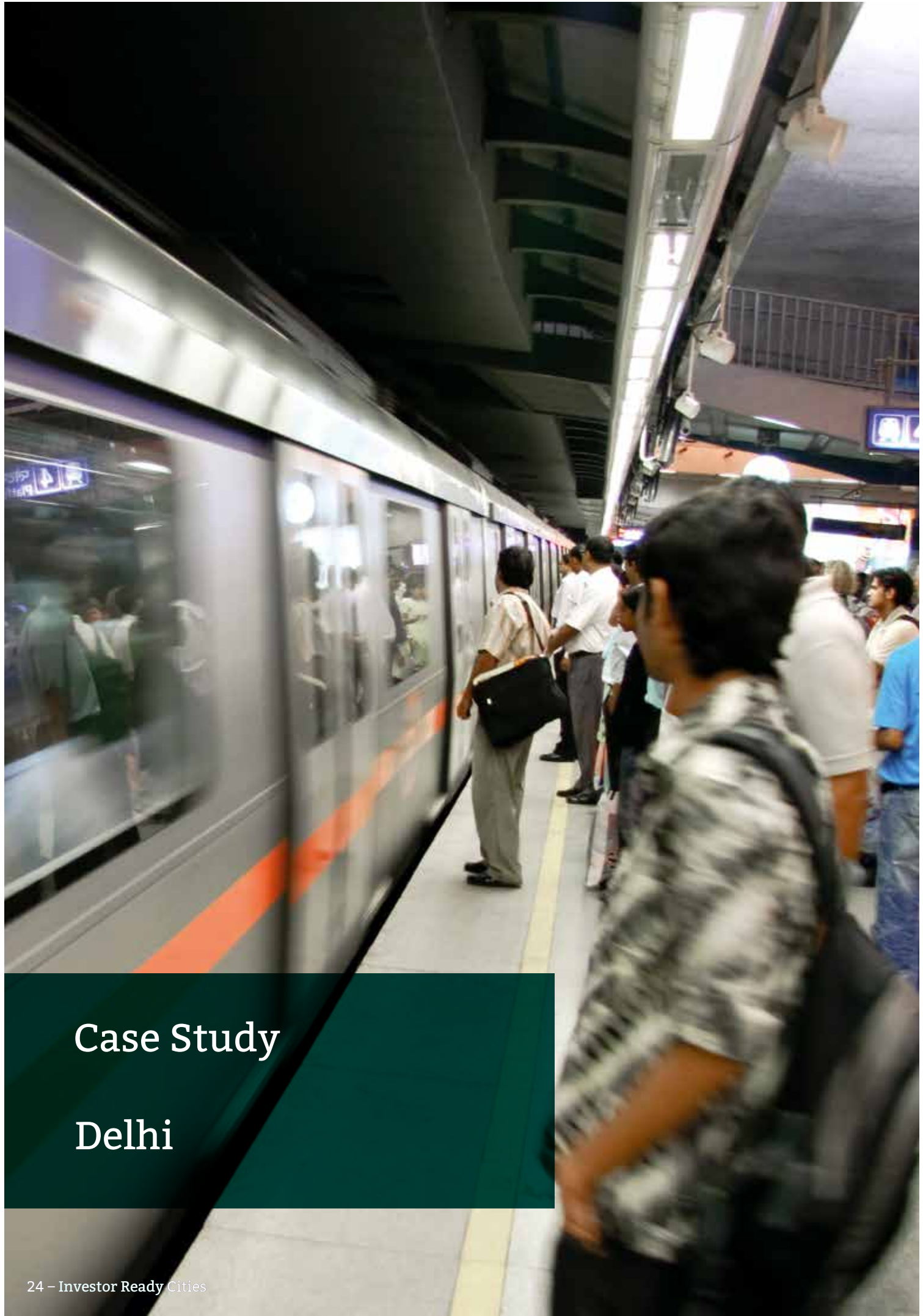


Case Study

The background of the slide is a blurred photograph of a Delhi Metro train at a station platform. The train is white with blue and grey accents. The platform has a curved glass and metal roof. The entire image is overlaid with a semi-transparent teal color.

Delhi

Delhi Metro



Case Study

Delhi

Keeping the city moving

Through innovative procurement, strong project and contract management, combined with a personal touch, this huge construction programme is running on time and to budget, with minimal disruption to the daily lives of millions of citizens.

Background

As the world's fourth largest city by population, Delhi has long suffered from intense traffic congestion, so in the mid-1990s the local government took the bold decision to build a metro rail system. This was an immense undertaking, with a planned track length of 400 kilometres that placed the new network on a similar scale to those in London and New York, and larger than Paris.

Delhi's awkward circular shape meant that the metro needed numerous interconnecting lines (as opposed to a simpler grid system), while the urban density and plethora of old, fragile, historic buildings added a further layer of complexity to the tunnelling process. On top of these technical challenges, the project owners had to resettle any displaced residents in a dignified manner, minimise traffic disruption over more than two decades of works, and locate and compensate thousands of landowners.

India has a limited track record in delivering large, complex, infrastructure programmes on time and on budget, and the success of the metro was likely to have a significant bearing upon the reputation of the local ruling political party.

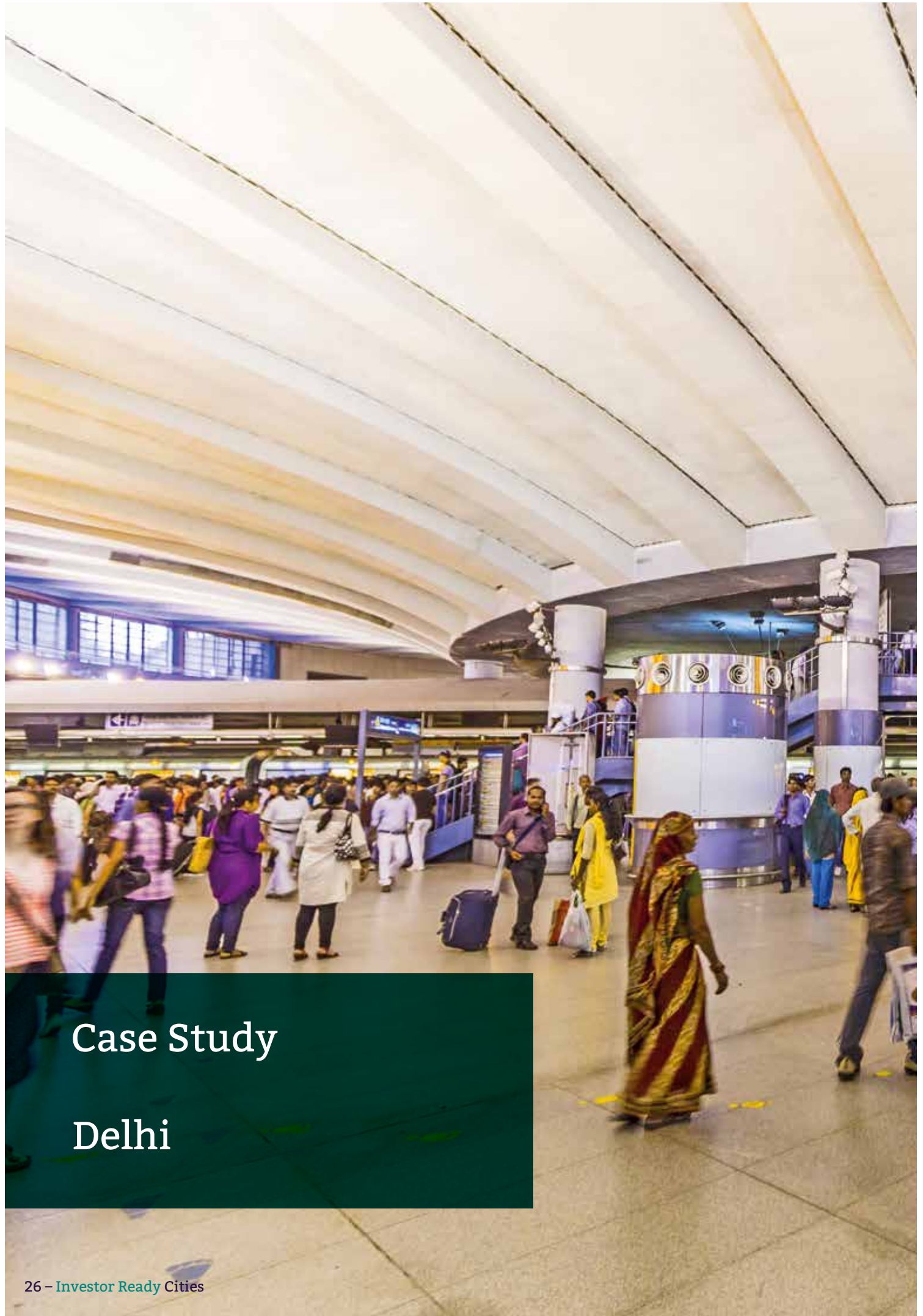
The story

Financing the new metro was relatively straightforward, with the majority of funds coming in the form of 'soft' loans (with a low interest rate and long payback period) from the Japan Bank for International Cooperation (JBIC) and Japan International Cooperation Agency (JICA), as well as equal-sized grants from the Government of Delhi and Government of India.

Around 10-15 percent of the total contribution came from commercial property development around the new stations, many of which were situated in popular locations; a technique previously used in other cities such as London, Hong Kong and New York.

Given the chequered history of major programmes in India, the respective governments of India and Delhi were determined to achieve strong governance. After forming the Delhi Metro Rail Corporation (DMRC) in 1995, Elattuvalapil Sreedharan was appointed to head the programme, based upon his impressive experience overseeing construction of the Mumbai-Goa rail link. Mr Sreedharan asked for, and was granted, the freedom to choose his own team, with minimal political interference. He was also permitted to adopt an innovative approach to purchasing that would enable greater control over the budget.

“As the world's fourth largest city by population, Delhi has long suffered from intense traffic congestion, so in the mid-1990s the local government took the bold decision to build a metro rail system”



Case Study

Delhi

Tightening up procurement and programme/project management

Traditional construction procurement in India involves contractors submitting unit prices for each category. Bidders tend to charge a high unit price for items where quantities may potentially rise above initial estimates, which can push up ultimate project costs significantly. Such a practice arguably incentivises the contractor to be late and over budget, particularly for expensive items, or where the volumes are poorly understood at the time of the contract.

DMRC's chosen approach was very different, with contracts offered on a fixed-price basis, and substantial penalties for late delivery, as well as rights to quality assurance and agreed procedures. These new arrangements gave far greater certainty of costs, and motivated contractors to be fast and efficient.

Approvals had also proved costly and time-consuming in the past, due to an excessively large number of detailed milestones for different stages, requiring sign-off from various layers of management. By streamlining this process, the programme owners created fewer, simpler targets, speeding up progress and cutting costs.

DMRC questioned whether the Indian market had the capacity to cope with a programme of such magnitude. To alleviate this concern, tenders were reduced in size to become more easily manageable for domestic contractors. However, this also increased the risk of an uneven interface between different projects – such as two stretches of track not meeting accurately, or signalling equipment being incompatible. These fears were overcome through excellent coordination of all contractor activity, aided by a number of highly skilled consultants from Japan, who provided valuable technical expertise.

Easing the pain

Construction began in 1998 and is expected to finish by 2021. As of May 2013, the first two phases (costing US\$2.7 billion) have been completed and work is ongoing on the third of the four phases. The first phase was completed under budget and almost 3 years ahead of schedule, and even though phase 2 was a year behind schedule, the overall timeliness and cost controls have raised the bar for Indian infrastructure programmes.

Despite the length of the programme, the disruption to traffic and daily life in the city has been limited, which has helped to keep public opinion onside and earned credit for the Government of Delhi, which has managed to win three successive terms in office.

The various incumbent contractors have also improved their capacity during the programme, and should be better placed to carry out future infrastructure development in India.

“As of May 2013, the first two phases (costing US\$2.7 billion) have been completed and work is ongoing on the third of the four phases”



Lessons Learned

The outstanding success of the Delhi Metro construction has demonstrated the benefits of strong governance, and shown how independence from larger bureaucracies and political interference can improve efficiency.

Through innovative procurement methods, the leadership team has created an environment where contractors' goals are closely aligned with those of the owners. DMRC's high-quality programme and project management (supported by external technical experts) has been in evidence, to coordinate the activities of a range of contractors and ensure that interfaces are seamless.

With so much focus on delivering the programme, it could have been all too easy to neglect the personal circumstances of those affected by the construction, such as displaced persons, and the millions of commuters suffering potential traffic chaos. By addressing these issues with professional rigour, the DMRC avoided a public relations disaster and maintained essential public permission for the duration of a long and arduous programme.





“The outstanding success of the Delhi Metro construction has demonstrated the benefits of strong governance”



Creating investor confidence

Putting in place the institutional enablers

When the tiny city-state of Singapore declared independence in 1965, the then Prime Minister, now Minister Mentor, Lee Kuan Yew had the vision to transform Singapore into a “first world oasis in a third world region”. A critical part of that vision was ensuring the nation’s water self-sufficiency.

As Minister Mentor Lee noted, “This [water] dominated every other policy. Every other policy had to bend at the knees for water survival.” Accordingly, one of the first things Lee did post-independence was to set up a unit in his office to coordinate the prioritisation of water at the whole-of-government level. Water policy topped the political agenda and all other sector policies were scrutinised for their alignment with the aim of long term water security.

The Public Utilities Board was created with the mission of ensuring the provision of an adequate and dependable supply of water that would sustain the country’s industrial and economic development as well as the well-being of its citizens. Not long after, in 1972, Singapore became one of the world’s first countries to form a Ministry (today called the Ministry of Environment and Water Resources) dedicated to sustaining a clean and healthy environment for its people.

Once heavily dependent on imported water, Singapore is today on the path to water self-sufficiency, and has turned this area of vulnerability into a strength and source of economic advantage. Its example shows how long-standing commitment and vision at the highest levels of government can direct public sector organisations to collaborate in an integrated way to achieve success.

Formulating a vision

With the legal basics in place, the city authority can take the next step which involves creating an attractive business proposition for potential investors. But what does this entail?

To provide investors with confidence that there is long term commitment to investment plans, cities need to have developed a clear, well-formulated vision for their future development. This has the power to energise stakeholders, steer their actions towards a common shared purpose and guide decision-making. The key here is to create alignment through the cycle of objective setting, planning, performance and monitoring.

The shaping of this vision should involve stakeholders inside and outside the city authority, creating a shared understanding and picture of the desired future for the city which includes attracting the interest of the investment community. A good vision requires political will as well as administrative leadership (see Vision with purpose). It needs to be ambitious but also realistic, with clear goals and practical steps towards them, enabling prioritisation of actions within limited resources.

Vision with purpose – From vulnerability to strength²

The vision should also continually reflect current and future realities. This can be achieved by regular review, based on intelligence or horizon scanning (locally, nationally and globally) to ensure that the vision remains relevant to current and future changes. This will involve thinking big, new, and sometimes ‘to the contrary’.

The vision must also be clearly articulated. To ensure local buy-in and investor confidence, the vision should be supported by a credible investment plan. To attract maximum investment benefit, the plan should be engaging and inspiring to private sector stakeholders.

To be effective in supporting infrastructure investment and in accommodating rapid growth sustainably, the high level vision and investment strategy should also be underpinned

by flexible yet clearly written city plans and policies which guide development, zoning and the allocation of permissions.

These plans should set the framework for 'grant of development' permits and identify the infrastructure necessary to support that development. Where investment is contingent upon realising values from investor driven property development or urban regeneration, the plans should convey confidence to investors that investment values will not be dissipated by oversupply, eroded by incompatible neighbouring developments or undermined by over-saturated infrastructure.

Creating a focal point for investors

With an attractive proposition created, and steps being taken if necessary in relation to wider legal and governance pre-requisites, city authorities then need the ability to communicate that proposition and engage with the private sector.

City administrations usually involve a range of potentially disparate public sector stakeholders, often with competing interests. To achieve holistic, integrated urban upgrade, corral publicly available finance sources and facilitate private sector investment, city authorities need to be able to draw together and focus inputs from these stakeholders and present a united face to the outside world. This involves selling a consistent message about the benefits of investing in their cities and demonstrating real accountability and sponsorship, which is important to instil confidence in the investor community.

There are various ways of achieving this, including:

- One organisation designated to act as the representative for all of the others
- A confederation of interests operating as a loose partnership under a city banner
- And a formally constituted legal vehicle designed to represent joint interests and having specific local or more general remits

Whichever model is chosen, to be successful it will need to operate within a framework set by law and policy and have various powers (see Powers to make things happen).

Powers to make things happen

The appropriate structure will need to accommodate both flexibility and democratic accountability, including transparency of actions. It will also need to provide the certainty of deliverability and the realistic prospects of the return which is required by both city stakeholders and investors.

Institutionally accepted governance structures, with clearly defined roles, obligations and decision making processes, and the ability to contract and interact flexibly with various parties will also be vitally important to investors.

A single vehicle with membership drawn from public and private sector stakeholders along with representatives of funding bodies and independent experts can be particularly effective in achieving these objectives. It could, for example, act as an indirect facilitator, such as a pump priming/grant funding body, or as a direct participator delivering infrastructure, creating development platforms and participating in actual development.

2. 'Future of Government', PwC, 2013

These will include the ability to:

- Receive and administer funding from a range of finance sources – single and multiple, national and international, public and private, conventional and innovative
- Confer development rights and the associated permissions to develop
- Assemble, prepare and dispose of land and land interests
- Construct and procure buildings and infrastructure; contract, and enter into, joint venture arrangements with the private sector as well as other public sector stakeholders

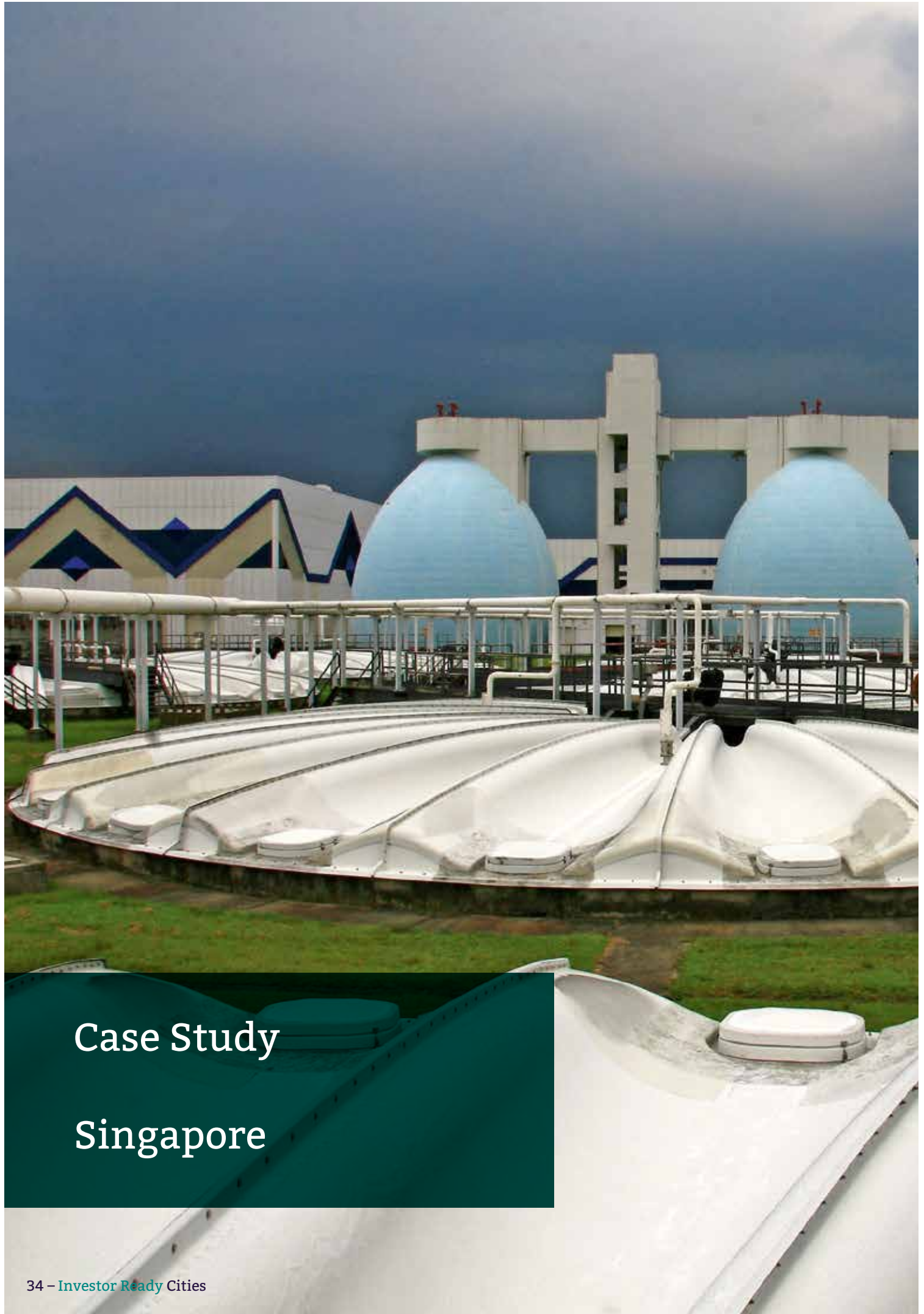


Case Study

An aerial night view of Singapore, showing the city skyline and the Marina Bay Sands hotel. The image is tinted with a dark blue color and features a faint, large watermark of the Singaporean flag in the center.

Singapore

Water System



Case Study

Singapore

Background

The population of Singapore expanded from c1.9 million people in 1965 to c5.3 million in 2012, and over this time per capita GDP (according to Singstat) increased from U\$516 to U\$52,051. Singapore's water system has undergone a similarly dramatic step change in order to support this growth.

The story

Historically, Singapore's water came from two sources, rainwater catchment and import from Malaysia. Street vendors sold water, and not all houses were sewered. Today, Singapore has a more diversified water supply, full sewer coverage and unaccounted for water below 5 percent, one of the world's lowest loss rates.

Singapore has employed three key policy planks to achieve this outcome, namely:

- Setting user prices that reflect the full economic cost of water, without subsidy
- Creating a culture of water conservation through both mandatory and nudge measures
- Harnessing technological innovations in water supply including desalination and water recycling

The role of pricing

Pricing water at full economic cost supports the infrastructure needed to deliver high quality water in a commercially and environmentally sustainable manner. It is also intrinsically linked to creating a culture of water conservation. Water and sewerage (used water) tariffs are regulated by the Ministry of Environment & Water Resources via the Public Utilities Board ("PUB").

Singapore's potable water tariffs are volumetric in nature to incentivise efficient usage. A percentage based water conservation tax is added to the base tariff to reflect the marginal water supply price, being desalinated and recycled water. Sewerage/used water charges are levied based on a combination of monthly flat charge per sanitary appliance, plus a volumetric element (measured by the volume of potable water delivered to the premises).

Water quality is strictly controlled by the PUB, and tariffs differentiate between potable water and recycled used water. The latter is partly blended back into potable water reservoirs, but mainly piped via separate transmission network to some 450 (mainly industrial) users.

“Historically, Singapore’s water came from two sources, rainwater catchment and import from Malaysia. Street vendors sold water, and not all houses were sewered”



Case Study

Singapore

Conservation culture

In part, demand side management is achieved through traditional building code measures such as low flow toilets and self-closing taps. To further develop a culture of water conservation, Singapore has employed nudge measures including educating users through a water efficiency labelling scheme, water based sporting and community spaces/events and water information (delivered both on line and through a water-themed visitors centre).

Technological innovation

On the supply side, Singapore continues to import water from Malaysia, but has increased the domestic rain catchment area to approximately 2/3rds of its land mass. New forms of water supply include sea water desalination (via reverse osmosis and re-mineralisation) and recycled used water known as NEWater (used water that is recycled via microfiltration, reverse osmosis and ultraviolet treatment).

Much of the desalination and NEWater infrastructure has been provided by the private sector. Singapore uses a common design-build-own-operate (“DBOO”) contract structure across NEWater, desalination and other wastewater treatment projects. This contractual structure is robust and relatively simple, meaning that the PUB is able to attract wide investment interest from the private sector.

Commercial & delivery models

Under this structure, PUB (which is both regulator and customer/off-taker) pays the infrastructure provider/operator a charge which has both fixed and variable elements. A typical payment mechanism allows the PUB to levy financial penalties against the infrastructure operator in the event of (for example) reduced plant availability, reduced storage capacity, excessive residual waste or insufficient water quality. This payment mechanism creates a significant incentive on the operator to deliver a high quality service in order to avoid these penalties that would (in turn) negatively affect investors in and/or lenders to the project.

In September 2005, Singapore commissioned a 30 million gallon per day (mgd) desalination plant using a 20 year DBOO. In March 2011, the PUB selected the preferred partner to develop a 70mgd desalination plant under a 25 year DBOO, and the facility is expected to commence operations in 2013. Presently, there are 4 NEWater plants, 3 of which were procured under the DBOO structure. The PUB is looking to procure more DBOO water plants, and PwC is acting as financial adviser to one of such procurement.

Going forward, Singapore’s water masterplan envisages increasing the catchment area to 90 percent of the land mass, reducing domestic water consumption from 155 to 145litres/person and using NEWater and desalination to meet 50 percent and 30 percent of water needs (respectively). Key to meeting these targets in a sustainable fashion is to reduce the amount of energy currently required to treat water using reverse osmosis, and PUB (with partners) undertakes extensive R&D accordingly. New technologies trialled include variable salinity (required to increasing the catchment area) and membrane bioreaction plants.

“In September 2005, Singapore commissioned a 30 million gallon per day (mgd) desalination plant using a 20 year DBOO”



Lessons Learned

.....

Water systems (and infrastructure generally) are crucial to supporting economic growth. User pricing that reflects the full economic cost of water ensures sustainability in terms of supply. On the demand side, responsible consumption can be incentivised effectively through a combination of financial (i.e. pricing) and non-financial (i.e. nudge) measures. Cultural measures are an important part of this mix.

Rising energy prices have highlighted the importance of managing input costs in water systems, especially those where desalination and recycling are part of the supply mix. Here, research and development as well as efficient, timely procurement of appropriate technologies contribute to managing energy costs.





“Singapore’s water masterplan envisages increasing the catchment area to 90 percent of the land mass”



Creating investor confidence

Putting in place the institutional enablers

Contracting with the private sector for successful delivery

Armed with an attractive proposition, an appropriate investment vehicle and a process for putting in place and enhancing the existing governance regime under which the city operates, city authorities also need to consider the appropriate delivery mechanisms to adopt. These can range from simple debt and equity based finance structures, which can be implemented whilst still developing the wider planning and governance frameworks, through to more sophisticated arrangements such as:

- Trading land, which is the most easily adopted mechanism available to cities
- Partnering arrangements with the private sector (“ppps”)
- Regulatory frameworks which promote design, build, operation and maintenance of public infrastructure by the private sector

For these to be ultimately successful in the long term, the city authority needs to be able to provide investors with confidence that there is a means of paying for infrastructure delivery and operation. If user charging is proposed there must be confidence that tariffs will be forthcoming and properly collected and enforced. Whichever mechanisms are chosen, they must be recognised as fair, transparent and enforceable if they are to ensure long term affordable funding.

There are many different delivery structures which can be adopted and the preferred option will depend upon the particular circumstances.

Whichever approach is taken, whether it is public sector led or to enable private sector involvement in infrastructure delivery, the delivery vehicle needs to be endowed with appropriate powers to deliver, or else to facilitate or procure delivery by others. This could include land assembly, providing financial investment or underwriting by providing guarantees. Alternatively, delivery could be achieved through subsidiary vehicles, Special Purpose Vehicles (see Energy Service Companies) or joining with other public bodies in procurement.

“We must invest available resources in ways that make our infrastructure more sustainable”

“The U.S. will not be economically competitive in the future global marketplace if we fail to invest in our infrastructure, especially systems in our cities and metropolitan areas which underpin so much of the nation’s economic output”

Tom Cochran, CEO and Executive Director, U.S. Conference of Mayors

Energy Service Companies (ESCOs)

Where the private sector is involved in delivering or operating an infrastructure project, contractual mechanisms also need to provide for risk allocation, performance outputs and incentives for innovation.

For instance, if the infrastructure delivery involves a design/build/operate style of PPP, contractual terms can be incorporated giving certainty to both parties:

- To investors that construction permits, operating rights and reasonable flexibility to price for profit will all be available
- To the public that there will be value for money and transparent accounting with absolute probity during appointment and approval processes

The robustness of wider legal and regulatory regimes and levels of investor confidence in the underlying business plan will often dictate the delivery mechanism, as will the interests of those who are to bear the ultimate delivery costs.

ESCOs deliver district wide heat and power networks and supply on large urban development projects. The use of an ESCO for a project typically involves the creation of a special purpose vehicle which acts as a hub for the contractual provision of connections to, and supply from, a district heat and power network. The ESCO may own the networks it operates or maintains or may have an interest in those networks under alternate structures, such as leases or concessions.

The corporate structure of such an ESCO also varies from development to development depending on the needs of the scheme and risk appetite of the various investors. For example, many procuring bodies will take a stake in such an ESCO, but allocate part of the equity in the ESCO to an industry partner e.g. a private sector entity with experience of delivering comparable networks.

The range of activities that an ESCO can undertake are broad and specific to the project including:

- The operation and maintenance of a network financed and constructed by a developer and supply of heat and power to users; through to complete design, building, financing, operation and maintenance of the network and supply of heat and power to users. For instance, this is the model adopted by EON for a project at Cranbrook, near Exeter in the UK. Heat will be supplied to manufacturing, industrial and office units at the 1.4 million sq ft sustainable Business Park and will potentially make Cranbrook one of the largest low carbon communities in the UK to deliver combined heat and power to all residents

Where an ESCO has contributed capital to the design and build of the scheme, it recovers capital investment by charging users of its networks and selling the heat and power generated by the scheme. Where projected revenues are potentially insufficient to recover its investment, there may be some sharing of risk or of capital investment by the procuring body developing the project.

Creating investor confidence

Putting in place the institutional enablers

Establishing regulatory frameworks to attract private investment

Legally regulating rights to provide public services is often required for partnering, or for private sector delivery, finance and operation of critical urban infrastructure.

Where the city authority is entitled to control the ability to provide public services, private sector involvement can be governed by contract or operating licence. The preferred option will be influenced by the extent to which the infrastructure assets are intended to form part of a network and how their use could develop over time.

For certain types of infrastructure where the main opportunities for private sector efficiency are at the construction stage, a standard, contractual procurement route may well be best. For other types of infrastructure, particularly where greater flexibility is needed to deal with uncertainties such as growth of the network, a licensing regime could be preferable.

The more robust and structured the regulatory framework, and the more efficiently it is enforced by independent regulators, the greater the scope to move away from reliance on public expenditure for financing particular infrastructure investment programmes to a greater emphasis on the private sector delivering essential public services to meet agreed outputs and deliver desired outcomes.

To take water services as an example, this would involve moving away from procurement of a particular network asset delivering water to licensing private sector operator(s) to provide municipal water supplies to the resident population whilst meeting stipulated water quality and security of supply standards and within agreed pricing parameters.

This is particularly effective in environments where there is sufficient population and demand to support a number of different operators competing to deliver the best offer to citizens and businesses. Greater efficiencies can then be achieved provided that the private companies and their regulators operate within a strategic framework set by the city. This in turn requires a wider framework and strategy to ensure that interactions between sectors are properly understood, and that relative priorities

“In Asia, we see enormous requirements for infrastructure. One estimate shows that 8 trillion dollars in infrastructure investments are needed over the next ten years in Asia. Transport is a major part of this infrastructure need. Without appropriate and adequate transport, countless millions of people lack access to jobs, markets, hospitals and schools”

Haruhiko Kuroda, President, Asian Development Bank

are considered. There is particular benefit to be gained in city authorities embedding appropriate obligations to contribute towards smart, interconnected service delivery when establishing the legal mechanisms under which infrastructure providers and operators are appointed. Ultimately, the outcomes to be sought should be matters of public policy rather than private choice.

Effective regulation is also important to ensure that, once delivered, the infrastructure assets operate optimally and that the city remains an attractive destination for investment. For example, poor regulation of a city's transport network can undermine economic growth whereas a fully integrated and efficient multi-modal transport regime can deliver substantial benefits and attract the location of businesses and citizens.

If they are to be effective in stimulating investment, regulatory frameworks need to be dynamic to anticipate and respond to future growth in demand and new, rapidly evolving technologies. They need to provide sufficient operator protections to instil the confidence to invest. Regulatory frameworks must also encourage competition and avoid monopolistic behaviour and abuse of market power.

The regulator's monitoring and oversight powers need to be robust and clearly defined. Enforcement powers should be applied in a targeted and efficient but not disproportionate manner. Regulation should not be allowed to stifle valuable innovation. The key is to establish a smarter approach to regulation which balances such stability with the need to flex and change over time.

The questions investors ask ...

- What risks will we be taking on? And are the returns worth it? Are the legal, governance and regulatory systems in place to ensure our investment is protected and that we can get a return on it?
- What do the credit rating agencies say about this city's investment grade? What are the economic fundamentals of the city? How large is its debt burden and does it have sufficient liquidity?
- How is the city supported? What is the legal, economic and political relationship between the city and the State? Is there a clear obligation for the State to provide fiscal support, if required?
- How does the city's institutional and governance framework measure up and is it stable? Does the city have mature and robust legislation for investment? Is the framework sufficiently clear in terms of roles and responsibilities?
- Are city revenues predictable? Does the city retain fiscal flexibility to change charges/taxes and are such changes capable in a politically acceptable manner?
- Is there a clear, well formulated and articulated vision for the infrastructure development proposed with buy-in from key stakeholders including the public?
- To what extent is the vision adaptable to changing events?
- Is there a single, stable vehicle representing the city as a whole and with the ability to contract?
- Is there a track record of success? And a willingness from the city to put in upfront investment as a sign of public commitment to the project?
- Are the regulatory systems smart and appropriate for the public services arising from the infrastructure investment?

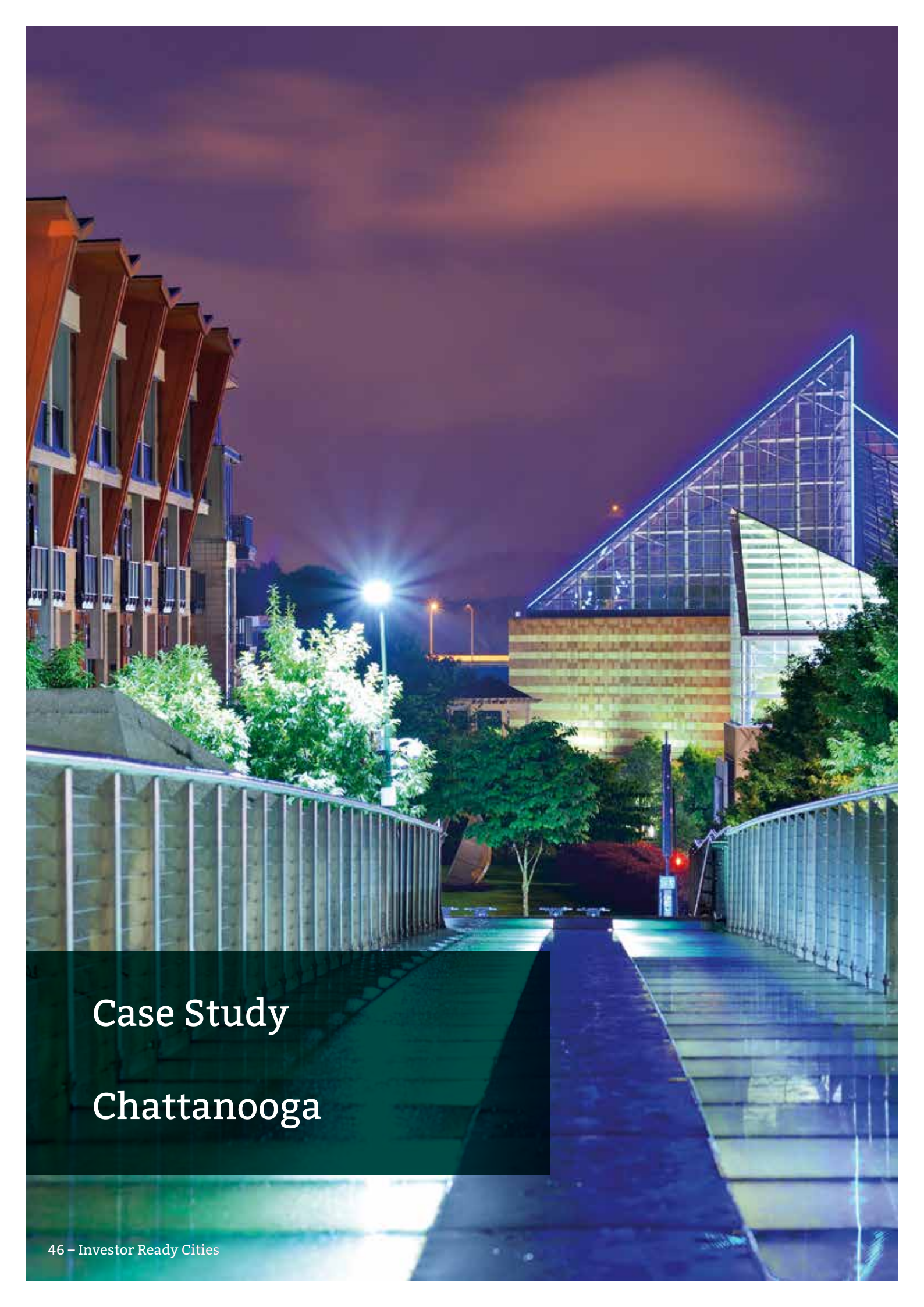


Case Study

The background of the slide is a photograph of a server room. The room features rows of server racks with glass doors. The lighting is dim, and the overall color palette is dark, with a prominent teal/blue gradient overlay that fades from the top left towards the bottom right. The text is white, providing high contrast against the dark background.

Chattanooga

Smart grid and communications



Case Study Chattanooga

Background

Located in the Tennessee River Valley, Chattanooga is a city which has faced repeated economic adversity, and each time has found a way to reinvent itself through the clever use of its natural assets, infrastructure and smart technology.

Rising from the grips of the Great Depression, Chattanooga was a beneficiary of Franklin D. Roosevelt's 'New Deal' finance which aimed to revitalise the region. As a result, Chattanooga became a bustling town with a thriving economy and one of the largest cities in the US.

With a history in industrial textiles and manufacturing, the city was considered the regional leader in the manufacturing of iron and steel equipment, and by the late 1930s there were nearly 400 manufacturing companies based in Chattanooga. In the 1940s a vibrant downtown brought the city to life with the economic activity of industry creating a thriving community. In 1945 Du Pont constructed a major facility in the city close to the Chickamauga Hydro Dam which provided electricity to the business, a clear sign that the provision of secure power is critical to city investment. The city continued to prosper with one in three Chattanoogans employed in manufacturing.

Forty years later however, the city was once again in deep decline; manufacturing activity, the prime source of employment, was stalling, and urban sprawl had seen much of the resident community move to the suburbs and the population dropped sharply by 20 percent between 1950–1990. The city had lost its economic drivers and was struggling to retain human capital. The effects of

suburbanisation further fragmented the community as people moved out of the urban core in search of affordable land. Roads were constructed to serve the suburbs, but the critical infrastructure needed to support such development did not arrive with it. A lack of public transport forced people into their cars contributing to the pollution that already dogged the city. Dubbed the most polluted city in the US in 1969, quality of life concerns were driving people out of Chattanooga. By 1990, only one in five people worked in manufacturing, and the downtown area with its stagnant economy, became plagued by deprivation.

By the mid 1980s the civic leadership realised the city was heading towards irreversible decline and instigated a process that would lead to new found recovery and secure strategic investment. This was known as 'The Chattanooga Way' – planning, citizen engagement, public-private partnership and as a result, transformative projects. Additionally, changes in local government structure to a Mayor-Council run administration allowed for efficiency and effectiveness which were critical in realising the city's transformation.

“By the mid 1980s the civic leadership realised the city was heading towards irreversible decline and instigated a process that would lead to new found recovery and secure strategic investment”



Case Study

Chattanooga

The story

The 2009 Recovery Act was passed in response to the global economic recession, making funds available to help US cities revitalise their economies. Only the most well prepared plans with clear economic reward were to benefit to ensure effective deployment of the funds.

Chattanooga had already established the need to re-invigorate the economy and plans to move the city forward were predicated on the need to attract new business and to provide those businesses with the tools they required to thrive in times of economic downturn. The city decided to provide its community with the latest technology enabled fibre optic smart grid energy network, providing more secure, more affordable, and more efficient power supply to homes and businesses throughout the city. The first phase of the network came online in 2009.

With power outages costing a city the size of Chattanooga around \$100 million per year, diverting city funds to maintaining outdated power distribution systems prevents economic growth and results in poor cross-service delivery. With this energy smart grid solution, businesses could invest in Chattanooga knowing that they had the highest levels of power reliability.

Chattanooga had re-established its credentials as a centre for energy security and city resilience.

The grid has self-healing capacity which can re-route power in the event of a fault, isolating the event and reducing outages across the city. Not only do users have the information to help manage their own energy consumption more effectively, there is now the ability to limit the use of unnecessary energy consumption in the city when demand is at its highest reducing the likelihood of power outages by 40 per cent. The overall impact beyond energy security, is a reduction in energy consumption and carbon emissions and the additional cost saving benefits that ensue from reduced usage and demand sensitive pricing.

By providing this solution to the city, quality of life is enhanced for residents and businesses, but the extent of new found interest for inward investment in the city has seen Chattanooga once again reverse the trend towards economic decline into one of potential sustained prosperity.

As a result of the infrastructure, the automotive industry has invested in the city creating 2000 direct jobs, and online retail distribution centres are also investing along with start up tech oriented businesses. Over 20 large industries have signed up to 'time-of-use' tariffs which will save those businesses collectively \$2.3 million a year.

Where public money may once have been spent on power grid maintenance, the city can now take this money together with increased local business tax and invest this in neighbourhoods and their communities. This has allowed the Mayor to concentrate more effort on city construction projects in conjunction with local citizens, which has resulted in a resurgence of community pride with neighbours coming together to fight blight and crime.

The financing for the project was a combination of federal funds which amounted to less than one third of the costs. The majority was raised by revenue bonds. In October 2012, the bond ratings were upgraded to AA+ status as a result of the economic success of the smart grid and fibre optic infrastructure implementation.

“As a result of the infrastructure, the automotive industry has invested in the city creating 2000 direct jobs, and online retail distribution centres are also investing”



Lessons Learned

.....

Following extreme climate events such as Hurricane Sandy which hit New York in October 2012, power outages are commonplace and result in huge costs to the city. The economic cost through loss of trading activity can be devastating for businesses.

Following the implementation of the energy smart grid, Chattanooga was hit by a series of tornadoes in July 2011 leaving 77,000 homes without power. Over 50 percent of those homes had power restored in two seconds - previously this would have taken 17 hours. 250 service visits were avoided due to the remote information mining provided by the smart grid technologies, thereby speeding up the restoration service to those who were affected. It was estimated that \$1.4 million restoration costs were saved in this one storm alone.

The smart solution for energy involves upgrading the distribution networks and providing the latest building integrated energy management with real time information to inform the user. Without both components, the true benefits are only ever partially realised.

Having the vision and driving change through city leadership, is critical to establishing long term success. Chattanooga has recognised that by providing its city with the latest energy network technology, it has future proofed itself from single sector vulnerability. Businesses recognise the need for secure energy to survive in global business. Chattanooga has responded through this insightful strategy, truly giving power back to its people.





“Having the vision and driving change through city leadership, is critical to establishing long term success”





Section 5

Finance and funding

Capturing value

Financing & funding of city infrastructure

Cities under pressure

Securing the necessary resources to deliver city infrastructure is a near-universal challenge for city authorities. In many countries, budget allocations from central governments to cities are under pressure. In countries with more devolved funding models, cities can generate revenue directly, collecting municipal income taxes, property taxes and business rates.

However, these revenues are not immune from economic slowdowns. In addition, locally held liabilities such as final salary pension fund obligations can grow faster than locally held assets. So regardless of the degree of centralisation, there is never enough money to go around and always a need to prioritise – “to govern is to choose”.

As a result, a great deal of attention has been focussed in recent years on prioritising infrastructure investments based on expected societal outcomes or economic benefits and then identifying new ways of making these investments happen. Much effort has centred on marketing individual financing products rather than undertaking a broader evaluation of the city’s financing options in the context of its overall funding framework.

Funding vs. financing

Although the terms funding and financing are often used interchangeably, they mean very different things to the investment community. Understanding this difference is an important part of analysing and then communicating the fiscal challenges that cities face and then developing options to address them in a way that attracts investors.

Financing represents the time shifting of costs incurred. Say a city borrows to construct an infrastructure project and doesn’t start to repay the loan for 5 years. In this case, the cost of the project has been time-shifted into the future through financing. However, financing does not set out how the funds to repay the loan will be earned.

In contrast, funding is the means by which the project’s costs are repaid, regardless of the period to which these costs are time-shifted. For infrastructure, this generally means identifying the long-term revenue stream necessary to pay back the funds initially invested.

By way of example, typical funding and financing sources are set out in the following table.



The different types of funding and financing

There are three generic funding and financing models:

- Devolved funding and financing, where city authorities retain locally sourced funding such as business rates or property taxes and then borrow corporately (from a variety of financing sources) against the future receipts of these funding flows
- Centralised funding and financing, where cities transfer general revenue collected for central government in exchange for budget allocations and/or central government guarantees of local borrowing, which is generally capped at a certain level
- Asset specific cash flows, such as disposing assets to recycle capital into new projects and linking (or 'hypothecating') specific cash flows to a specific project; for instance, introducing tolls or user charging directly related to use of an asset like a road

Funding:

- Property taxes
- Business rates
- Municipal income tax
- Tolls and user charges
- Asset disposals
- Budget allocations received
- Grants received

Financing:

- Public sector banks
- Commercial banks
- Municipal or project bonds
- Pension fund private placement bonds
- Development banks / multilaterals
- Equity investment and infrastructure fund managers
- Leasing and vendor finance



Financing & funding of city infrastructure

Funding vs. financing (continued)

Many of the financing instruments set out in the above table will be familiar to city treasurers around the world. However, bonds have been used mainly in the Americas, particularly the United States. In part this is due to the United States capital markets being the deepest and most liquid in the world. It is also due to the relatively short repayment periods for bank debt in the Americas, which can pose a risk when financing (and refinancing) long-lived infrastructure projects. Other factors for the popularity of bonds in the United States include the more devolved nature of funding as well as central government tax hypothecation (in the form of tax-exempt municipal bond issuance) that cuts interest costs for municipal issuers. 2012 saw record levels of bond issuance, in part due to central bank actions holding down the government reference rates against which most bonds are priced.

It is worth noting, however, that bonds are increasingly being issued in markets other than the United States.

Numerous high growth countries (especially in Africa) have recently launched maiden issues. Project bonds are emerging (or re-emerging) in the infrastructure finance market outside the United States. In 2013, there were landmark transactions in Brazil, Spain, Holland, the UK and France. In certain jurisdictions, sukuk (or Islamic bonds) can be used to raise finance. Sukuks are structured to ensure that returns to investors (often through undivided ownership, rents as well as borrower commitments to repurchase assets) are Shari'ah compliant.

A public bond is listed on a public exchange, and can be traded in the secondary market. A private placement is not listed on a public exchange. Both instruments involve funds flowing directly between the end investor and the borrower without an intermediary (such as a bank). A project bond is generally limited recourse, meaning that repayment is linked to the performance of a specific project and not the general obligation of the issuer.

Macro and Micro level

Vendor finance is supplied by the financial services arms of equipment suppliers. Vendor financing (and credit support from vendors generally) can assist with commercial financing, subject to value for money testing and development of appropriate inter-creditor arrangements.

Financing products each have their specific benefits and costs for cities and their investors which can be explored through appropriate due diligence. However, identifying sources of funding i.e. the revenue needed to support and repay the financed sums, is a much tougher task and is often the difficult issue which prevents projects from proceeding.

Many cities own significant assets, some of which they are entitled to generate income from, for example, revenue generated from land assets such as parking lots or rental properties. As such, many of the new models under consideration for funding relate in some way to land, although user charging can break this link.

Models in context

Most cities are familiar with using a particular mix of devolved and centralised funding and financing, with city governance processes designed to fit the chosen model. Adopting new funding and financing models, however, can impact the city's governance approach and its relationships with other public bodies.

At a macro level, the preconditions for an active bond market include:

- Available capital outside of the banking system
- Sufficient governance and transparency in financial reporting
- Suitable tax and commercial policies
- In the case of project bonds, mechanisms for project-specific credit support

At a micro level, key considerations for borrowers include:

- Price certainty as public bond interest costs are not known with certainty until shortly before issuance
- Flexibility, as early repayment can be costly
- Information disclosure, particularly for public bonds)
- Governance, especially for project bonds and in particular the mechanism for disparate investors to make decisions over the life of the project

Financing & funding of city infrastructure

For example, the proceeds from asset disposals may be repayable to national government. And where user charging is being considered, users may perceive the charges as doubling up on costs to which they have already contributed through taxation.

This can lead to a wider debate on fairness, a classic example being road pricing. In this case, introducing widespread road user charging is often resisted because drivers believe that they have already paid for their road usage through taxes such as vehicle excise duty. This resistance makes it vitally important for cities to explain clearly the reasons for introducing such charging, be that to curb air pollution or reduce congestion, and ultimately improve quality of life.

Another example is US municipal bonds which often pay interest that is tax-free in the hands of the bondholder. This allows the borrower to pay the bondholder a lower interest rate for the same risk than they would need to if the bondholder's interest earned was taxable. As such, the city is undertaking the financing locally against local funding flows but by exempting interest from tax, central government is in fact supporting the financing.

So cities considering new funding and financing models should dedicate sufficient time, human resource and money to understand the wider implications of their decisions in order to reduce the risk of delay and abortive costs for investors later in the process.

Capturing value

Whilst the range of potential finance sources is broad, major challenges will often remain in terms of how to bridge the gaps between the direct costs of creating infrastructure and the realistic returns arising from it. Finance must be repaid and deficits have to be overcome.

One way of addressing funding gaps is to develop a range of options for capturing the value that arises from an infrastructure development. In an urban context, new and improved infrastructure often enhances land values as well as serving existing populations. Such value enhancement can in turn help fund infrastructure delivery if it can be captured.



There are many models and structures which can be developed for capturing such value (see Generic models).

Generic models

Whether some or all are used in relation to a particular item of infrastructure will depend on:

- The amounts to be raised
- The degree to which the need for infrastructure is driven by the city's general needs or those of a particular development or development area
- Whether the investment secures wholly new infrastructure or the enhancement of an existing development
- Whether existing charging systems already exist and how large a population is likely to benefit

The available models include:

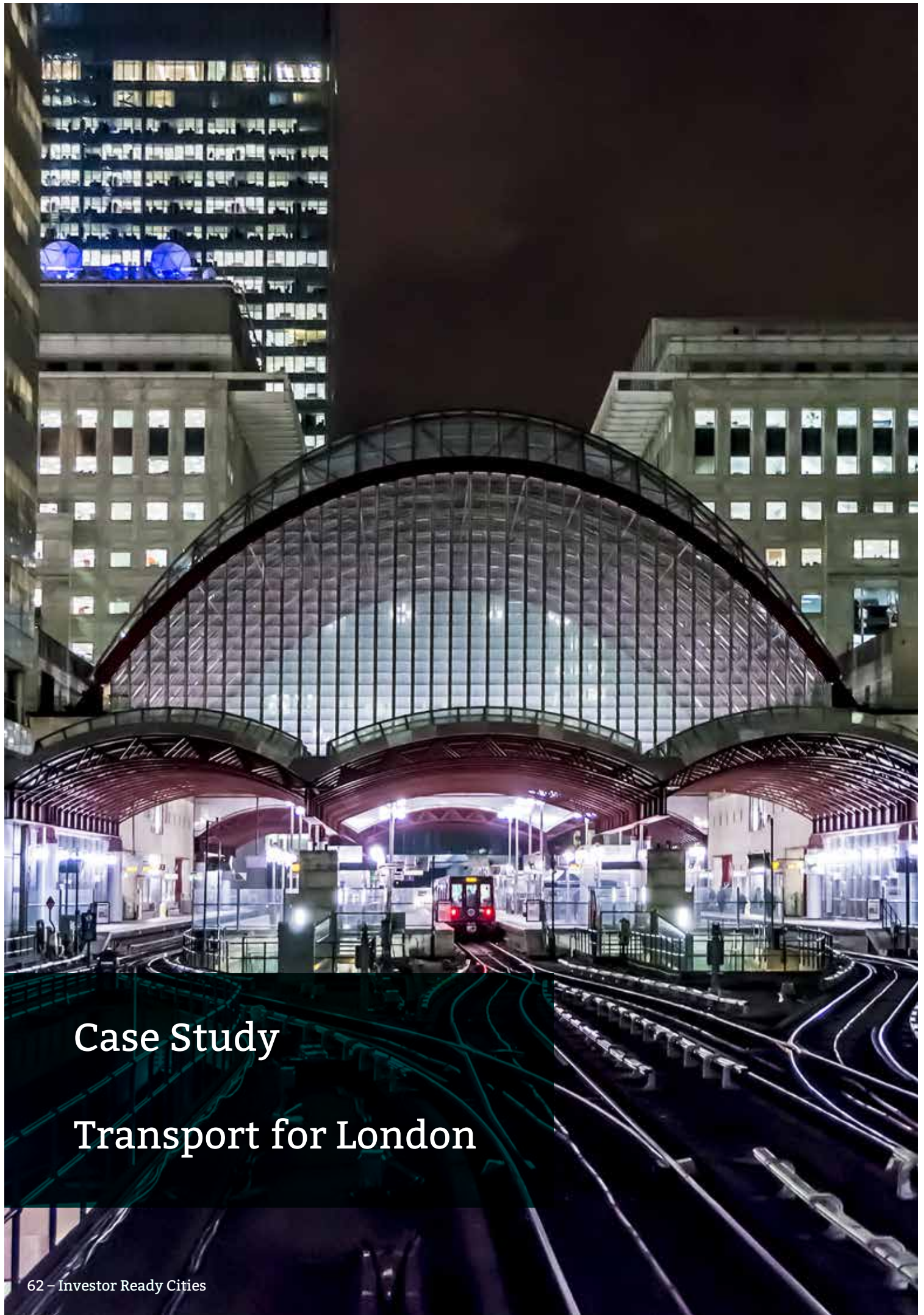
- Mechanisms related to the granting of development consents for projects likely to benefit directly or indirectly from the infrastructure e.g. Lump sums or contributions in kind based on predictions of infrastructure demand, or pre-set tariff payments based on sharing costs in some way such as on the basis of floor space
- Supplementary local taxes on all addresses, or specific types of property, within the area defined as deriving special benefits from the infrastructure developed
- Assembling land which stands particularly to benefit from a new infrastructure development in the form of an investment security for longer term disposal or capturing revenue streams through later sale of property rights, lease and claw back mechanisms
- Joint venture arrangements competitively tendered, to avoid unfair subsidies and to secure best value, with the public sector retaining a long term financial interest



Case Study

A photograph of a London Underground station platform, likely Old Street, with a train on the left and a platform with advertisements on the right. The image is overlaid with a dark teal color and white text.

Transport for London



Case Study

Transport for London

The Background

Transport for London (TfL) is a statutory body, set up in 2000 at the same time that Greater London first elected a Mayor. Transport policies have featured heavily in the programmes of the first two London Mayors (Ken Livingstone 2000-2008 and Boris Johnson 2008 to date). The Mayor has a statutory duty under national legislation to develop and implement policies to promote and encourage safe, integrated, efficient and economic transport facilities and services to, from and within London. The Mayor's remit covers London Underground, some heavy rail services, buses, river services and roads. It includes control of traffic lights, ownership of the main London coach station and licensing of taxis.

TfL's role is established also by national legislation and its remit is to implement the Mayor's Transport Strategy and manage services. TfL is responsible for the planning, delivery and day-to-day operation of London's public transport system. It has a particular duty to provide or secure the provision of public transport passenger services to, from or within Greater London. TfL's largest current infrastructure project is Crossrail.

Governance and policy

TfL is directed by a Board whose members are appointed by the Mayor of London, who also chairs it. TfL's Commissioner and chief officers are accountable for the daily running of the organisation and the work of its 25,000 employees. Day-to-day delivery of public transport services is delivered through a series of operating subsidiaries. The largest is London Underground Ltd (LUL). They also include: London Buses Limited, Docklands Light Railways Limited, London River Services Limited, Rail for London Limited and Crossrail Limited. A number, such as Tube Lines (Holdings) Limited have been structured specifically to facilitate public-private partnerships.

The current Mayor's Transport Strategy both recognises and emphasises the contribution of good transport systems to the economic performance of London, as well as to meeting environmental and social inclusion objectives. The Strategy puts great emphasis on an holistic approach to transportation connectivity and to improving connectivity at all levels from international to local. This is against the background of significant increases in public transport use.

Delivery mechanisms

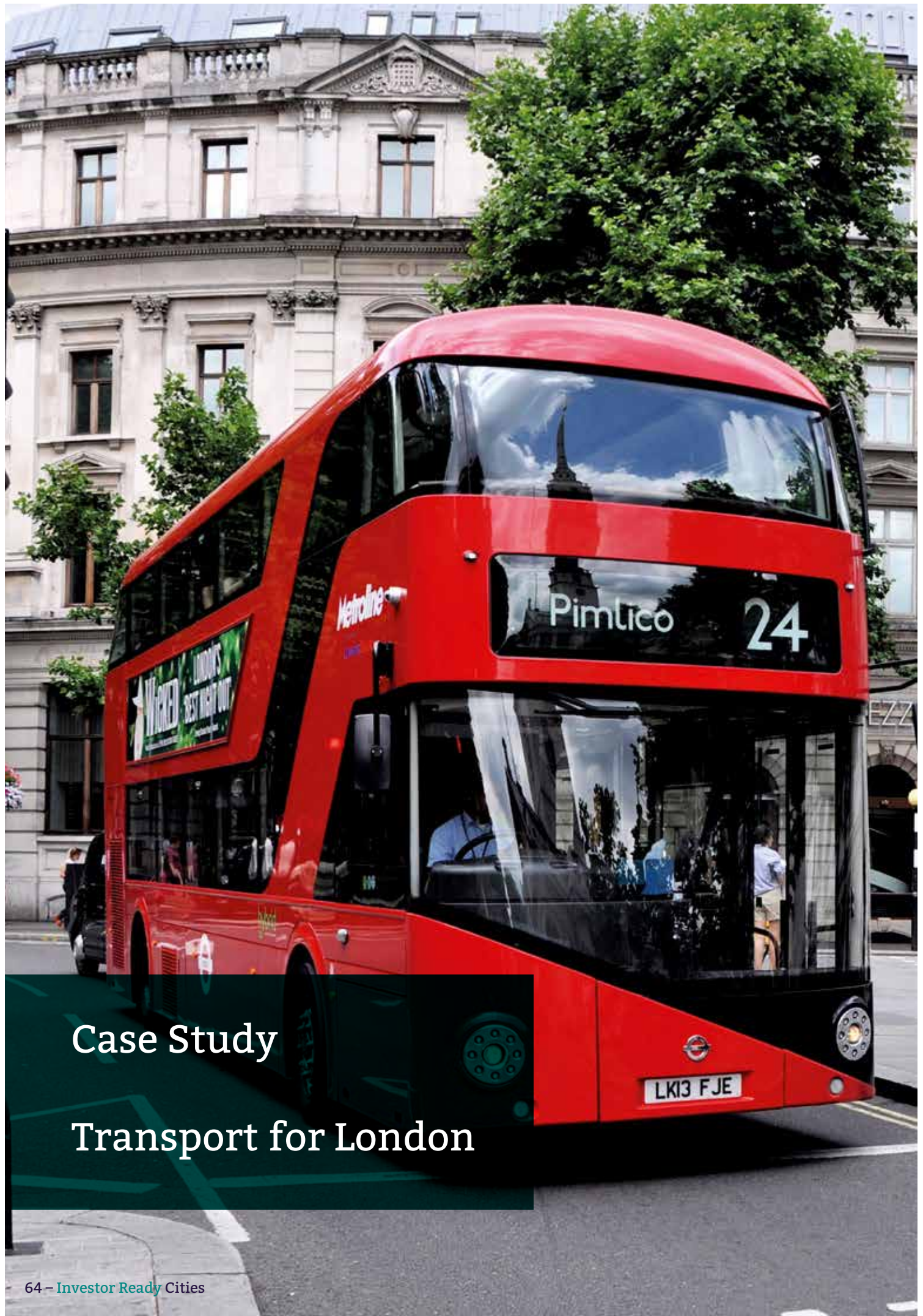
TfL has adopted a range of mechanisms for delivering transport and infrastructure services. Typically, in line with UK approaches to transport infrastructure, they rely on dividing up and contracting separately in relation to (a) service operation, (b) infrastructure ownership operation and maintenance and (c) vehicle/rolling stock ownership, operation and maintenance. Management of design, construction and procurement of new projects including infrastructure and vehicles/rolling stock is also treated separately.

Generally, TfL – through an operating subsidiary – manages and procures new projects directly. Services on London Underground are publicly operated: LUL employs directly all drivers, station staff and signallers. By contrast, overground bus services and rail services for which the Mayor is responsible are provided under contract with private sector companies. These contracts are generally in the form of a concession agreement, with the private sector companies providing services specified by TfL, at an identified cost, with associated performance measures and financial penalties. All revenue is paid to TfL, so that the contractor does not take any revenue risk.

Infrastructure services are also delivered in a range of ways. Maintenance of buses and rolling stock is often contracted out to the vehicle manufacturer or to the concession operator. LUL, however, maintains its own infrastructure directly.

TfL's operations, and in particular those of London Underground are notably more embedded in the public sector than other UK utility services. This follows attempts to contract out all infrastructure maintenance, renewal and enhancement on the Underground network through a Public Private Partnership having proven unsuccessful in the past. It also reflects an economic reality that in the current market, TfL has been able to provide services and raise finance more economically by taking direct responsibility than by placing responsibility with a third party.

“The Strategy puts great emphasis on an holistic approach to transportation connectivity”



Case Study

Transport for London

Crossrail and its funding structure

The Crossrail project involves construction of 21 km of new twin-bore tunnels under central London, construction of nine stations and procurement of new rolling stock. Services are expected to start in 2018. Each train will carry 1,500 passengers, with peak services of 24 trains per hour in each direction.

The project is jointly sponsored by the Mayor and central Government, but is being delivered by a company which is now a wholly owned subsidiary of TfL.

Crossrail is expected to cost just under £15 bn, and is currently the largest construction project in Europe. But its wider economic benefits have been estimated at over £40 bn.

Crossrail will be funded by a variety of means. Over 60 percent of Crossrail's funding will come from Londoners and London businesses, through fares. In addition, value capture schemes have been set up: compulsory developer contributions as part of a Mayoral Community Infrastructure Levy; and a more generally levied Crossrail Business Rate Supplement. There will also be a grant from central Government. Financing has included a loan of £1 bn from the European Investment Bank to TfL, one of the largest loans it has ever made.

The biggest single contract within the project, at around £1 bn, is for the procurement of new trains and a maintenance depot. Originally, this was planned on a private finance basis, but it has recently been decided that procurement will be wholly funded by central Government and TfL. This is expected to result in lower costs.

Benefits of holistic transportation control and consequent innovations

By having overall operational control of all modes of transport within London, the Mayor and TfL have been able to operate systems within London holistically. It has been possible to take decisions based on what is considered to work best in overall transportation terms rather than simply in the best interests of the operator of a particular mode. This has enabled both innovation and proactivity in persuading travellers to shift between transport modes.

By way of example, one of the key policies of the first Mayor was to introduce a Congestion Charge in central London. This was implemented in 2003. It is the only major zonal road charging system in the UK, and has reduced traffic entering the charging zone by over a quarter and enabled travel by public transport within the same zone commensurately to increase.

Another example of innovation is introduction of the multi-transport mode "Oyster" travel card and payment system. This is a contactless smartcard which is accepted on all TfL operated or contracted services as well as national rail services within Greater London. Not only does it introduce great flexibility in choice of travel mode, and an easy means of offering incentives for public transport use, but also it enables data concerning travel patterns to be captured and to feed into future decisions on service levels and timetabling. More than eight million cards are in regular use, and each week, around 57 million journeys are made using Oyster. Less than 2 percent of bus journeys are now paid for by cash.

“It has been possible to take decisions based on what is considered to work best in overall transportation terms rather than simply in the best interests of the operator of a particular mode”



Lessons Learned

TfL reflects the latest stage in the evolution of one of the world's most complex transportation systems within one of the world's oldest and most densely populated cities.

The success of TfL is a good example of the benefits of enabling holistic city wide control and decision making over the most important modes of transportation.

In respect of delivery of new and improved existing infrastructure, it has enabled flexibility in attracting investment and finance with maximum control over cost.

Objective, policy-led efficiencies, evolution and innovation are made possible by decision making at a City level with a particular focus on City priorities both generally and with particular respect to transportation.

The model of a transport body with cross-modal powers, the ability to raise finance directly in capital markets and answerable to city rather than national politicians is one that has broad relevance to major cities.





*“The success of TfL is
a good example of the
benefits of enabling
holistic city wide control”*



Financing & funding of city infrastructure

In the UK, local authorities cannot finance against expected future CIL receipts. However, an interesting example where CIL type receipts are used to pre-fund local infrastructure is the Milton Keynes Tariff³. Essentially, a “roof tax” is levied on new developments to contribute to the costs of local enabling infrastructure such as expanding transport, highways, education, health and other social infrastructure networks to service new communities in expansion areas of the city.

With the approval of HM Treasury, English Partnerships(EP)⁴ pre-funded the infrastructure works in advance of receiving the CIL. The CIL program was administered by the Milton Keynes Partnership Committee (MKPC), a formally constituted subcommittee of EP. The scheme was developed by MKPC in collaboration with the Milton Keynes Council, the Highways Agency, local health officials and Milton Keynes Forward, a body representing developers and landowners.

MKPC acted as the local planning authority for major applications within a designated Urban Development Area (UDA). In 2013, Milton Keynes Council took on direct responsibility for the tariff as part of the transfer of HCA roles and assets. The tariff applies to all major developments (sites in excess of 10 dwellings per hectare) granted planning consent in the UDA. The developers’ tariff contributions are (before adjusting for inflation) £18,500 per residential dwelling and £260,000 per hectare of employment space. Some of these tariff requirements can be paid via in-kind contributions such as provision of open public space.

The CIL payments are phased, and the first phase is triggered by the grant of planning permission with the phasing differing between commercial and residential developments.

All payments must be received by a long stop date 10-15 years from the grant of an implementable planning consent. As such, if the development has not been completed in the agreed time frame, the remaining CIL payments are due from the developer.

Community infrastructure levy

One model for cities to fund new infrastructure is to capture a share of the uplift in land values which are attached to an offer of planning permission for a development. This model typically involves setting and then applying a tariff, or levy, on new (‘green field’), developments. One example is the community infrastructure levy (CIL) which is fixed on a per square metre basis according to a schedule of rates published by the city. A CIL was an important part of the Milton Keynes Tariff (see Milton Keynes Tariff).

Milton Keynes Tariff

Of course, municipal financing traditionally comprises a mixture of cash transfers from national government, some grant funding and in some markets concessionary loans from bilateral and multilateral donor organisations in high growth markets. Increasingly, it is also supported by the devolved ability to raise local taxes and, where the credit rating is high enough, by recourse to debt and capital markets providing loan and bond based finance. When investors consider a particular project, they and their rating agencies will obviously pay close attention to the ability of the city to make its projected contribution to the project after allowing for its other financial commitments.

Crucial to developing a viable CIL is the creation of an infrastructure plan that identifies the investments needed to support growth. This would typically be done in discussion with developers and landowners to agree the essential infrastructure items required to avoid future delays to planning consents. Assessing this plan against the city’s existing ability to fund it will identify the “funding gap” that the CIL needs to fill.

The key challenge is balancing the need to raise funds against not setting the tariff too high and so stifle the ability for development to happen. One of the attractions of this model is that developers know in advance how much CIL payments any proposed development is likely to attract. As with any new model, however, it is important that stakeholders are brought along in the development process so that risks are managed.

For instance, investors will require confidence over the extent to which the tariff levels are open to subsequent review. For instance, there have been some instances in the UK where consultation and inspection reduced the original CIL tariffs. This in turn causes risk for those looking to adopt and/or rely on them as a funding stream to support investment in infrastructure.

Authorities designing such schemes should also be aware that the more flexibility there is in resetting charges, the greater the risk for the developer and the weaker the development incentive. Recent examples of the incentive effect of this include reductions in solar tariffs in Spain and gas transmission tariffs in Norway.

In addition, the timing of receipts under the CIL will depend on timing of new developments being delivered⁵. As such, the revenue stream could be irregular due to dependence on market conditions and development time scales, which again may be less attractive to investors.

Cities therefore need to consider how receipts under new models such as CIL compare to those under more traditional 'developer contribution' models such as negotiated planning obligations. For example, where a CIL is based on area, it is generally only charged on net additional development. This means that on brownfield sites, CIL would only be paid on any floor space additional to that which was on the site originally. As such, a CIL may be better suited to green field rather than brownfield developments.

3. http://www.miltonkeynespartnership.info/about_MKP/business_plans_infrastructure_tariff.php

4. A regeneration body, now part of the Homes & Communities Agency (the national housing and regeneration agency for England). HCA is a non-departmental public body sponsored by the Department for Communities and Local Government.

5. The trigger for payment is the start of a development, although payments can be made in instalments if local authority policy allows.

*“Tomorrow’s climate needs will require
us to build infrastructure that can
withstand new conditions and support
greater numbers of people”*

Robert Zoellick, former President, World Bank

Financing & funding of city infrastructure

Tax incremental financing (TIF)

Taxation based mechanisms are particularly suited to financing projects where:

- Contributions from the new development and/or user charging would be insufficient
- Requiring the whole population to contribute in addition to general taxes and charges for use would also be unfair

The pre-requisites of a local tax based regime include:

- The city having power to raise taxes over a particular area for a particular period and for a particular purpose
- A predictable present and future population on whom the tax could be levied and who would have the means to pay
- A perception of legitimacy among those required to pay through enhanced property values or local amenities
- A reliable means of enforcing payment

Tax incremental financing (TIF) models represent an interesting combination of all three generic funding models. The term TIF is widely used for a variety of structures, and it is worth setting out the definition used here. Specifically, we consider a TIF to be the creation of additional tax revenues:

- Based on broadening the tax base rather than raising the tax rate or creating additional taxes
- Collected within the area directly affected by the investment financed by the TIF. Taking a railway station as an example, the TIF “catchment area” is generally limited to a few hundred or thousand metres, rather than the whole city or region

TIF is not a new idea. It has been studied and put into practice since the 1980s, especially in the United States, where most states already have the legal framework to hypothecate taxes collected to a specific financing structure.

Repayments to financiers in a TIF are ostensibly based on the economic performance of the TIF catchment area. Where this area is subject to significant redevelopment risk, lenders may struggle to provide senior debt⁶ at reasonable rates as they are being asked to take a level of development risk more commonly associated with higher risk investments such as equity.

As such, there are a number of threshold conditions for TIF to be considered by cities if investors are to be attracted.

“We need to build smarter infrastructure that is both less polluting and more resilient. We must find solutions to provide clean energy, healthy food, and clean water for all in an increasingly resource-constrained world”

Takehiko Nakao, President, Asian Development Bank ADB

These include physical proximity to nearby sites that have high property values as well as significant undervaluation of the area for development relative to surrounding areas (see Hudson Yards). Even where these conditions are present, the success of a TIF depends on the fulfilment of certain project specific cash flow assumptions which are unpredictable. As such, investors to date have generally required evidence of support from devolved bodies or central government in order to provide some sort of guarantee or to credit-enhance these cash flows.

Hudson Yards

The type of ratings gap seen in Hudson Yards can be narrowed by additional credit support from the host government at national or local level. However, as the degree of this support increases, a TIF begins to resemble more closely a corporately guaranteed debt i.e. covered entirely by devolved and/or central government.

If the city authority and/or national government takes all of the risk on realising projected TIF revenues and growth does not materialise, the public administration effectively bears the development risk, which may not have been the original intent of the TIF. The question for the city authority is whether any incremental financing capacity available under TIF is worth the increased cost in funds, and how efficient the transfer of development risk is under the TIF.

Accurately measuring the uplift in business rates within the TIF catchment area also requires an accurate analysis of the baseline i.e. how much funding is realised through business rates prior to the TIF. Measuring this level is particularly important when the relevant funding flow is being devolved from a central administration to a local authority as part of the TIF.

In summary, it should be recognised that capturing value for investors requires value creation for users as a precondition. Value creation projects are often complex, extensive and time-consuming. They require the public stakeholders to develop and agree upon a stable strategic vision, a definition of clear roles and the implementation of specific contract frameworks to ensure that obligations are respected by long-term partners. Given the complexity of the projects, stakeholder groups and potential for delay, streamlined decision-making structures in the public sector can be mission critical to making this work.

An example of a TIF is the Hudson Yards redevelopment financing in Manhattan, New York. The former industrial/rail logistics site is the least developed part of Manhattan, which is (more generally) one of the densest office space areas in the USA. A key part of unlocking the site's wider commercial and residential development potential was connecting it to the metro system. As a result, the city decided to extend the Flushing Line / 7 westward by 2.4km to a new terminal in the Hudson Yards district.

To support the financing and limit the public subsidy, the city opted for a TIF structure on the 150 hectare site. TIF investors required dedication of certain local property taxes via payments in lieu of tax. Essentially, these payments are equal to (or for a limited period less than) the property taxes that would otherwise have been paid in the normal course of events, except they were pledged to service the TIF financing rather than count towards the city's corporate cash flow. In addition, the City of New York agreed to cover interest⁷ on the TIF bonds in the event that dedicated TIF-related revenue flows were insufficient to do so.

The greater the distance of the TIF from the host government's backing, the greater the increase in the interest costs relative to bonds issued directly by the host government. For example, although the Hudson Yards TIF bonds were supported by the city, the TIF bonds launched in October 2011 (A-) were not considered credit-equivalent to New York City bonds (AA). The lower rated credits then require higher interest payments to compensate investors for additional risk (and vice versa).

6. Loans or debt securities that have claim prior to junior obligations and equity on an entity's assets. Typical examples include amounts borrowed from banks, insurance companies and other financial institutions as well as instruments not expressly defined as junior instruments.

7. The original capital sum, or principal, is excluded



Case Study

Medellin

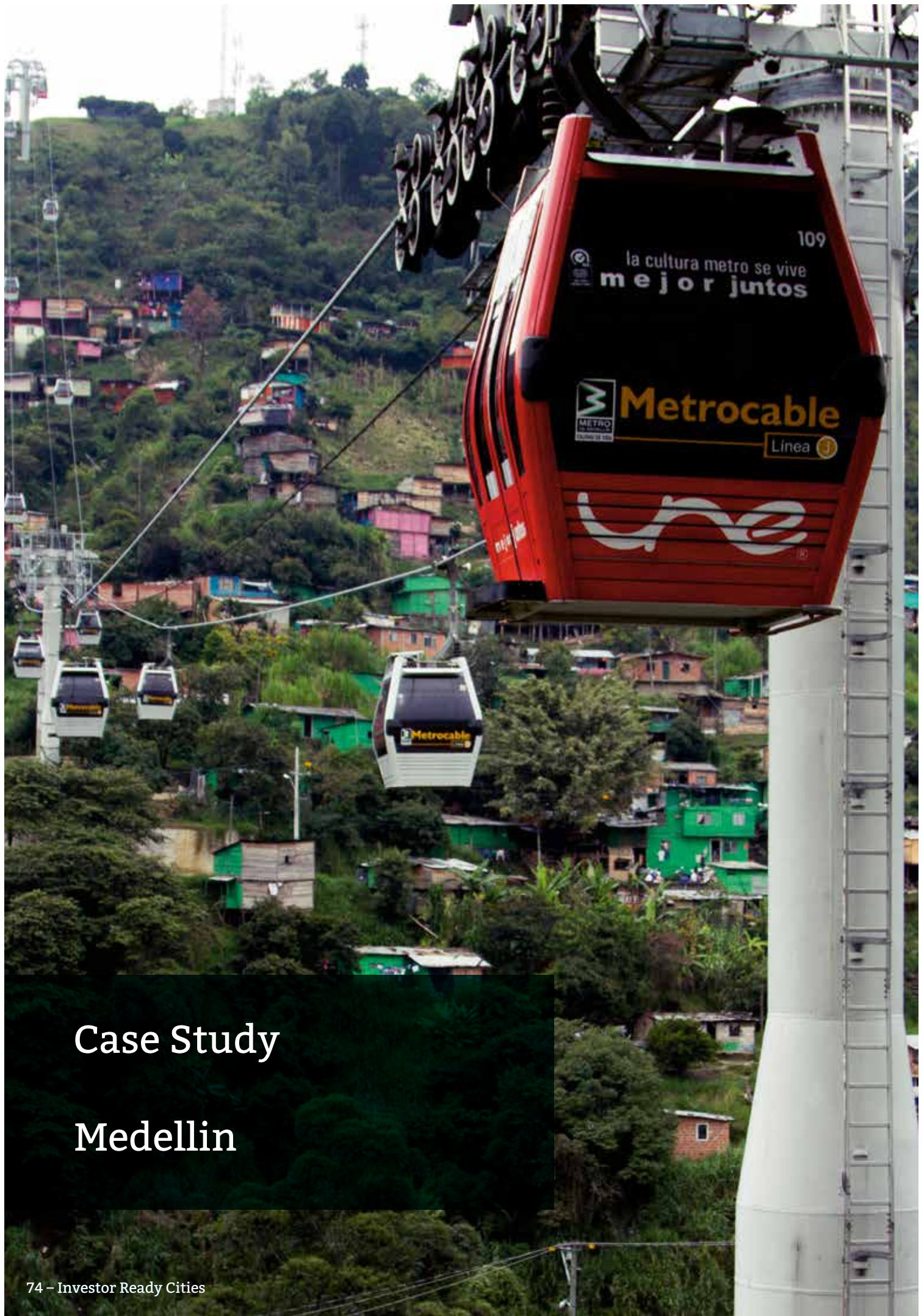
Integrated Planning for social mobility

29



Metrocable

Línea J



Case Study

Medellin

Background

Latin America is the most urbanised region in the world, with cities experiencing huge change as rural communities move into urban neighbourhoods creating social, economic and environmental problems that cities often struggle to overcome.

Medellin saw a threefold increase in population over a 20 year period at a time when governance and power was concentrated at national level and control of financing being distributed to nationally important projects. As a result of this urbanisation, informal settlements appeared on the city fringes and up onto the precarious hillsides that surround the city, leaving their residents disconnected from the commercial heart of the city and the very employment opportunities they had sought to access. Poor infrastructure and lack of opportunity led to Medellin experiencing some of the highest levels of crime endured by any city across the globe.

In 1988, a restructuring of national power resulted in the first election of city mayors by popular vote, and in 1991 a new constitution increased the influence and remit of municipal government. For Medellin, this meant the power, authority and responsibility to tackle these issues through strategic intervention that was to literally change the city landscape.

The Story

In 2000, Luis Perez was elected mayor and began the process of creating an integrated urban development plan. This was then built upon and further developed by succeeding mayors Sergio Fajardo, and Alonso Salazar covering a period of over 10 years. The vision for the city allowed for a comprehensive strategy which sought to tackle issues facing the most deprived neighbourhoods of Medellin and to identify solutions to the growing problem of poor connectivity, education and governance, and the use of public space. PUIs (Integral Urban Projects) were then identified, introducing major infrastructure projects, and using this as the anchor for local development and the catalyst for the enhancement of public and green space. The plans challenged some of the more typical urban development initiatives of their day by seeking to recover the most marginalised areas of the city, realising that by creating vehicles for social inclusion and improved education, and using architecture as a symbol of identity and place making, it would invigorate local communities and re-engage the dispossessed.

The first major infrastructure project to take place under the PUI was the gondola system 'Metro Cable, Linea K'. The cable car, opened in 2004 stretches 2km into the neighbourhood of Santo Domingo creating a link directly from the city centre into one of the city's poorest areas.

“In 1988, a restructuring of national power resulted in the first election of city mayors by popular vote, and in 1991 a new constitution increased the influence and remit of municipal government”



Case Study

Medellin

The Story ... continued

The creativity in developing an approach appropriate to the local context has not only resulted in a solution which can work effectively with the local typography, but reduced travel times of up to 2 hours by road, down to 7 minutes by cable car. It has also saved millions of dollars which would have been necessary to implement an alternative engineering solution. The cable car itself is also far less polluting than a road or rail based alternative and is powered by renewable energy – a combination of hydro power serving the city and photovoltaic panels on the roofs of the stations themselves. A single fare approach has also been included in the project by integrating the cable car with the other transport networks around the city, simplifying journeys for the user. This approach has resulted in savings to the end user of around 100USD per month.

As a transport solution success, it is worthy of recognition in its own right, but when delivered in conjunction with the urban development plan, the story is one of social mobility and revived community integration that is far greater than the transport story alone.

The cable car stations were made a place of social integration, where the community could come together and be trained in the use of IT, providing additional connectivity for people who otherwise did not have access to education or information.

A library, designed by a signature architect was also developed adjacent to a cable car station giving access to further resources and educational material, otherwise untapped by the local community.

By connecting communities, there has also been a significant decrease in the levels of crime with violent crime having reduced by nearly 80 percent, and a new trust has developed towards the public sector. People have taken ownership of their cable car, witnessed by the way in which the community maintains the stations. Their pride in the cable car is seen in the cleanliness of the buildings and the way in which people interact at the stations.

The economic impact has also been a significant win for the city. People from Santo Domingo can now make affordable journeys into the commercial heart of Medellin giving them access to employment opportunities. Commercial activity is said to have increased by 400 percent, and new businesses have developed along the route of the cable car, creating employment for less skilled workers. Additional benefits have been seen in the increased land values and rents along the cable car route and the fact that tourists are now using the cable car to see part of the city previously off limits. Banks are also now opening in the vicinity to serve a new clientele.

The financing was provided jointly by the municipality contributing 55 percent and the cable car operator, Metrocable providing 45 percent. Metrocable's financial model was based not only on direct revenue, but is also supplemented by carbon trading where savings have been quantified at nearly 20,000 tonnes of CO2 per year. Additionally, Metrocable also operate the wider transport network which has seen an increase in user activity further enhancing their revenue streams.

“By connecting communities, there has also been a significant decrease in the levels of crime with violent crime having reduced by nearly 80 percent”



Lessons Learned

The key success factor for the Medellín cable car, was a combination of strategic urban development strategy, layering the need for transport solutions, the use of public space, the provision of public services and the desire to improve education which would ultimately lead to increased employment and economic growth. In addition, and most importantly was the continuity in carrying through a vision, across political tenures, and delivering on the key themes that were identified as levers to unleash the hidden potential within the city.

Each mayor provided his own contribution, bringing strength and direction to the plan, and this continues to be realised by the current mayor Anibal Gaviria who is now building upon the success of the cable car with additional lines and further enhancements to the overall transport strategy. Whilst this case study relates to a specific project, it demonstrates how a city can turn around its fortune through creative and innovative interventions which act as a foundation for further development and ultimately lead to growth that could otherwise not have taken place.

Medellín has demonstrated the benefits of applying the 'correct' solution for its city, which as a consequence has made Medellín one of the most vibrant and commercially active cities in Latin America.





“People from Santo Domingo can now make affordable journeys into the commercial heart of Medellin”



Financing & funding of city infrastructure

User charging

Increasingly, governments are considering user charging as a means of financing new infrastructure, especially where it provides a step-change in quality for users or for the city at large. Nothing in life is free – citizens and businesses pay for government services through taxation. The relevant debate is how public services are funded and whether this occurs through general taxation or specific charging in relation to service use. It is the potential for charging to be a policy lever which helps to change the way in which citizens interact with public services that is of interest.

User charging offers a more direct match between who uses a service and who pays for it. In this way, charging regimes can be seen as ‘fairer’ than services universally free at the point of access, in the sense that those who use the service more, or use it more intensively, pay more. An example is Eurovignette, where heavy goods vehicles using motorways and toll highways in Eurovignette countries purchase certificates to help offset the additional money spent on motorway maintenance.

User charging regimes can usually co-exist with mechanisms to capture value for investors and/or enhanced taxation regimes. The London Crossrail finance structure has all three.

The essential prerequisite of a user charging regime is to ensure that only those who pay for use are entitled to benefit from a service or facility. This is easy to achieve where new utility connections or a new transport network is created. It is less easy to achieve where one is seeking to improve or add to existing infrastructure where no charging regime exists. The basic legal requirements are:

- Ownership or defined use rights in relation to the asset being assigned to the organisation that is to charge for use
- A system, controlled by the city, giving the legal authority for charges to be levied
- And the establishment of an independent regulator with a body of regulation enshrining service level standards for users and a framework for reviewing pricing tariffs (including inflation adjustment)

At its simplest, one might have a single tariff, cash-based toll such as for a tolled bridge or motorway. At a more complex level one might have multiple tariff models used to spread demand, such as a smart metering system for winter use of energy or summer use of water.

User charging also offers the potential for managing demand for services where supply capacity is constrained. An example is the change in demand behaviour that resulted from London's congestion charge where adding additional road capacity is practically very difficult. A similar example is in Tel Aviv (see Tel Aviv Dynamic Tolling).

Tel Aviv Dynamic Tolling

In 2011, a new 13km Fast Lane project was completed on Highway 1, the road to Tel Aviv airport. The reason for the new lane was the heavy congestion that blighted travel in and out of the city with an often 4 hour journey to the airport. The Fast Lane is a unique project, because the tolling used on the road is dynamic – responding to the volume of traffic travelling on the road in real time: as demand for the lane goes up, so too does the price.

Video cameras and sensors set up all along the route measure the traffic volume on the pay lane as well as the other free lanes. This information is calibrated per minute along with other driving condition factors to calculate a real time toll that can vary between 7 and 75 shekels (1.40 € to 16 €). License plate recognition software then charges every driver the real-time toll. Messaging signs communicate these costs to the vehicle driver.

The lane encourages carpooling by waving the toll for vehicles with three or more passengers, and part of the revenue from the collected toll finances a completely free commuter bus. The lane also means that optimal speeds are maintained, even in rush hour, thereby offering a quicker journey and reduced vehicle emissions.

An estimated 6,000 vehicles pay the toll daily for use of the lane. A parking facility is also provided for those choosing to use the shuttle bus.

Due to the huge success of the Fast Lane, it has been decided to build another such project from Tel Aviv to Rishon Le Zion and other similar lanes are under consideration.

Financing & funding of city infrastructure

In 2008⁸, London introduced a Low Emissions Zone (LEZ), a designated ring zone around the city, with the intention of discouraging heavy polluting vehicles from entering London, or face a significant charge for doing so. The purpose of the project was to reduce the air pollution caused by high emission vehicles.

Research shows that a large proportion of greenhouse gases in Europe come from lorries which are particularly prone to emitting PM10. It also shows that in the European Union 348,000 premature deaths occur each year as a result of PM10, typically affecting the most vulnerable in society. In addition to the quality of life implications for its citizens, London estimated that the cost of air pollution to the city each year was in the region of £2bn and therefore introduced the LEZ to help address the problem.

The zone is operated 24 hours per day with automated number plate recognition cameras which identify every vehicle entering the zone. Limits were set in 2008 stating the emissions requirements of certain vehicle types based on European emissions standards and metrics. All vehicles over 3.5tons had to be EURO III rising to Euro IV in 2012, and vans and minibuses had to achieve Euro III in 2012. The penalties for driving into London with vehicles which don't meet these standards are high at £200 per day, and a £1,000 penalty for non payment.

The project is not self-financing, but when taking into account the wider economic benefits, the project was deemed highly justifiable. It is expected that the LEZ will bring forward natural PM10 reductions by up to 4 years. Benefits are also doubled when effects outside the zone are included.

The health impacts in London are estimated to be:

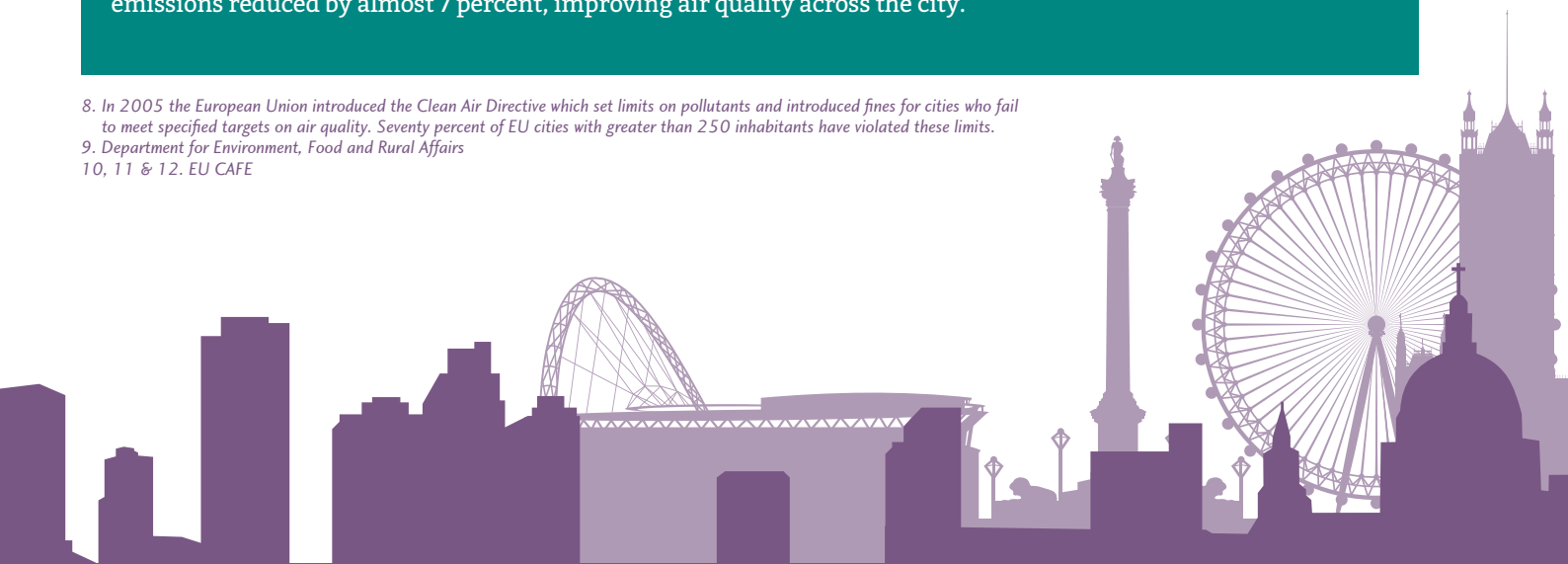
- 5,362 years of life expectancy lost across London to be gained⁹
- 350,000 fewer cases of lesser respiratory symptoms¹⁰
- 34,000 fewer cases of respiratory medication use¹¹
- 256,000 fewer restricted activity days¹²

As a result of this project, companies have upgraded vehicles to meet the standards at a conversion cost of what is estimated to be between £1,000 – £5,000, and new vehicles being purchased are also within the Euro band requirements. In the first 4 years of operation, and before the higher standards were implemented, London's emissions reduced by almost 7 percent, improving air quality across the city.

8. In 2005 the European Union introduced the Clean Air Directive which set limits on pollutants and introduced fines for cities who fail to meet specified targets on air quality. Seventy percent of EU cities with greater than 250 inhabitants have violated these limits.

9. Department for Environment, Food and Rural Affairs

10, 11 & 12. EU CAFE



There are a growing number of public and private sector examples of intelligently designed and implemented charging regimes, helping to ‘nudge’ and shape customer behaviour in relation to a given service (see Low Emissions Zone).

Low Emissions Zone

Well designed user charging schemes have other advantages:

- Support increased consumer choice, in that people gain decision-making power over their level of consumption and the configuration of their services
- Develop new markets and business models to stimulate private enterprise
- And create the potential for a contestable supply market, driving down costs and improving quality by promoting innovation

The feasibility of user charging depends in part on how familiar a given market already is with such charging in other sectors. For jurisdictions where it is not the norm, users generally expect the charges to be linked to an objective benefit. In transport, this could be reduced travel times/convenience or easing of congestion. This may limit the applicability of user charging to projects where the improvement in service is compelling for customers. Early engagement with policy makers, and setting out the business case for such an option, can prevent unnecessary work and ensure key stakeholders including investors are brought along with the process.

It should be noted, however, that there are plenty of ways of structuring charges wrongly, leading to frustration and resentment on the part of service users. Symptoms of poor design include:

- Lack of transparency – customers can be confused about how much they will have to pay
- Weak relationship to costs – users often accept paying more for an extra element of service but will want to be satisfied that the extra charge broadly reflects the extra costs incurred by the provider
- Unavoidable extras – people may resent paying for an “extra” service that is in practice unavoidable or one which they had always regarded as part of the core service



Financing & funding of city infrastructure

When designing charging systems, policy makers need to consider the following questions:

- Where to charge: Perhaps the most significant challenge is identifying which services could and should be charged for. Authorities should identify those services in relation to which charges should and should not be considered and establish charging regimes that deliver wider policy outcomes
- What to charge: Charging levels will depend on the purpose of the charge. For example, where the sole objective is revenue raising, a market or cost price may be most appropriate. Where policy aims are more complex, the approach to pricing will follow. For example, if the main goal of the charging scheme is to shape customer behaviour, prices may need to be set at levels that deliver the necessary 'nudge', which may mean setting prices either significantly below or above the market or cost price
- How to charge: Establishing charging mechanisms can be a complex exercise and policy makers should consider operational delivery issues in developing charging regimes. Where some parts of a given service are already charged for, such as in parking charges, the development of further charges or an augmented approach to charging may be straightforward to implement. This could include additions such as introducing price variations or discounts. Where an entirely new charging regime is being put in place, policy makers will need to consider what capabilities and processes will be required to support it

There can also be economic or behavioural limitations on the amount of user charging that can be implemented. An example of this is in rail where, depending on the usage of the line in question, ticket revenues often cover only a portion of the system's operating costs and little or none of the capital costs. As such, additional devolved or centralised support will be required by investors for the proportion of the system cost that cannot be met by user charging.

Guidelines for designing user charging



Lastly, asking investors to take the risk on the resultant revenue volumes in a user charging environment can be challenging. Key to this analysis is the degree of control over volumes that investors have. For example, asking investors to take volume risk on a stretch of motorway where the government retains (say) planning control over where businesses and housing will be located can be quite difficult, especially for green field assets. This is in essence the same revenue variability risk described above that drives TIF investors to seek comfort on the expected increase in the tax base of the TIF catchment area. As such, any user charging proposition should be constructed in a way that those being asked to take risk on the revenue volumes have sufficient ability to influence those volumes.

The questions investors ask ...

- How will the infrastructure be funded, as opposed to financed?
- What is the underlying value to be unlocked and how will this be captured?
- How certain are the methods of payment? Are they enforceable?
- Is the infrastructure development capable of being ring-fenced to capture its value?
- To what extent can charging users play a role? And if so, how will they be charged and at what level?
- Is there public support for user charging or will this be seen as unfair as a double charge on top of taxes already paid?
- Is there a track record of successfully capturing value for investors and/or user charging?
- Will investors bear too much risk, being too dependent on uncontrollable factors e.g. transport volumes in road tolling schemes?
- Will the decision-making process for capturing value be streamlined or involve excessive delays and hence cost?





Case Study

The background of the slide features a dark teal gradient. In the lower half, there is a faint, high-contrast image of a cloudy sky. At the very bottom, a dark silhouette of a balcony railing with decorative balusters is visible.

Rio de Janeiro

Porto Maravilha



Case Study

Porto Maravilha

Background

Rio's port area was traditionally an economically dynamic area connecting the city to the world's trade routes and supporting thousands of businesses. Beset by a sharp decline in its fortunes from the 1970s onwards, the port entered the 21st century with a legacy of over 1 million square metres of under-utilised and degraded areas, poor infrastructure and sanitation, and derelict historic buildings. The Porto Maravilha ('Port of Wonder') project is central to the regeneration of Rio's physical and social infrastructure. By regenerating the port, Rio is using the only centrally-located area available for substantial development whilst also refocusing commercial growth back into the city centre and supporting greater transport integration.

The US \$3.5 billion investment is driven by the municipal government. It is inspired by events such as Rio's 450th anniversary, the 2014 World Cup and the 2016 Olympics. When complete, Porto Maravilha will boast 1,235 acres of world-class infrastructure and mixed-use real estate (with nearly half the area designated for residential development) serving a population projected to increase fourfold by 2020 to 100,000.

Legislative framework

Under the Brazil Constitution there are essentially three tiers of government: federal, state and municipal. Each has the ability to make laws within its area of jurisdiction. The Federal Constitution makes cooperation between tiers compulsory. The Brazil Constitution 1988 establishes the overarching policy context for municipal governance of urban development and requires municipalities with a population of more than 20,000 inhabitants to produce master plans to guide urban development and expansion. The City Statute sets a framework to govern land assembly, land use planning and control of built development, and to facilitate public ownership of development rights and value capture to fund identified projects. In particular, it provides for the:

- Issue and auction of "Certificates of Potential Additional Construction" (CEPACs) to pay for urban operations
- Creation of "consorted urban operations" concerned with introducing urban projects on the basis of partnerships between public authorities, property owners, civil society and private capital

“the port entered the 21st century with a legacy of over 1 million square metres of under-utilised and degraded areas, poor infrastructure and sanitation, and derelict historic buildings”



Case Study

Porto Maravilha

CEPACs

CEPACs are Certificates of Potential Additional Construction issued by municipalities. They are used to finance building projects and infrastructure development within a particular area through sale of real estate development rights.

Construction potential is the total floorspace that can be constructed on all floors on a given piece of land. The laws establishing Urban Operations define additional construction potential for a number of areas varying according to use types and localities. In order to be permitted to use this additional construction potential, CEPACs must be obtained.

CEPACs are usually issued by municipal authorities (City Halls) and auctioned on the Brazil stock market as financial bonds. They are tradeable and give the bearer additional building rights within the perimeter of the Urban Operation for which they were issued. They may be used to increase floor area ratio, change use and/or change footprint. The City Hall's receipts from CEPAC issues are ring fenced for specified purposes.

Phased issue of CEPACs allows city authorities to tap into land value enhancements at various stages. During the earliest stages when land values are still low, CEPACs can be sold to forward fund infrastructure based on projections of future land values allowing for discount for risk. As development progresses and base land values increase, further CEPACs can be issued at premium values to capture values reflecting the effects of regeneration already in train. In addition to leveraging private finance and sharing regeneration benefits through phased CEPAC issues, the public sector will itself directly participate in land value uplifts through sales and joint venture arrangements in relation to its own land.

Within Porto Maravilha, Caixa Economica Federal (the Brazilian Federal Savings Bank) (CEF) took up all CEPACs issued from Rio City Hall. CEF did so through a specifically created Fund – the Porto Maravilha Real Estate Investment Fund (FII). FII is now able to sell CEPACs directly to developers or otherwise bring them into play for joint venture purposes both to help make a market and to capitalise on market buoyancy.

The Porto Maravilha Urban Operation

The Urban Operation establishes detailed plans for development within Porto Maravilha including provisions for: sustainability standards, limits on building rights, absent CEPACs and for CEPACs themselves.

The zoning system within the Urban Operation allocates different development air right values by reference to sectors and property use. It is designed to incentivise investment in sustainable and mixed-use real estate development. For example, fewer CEPACs are needed for residential developments than commercial projects, with differences of total CEPACs varying by up to 50 percent within some zones.

Rio de Janeiro Port Region Urban Development Company (Cdurp).

The Urban Operation is managed by Cdurp – a mixed capital company in which the majority interest is held by the City of Rio. Cdurp manages the CPN PPP Consortium, acts as project manager for the Urban Operation and acts as a development agency for attracting inward investment. Additionally, Cdurp can channel publicly owned land to the market through FII.

Porto Novo Consortium (CPN PPP Consortium)

The City of Rio has awarded an exclusive concession to Concessionária Porto Novo S.A. (CPN) from February 2011 to construct, within 5 years and then for 15 years to operate and maintain the key infrastructure and public realm regeneration works at the heart of the redevelopment project. CPN is a consortium of three companies. The concession is managed by Cdurp and part-funded through FII and via Cdurp.

“CEPACs are Certificates of Potential Additional Construction issued by municipalities. They are used to finance building projects”



Lessons Learned

Rio's review of international port regeneration projects allowed it to draw on the lessons learnt to create development and finance models to suit the city's needs.

Porto Maravilha is an excellent example of an holistic approach to city-led regeneration and infrastructure delivery. It combines: urban project legislation; land use zoning; real estate tax breaks; creation of an urban development company, real estate investment fund and PPPs; strategic use of public land and tradeable financial instruments.

By these means, the City of Rio is able: to use new and existing assets to lever private investment; to stimulate regeneration through strategic infrastructure investment; to direct of development activity; and itself to share in value uplift through strategic land disposal, joint ventures and CEPAC trades.





“Porto Maravilha is an excellent example of an holistic approach to city-led regeneration and infrastructure delivery”





Section 6

Is your city
investor
ready?

Is your city investor ready?

Delivering sustainable urban infrastructure is about having the built-in ability, and the internal dynamics, to develop and deliver upon a vision for long term growth and economic success, and to remain resilient in an ever changing world.

As historic urban fabric decays, cities will have to address obsolescence. In those that experienced rapid growth at the end of the 20th century, retrofitting, replacement and adaptation will become increasingly important.

Resources available to even the richest cities are scarce, and access to globally mobile capital is likely to become increasingly competitive. With rising costs across all sectors, strategies to optimise investments to achieve the greatest returns for lowest cost will be critical. In the past, investment has often been sub-optimal as it has been directed to the wrong priorities, poorly sequenced and not integrated with complementary strategies.

To deliver sustainable urban infrastructure, and to attract the necessary investment, a coherent narrative, supported by an investment ready legal and regulatory framework, is needed around funding which will increase the chance of a successful financing.

Urban environments that are not underpinned by robust legal and governance frameworks will limit the ability of those cities to attract much needed investment as well as the potential funding sources available to them and is ultimately unlikely to result in sustainable benefits. As our case studies demonstrate, it is through effective utilisation of this capacity that integrated urban strategies yield potentially spectacular results.

Increasingly, financiers are also asking funding – rather than financing – related questions as they seek clarity on the source and timing of repayments.

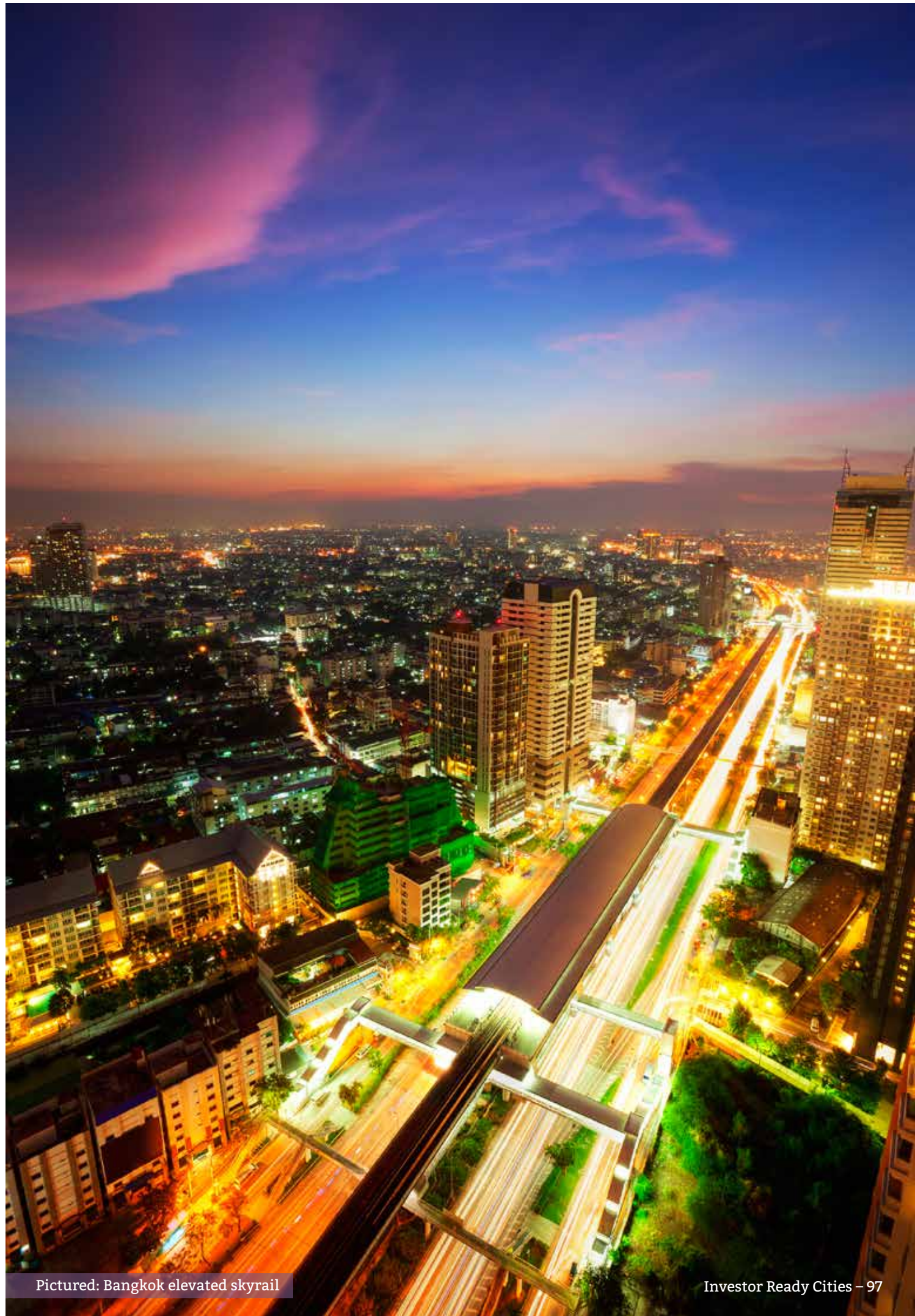
Models related to property assets generally contain development risk and it is a question of who best bears that risk and creates the most value from it. Models underpinned by land values are, by definition, more exposed to economic conditions and may not be suitable where steady cash flows are more important than long term value.

Well designed user charging models also represent an opportunity not just to raise revenue, but to change behaviours and achieve wider policy outcomes. And cities should not overlook the potential for efficiency in their existing operations as a way of freeing up resources to invest in new projects.

New funding and financing models need to be considered not just in the context of the specific project being developed, but with reference to the wider legal governance and regulatory environment more generally. City leaders need to be realistic around the options that are in their control and recognise the interrelationships with other stakeholders which will be created by new models. In particular, the success and timing of implementation of these new models will depend on the perceptions of residents as well as other public and private sector stakeholders.

A city's ability to deliver the necessary urban infrastructure for sustainable and effective growth is intrinsically linked to its ability to attract and retain capital, both in terms of human resources and talent as well as financial capital. At a time of intense competition between cities, the ability to attract such mobile capital will define success.

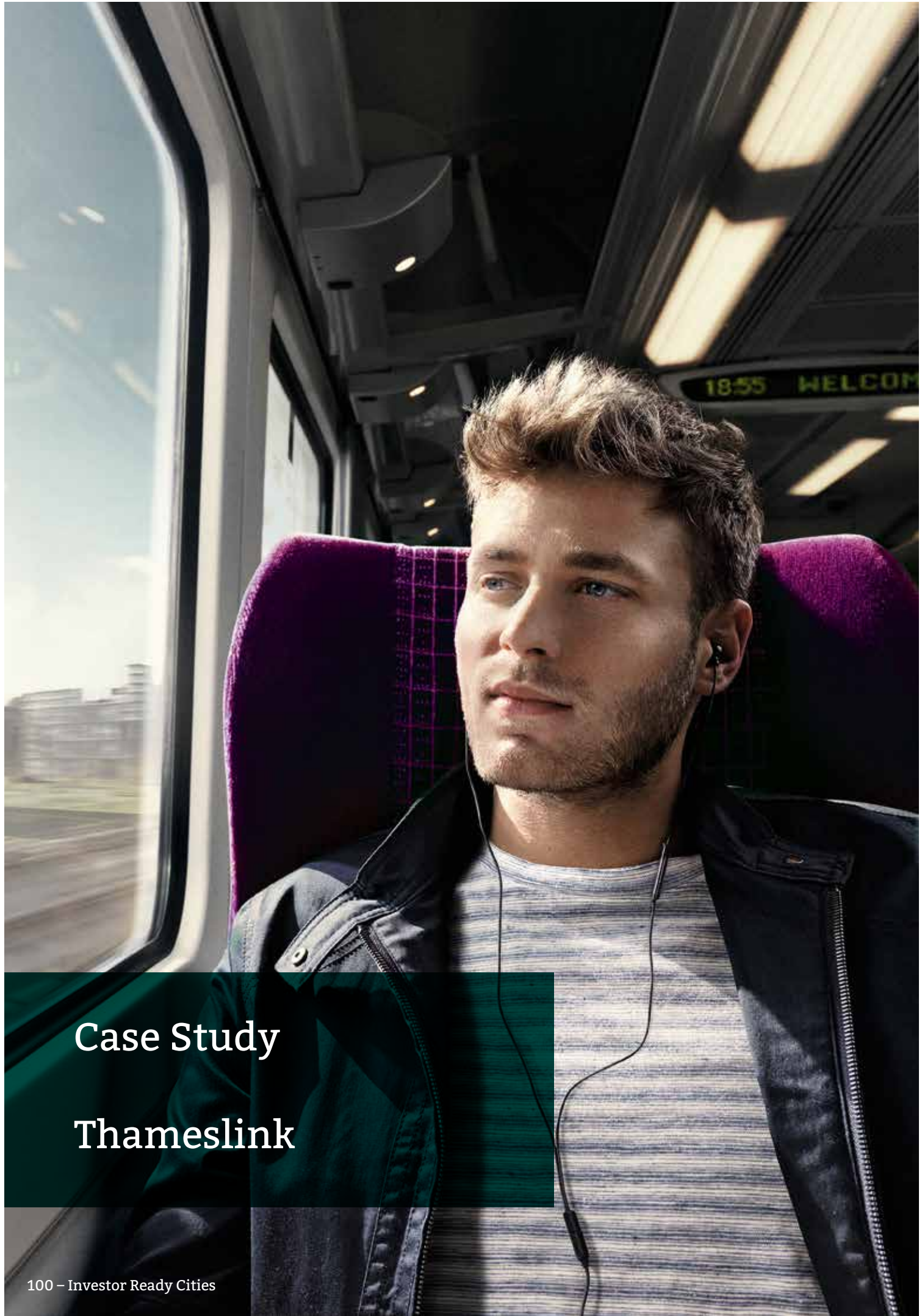






Case Study

Thameslink



Case Study

Thameslink

The Background

Almost 1 million people travel into London by rail every day, with over 500,000 passengers arriving during the morning rush hour. Along key commuter lines, increasing demand and aging infrastructure have contributed to overcrowding and delays. Because of this, improving the quality of London's key rail services, such as Thameslink, has been highlighted by a succession of UK governments as a top transport priority.

Thameslink is the key north-south rail corridor running through central London and the South East of England. Carrying over 50 million passengers per year, the service has suffered from delays, overcrowding and low passenger satisfaction. This had the knock-on effect of putting further strain on other parts of London's already congested transport system. In 2005, the UK government's Department for Transport ("DfT") took ownership of the programme as sponsor, in order to manage delivery of the much needed upgrade to the service.

Two years later, DfT laid out its plans for the Thameslink Programme as part of its wider rail infrastructure and funding policy initiative. This included £6.5 billion worth of specific commitments to upgrade the Thameslink infrastructure and the procurement of new rolling stock through the Thameslink Rolling Stock Project ("TRSP"). The Thameslink Programme will transform the travelling experience for passengers by introducing 24 trains per hour at peak times through the core of the network between Blackfriars and St Pancras.

The Story

In April 2008, DfT opened the TRSP competitive tender for the new rolling stock (1,140 carriages), which also included the design and construction of two new maintenance depots and a maintenance service contract. For its part, Network Rail has been undertaking major redevelopment works at key Thameslink stations to relieve bottlenecks, as well as provide platform and line extensions and other track improvements to get ready for TRSP.

DfT worked to develop the transaction in a way that balanced the objectives of the public and private sectors. Siemens, the Infrastructure & Cities Sector and Siemens Financial Services, the in-house financial services arm, worked together to provide a "total solution", offering a combination of world-class rail engineering technology with the financial and corporate support package needed to deliver the rolling stock and its subsequent maintenance in two purpose-built depots.

The new trains needed to be designed with greater passenger capacity and also to meet the flexible-use requirements of the train operator. In order to meet DfT's tender requirements and address Thameslink's specific issues, Siemens custom-designed the Desiro City, a new rolling stock carriage with increased operational efficiency, intelligent on-board technology and excellent environment and energy efficiency credentials. The Desiro City is an evolution of the successful and reliable Desiro UK which already travels some 50 million miles around the UK each year.

"Thameslink is the key north-south rail corridor running through central London and the South East of England, carrying over 50 million passengers per year"



Case Study

Thameslink

The Story... continued

Given the difficult economic environment and to reduce any risk associated with new technology, Siemens supported the transaction by underwriting some key risks through the supply contracts, providing equity for the rolling stock and financing the depots in their entirety. Siemens Financial Services (SFS) helped structure the overall debt package, including acting as arranger of the depot financing (see right).

Following a competitive bid process, the TRSP contract was awarded to the Siemens-led Cross London Trains Limited consortium in the summer of 2013 following a period of intense work to finalise the project and related finance documentation.

Financing the Thameslink Rolling Stock Project (TRSP)

To finance the project a Private Finance Initiative/Public-Private Partnership (PFI/PPP) arrangement for lease of the rolling stock and the two depots was put in place. These leases together with the maintenance of the trains all over a period of 20 years have an aggregate contract value of £2.6 billion in present value terms discounted to 2013 prices. SFS and its Cross London Trains consortium partners (3i Infrastructure and Innisfree), the DfT and a syndicate of 19 banks worked to close the deal. DfT was advised throughout the process to financial close by PwC who provided financial advice, supported by JC Rathbone Associates Ltd on hedging issues.

Siemens Financial Services financed the maintenance depots – approximately £350 million – on its balance sheet, thereby reducing the total requirement for bank funding. This helped to galvanize stakeholder confidence during a period when the lack of bank liquidity had been perceived as a significant risk. Structuring an investor-friendly package for the rolling stock was a challenge, not least due to the complex multi-layered contractual relationships underpinning the project, as well as the need to manage these multi-stakeholder relationships. In respect of the trains, Siemens Financial Services' own £60 million equity investment alongside a £425 million senior debt facility provided by the European Investment Bank helped secure the commercial bank debt required.

Financing major developments of rail infrastructure presents many complex challenges, requiring significant planning, a well thought-out solution and skilled execution teams. The corporate support provided by Siemens both through supply contracts and financing was fundamental in enabling stakeholders to feel comfortable with the risks, as well as attracting a sufficient number of banks to meet the rolling stock financing requirement.

“Financing major developments of rail infrastructure presents many complex challenges, requiring significant planning, a well thought-out solution and skilled execution teams”



Lessons Learned

Strong corporate support from the Siemens group ensured a successful bank deal. Different financing structures were considered during the two year preferred bidder period, including capital market solutions. The bank financing is expected to offer refinancing opportunities following the end of the manufacturing phase. When manufacturing is complete and the trains have been bedded in on the network, providing a clear, lower risk profile, capital markets refinancing is a possibility. A credit rating for the project was sought prior to financial close to help facilitate a refinancing at a later date. Ensuring the project is well structured is critical to enabling the appropriate mix of bank, multilateral, capital markets and vendor finance. Vendor-provided equity and/or debt can be welcome additions to the sources of finance for a project, particularly where value can be tested competitively.

Managing multi-stakeholder partnerships is critical for major infrastructure projects in order to develop realistic project-delivery milestones and build robust contingency plans. Furthermore, coordinating these partnerships so that interests are closely aligned and communicated is vital to keeping major infrastructure projects on-track throughout financial negotiations.





“Siemens Financial Services financed the maintenance depots – approximately £350 million – thereby reducing the total requirement for bank funding.”



Acknowledgements

SIEMENS

Julie Alexander
Director of Urban Development
Infrastructure & Cities Sector
Tel +44 (0) 207 055 6468
Email julie.alexander@siemens.com

Martin Powell
Head of Urban Development
Infrastructure & Cities Sector
Tel +44 (0) 207 055 6467
Email martin.powell@siemens.com

Basil J. Wetters
Head of Infrastructure Equity
Investments
Siemens Financial Services
Tel +44 7808 827082
Email basil.wetters@siemens.com

Mark-Robert Sontag
Head of Infrastructure Finance Advisory
and Structuring
Siemens Financial Services
Tel: +49 9131 7-27023
Email mark.sontag@siemens.com

Hartmut Huebner
Head of Communications
Siemens Financial Services
Tel +49 89 636-34183
Email hartmut.huebner@siemens.com

www.siemens.com/sustainable-cities



Richard Abadie
Global leader, Capital Projects &
Infrastructure
Tel: +44 (0) 20 7213 3225
Email richard.abadie@uk.pwc.com

Hazem Galal
Cities & Local Government Sector
Global Leader
Tel: +974 4419 2852 (Doha, Qatar)
Email hazem.galal@qa.pwc.com

Ray Mills
Partner
Tel: +44 (0) 20 7213 3710
Email ray.mills@uk.pwc.com

David MacGray
Infrastructure Director
Tel: +44 (0) 20 7213 3557
Email david.a.macgray@uk.pwc.com

Nick C Jones
Director, Public Sector Research
Centre
Tel: +44 (0) 207 213 1593
Email: nick.c.jones@uk.pwc.com

www.psrc.pwc.com



Mukhtiar Tanda
Partner
Urban Development
Tel +44 (0) 20 3400 4156
Email mukhtiar.tanda@blplaw.com

Tim Pugh
Partner
Urban and Infrastructure Planning
Tel +44 (0) 20 3400 4453
Email timothy.pugh@blplaw.com

Mark Richards
Partner
Finance and Infrastructure
Tel +44 (0) 20 3400 4603
Email mark.richards@blplaw.com

David Harrison
Partner
Competition and Regulation
Tel +44 (0) 20 3400 4269
Email david.harrison@blplaw.com

Chris Bolt
Consultant
Competition and Regulation
Tel +44 (0) 20 3400 1000

www.blplaw.com

Your Notes

