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Book

Sustaining transit investment in Asia's cities : a beneficiary-funding and land value capture perspective

SUSTAINING TRANSIT INVESTMENT IN ASIA'S CITIES

A Beneficiary-Funding and Land Value Capture Perspective

APRIL 2019

SUSTAINING TRANSIT INVESTMENT IN ASIA'S CITIES

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ISBN 978-92-9261-572-7 (print), 978-92-9261-573-4 (electronic)
Publication Stock No. ARM190085-2
DOI: http://dx.doi.org/10.22617/ARM190085-2

Notes:
In this publication, "Rp" refers to Indonesian rupiah, "₱" refers to Philippine peso, "B" refers to Thai baht, and "$" refers to United States dollar.

ADB recognizes "China" as the People's Republic of China; "Hong Kong" as Hong Kong, China; "Korea" as the Republic of Korea; and "America" as the United States.

Cover design by Chris Hale and Rhommell Rico.

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Foreword

More than half of the population of Asia and the Pacific will be urban by 2030. Economically, the region has been the fastest-growing in the last several decades, contributing one-third of global gross domestic product in 2016. With this shift in the economic center of gravity and the rise of city living, developing Asia in particular faces unique urbanization challenges, but also unique urbanization potential under the right conditions. Megacities like Bangkok, Jakarta, and Manila—the three cities on which this report places special focus—are characterized by lower per capita income compared to global peer cities, higher density, inadequate public transport systems, and the need for change to tip the scales toward the growth of sustainable, livable cities.

The Asian Development Bank (ADB) has highlighted the need for $1.7 trillion annually to pay for developing Asia's infrastructure from 2016-2030. There is a large difference between this target and current levels of spending. The biggest infrastructure finance gap is in the transport sector, where $600 billion is needed annually across developing Asia. Further, almost 80% of transportation infrastructure funding in developing Asia comes from the public sector, which has many other priority spending needs. Capacity-building is thus a must for the public sector, where informed government agencies can understand who benefits from public investment and by how much, and use this knowledge to better negotiate private sector buy-in to urban transportation projects. Without innovation in transportation finance to bridge the spending gap, unmet demand for urban transport will constrain inclusive urban development.

Land Value Capture (LVC) is one type of beneficiary funding approach that can foster sustainable urban growth. *Sustaining Transit Investment in Asia's Cities* provides a primer on the importance of LVC in urban planning and growth in developing Asia, looking to global and high-income Asian city examples and identifying challenges to shifting this success to Southeast Asian megacities like Bangkok, Jakarta, and Manila. The report combines technical analysis of land value increases around public mass transit investments with policy-focused recommendations for the application of LVC mechanisms in a developing Asia context.

Both the Sustainable Development Goals and ADB's own Strategy 2030 emphasize sustainable urbanization, which can be promoted through effective public sector reforms, private sector development, and domestic resource mobilization. This report serves as a springboard for discussion on how proven methods of LVC can be applied in developing Asia to promote the Strategy 2030 goals. *Sustaining Transit Investment in Asia's Cities* is especially timely, as ADB is financing mass rapid transit in Bangkok, Bengaluru, Ha Noi, Ho Chi Minh City, Jaipur, Mumbai, and Tbilisi. In addition, ADB is offering technical assistance to strengthen domestic resource mobilization across the region—including support to the Philippine government to reform property taxation and value assessment. I highly recommend it to public, private, and multilateral development bank champions of livable cities.

Bambang Susantono
Vice-President for Knowledge Management and Sustainable Development
Asian Development Bank

Acknowledgments

This report was written by Abdul Abiad and Kathleen Farrin of the Economic Research and Regional Cooperation Department (ERCD) of the Asian Development Bank (ADB) and Chris Hale, an international expert on transport infrastructure and urban planning. We would like to acknowledge the research and technical support provided by Ann Jillian Adona, Nina Ashley Dela Cruz, and Orlee Velarde; infographic rendering and typesetting by Rhommell Rico; and map illustrations by Abraham Villanueva.

ERCD also acknowledges Sutee Anantsuksomsri, Eva Ayaragarnchanakul, Peerapat Chokesuwattanaskul, Suwadee Hansasooksin, Cresencio Montalbo, Jr., Ibnu Syabri Munir, Ma. Sheila Napalang, Supree Srisamran, Nij Tontisirin, and Haryo Winarso for the background papers they prepared for this report. We also gratefully acknowledge Hiroaki Suzuki for the initial preparatory work in studying land value capture and its role in transit investment in the Asian region.

We would like to thank our ADB colleagues who provided valuable inputs for this report. We are grateful to Chaorin Shim and Markus Roesner of the Southeast Asia Department, Srinivas Sampath of the Office of Public-Private Partnership, Director Rana Hasan of ERCD's Economic Analysis and Operational Support Division, and Country Director Hideaki Iwasaki of Thailand Resident Mission. We would also like to thank Country Director Winfried Wicklein of Indonesia Resident Mission and Country Director Kelly Bird of the Philippines Country Office, who facilitated the planning of in-country workshops where we received valuable feedback during the report drafting process.

Finally, we would like to acknowledge private and government stakeholders who actively participated in the in-country workshops and discussion meetings organized by ADB. The recommendations and comments we received during these meetings enriched the discussion in the report in introducing the role of land value capture in the context of developing Asia.

This report is funded by ADB's *Technical Assistance for the Urbanization-Poverty-Inequality Triangle in Asia and the Pacific*.

Yasuyuki Sawada
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Abbreviations

ADB	Asian Development Bank
ARL	Airport Rail Link (Bangkok)
BMR	Bangkok Metropolitan Region
BRT	bus rapid transit
BTS	Bangkok Mass Transit System
BTSC	Bangkok Mass Transit System Public Company Limited
CBD	central business district
DID	difference-in-differences
EDSA	Epifanio de los Santos Avenue
FAR	floor area ratio
GDP	gross domestic product
GRP	gross regional product
JICA	Japan International Cooperation Agency
KRL	Kereta Rel Listrik (Light Rail Train)
LRT	light rail transit
LVC	land value capture
MRL	Monorail Transit Line (Bangkok)
MRT	Metropolitan Rapid Transit (Bangkok); Metro Rail Transit (Manila)
MTR Corporation	Mass Transit Rail Corporation (Hong Kong, China)
NCR	National Capital Region
NEDA	National Economic and Development Authority
PNR	Philippine National Railways
PPP	public-private partnership
PRC	People's Republic of China
REIC	Real Estate Information Center
TOD	transit oriented development
US	United States
URA	Urban Redevelopment Authority

Executive Summary

The rise of urbanization in developing Asia highlights a significant need for infrastructure financing—estimated at $26 trillion from 2016–2030—despite a funding gap that can be as much as 5% of gross domestic product in some Asian countries. A constrained funding base stifles long-term urban planning and ambitious mass rapid transit provision schedules that are needed to reduce congestion and foster increased economic performance in ever-growing Asian cities.

One innovative funding approach to bridge the infrastructure finance gap is ***Land Value Capture (LVC)***, by which governments and their agencies (i) trigger a rise in land values through a range of actions, including accessibility-improving infrastructure investments or regulatory changes; (ii) institute a process to retain part of the value-add through public projects; and (iii) use LVC proceeds to fund ongoing or planned infrastructure investments or to offset any potentially negative impacts of public infrastructure projects.

This report puts developing Asia's urbanization into context, highlighting sustained mass rapid transit investment as a crucial component of "Livable Cities," one of the Asian Development Bank's operational priorities for Strategy 2030. Three Southeast Asian megacities—Bangkok, Jakarta and Manila—receive special focus in the report, as these cities uniquely characterize the challenges of urban growth in developing Asia.

Compared to their global peers, Southeast Asian megacities are larger, more densely populated, and offer smaller mass rapid transit networks to facilitate urban connectivity that supports a 21st century "knowledge economy." One constraint to mass rapid transit is the timing of the growth trajectory of these Southeast Asian megacities: urbanization in developing Asia picked up much later than in other global cities—from the 1970s to 1990s—after motorization had already solidified a car culture; this path dependency makes mass rapid transit investment more difficult in Southeast Asian megacities, where road networks have traditionally been the core of modern public infrastructure investment. Further, while all three Southeast Asian megacities are in countries that have now achieved middle income status, per capita incomes were relatively lower in these countries as they hit a critical mass of population beyond which mass rapid transit should be phased in to accommodate travel demand—demand that cannot be met by private vehicle trips or even by other forms of public transit like bus rapid transit (BRT).

To integrate LVC techniques into urban planning and public infrastructure finance, the first hurdle is to quantify the land value uplift that can occur as a result of government action. Through a systematic literature review and quantitative analysis using case studies, this report shows the potential for value-add around mass rapid stations around the world, and particularly in Bangkok, Jakarta, and Manila.

A review of 61 studies of mass rapid transit in both advanced and developing economies shows that the price premium for properties within a catchment area of a mass rapid transit station is 5% for residential properties and 30% for commercial properties; beyond the catchment area, land prices continue to decline the farther away a property is from a mass rapid transit station (by 8% and 15% per km of distance from the station for residential and commercial properties, respectively). However, looking only at average effects of mass transit on property values ignores a vast variation across studies of land price effects of proximity to mass rapid transit stations; differences in overall design quality, network accessibility, and economic conditions across cities can account for some of the differences in the effect of mass rapid transit on land values.

Results for Bangkok, Jakarta, and Manila case studies show:

- On average, land values in Bangkok increase by $23 per m^2 with every 10% decrease in distance to the nearest mass rapid transit station; a case study of a new mass rapid transit station in Bangkok reveals an incremental land value increase of $5.8 billion within a 5 km radius.

- Land value changes in rail-served Dukuh Atas, a planned integrated transport hub in central Jakarta, are greater than for Harmoni, a bus-served transit hub that will not have access to the light rail transit (LRT) line currently under construction; between 2015 and 2018, land prices rose by 38.4% in Dukuh Atas, while prices in Harmoni increased by only 14.3%.

- In Manila, growth in value of land parcels within one km of MRT-3 stations is higher than for parcels more than 2 km away from a station; residential parcel value grew by $154 per m^2 more and commercial parcel value grew by $545 per m^2 more in near-MRT-3 areas compared to farther-out comparator parcels, despite a similar growth trend in parcel prices for all areas prior to announcement of the MRT-3 project in 1995. Conservative estimates of total value uplift attributable to public investment in MRT-3 is close to $3.4 billion—roughly five times the $655 million construction cost of MRT-3.

After estimating the quantity available for potential value capture in the three Southeast Asian megacities and outlining global examples from which developing Asia can learn, the report outlines five proven LVC mechanisms that can be used in combination to provide a practical pathway to successful funding of major transit initiatives:

A. Value capture through the mainstream taxation system;
B. Special fees and levies;
C. Auction of development rights;
D. A comprehensive TOD and urban renewal agency with value capture capabilities;
E. Direct property-rail agency as developer in the "East Asian" style.

Leading Asian cities such as Singapore and Hong Kong, China, tend to use all these mechanisms in tandem for their urban development strategies.

The final section of the report outlines key messages that address the barriers and challenges to implementing LVC in a developing Asia context, emphasizing increasing capacity of government agencies and using short-term strategies to implement LVC within existing frameworks where possible, as Bangkok, Jakarta, and Manila are all currently in critical investment stages for urban mass rapid transit. Project benefits appraisal, corridor zoning best practices, and property tax reform are just a few of the capacity-building demands that should be met. As the role of LVC within major projects is set to grow, multilateral development banks need to adapt their lending approaches, taking stock of urban and transport projects and creating expectations related to the inclusion of LVC funding sources in the project funding mix.

In this report, "mass rapid transit" is defined as an electric-powered urban rail system that is completely isolated from interactions with automobile traffic and pedestrians. This excludes most streetcars because they interact with vehicle traffic. There is no distinction between surface, underground, or aboveground mass rapid transit lines as long as the system meets the exclusive right of way condition (Gonzalez-Navarro and Turner (2018) use this definition for "subways"). However, considering the stylized facts of urban transportation in Southeast Asian megacities—particularly that of populous urban sprawl areas—heavy rail commuter lines also fall under the definition of mass rapid transit in this report. Generally, mass rapid transit is defined by higher capacity than other public transit such as buses or trams ("mass") and is rail-based and separated from traffic ("rapid").

Introduction

Cities in developing Asia are experiencing escalating growth—bringing challenges such as urban sprawl, congestion, air pollution, and inequality of access to key services. Many of these impacts are caused by inadequate urban planning, combined with increased automobile use and a lack of alternative travel options. Faced with these challenges, many cities in Asia are accelerating mass rapid transit system investment in order to change course. The majority of new mass rapid transit systems built between 2001 and 2010 were built in Asia, with half of Asia's new mass rapid transit systems built in the People's Republic of China (PRC). If subway construction continues at its current trend, we should see 2,300 additional kilometers of track and 1,100 new stations in Asia between 2016 and 2030, with the PRC and India leading the way in mass rapid transit system growth (ADB 2017). And these trends are likely to continue: many Asian cities with growing populations and vibrant economies are expanding, constructing, or at least discussing the possibility of investing in new mass rapid transit systems. These cities include more than 30 in the PRC—cities like Beijing, Shanghai, Shenzhen, Chengdu, Hangzhou, and Tianjin; about 20 Indian cities like Delhi, Mumbai, Chennai, Bengaluru, and Jaipur; and Southeast Asian megacities like Bangkok, Jakarta, and Manila.

But capital investment as well as operation and maintenance costs of mass rapid transit systems are high, often exceeding the immediate fiscal capacities of most cities in developing countries. Local and other tiers of government have many obligations and competing funding demands for various forms of urban infrastructure (such as water, waste management, parks, sewage, and public housing) and for social needs such as health and education.

A constrained funding base fundamentally defines the immediate and longer-term scenario for investment in quality mass rapid transit systems in Asian cities. The ADB (2017) estimates that from 2016 to 2030 developing Asia will need to invest $26 trillion in infrastructure to maintain the region's growth momentum and respond to climate change, of which $8.4 trillion is needed for transport. Excluding the PRC, the infrastructure investment gap for developing Asia—the difference between the investment needed and what is currently being spent—exceeds 5% of GDP.

Fiscal constraints have stimulated interest in new and innovative project funding sources, including ***Land Value Capture (LVC)***. LVC hinges on two interrelated concepts. The first is that improved accessibility or land use planning creates and adds value to property and other beneficiaries. But—consequently and most importantly—the concept of LVC also asserts that all those who benefit from transit's added value should contribute to the cost of high-quality transit connections.

This conceptualization of the relationship between transit access, value-add, and funding contribution is particularly pertinent for cities undergoing rapid growth. These cities are characterized by rising real incomes, but also increasing congestion levels and constraints on accessibility that can hinder future growth and livability. The conditions and drivers for discussing and potentially introducing value capture mechanisms are therefore already at play in many rapidly growing cities across developing Asia.

When the public sector properly secures the windfalls from increased revenues resulting from its own infrastructure investments, the burden on traditional forms of taxpayer funding is reduced. Recycling LVC revenues back into mass rapid transit allows cities to sustainably expand their transport networks over decades, rather than worrying how each new addition will be funded. And when undertaken in a context of enlightened and integrated urban planning, LVC also potentially promotes and supports a broader set of sustainable urban planning and development outcomes.

In this report, LVC is defined as a public funding method by which governments and their agencies:

- trigger a rise in land values through a range of actions, including accessibility-improving infrastructure investments (particularly mass rapid transit) or regulatory decisions such as a change in land use or floor area ratios (FAR);

- institute a process to retain part of the value-add generated through public projects; and

- use LVC proceeds to fund ongoing or planned infrastructure investments, particularly in accessibility-enhancing transit, or to offset any potentially negative impacts (Suzuki et al. 2015).

Although LVC is a "public" infrastructure funding instrument, its benefits are not only relevant for governments or taxpayers. Private developers and landholders benefit from participation in LVC arrangements because the value added to their property from improved accessibility exceeds the contribution asked of them. Other stakeholders such as private railway companies have a natural stake in partnering with governments in sensible LVC arrangements—whether to increase their ridership or to maximize the value of their own property assets.

Despite the existing conditions for LVC in growing and urbanizing Asia, many cities still need to work on improving the conditions required for successful LVC implementation. This can be done in several ways: strengthening the needed legal, regulatory, and institutional frameworks; gaining know-how and techniques, including from others' practical experience; and developing sufficient institutional capacity to apply context-specific value capture techniques across complex transit projects, including comprehensive, multi-decade transit network build-out programs. In rapidly developing Southeast Asian countries and cities such as Bangkok, Thailand; Jakarta, Indonesia; and Manila, Philippines, governments have begun to show interest toward integrating LVC into the funding arrangements for transit investments and may already be doing so to an extent (albeit informally) within existing public-private partnership (PPP) structures. It is crucial to note that successful developed cities such as Tokyo; Nagoya; Osaka; Singapore; Hong Kong, China; and Seoul have all previously made the transition from developing city status into the top league of economic performance, all with a strong focus on mass rapid transit investment that rested on value capture concepts.

This report aims to contextualize transit investment as a crucial component of urbanization in developing Asia. It presents evidence in support of the use of LVC in transit investment and discusses prospects and constraints around implementing LVC. The report places special focus on Bangkok, Jakarta, and Manila—three cities that characterize the challenges of urban growth in Southeast Asia.

Section 1 provides an overview of the urbanization and transport environment for three Southeast Asian megacities—Bangkok, Jakarta, and Manila. In this section, these three megacities are also compared to selected global peers (which tend to have much larger transit networks relative to their populations).

Section 2 introduces key LVC concepts, theories, and principles within a broader umbrella of beneficiary funding for major mass rapid transit initiatives.

Section 3 presents new evidence of property value increases around transit stations in the three Southeast Asian megacities and beyond. Given that Bangkok, Jakarta, and Manila have relatively less experience with LVC than their global peers, one of the first barriers to LVC strategies may be that public decision-makers are simply unaware of how much money they are leaving on the table when the value-add from transit investments accrues entirely to speculators or the private sector. This section shows that it is possible to quantify these gains, even in developing countries.

Section 4 gives examples of LVC success (and pitfalls) in global cities, where tried-and-true methods can serve as a partial blueprint that can be adapted for LVC in developing Asia.

Section 5 defines the five main LVC mechanisms that have been successfully used by global peer cities. The best-fit combination of LVC mechanisms will differ from city to city and even from one project to another, but these five mechanisms are near-exhaustive in terms of the available options toward practical implementation of LVC in developing Asia.

Section 6 outlines the challenges of using proven LVC mechanisms in Bangkok, Jakarta, and Manila, and gives examples of progress toward more innovative mass rapid transit finance in each city.

Section 7 concludes the study, offering insights on the way forward for implementation of LVC and key messages for governments and multilateral development partners, who will be instrumental in championing the mainstreaming of LVC into mass rapid transit and infrastructure projects. A range of technical, research, policy, and capacity-building recommendations are outlined.

1. A Tale of Three Megacities in Developing Asia: The Need for Sustained Mass Rapid Transit Investment in Bangkok, Jakarta, and Manila

Bangkok, Jakarta, and Manila are three leading examples of urbanization and the growth of megacities in developing Asia. All three cities have populations exceeding 10 million, necessitating drastic changes to mass rapid transit delivery. While lessons can be learned from the urbanization process in other cities in Asia and around the world, the socioeconomic, demographic, and transit system contexts for these three megacities must be carefully considered when choosing an appropriate mix of funding mechanisms for transport infrastructure. Evidence suggests sustained mass rapid transit delivery is a crucially important intervention at this time—one that can profoundly assist with development trajectories and quality-of-life improvements in these important cities.

How do leading Southeast Asian cities compare to global peers?

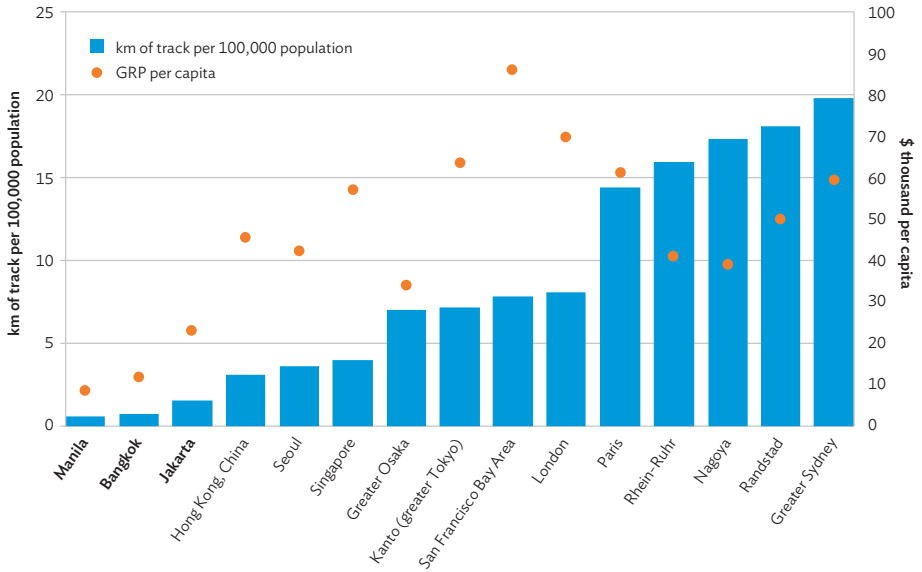
Population, economy, and transport system fundamentals of the three developing Asian megacities paint a compelling picture when compared to their international peers. The data suggest a convergence of attributes in these three developing Asian cities: all have expanded rapidly in population and belong to middle income group economies (World Bank). However, other major global cities enjoy a profoundly greater level of current mass rapid transit network and service offering (Figure 1.1)—and, importantly, higher per capita gross regional product (GRP). And many of these cities began building their mass rapid transit networks when their populations and densities were much lower than the levels currently seen in developing Asian cities (Figure 1.2). This holds substantial implications for the economic development trajectory (a topic to be discussed in greater depth in the following section), but also for basic quality of life and daily convenience.

Based on the analysis presented in this section for Bangkok, Jakarta, and Manila, it is almost impossible to escape the conclusion that their next phase of evolution must surely involve sustained emphasis on expanding their mass rapid transit service. This implies rapid increases in activity around network planning, project development work, and project delivery—but also commensurate increases in demand for sustainable infrastructure project funding. This is where LVC and other beneficiary funding approaches become relevant and necessary.

Bangkok, Jakarta, and Manila are currently involved in planning and project delivery for mass rapid transit enhancement. But realistically, even the ambitious agenda of Bangkok is only a beginning for a period in which sustained mass rapid transit investment and project activity will be underway for a generational 10- to 25-year period. The time has come for serious discussion around sustainable, predictable, reliable, and equitable funding arrangements.

Figure 1.1: Rail Length and Gross Regional Product

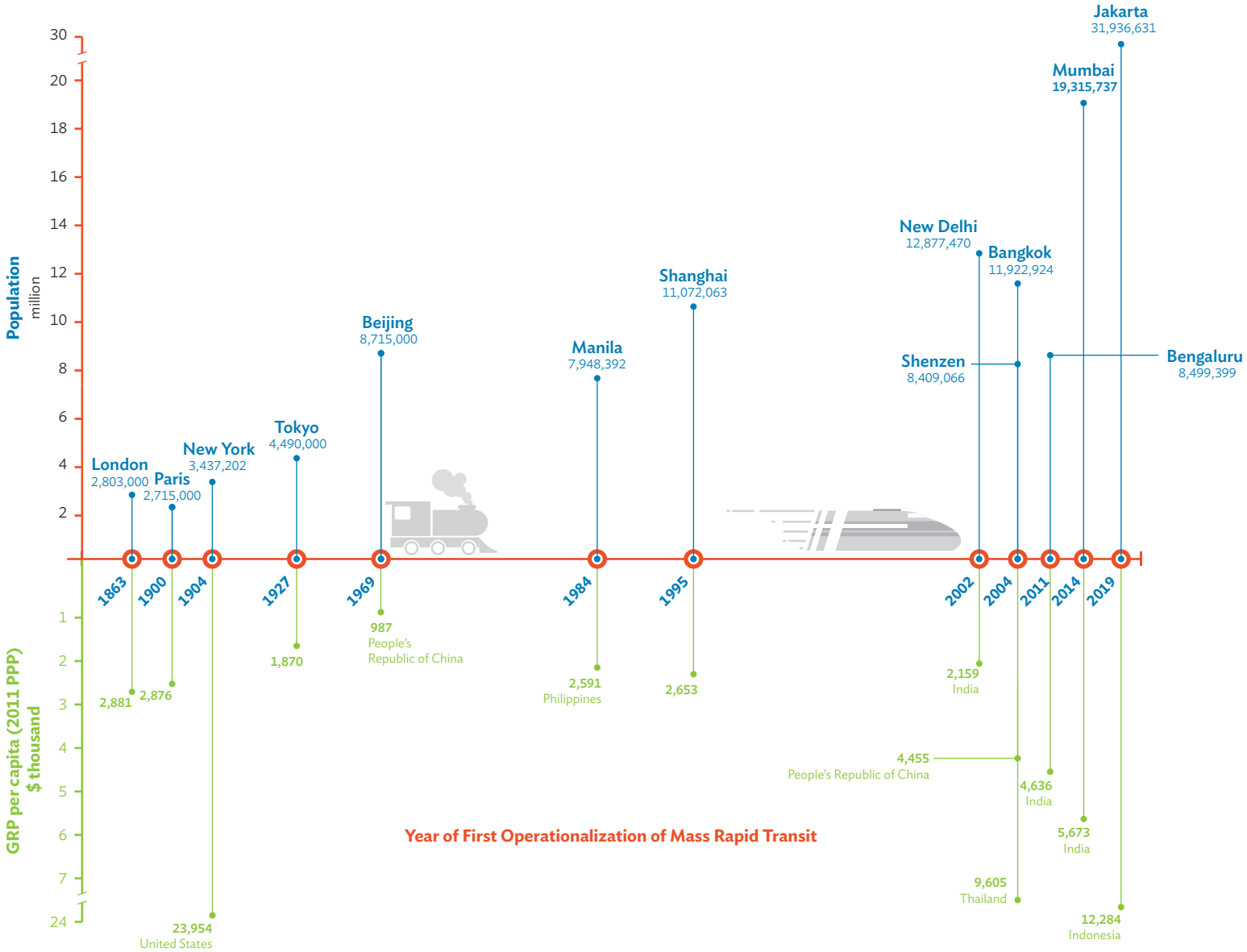
Bangkok, Jakarta, and Manila are large, growing cities with a transit infrastructure backlog and lower gross regional product (GRP) per capita in comparison to international peers—so closing the infrastructure gap requires new funding options.



GRP = gross regional product; km = kilometer.

Sources: ADB estimates using data from Abiad and Adona (forthcoming); Australia Bureau of Statistics; Eurostat (2018); Government of France, National Institute of Statistics and Economic Studies; Government of Germany, Federal Statistical Office; Government of the Hong Kong Special Administrative Region, Census and Statistics Department; Government of Singapore, Department of Statistics; Government of the United Kingdom, Office for National Statistics; Hale and Eagleson (2015); Japan Statistics Bureau; Kingdom of Thailand, Office of the National Economic and Social Development Board; NSW Trains (2014); Paris Region Enterprises (2016); Philippine Statistics Authority; PT Kereta Commuter Indonesia; Randstad Region (2017); Seoul Metropolitan Government; SGTrains; Statistics Indonesia; UrbanRail.Net; United Nations (2016); United States Bureau of Economic Analysis; United States Census Bureau .

Figure 1.2: Why the Wait?
Mass Rapid Transit Inception in Developing Asia Occurs at a Higher Population Threshold



GRP = gross regional product; PPP = purchasing power parity.

Sources: Beijing Municipal Bureau of Statistic; Government of India, Ministry of Statistics and Programme Implementation; Government of National Capital Territory of Delhi (2012, 2014); Kingdom of Thailand, Office of the National Economic and Social Development Board; Shigeru and Acharya (2013); Philippine Statistics Authority; Shanghai Municipal People's Government; Statistics Indonesia; Tokyo Metropolitan Government; United States Census Bureau; World Bank.

Development trajectory and timing of urban expansion: explaining car dependence in Southeast Asian cities

One constraint to mass rapid transit network development is the timing of the growth trajectory of these Southeast Asian megacities: urbanization in developing Asia picked up much later than in other global cities. Whereas cities like Tokyo, London, and New York had populations in the multimillions by the turn of the 20th century, Bangkok, Jakarta, and Manila did not breach the one-million population mark until the 1940s and 1950s and did not experience rapid urban expansion until the 1970s to 1990s—after motorization had already solidified a car culture. This path dependency makes mass rapid transit investment more difficult in Southeast Asian megacities, where early responses to traffic saturation focused on increased road capacity and an attempt to accommodate more motorization through car-oriented planning norms. Conversely, "old transit cities" (e.g., Tokyo, Osaka, Paris, London) had large, traffic-immune mass rapid transit systems before mass motorization started (Barter 2018).

Further, while Bangkok, Jakarta, and Manila are in countries that have now achieved middle income status, per capita incomes were relatively lower in these countries as they hit a critical mass of population beyond which mass rapid transit should be phased in to accommodate travel demand—demand that cannot be met by private vehicle trips or even by other forms of public transit like bus rapid transit (BRT). At the same time, (growing) per capita income in these cities was approaching or had exceeded the $5,000–$6,000 threshold that has been associated with an uptick in car ownership. This rise in income during the age of motorization—in combination with a lack of quality public transportation alternatives—drove up car use (Acharya and Morichi 2007).

Early Rail Transportation Replaced by Motorization in Southeast Asian Cities

Until 1950, Manila's urban expansion was led by a modern hierarchical road network and extensive electric tramways. Urban planning and subdivision control led to an effective urban system within the circumferential Epifanio de los Santos (EDSA), marked by the development of suburban centers (e.g., Makati and Ortigas) that later became central business districts. However, once urbanization accelerated (Manila's population went from about 1.6 million in 1950 to 7.9 million by 1990, almost quintupling over 40 years), motorization increased and urban transport infrastructure became insufficient to accommodate this level of urban growth.

Early Bangkok was characterized by an urban transportation system on the water; the transition to a road-based system was made without proper planning of the road network and with little in the way of development control. The urban area is bifurcated into the areas within and outside the city's middle ring road; the former is characterized by a relatively better road network and the latter by a road network deficiency, with a lack of roads aside from intercity arteries. While electric trams were a popular form of public transportation starting in the late 1800s, the system was handed from a private operator to the government in 1950 and fell out of favor over the next 20 years as cars became more popular; electric trams went out of operation in 1968.

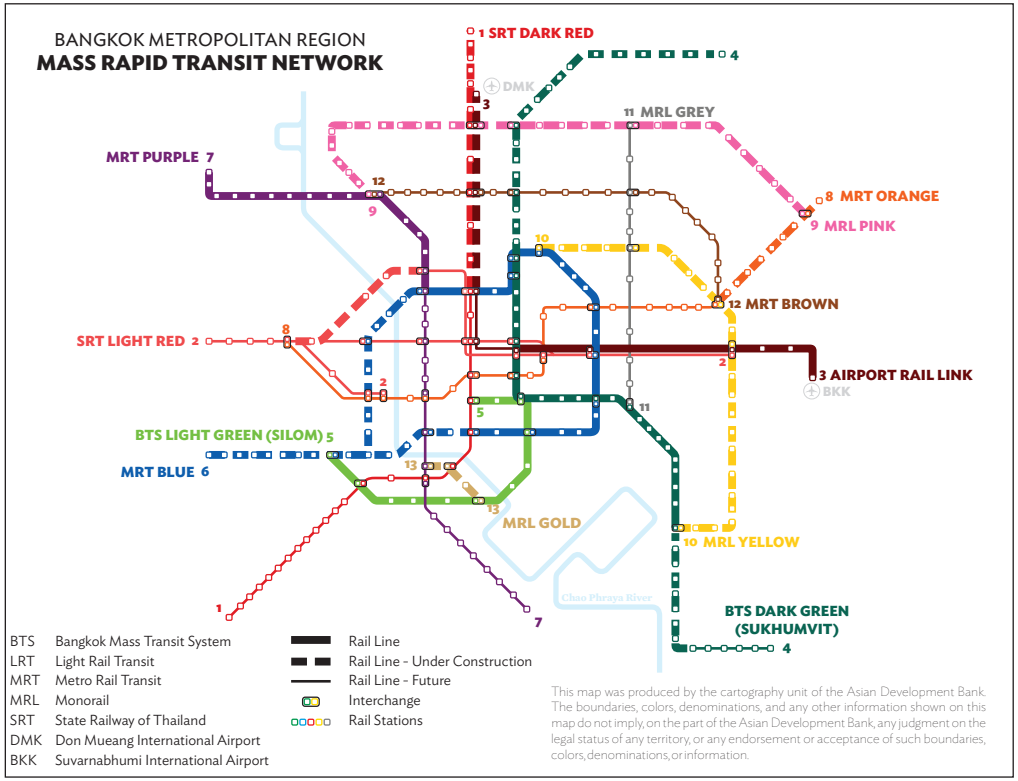
Jakarta had an initial mass rapid transit period as early as the 1870s, first with a suburban rail system followed by steam and electric trams in the 1880s and 1890s, respectively. While travel in the urban core was facilitated by an extensive network of roads, railways, and tramways, these networks were not expanded as the city grew outward. Densely inhabited rural settlements on Jakarta's fringe were incorporated into the city area without being reorganized or resettled, with construction of modern roads only prioritized in the 1960s with the shift of the capital to Jakarta (1952) and the holding of the Asian Games (1962). The current road network is thus hierarchical, marked by major arteries and few secondary roads for intracity travel (Iwata 1995).

Network of trams in Plaza Goiti, Manila, ca. 1920–1940 (photo by Maryknoll Mission Archives).

Bangkok, Thailand

As the capital city of Thailand, Bangkok is the center of social, economic, and cultural development for the nation. A city once known as "the Venice of the East" for its canal and river networks, Bangkok today is notorious for its high automobile dependence, severely congested traffic, and worsening air pollution. Unplanned growth, uncontrolled car ownership, inadequate road systems, and a lack of effective public transportation have resulted in extremely congested traffic in the city (Jenks 2005; Poboon 1997). Severe traffic congestion takes a large toll on the economy, environment, and society. During rush hours in the city, for example, cars move at just 15 km per hour on average. Travelers often face long and wasteful commutes, and consequently countless hours and gallons of fuel are wasted every day in Bangkok's idle traffic (Online Reporters 2015).

To solve the severe traffic congestion problem in Bangkok, the government has planned an extensive network of public transportation systems. Since the 1990s, the government started to equip Bangkok with diversified mass rapid transit modes, such as the Bangkok Mass Transit System (BTS) Skytrain, the Metropolitan Rapid Transit (MRT) subway, and the Airport Rail Link (ARL) line.



183471B ABV

Population

15,758,964

Population growth rate

1.15%

Population density

2,030 people per km²

Public transport mode share

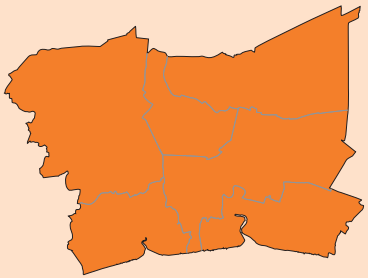
43%

GRP per capita

$12,103

Mass rapid transit network:
Number of stations: 78
Kilometers of track: 112

Sources: Kingdom of Thailand, Office of the National Economic and Social Development Board; Suparee (n. d.); UrbanRail.Net.



Bangkok Metropolitan Region includes the capital city of Bangkok and five adjacent provinces of Nakhon Pathom, Pathum Thani, Nonthaburi, Samut Prakan, and Samut Sakhon.

This map was produced by the cartography unit of the Asian Development Bank. The boundaries, colors, denominations, and any other information shown on this map do not imply, on the part of the Asian Development Bank, any judgment on the legal status of any territory, or any endorsement or acceptance of such boundaries, colors, denominations, or information.

Bangkok Skytrain (photo by ADB Photo Library).

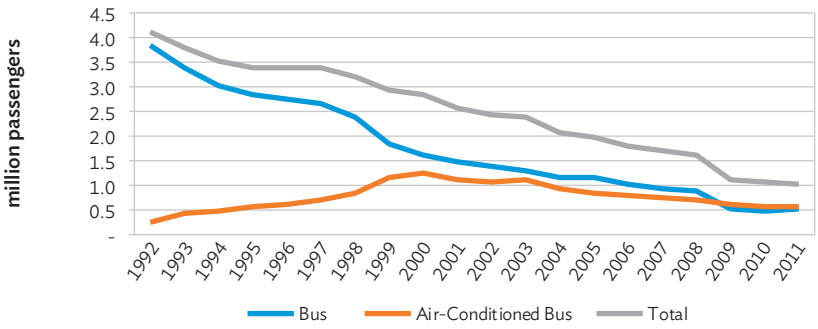
The five public mass rapid transit systems currently operating in the Bangkok Metropolitan Region (BMR) are the BTS Sukhumvit Line (dark green), BTS Silom Line (light green), MRT Blue Line (blue), Airport Rail Link, and MRT Purple Line (purple). Several other mass rapid transit systems have been planned and are currently being constructed throughout the BMR (see transit map). With these planned mass rapid transit systems, there will be 310 stations (176 of which are planned to open by around 2023), with a total length of 524 km (212 km to be operational in 2023) (Bangkok Metropolitan Administration 2017; Anantsuksomsri et al., forthcoming).

New public transportation systems have shifted the commuting patterns of BMR residents. Total bus ridership has fallen substantially, from 4 million in 1992 to one million in 2011 (Figure 1.3). Although the quality improvement of air-conditioned buses increased ridership from 1992 to 1999, Bangkok commuters shifted toward other modes of transportation following the operationalization of the first BTS line in late 1999. Conversely, mass rapid transit ridership has been on the rise since then (Figure 1.4). Nevertheless, cars remain prominent in Bangkok, and the number of registered vehicles in Bangkok continues to rise; while the growth in both car and motorcycle registration has slowed since 2012, people in Thailand are registering vehicles faster than the population is growing (Figure 1.5).

Currently, B300 billion ($8.8 billion) has been invested for mass rapid transit lines under construction (Thaiturapaisan 2017). With the exception of the Airport Rail Link (ARL), mass rapid transit has been developed through various public-private partnership (PPP) models.

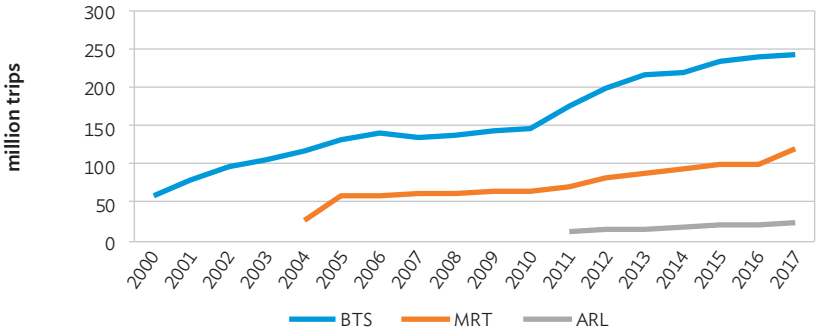
The BTS is one of the most well-known PPP projects in BMR. The BTS PPP project was developed in 1992, with service beginning in 1999. The Bangkok Metropolitan Administration (BMA) was the public partner and the Bangkok Transit System Corporation (BTSC) was the private partner (BTSC was formed especially for this project). Financing had to come from both equity and debt. The BTS project faced huge initial losses because of overestimated ridership forecasts, missing integration with other transportation modes, a low level of accessibility, limited network, and high fare rate. However, after connecting the transportation modes, installing direct ramps into important buildings and escalators between floors, and extending the BTS line, the project came into the black in 2008. The most important lesson learned from the BTS case is that with the lack of a mass rapid transit benchmark in Thailand, learning from other countries' experience alone, while overlooking local characteristics (such as weather), is inadequate and causes severe financial problems (Verougstraete and Enders 2014).

Figure 1.3: Number of BMTA (bus) Passengers, 1992–2011



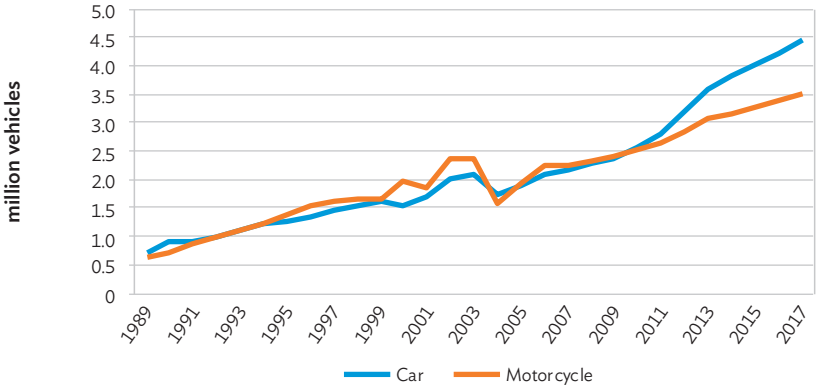
Source: Bangkok Metropolitan Administration (2017).

Figure 1.4: Mass Rapid Transit Ridership in Bangkok, 2000–2017



Source: Kingdom of Thailand, Ministry of Transport.

Figure 1.5: Number of Registered Vehicles in Bangkok, 1989–2017

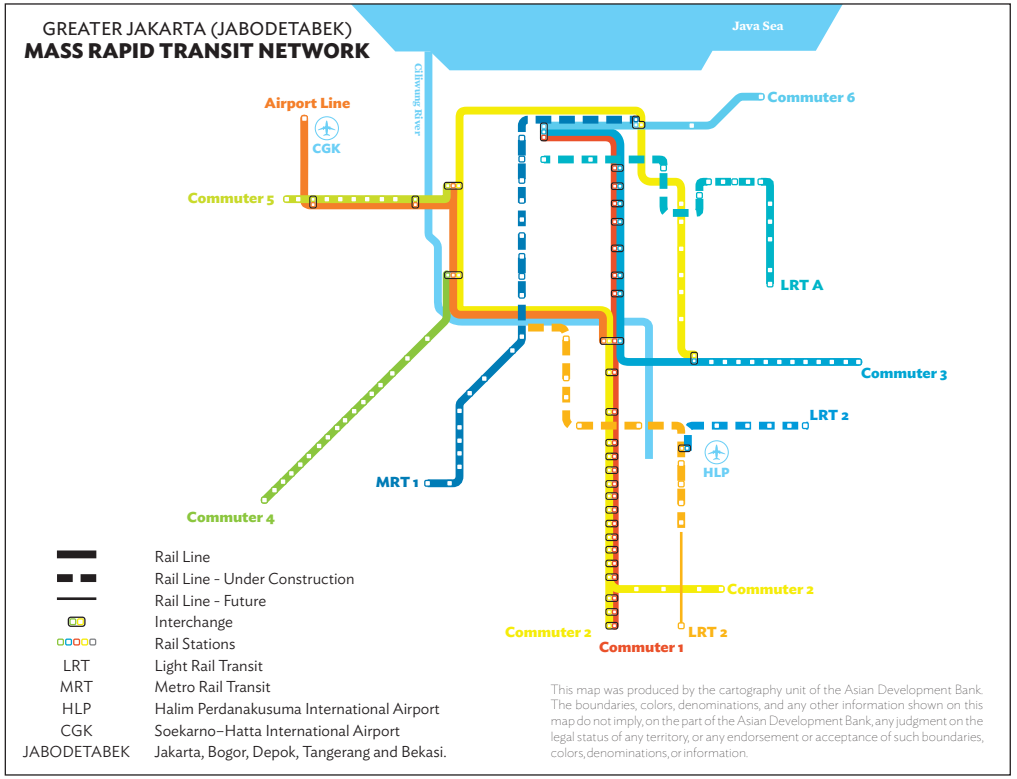


Source: Kingdom of Thailand, Department of Land Transport Planning.

Jakarta, Indonesia

Indonesia has had success with economic growth and poverty reduction over the past 3 decades but is now facing challenges associated with ongoing population growth and urbanization, especially in major cities. Cities in Indonesia are growing at an average of 1.4% per year, a faster pace than most other Asian cities. By 2025, about 68% of Indonesians will live in cities (Statistics Indonesia). The Jakarta metropolitan area, comprising the capital city Jakarta, Bogor, Depok, Tangerang, and Bekasi (also referred to as Greater Jakarta or Jabodetabek), currently has a population of 32 million, and by at least one estimate it will surpass Tokyo as the most populous megacity in the world by 2030 (Razvadauskas, n. d.).

A 1% increase in urbanization is generally associated with a more-than-proportional percentage increase in per capita GDP, whose magnitude differs across countries: a 1% increase in urbanization is associated with an increase in GDP per capita by 13% in India, 10% in the PRC, and 7% in Thailand, but by only 2% in Indonesia. This dampened effect of increased urbanization in Indonesia is believed to be due to issues such as transport congestion, pollution, and greater disaster risk due to inadequate infrastructure investment (World Bank 2012a).



183471C ABV

Population

31,936,631

Population growth rate

1.09%

Population density

4,987 people per km²

Public transport mode share

11%

GRP per capita

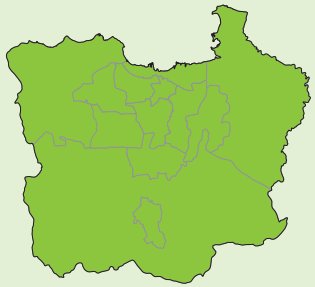
$23,531

Mass rapid transit network:

Number of stations: 93

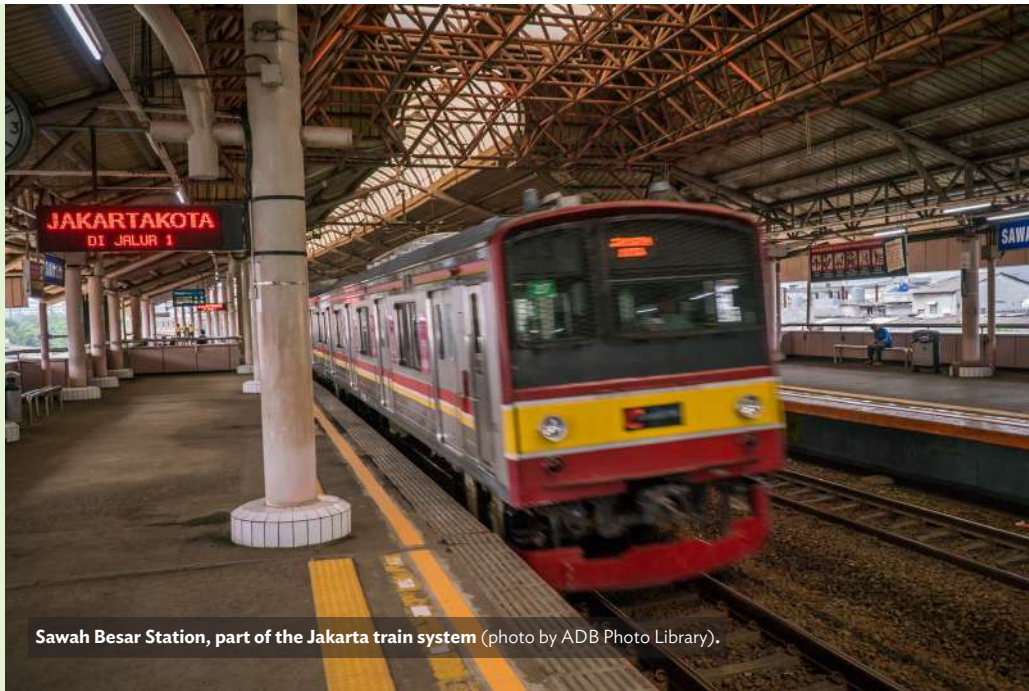
Kilometers of track: 434

Sources: Prayudyanto and Thohir (2017); PT Kereta Commuter Indonesia; Statistics Indonesia; UrbanRail.Net.



Greater Jakarta or Jabodetabek includes the capital city of Jakarta and the cities of Bogor, Depok, Bekasi, Tangerang and South Tangerang, and three regencies, namely, Bekasi Regency, Tangerang Regency and Bogor Regency.

This map was produced by the cartography unit of the Asian Development Bank. The boundaries, colors, denominations, and any other information shown on this map do not imply, on the part of the Asian Development Bank, any judgment on the legal status of any territory, or any endorsement or acceptance of such boundaries, colors, denominations, or information.



Sawah Besar Station, part of the Jakarta train system (photo by ADB Photo Library).

There are two main options for public transport in Jakarta: the Transjakarta Bus Rapid Transit (BRT) and the KRL Commuter line systems. Transjakarta operates approximately 1,100 buses across 15 cities, but BRT is currently only able to serve around 20% of the daily mobility needs of urban populations throughout Indonesia. Since modernization in 2011, the KRL system operates six integrated commuter lines across 79 stations in Jabodetabek. This mass rapid transit system serves 1 million users on average per day.

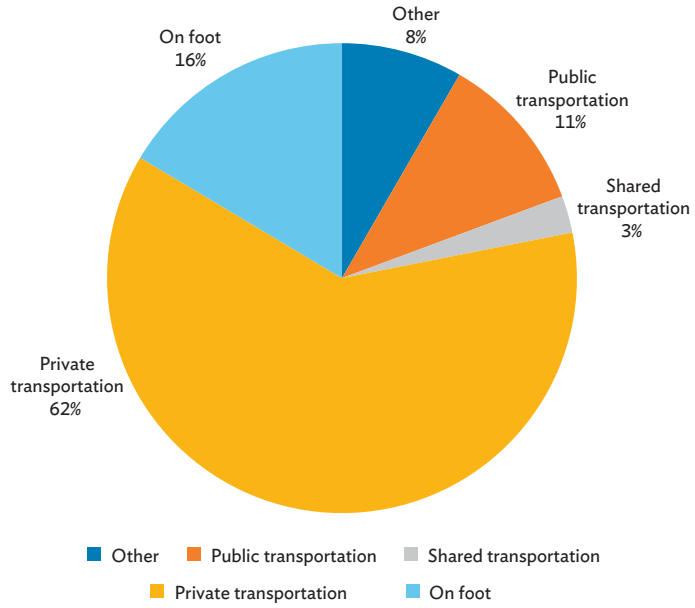
Despite this, the number of private vehicles in Jakarta has increased significantly, growing on average 8% per year. Among those employed in Jabodetabek and residing both in and outside of the metropolitan region, transport mode shares are 11% for public transportation and 62% for private transportation. Those who both work and live in Jabodetabek use private transport even more to get to their place of employment—private vehicles comprise 66% of their transport mode share (Statistics Indonesia 2017). Across the country, motorcycles are by far the most popular vehicle (81% of vehicles owned) followed by passenger cars (11% of vehicles owned) (Statistics Indonesia). Vehicle ownership is continuously increasing. This large and growing dependency on private vehicles is associated with the (similarly large) average one-way commute time in Jakarta: 120 minutes (Syabri and Winarso, forthcoming).

The inadequacy of public transportation systems and services has also led to the growth of paratransit—transport services that are owned and operated by private companies and individuals (see Cervero 1997; Cervero and Golub 2007, for recent reviews). Paratransit has also become an important source of mobility, especially for poor people in many medium-sized or even larger cities in Indonesia.

While paratransit falls in a gray area between public and private transit, it is characterized by having no trip pattern (or one that is not consistently followed) of specific stops, stations, or schedules; thus, it is characterized as private transportation in this report. This is why, for example, public transportation mode share is relatively low for cities like Jakarta and Manila, whose residents rely heavily on paratransit for their daily travel needs.

The Greater Jakarta Transport Authority is addressing traffic and congestion problems by focusing on mass rapid transit and plans for MRT and LRT lines are underway. Phase I of the North to South corridor of MRT Jakarta has been constructed (Phase I is 16 km of track, commencing operations in 2019), and the extension of this line (Phase II) is expected to be complete by 2025. An East to West line is also planned to become operational in 2024.

Figure 1.6: Mode of Transportation of Workers in Jabodetabek

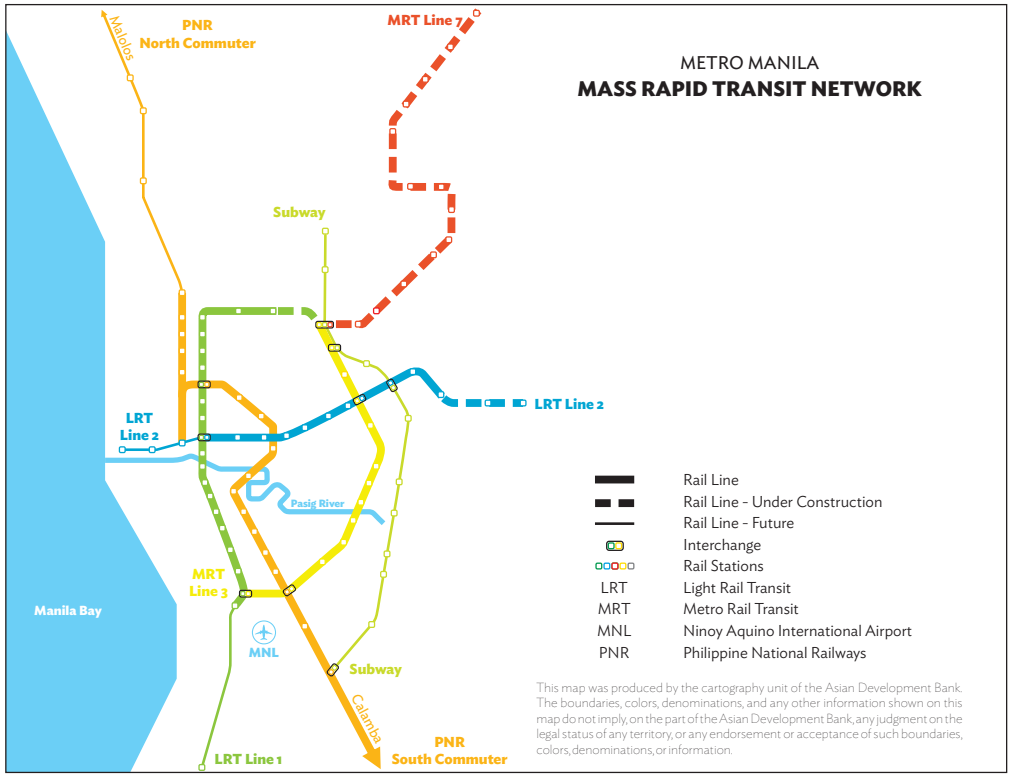


Source: Statistics Indonesia (2017).

Manila, Philippines

Like many other megacities in developing Asia, Metro Manila is facing increasingly serious problems with congestion. Population density in the National Capital Region (NCR, the official designation of the metropolis) has more than doubled since 1980, from 9,565 people per km^2 to 20,785 people per km^2 in 2015 (Figure 1.7A). In 2017, Metro Manila ranked fourth among the largest built-up urban areas in the world, behind Tokyo, Jakarta, and New Delhi (Demographia 2018).

The increase in motor vehicles has been even more pronounced. Annual growth in motor vehicles registered in the NCR averaged 7.3% between 2007 and 2016, which translates to a doubling in the number of registered vehicles in just 1 decade (Figure 1.7B). In the first half of the 2000s, the rise in vehicles was concentrated in motorcycles, whose numbers increased fivefold. But rapid income growth has generated more rapid growth in cars and utility vehicles in the past decade. As a result, many of Manila's streets are well beyond capacity.



183471A ABV

Population

12,877,253

Population growth rate

1.03%

Population density

20,785 people per km^2

Public transport mode share

9%

GRP per capita

$9,092

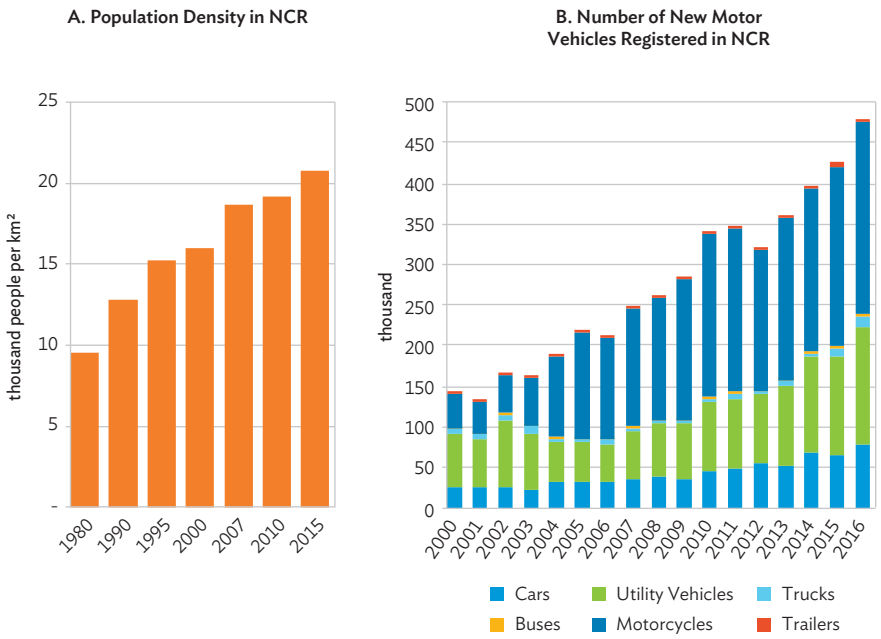
Mass rapid transit network:
Number of stations: 61
Kilometers of track: 78.4

Sources: Abiad and Adona (forthcoming); Clean Air Asia (2016); Philippine Statistics Authority.

Metro Manila or the National Capital Region (NCR) includes the capital city of Manila and 15 other cities, namely, Caloocan, Las Piñas, Makati, Malabon, Mandaluyong, Marikina, Muntinlupa, Navotas, Parañaque, Pasay, Pasig, Quezon City, San Juan, Taguig, and Valenzuela, and the municipality of Pateros.

Metro Rail Transit (MRT-3) (photo by lcqgirl under public domain).

Figure 1.7: Metro Manila Is Growing, and Growing Congested



km² = square kilometer; NCR = National Capital Region.

Source: Philippine Statistics Authority.

The city's main artery, the circumferential Epifanio de los Santos Avenue (EDSA), can carry 6,000 vehicles per hour in each direction. It currently carries 7,500 in each direction, or 25% above its carrying capacity (Pateña 2017). Like other megacities, Metro Manila is in dire need of a functioning and adequate mass rapid transit system.

Unfortunately, Metro Manila's mass rapid transit system is failing to keep pace with demand. The metropolis currently has three mass rapid transit lines—Light Rail Transit (LRT) Lines 1 and 2, and Metro Rail Transit (MRT) Line 3—with a total route length of just 47.6 km (Table 1.1). These are complemented by an aging commuter line of the Philippine National Railways (PNR). Combined daily ridership on the three mass rapid transit lines and the commuter line is about 1.24 million, which accounts for less than a tenth of the 13.4 million motorized trips a day that Metro Manila's citizens make. Private transport accounts for 91% of trips in the metropolis—29% by own vehicle and 62% by paratransit (jeepney, bus, and public utility vehicle)—but on increasingly congested roads (JICA and NEDA 2014).

Table 1.1: An Overview of Metro Manila's Mass Rapid Transit System

	LRT-1	LRT-2	MRT-3
Opening year	1984	2004	2000
Route length (km)	18.1	12.6	16.9
Number of stations	20	11	13
Maximum speed (kph)	60	80	65
Maximum train capacity (passengers per train)	1,358	1,628	1,182
Daily ridership (2017)	435,000	240,000	463,000
Construction cost ($ million)	500	850	655
Construction cost ($ million per km)	35	61.6	39

km = kilometer; kph = kilometer per hour; LRT = Light Rail Transit; MRT = Metro Rail Transit.

Source: METI, Ernst & Young, and JETRO (2013).

The costs of this congestion are high and rising. In 2017, the Japan International Cooperation Agency (JICA) and the National Economic and Development Authority (NEDA) estimated the economic cost of traffic congestion in Metro Manila (as measured by time and vehicle operating costs spent by drivers and passengers along the road network, but excluding pollution, health and other costs) at ₱3.5 billion ($69 million) a day, up from a previous estimate of ₱2.4 billion ($57 million) in 2012. And they estimate that this cost will rise to ₱5.4 billion ($102 million) a day in the absence of any action (JICA and NEDA 2018).

The Philippine government is acutely aware of the transport problems facing Metro Manila, and a slew of mass rapid transit programs are part of the government's ambitious "Build, Build, Build" infrastructure program. These include the Mega Manila Subway, the MRT-7 from Metro Manila to Bulacan, extensions of LRT-1 to Cavite and of LRT-2 to Rizal, a Unified Common Station (for LRT-1, MRT-3, MRT-7, and the subway), and three PNR projects to the north and south.

But these projects come with a hefty price tag. They are expected to cost ₱757 billion ($14.3 billion), or about 5% of GDP. But fiscal space is limited, and the government has many priority spending areas. These include other infrastructure spending, outside the NCR and in areas other than transport, as public spending for "Build, Build, Build" is targeted to reach ₱8-9 trillion ($150-170 billion) between 2017 and 2022 (BuildBuildBuild). And of course there are important non-infrastructure spending priorities, including social spending on health and education. All of these factors lend credence to the idea that new, equitable, innovative beneficiary contributions are worth actively exploring at this time (Montalbo and Napalang, forthcoming).

Population, Economy, and Transit in Global Cities

Having reviewed the basic infrastructure-related context for Bangkok, Jakarta, and Manila, the remainder of this section looks at infrastructure, growth, and basic economic conditions in several carefully selected comparator cities.

Our three Southeast Asian capital cities are important on a global scale—they are the key cities of three countries located in the world's most dynamic region. Thus, for comparison we have selected important global cities clustered around a roughly similar population scale (with some chosen to be deliberately below and above the population of our Southeast Asian cities), and provide key statistics for these cities. All selected global comparator cities feature large and high-quality mass rapid transit networks, and this marks both a point of departure from the conditions seen in Bangkok, Jakarta, and Manila, and a goal to be pursued.

For example, Sydney is the smallest of the cities in our listing by population, but its mass rapid transit network is larger than the mass rapid transit networks of Manila, Jakarta, and Bangkok combined.

From another perspective, the largest four cities in our listing—Paris, Osaka, Seoul, and Tokyo—all have very high average incomes, but these cities are inconceivable as working economic and social units without the high-quality transit systems that underpin viable movement and economic exchange within their boundaries.

It would be virtually impossible to expect a sustained move from middle to high income status for cities like Bangkok, Jakarta, and Manila without the sustained mass rapid transit investment programs that closely accompanied the development trajectory of the peer cities in our listing. The large number of Asian cities in the listing should underpin this message—Asian peer cities Singapore; Hong Kong, China; Nagoya; Seoul; Osaka; and Tokyo experienced economic development surges at different times during the mid- to late 20th century that went hand-in-hand with a substantial, long-range mass rapid transit investment program, with aspects of LVC mobilized to sustain this investment dynamic. For these Asian peer cities, transportation has been transformational to urban growth and economic performance.

A key message here is to begin seeing urban and metropolitan mass rapid transit investment and development as a tool and a driver of economic and social progress, rather than a side effect of economic growth that occurs entirely separate from infrastructure-led development and improvement. Stakeholders in Bangkok, Jakarta, and Manila should take on the challenge to refresh their outlook on the role of transit investment in city change and economics, and when selecting cities from which relevant and effective policy learning may be derived.

Key Statistics for Selected Global Comparator Cities

Greater Sydney

New South Wales, Australia

Population

5,131,326

Population growth rate	Population density
2%	**400** people per km²
Public transport mode share	GRP per capita
23%	**$60,101**

Mass rapid transit network:

- Number of stations: **213**
- Kilometers of track: **1,023**

Medium-sized cities

Singapore

Singapore

Population

5,612,253

Population growth rate	Population density
0.1%	**7,796** people per km²
Public transport mode share	GRP per capita
67%	**$57,722**

Mass rapid transit network:

- Number of stations: **157**
- Kilometers of track: **228**

Medium-sized cities

Hong Kong, China

Hong Kong, China

Population

7,413,100

Population growth rate	Population density
0.5%	**6,300** people per km²
Public transport mode share	GRP per capita
95%	**$46,193**

Mass rapid transit network:

- Number of stations: **113**
- Kilometers of track: **230**

Large cities

San Francisco Bay Area

California, United States

Population

7,760,000

Population growth rate	Population density
0.7%	**425.7** people per km²
Public transport mode share	GRP per capita
25%	**$86,830**

Mass rapid transit network:

- Number of stations: **86**
- Kilometers of track: **613**

Large cities

Sources: Australia Bureau of Statistics; Government of the Hong Kong Special Administrative Region, Census and Statistics Department; Government of the Hong Kong Special Administrative Region, Legislative Council (2016); Government of Singapore, Department of Statistics and Ministry of Transport; Hale and Eagleson (2015); id community; NSW Trains (2014); San Francisco Municipal Transportation Agency (2018); SGTrains; United States Census Bureau; UrbanRail.Net.

Randstad

The Netherlands

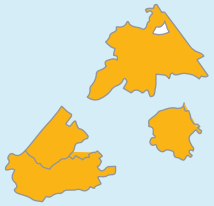
Population

8,219,380

Population growth rate	Population density
0.7%	**1,500** people per km²
Public transport mode share	GRP per capita
16%	**$50,710**

Mass rapid transit network:

- Number of stations: **250+**
- Kilometers of track: **1,500+**



Large cities

London

England, United Kingdom

Population

8,825,001

Population growth rate	Population density
5.7%	**5,613** people per km²
Public transport mode share	GRP per capita
27%	**$70,462**

Mass rapid transit network:

- Number of stations: **450+**
- Kilometers of track: **735+**

Large cities

Greater Osaka

Japan

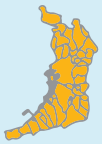
Population

8,839,469

Population growth rate	Population density
–0.3%	**4,640** people per km²
Public transport mode share	GRP per capita
34%	**$34,517**

Mass rapid transit network:

- Number of stations: **150**
- Kilometers of track: **164**



Large cities

Rhein–Ruhr

Germany

Population

10,680,783

Population growth rate	Population density
0.2%	**1,469** people per km²
Public transport mode share	GRP per capita
18%	**$41,591**

Mass rapid transit network:

- Number of stations: **190+**
- Kilometers of track: **1,690+**

Supercities

Sources: Government of Germany, Federal Statistical Office; Government of the United Kingdom, Office for National Statistics; Hale and Eagleson (2015); Japan Statistics Bureau; New Geography; Randstad Region (2017).

Paris

France

Population

12,405,426

Population growth rate	Population density
0.7%	**720** people per km²
Public transport mode share	GRP per capita
70%	**$61,945**

Mass rapid transit network:

- Number of stations: **560+**
- Kilometers of track: **1,800**

Supercities

Nagoya

Japan

Population

15,031,000

Population growth rate	Population density
–0.11%	**1,288** people per km²
Public transport mode share	GRP per capita
25%	**$39,643**

Mass rapid transit network:

- Number of stations: **800+**
- Kilometers of track: **2,600+**

Supercities

Seoul

Republic of Korea

Population

25,600,000

Population growth rate	Population density
0.2%	**10,400** people per km²
Public transport mode share	GRP per capita
63%	**$42,793**

Mass rapid transit network:

- Number of stations: **707**
- Kilometers of track: **940**

Megacities

Kanto (Greater Tokyo)

Japan

Population

36,131,000

Population growth rate	Population density
0.3%	**2,662** people per km²
Public transport mode share	GRP per capita
51%	**$64,269**

Mass rapid transit network:

- Number of stations: **800+**
- Kilometers of track: **2,600**

Megacities

Sources: Government of France, National Institute of Statistics and Economic Studies; Hale and Eagleson (2015); Japan Statistics Bureau; Paris Region Enterprises (2016); United Nations (2016).

2. Land Value Capture and Beneficiary Funding—Concept and Principles

In this section of the report, we outline the basic concepts, theories and principles behind land value capture, within a broader umbrella of beneficiary funding for major mass rapid transit initiatives. Rather than treating these concepts as novel, new, or unproven, we remind readers that such approaches represent a longstanding approach to workable mass rapid transit network planning, funding and delivery—with a history dating back more than a century. These principles are strongly grounded in equity and fairness, and a close matchup is sought between project funding contributions and the benefits received by various beneficiaries from major projects.

The 21st Century City Economy

The 21st century metropolis is often characterized by the tertiary or services economy. It is said to be a place of ideas and exchange. Much of the growth in employment and activity is focused in the financial and business services sectors; retailing and hospitality; information technology (IT) and communications; education and research; and healthcare. The knowledge economy concept has strong grounding in actual economic reality. The 21st century metropolis thrives on contact and exchange among and across people, businesses, institutions, and ideas (Figure 2.1). It is not difficult to identify the role that personal mobility and transport can or should play in these exchanges.

Figure 2.1: The 21st Century Urban Economy

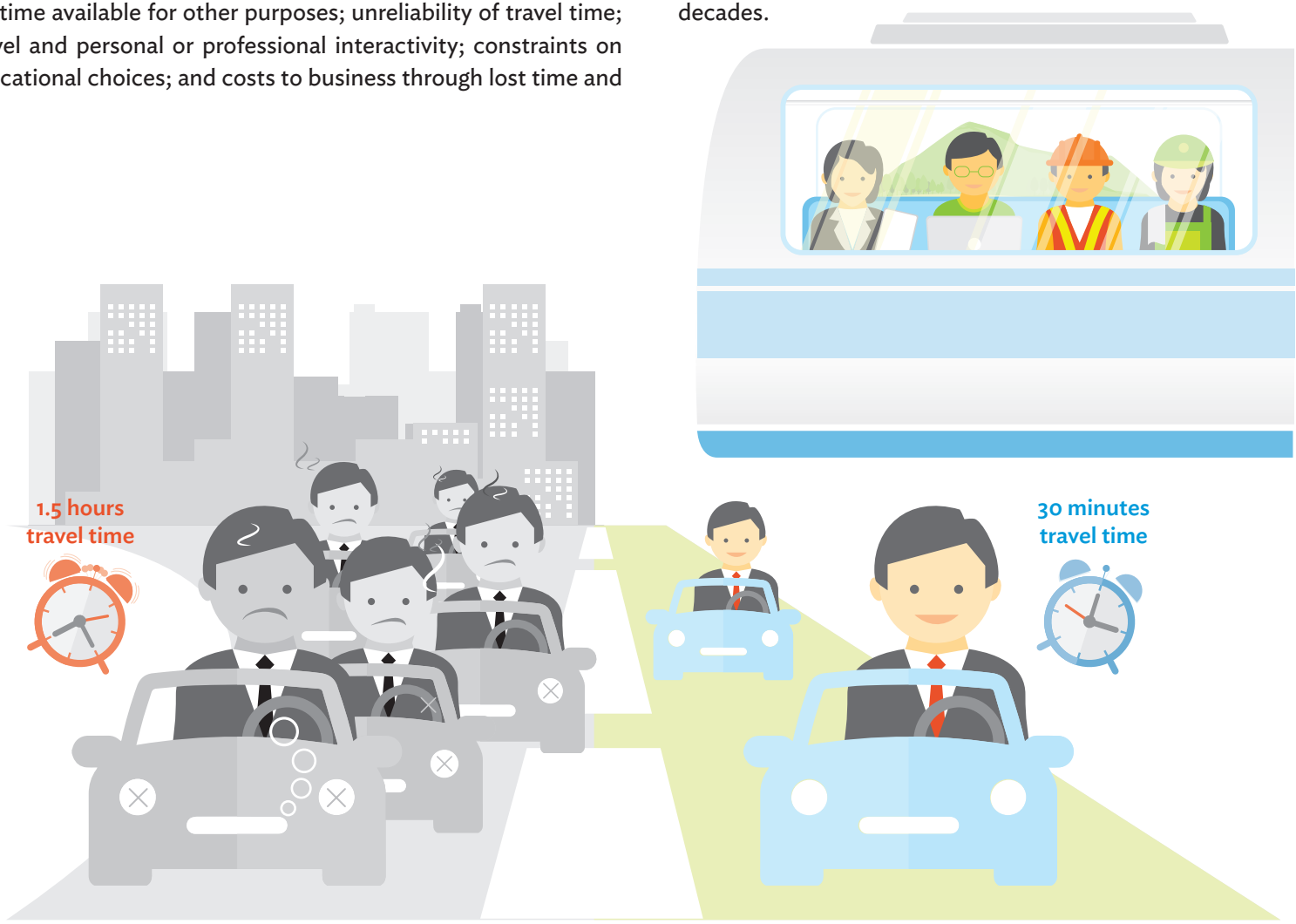
Source: Authors.

Connectivity problems—constraints on connectivity and the economy

By the same token, the concentration of people, things, and organizations within a confined spatial territory is not entirely trouble-free or unproblematic. The traditional complaint of congestion is basically a surface-level symptom of a deeper, broader, and more complex set of issues and challenges related to the fundamental human and economic demand for movement and interactivity. Problematic issues related to poor connectivity in urban or metropolitan contexts include, among others, travel congestion; long commute times impacting the quality of life and time available for other purposes; unreliability of travel time; deterrence to travel and personal or professional interactivity; constraints on job options or educational choices; and costs to business through lost time and productivity.

Accessibility as a driver of value

On the flipside, there is profound economic and social value associated with improvements to accessibility, connectivity, travel speed, travel reliability, and convenience. Accessibility is a driver of exchange, connectivity, value, opportunity, and real estate development. Projects that deliver even relatively small travel time improvements per individual traveler can provide profound economy-wide benefits when that same small impact accrues across very large numbers of people or organizations, day-in and day-out, over many years and decades.



Source: Authors.

Transport projects—benefits and beneficiaries

Travel time improvements comprise a prominent benefit offered by major transport projects. But good projects offer an array of impacts and benefits beyond time savings for users. A listing of benefits and beneficiaries is provided in Figure 2.2. Sound project planning and economic appraisal processes quantify the impacts of the project on each and every one of these beneficiary groups. While land value capture (LVC) is focused on the property-related impacts and benefits of transport projects, it needs to take place within a broader remit for beneficiary funding in which balanced contributions are made by beneficiary groups, relative to the benefit they receive from the project.

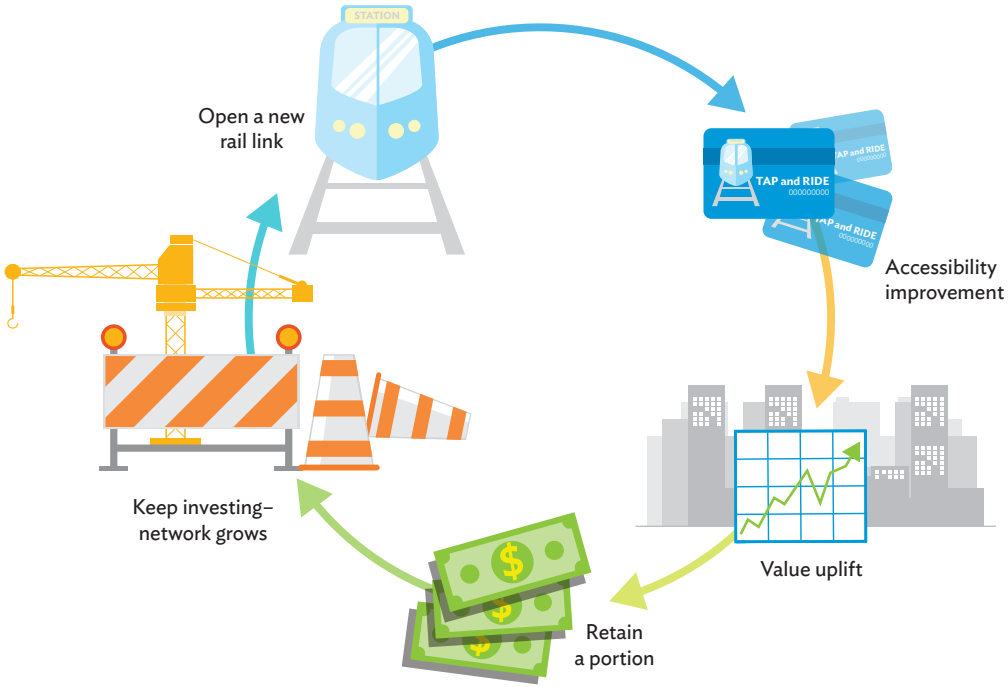
Figure 2.2: Accessibility Improvement Drives Benefits

Source: Authors.

Sustaining the virtuous cycle of value capture

Without solid project funding, it is obviously difficult to deliver major projects, let alone an entire suite of projects or investments over a long-term horizon comprising years and even decades. Without sustainable project funding, good projects remain unbuilt, and potential beneficiaries forgo substantial benefits that they would otherwise receive. Value capture can therefore be described as a virtuous cycle in which a larger number of good projects can be delivered (Figure 2.3)—releasing a range of benefits to an array of stakeholders and beneficiaries—by inviting those beneficiaries (property owners included) to make a manageable contribution to the project, substantially smaller than the benefit they receive.

Figure 2.3: The Virtuous Cycle of Value Capture



Source: Authors.

Equity and fairness—finding a better match between funding contribution and benefit received

An arrangement involving sensible contributions from key beneficiaries is good for those beneficiaries, and good for cities that need transport investment. But it also provides another crucial outcome in the form of a more fair and equitable approach to the funding of major projects. When taxpayers are the main source of funding (whether in direct funding contribution, as repayment of loans, or repayment of PPP-related fees), individual taxpayers contribute regardless of the benefit they receive, regardless of whether they use the new transport connection, and even regardless of whether they live in the city where the project is built. Value capture is therefore a crucial element in any move toward greater fairness, balance, and equity in project funding. It provides and supports a closer interrelationship between benefit received and contribution made to project funding.

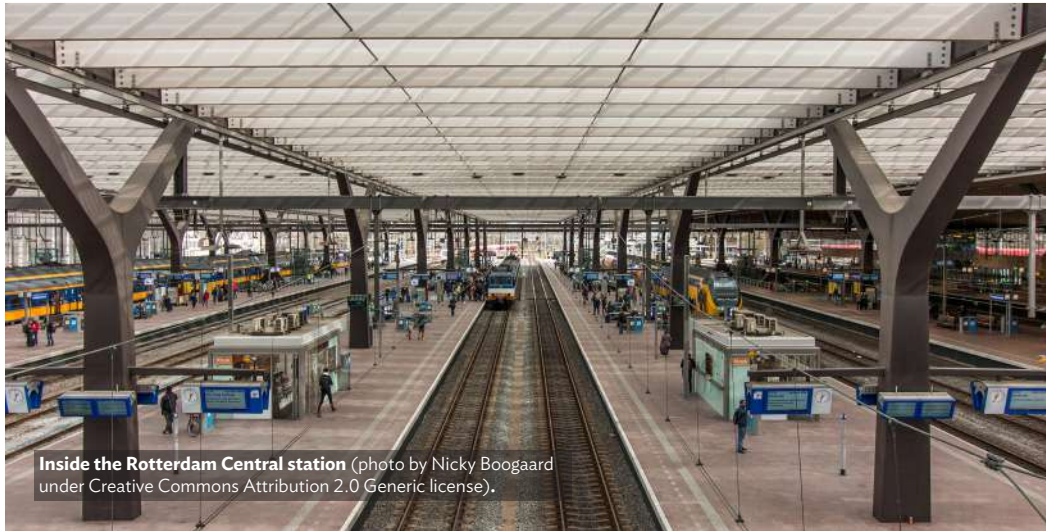
The design dividend—creating value through better projects

It would be incorrect to describe LVC as static. Value capture concepts are better placed when they are proactively and robustly integrated into project development, planning, and design. Transit Oriented Development (TOD), broadly defined as mixed-use development near and/or oriented to mass rapid transit facilities, is a complement to LVC. Common characteristics of TOD include urban compactness, pedestrian and bicycle-friendliness, public spaces near stations, and stations designed to be community hubs (Thomas et al. 2018). These characteristics increase both quality and accessibility of urban transit infrastructure, delivering better projects and increasing the potential to create value in the context of LVC. TOD for LVC can be enacted through intelligent corridor planning and station location choices, through initiatives that provide better access and connectivity to new or existing stations (through integrated feeder buses or improved pedestrian access), or through initiatives to deliver better station facilities—loaded with retail and other opportunities. These outcomes can be pursued through a process of project refinement that is closely connected with enlightened, up-to-date ideas on design, architecture, and real-estate positioning. One of many positive messages from LVC is the notion that it supports and resources better station facilities, better precinct planning, and better architecture.

Bicycle lanes in Copenhagen (photo by Alphotographic via Getty Images).

Recent European major projects tend to leverage quality architecture, public realm, transport options, and in-station retailing to maximize project value through intelligent design. Value optimization through design is a crucial element of enlightened land value capture methodology.

Rotterdam Central station is the main train station of the city of Rotterdam in the Netherlands, and has both domestic and international rail connections network with Belgium, France, and the United Kingdom (photo by Leo Luijten under Creative Commons Attribution 2.0 Generic license).



Inside the Rotterdam Central station (photo by Nicky Boogaard under Creative Commons Attribution 2.0 Generic license).

3. Property Value Increases Due to Transit—Evidence from Southeast Asia and the World

To illustrate how much money governments are potentially leaving on the table by not implementing LVC in urban planning and transit finance, this section provides quantitative evidence on the property value impacts of mass rapid transit. It begins by laying out the conceptual underpinnings of how mass rapid transit affects property values, and then uses statistical techniques to summarize the broad international experience on the subject. It then describes the findings of three background studies that examine this issue in the specific context of mass rapid transit in Bangkok, Jakarta, and Manila. Taken as a whole, the international and Southeast Asian evidence is compelling, and clearly illustrates the validity of the notion that land value increases are an inherent effect of mass rapid transit accessibility and investment.

Theory of land value impacts from transit

The concept of land value premiums arising from mass rapid transit is both well-established, and reasonably intuitive and straightforward.

Economic theory suggests that transit infrastructure can have positive impacts on property values by improving accessibility. The "bid-rent theory" for properties posits that households and firms are prepared to pay a certain amount of money for the location of the land, based on the value they place on that location's accessibility to markets, jobs, and other activities. Because transit infrastructure improves accessibility of a location to the central business district and other areas, proximity to transit stations is of value, although rents are expected to decline as distance from a transit station increases. However, mass rapid transit may also have negative effects on rents and land values if it generates negative externalities, such as noise.

These concepts are mostly well-understood. But it is also important to stress that accessibility is a broad concept, of which proximity is just one part (Figure 3.1). And accessibility drives property values, rather than proximity. One may

Figure 3.1: Accessibility Is What Matters

Source: Authors.

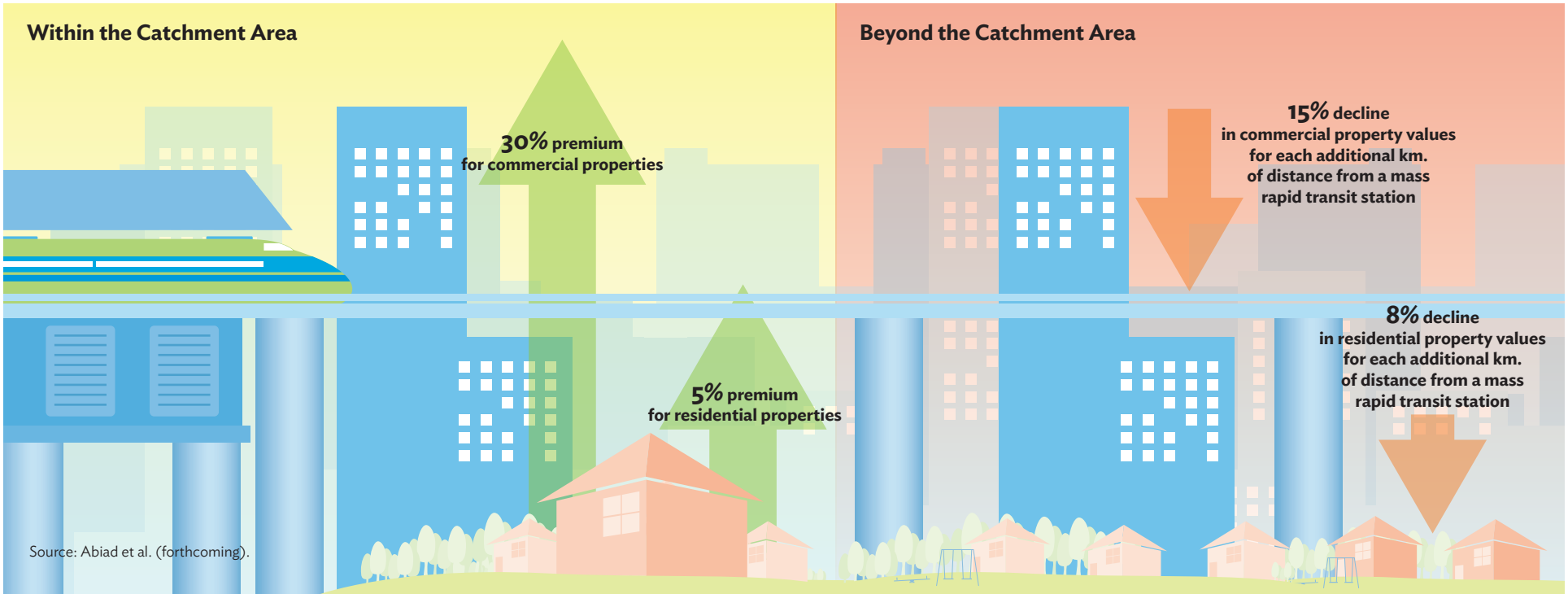
be relatively close to a mass rapid transit station, but if access is impeded by poor pedestrian, bike, or transit connection access, this will inhibit accessibility of that particular location. There are also variations in levels of accessibility to consider across the different stations of a mass rapid transit network. Travel time to key destinations is not the same across stations, and those stations offering faster travel times to key destinations should see greater value, all things being equal. Finally, even operational or service changes, such as improved frequency or reliability of service, impact accessibility; thus, service and operational outcomes can be influential in driving property value changes (although the academic literature has devoted less attention to this issue).

International evidence on property value premiums to transit—a systematic summary

The literature on the effect of rail transit on property values is vast and still growing. A systematic search of the literature conducted for this report (Abiad et al., forthcoming) yielded 61 studies, of which 43 were published in just the last decade. Three-quarters of the studies analyzed mass rapid transit in advanced economies, and one-quarter examined those in developing economies. These studies analyzed a wide range of cities, property types, and rail systems, and adopted different methods—which resulted in different impact estimates.

A review of this literature—using statistical techniques of meta-regression analysis—finds significant impacts of mass rapid transit access, although these impacts vary by property type and city context. For developing country studies that examine the impact of being in a catchment area (the definition of which varies across studies, from 100 m to 1.6 km in our sample), the observed premium for residential properties close to a mass rapid transit station is 5% (Figure 3.2). For commercial properties the average premium is higher, at 30%. Looking beyond the catchment area, other developing country studies examine how property values vary with distance to a mass rapid transit station, and the summary finding is that residential property prices decline by 8% on average for each 1 km one moves away from a mass rapid transit station. The effect is larger for commercial properties, which see a 15% value decline on average for every additional km of distance from a mass rapid transit station.

Figure 3.2: International Evidence on the Effect of Mass Rapid Transit on Property Values in Developing Economies



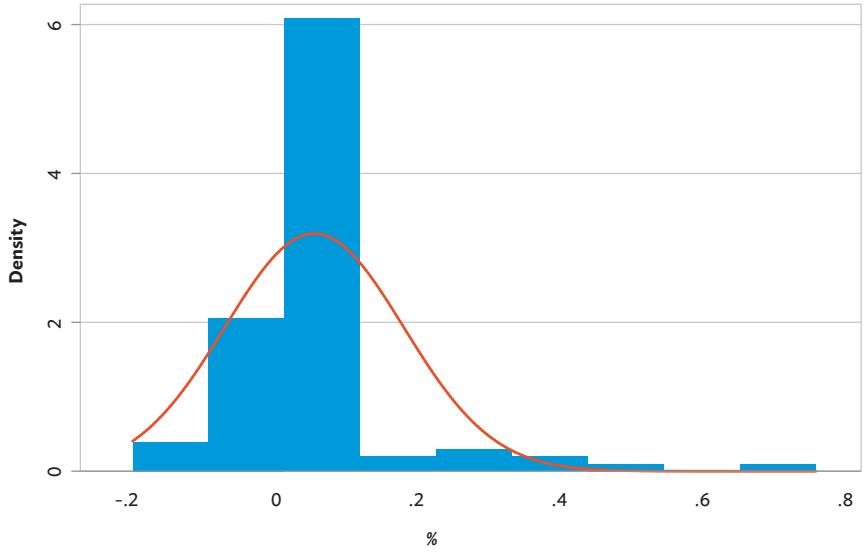
Source: Abiad et al. (forthcoming).

One should be careful in interpreting average effects, however, because another important takeaway from the literature is that the estimated effects of mass rapid transit accessibility on property values vary greatly across studies—in other words, these effects can be very context-specific. Figure 3.3 shows the dispersion of estimates of the premium for being located in the catchment area of a mass rapid transit station. While the majority of studies find a positive effect, there are others that find negative effects of proximity on residential properties—a finding that is not implausible when considering the importance of the design dividend, as mass rapid transit stations can have negative externalities such as noise. The evidence supporting an accessibility premium is more evident in studies that examine distance to mass rapid transit stations (Figure 3.4). The histogram shows that estimated effects of how property values vary with distance to rail stations are almost always negative, but here as well the dispersion of estimates are wide.

It should not come as a surprise that estimates show wide variation. Mass rapid transit systems differ widely across cities, with some "rail-heavy" cities such as Hong Kong, China; London; Singapore; or Tokyo indicating profound property-related benefits of accessibility to rail relative to cities with only one or two rail lines. Unfortunately, most studies examine "rail-light" cities, in part because rail lines in these cities are those constructed more recently and are thus more amenable to analysis.

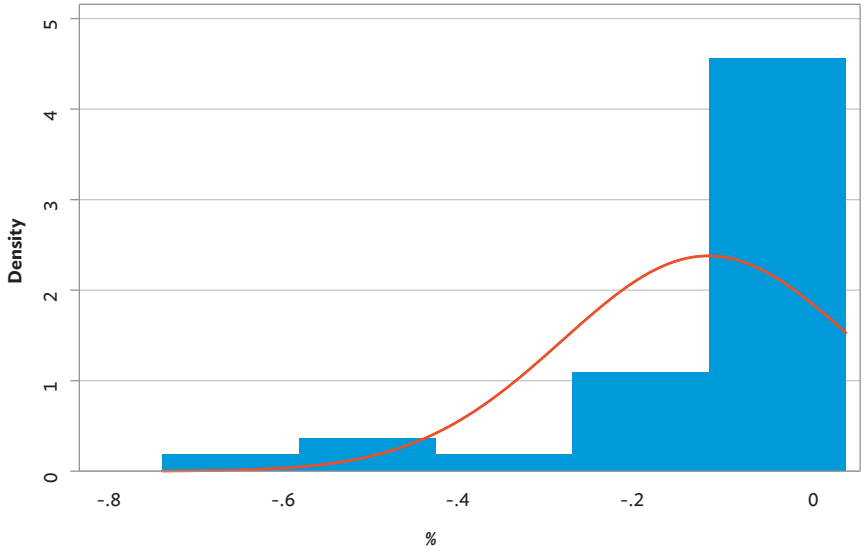
The bottom line is that estimates from many past studies cannot simply be taken "off the shelf" and used for the cities we examine here. It is in this context that several background studies were performed, examining the effects of mass rapid transit on property prices in Bangkok, Jakarta, and Manila.

Figure 3.3: Dispersion of Estimated Effects of Being in the Catchment Area of a Mass Rapid Transit Station on Property Prices



Source: Abiad et al. (forthcoming).

Figure 3.4: Dispersion of Estimated Effects of Distance to a Mass Rapid Transit Station on Property Prices



Source: Abiad et al. (forthcoming).

Bangkok—the increasing value of being close to mass rapid transit stations

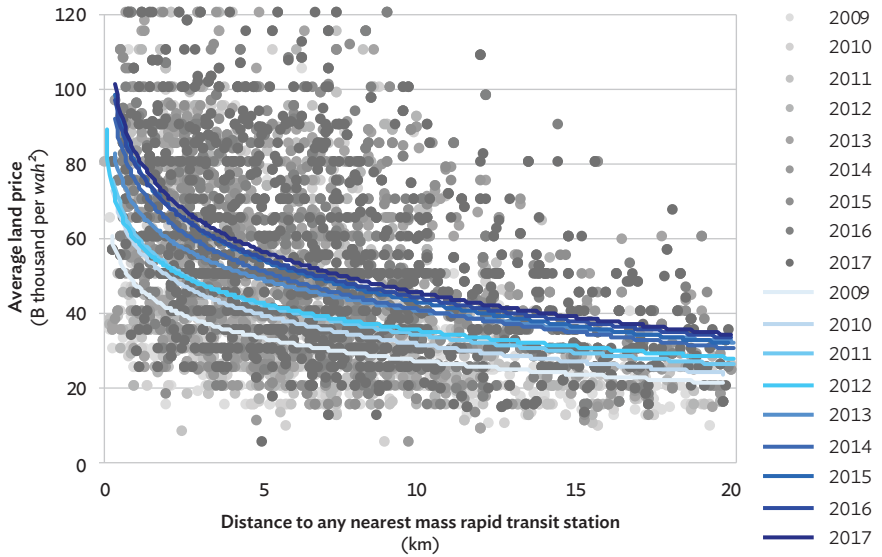
For the Bangkok Metropolitan Region (BMR), a background report (Anantsuksomsri et al., forthcoming) analyzes the relationship between proximity to mass rapid transit stations and land values in low-rise residential real estate projects, using data from Bangkok's Real Estate Information Center (REIC). The data comprise 7,667 observations in total from 2009 to 2017.

A hedonic pricing approach is used to determine the influence of property, neighborhood, and accessibility characteristics on land values. Property characteristics include the age of the dwelling, number of stories, number of housing units, land and housing areas, and parking space. Neighborhood characteristics include crime rates, racial diversity, and a walk-friendly environment. Finally, accessibility variables include distances to the nearest arterial road, mass rapid transit station, hospital, educational institution, shopping mall, and park.

Figure 3.5 shows the scatterplot of land values of residential projects in the BMR against distances to the nearest mass rapid transit stations. The blue lines show best-fit curves over time; darker lines signify more recent years.

Three things are evident from the figure. First, the downward slope of the lines confirms that property prices are lower the farther one gets from a mass rapid transit station. Second, the price-distance relationship is stronger in areas closest to mass rapid transit stations. And third, the gradient or steepness of the whole curve has risen over the years. This last finding implies that properties closer to mass rapid transit stations have seen greater increases in land values over time than those farther away. It also supports the idea that proximity to a transit station is more valuable as the transit network grows, offering greater accessibility from the same transit station over time.

Figure 3.5: Average Land Price of Residential Projects in the BMR and Distances to the Nearest Mass Rapid Transit Station, with Logarithmic Trendlines, 2009–2017

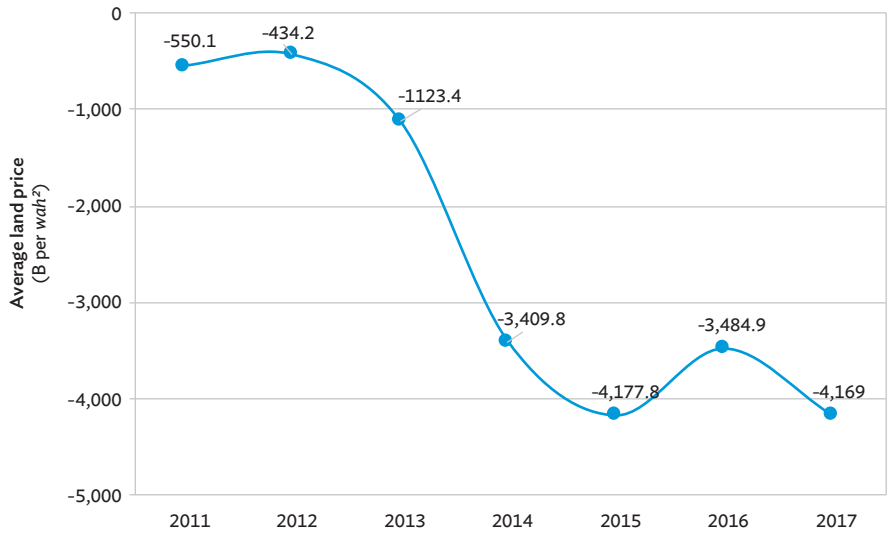


B = baht; BMR= Bangkok Metropolitan Region; km = kilometer; *wah*² = 4 m².

Source: Anantsuksomsri et al. (forthcoming).

Results for the sample as a whole show average land values decrease by B191 per *wah*² ($23 per m²) for each 10% increase in distance from the nearest mass rapid transit station. And this negative relationship between land values and distance to mass rapid transit has become stronger over time. In 2011, the change in average land values for each 10% increase in distance from mass rapid transit was just B55 per *wah*² ($7 per m²) for each 10% increase in distance from the nearest mass rapid transit station. But by 2017, each 10% increase in distance was associated with a decline in average land values of B417 per *wah*² ($49 per m²) (Figure 3.6 and Figure 3.7).

Figure 3.6: Land Value-Distance Coefficient Over Time



B = baht; wah^2 = 4 m^2.

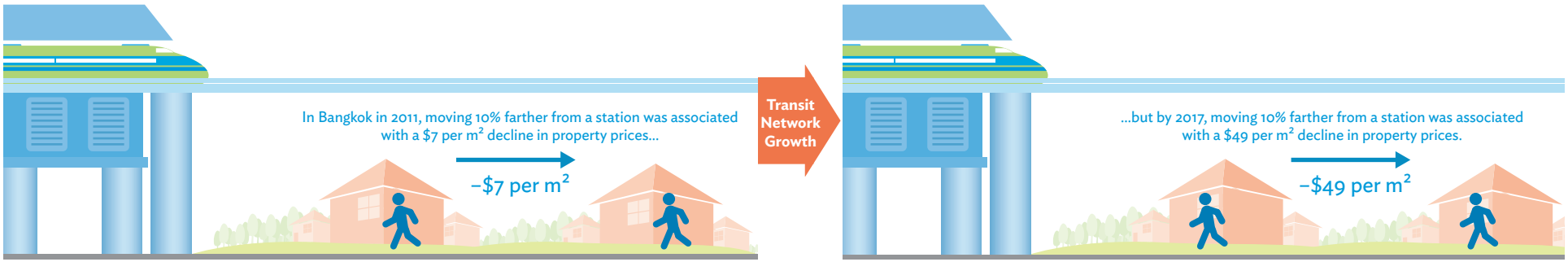
Source: Anantsuksomsri et al. (forthcoming) .

The BTS skytrain also provides a case study for a "difference-in-differences" hedonic regression. Among the BMR's mass rapid transit lines, the BTS has been operating for the longest period (since 1999) and has the highest ridership. The BTS extensions on the BTS Silom line that were opened in 2013 include five new stations: Wongwian Yai, Pho Nimit, Talat Phu, Wutthakat, and Bang Wa stations. The "treatment" group consists of all residential projects within 20 km of these five new stations, and all other residential projects within 20 km of a BTS station are used as the "comparison" group. Land values of housing projects before and after 2013 are compared, as that was the year the five new stations started operating.

The analysis finds that residential projects in the treatment group close to the five new stations had slightly lower prices than those in the comparison group prior to 2013. After 2013, the comparison group saw land values increase by a land price of B15,427 per wah^2. But projects in the treatment group experienced price increase of B18,086 per wah^2, or B2,659 per wah^2 (17%) more. There was a willingness to pay a price premium to live in the area close to the new BTS stations after they opened. There was insufficient data to analyze relative price increases following announcement and during construction but subsequent evidence from Manila suggests that these are likely to be substantial.

To calculate the aggregate effect of a new BTS station on land prices, the BTS Pu Chao station on the BTS Sukhumvit line is selected as a case study, as the station was set to open in late 2018. The incremental increase in land value in a 5 km radius of the Pu Chao station is estimated to be approximately B190 billion ($5.8 billion at current exchange rates), suggesting strong potential for land value capture for mass rapid transit in the BMR.

Figure 3.7: The Increasing Value of Proximity to Transit Over Time



Source: Authors.

Jakarta—comparing land value changes in rail-served Dukuh Atas and bus-served Harmoni

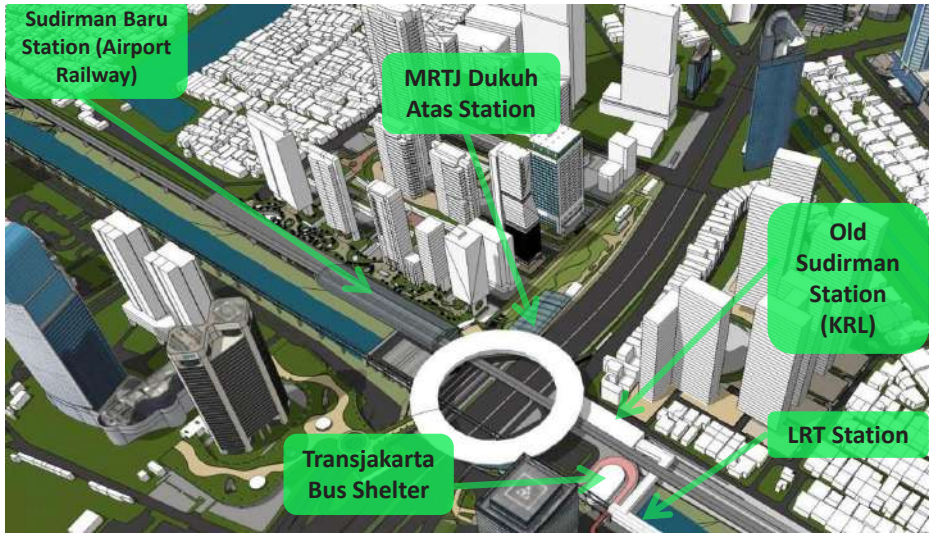
In a background report on the Greater Jakarta area (also known as Jabodetabek), property prices in two locations in Jakarta—the Dukuh Atas rail/bus transport hub and the bus-centered Harmoni area—are compared to examine the relationship between improved transit modes and connectivity (Syabri and Winarso, forthcoming).

The Dukuh Atas area is where the North-South axis of the city (Thamrin/Sudirman Boulevard) meets the East-West axis of the railway from Tanah Abang to Bekasi, making it one of the most important transportation hubs in Central Jakarta (Figure 3.8). The commuter rail line from Bekasi to Tanah Abang passes through the area at Sudirman station, which is used by many passengers to access other central business districts (CBDs) in Jakarta. In 2017, the Sudirman Baru railway station linked Dukuh Atas to the airport. And beginning in 2019 the area will be served by the DKI Jakarta MRT and light rail transit, as part of the project's first phase. In addition, three bus rapid transit (BRT) lines cross the area: namely the Transjakarta Koridor 1 (Thamrin/Sudirman boulevard), 4 (Dukuh Atas – Puro Gadung), and 6 (Dukuh Atas – Ragunan).

About 5 km north of Dukuh Atas, the Harmoni area is home to the busiest bus interchange in the Transjakarta BRT system, Harmoni Sentral Station. While Harmoni will eventually be served by rail in Phase II of the DKI Jakarta Project, construction has not yet begun and under current plans will not be completed until at least 2024 (Tambun 2018).

As both Dukuh Atas and Harmoni contain vital transit hubs, the sites were selected for study. Dukuh Atas was chosen as the "rail-served" location, while Harmoni serves as a "comparison" location that is an important transit hub without direct access to rail transit. Both are located in central areas of Jakarta, and both generally align themselves with Central Jakarta's reputation for robust property prices. Land values were collected for parcels in each area between 2015 and 2018.

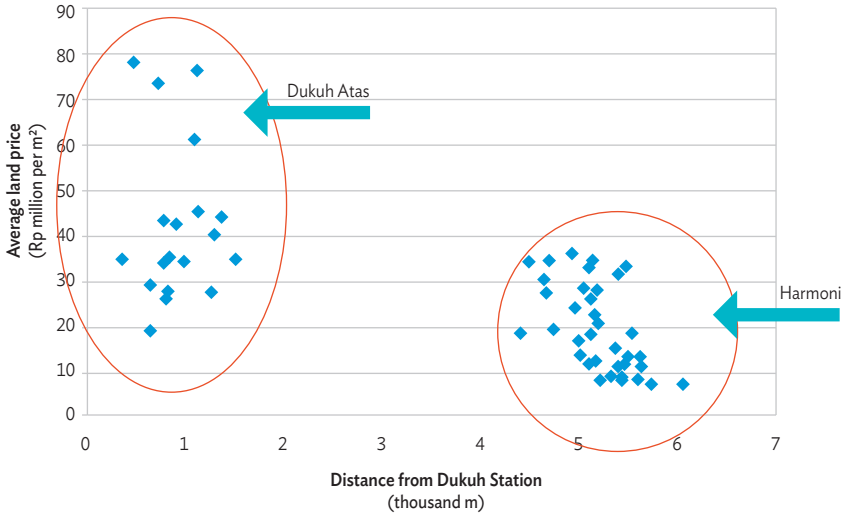
Figure 3.8: The Dukuh Atas Transport Hub



Source: Sinaga (2015).

Figure 3.9 indicates a clear price premium in the Dukuh Atas rail-served study site relative to Harmoni. Just under half of the observations taken at Dukuh Atas sit above the Rp40 million per m^2 mark, whereas there were no observations above that price point taken at Harmoni. There may be a number of reasons why land values in Dukuh Atas are higher than in Harmoni, including more land being used for institutional purposes in Harmoni. A potentially more meaningful indicator would be the change in land values between 2015 and 2018, a period when new rail lines became operational and were being constructed in Dukuh Atas.

Figure 3.9: Land Prices in Dukuh Atas and Harmoni Areas, 2015



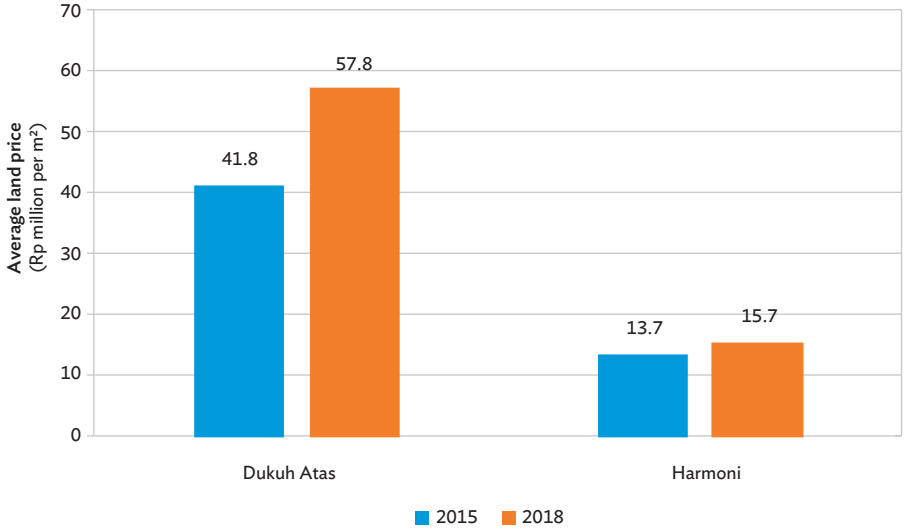
m = meter; m² = square meter; Rp = rupiah.

Source: Syabri and Winarso (forthcoming).

Average land values in Dukuh Atas rose from Rp41.8 million per m² ($3,122 per m²) in 2015 to Rp57.8 million per m² ($4,091 per m²) by 2018, an increase of Rp16 million per m² or 38.4% (Figure 3.10). In the comparator district of Harmoni prices rose from Rp13.7 million per m² ($1,023 per m²) in 2015 to Rp15.7 million per m² ($1,111 per m²) by 2018, an increase of Rp2 million per m² or 14.3%.

While this analysis is by no means comprehensive or wide-ranging across the property landscape of Jakarta, nor in its teasing out the effects of rail accessibility versus other factors, it does provide suggestive evidence that rail-served locations are demonstrably robust property value performers. The analysis suggests the potential for positive land value uplift arising from rail availability in Jakarta and underlines the importance of further investigation to clarify these relationships. This is particularly the case as Jakarta's nascent mass rapid transit network will expand over the next five years, offering additional accessibility from the Dukuh Atas transport hub and other existing commuter line stations. The possibility of exploring LVC opportunities arising from rail infrastructure in Jakarta is supported by this initial analysis.

Figure 3.10: Average Land Values in Dukuh Atas and Harmoni Areas, 2015 and 2018



m² = square meter; Rp = rupiah.

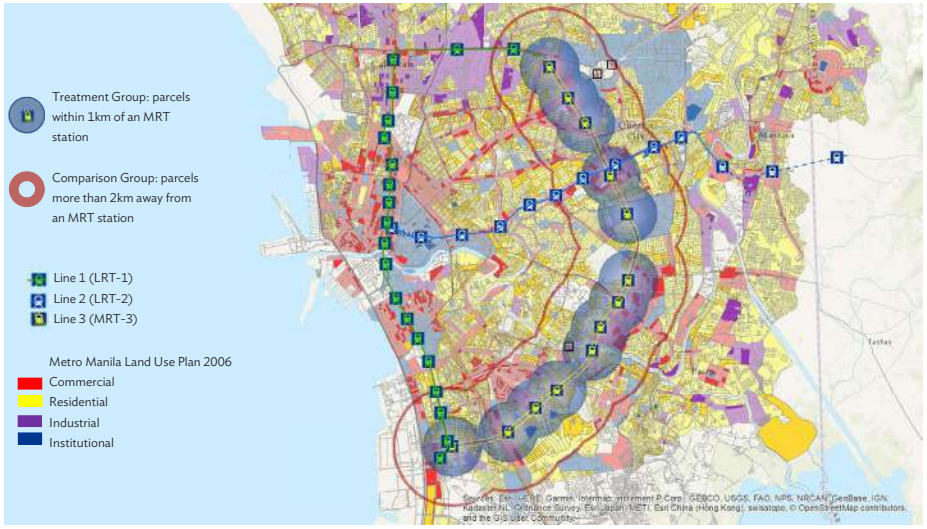
Source: Syabri and Winarso (forthcoming).

Manila—how MRT-3 affects land values

The MRT-3 line in Metro Manila is the busiest of the three mass rapid transit lines in the metropolis. Planning for the line began in the late 1980s, but it was not until the Supreme Court upheld the validity of the MRT-3 contract in 1995 that the project moved forward in earnest. Construction began in 1996, the first section was inaugurated in 1999, and full operations commenced in 2000.

To examine how residential and commercial land values are affected by the construction of MRT-3, a background study (Abiad and Adona, forthcoming) combines historical land value assessments from the Philippine Bureau of Internal Revenue with a land use map of the metropolis. This allows for the construction of a panel dataset of land values for over 5,800 parcels in Metro Manila from 1990 to 2015, for a total of more than 150,000 observations. Using a "difference-in-differences" approach—which compares changes in land values for parcels close to MRT-3 stations vis-à-vis changes for parcels farther away—and utilizing the timing of MRT-3 contract finalization, construction, and start of operations, findings of the value-add go beyond simply establishing correlations and estimate the causal impact of MRT-3 on land values.

Figure 3.11: MRT-3 Treatment and Comparison Land Parcels



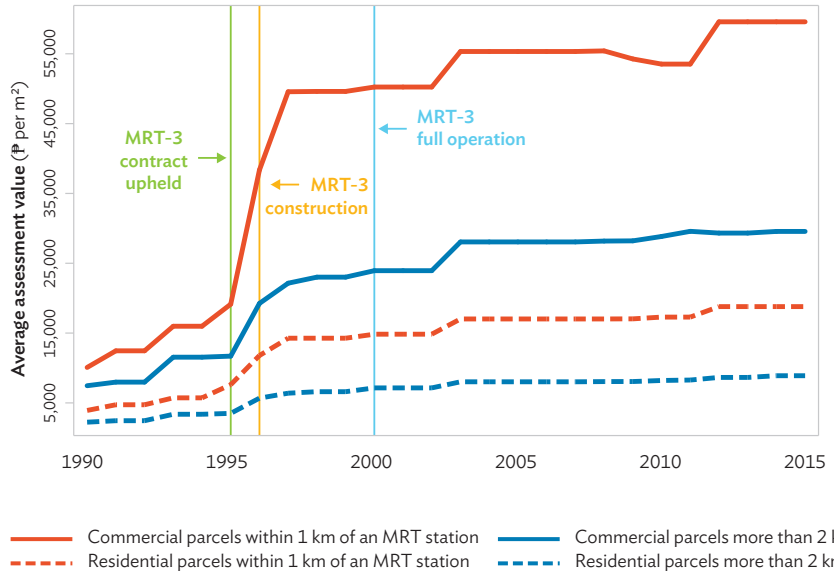
Source: Abiad and Adona (forthcoming).

As shown in Figure 3.11, parcels within 1 km of MRT-3 stations (within the blue circles) comprise the treatment group, whose prices are expected to be most affected by MRT-3 construction. Parcels more than 2 km away from MRT-3 stations (beyond the red line) comprise the comparison group.

Figure 3.12 shows that land values for close-in treatment parcels and farther-out comparison parcels moved in parallel up until 1994. But starting in 1995 — the year the MRT-3 contract was finalized—land values in the two groups start diverging, with close-in parcels seeing larger increases in values. This divergence continues throughout the construction period and until and after operations commence.

Average residential and commercial land values before and after 1995 for both treatment and comparison groups are presented in Table 3.1. While residential parcels farther away from MRT-3 saw a substantial increase in value from ₱2,789 ($107) to ₱7,584 ($172) per m^2, close-in residential parcels saw a substantially bigger increase, from ₱4,972 ($190) to ₱16,036 ($364) per m^2, so that residential parcels in the treatment group saw values increase by

Figure 3.12: Evolution of Commercial and Residential Land Values



m^2 = square meter; MRT = Metro Rail Transit.

Source: Abiad and Adona (forthcoming).

₱6,268 ($154) per m^2 more than in the comparison group. The difference-in-differences estimate is even larger for commercial parcels, at ₱22,140 ($545) per m^2.

Using a more sophisticated difference-in-differences hedonic regression approach to control for other factors that affect land values, including distance to other rail lines, distance to CBDs, population density, and per capita income, among others, the estimated impact of MRT-3 on land values declines to ₱3,743 ($92) per m^2 for residential parcels and ₱13,968 ($344) per m^2 for commercial parcels. Using these more conservative estimates the impact on aggregate land values within 1 km of MRT-3 stations is estimated to be close to ₱180 billion or $3.4 billion at current exchange rates, roughly five times the $655 million construction cost of the MRT-3 (Table 3.2).

In other words, just one-fifth of the incremental land value increase due to MRT-3 would have been enough to pay for the $655 million total cost of MRT-3, while still leaving a very substantial windfall for private property owners. This implies substantial scope for generating "win-win" situations via LVC: more infrastructure funding means more mass rapid transit gets built, and more quickly; this generates more windfalls for property owners and improves productivity and welfare for all residents.

Table 3.1: Land Values Over Time in Treatment and Comparison Groups

Average assessment value (₱per m^2)	Before 1995	After 1995	Difference (After - Before)	Regression-adjusted DID estimate
	(i)	(ii)	(iii)	(iv)
Residential parcels				
1. Treatment: parcels within 1 km of a station	4,972	16,036	11,063	
2. Comparison: Parcels more than 2 km away from a station	2,789	7,584	4,795	
3. Difference (Treatment minus Comparison)	2,183	8,452	**DID: 6,268**	**3,743**
Commercial parcels				
4. Treatment: parcels within 1 km of a station	13,424	52,443	39,019	
5. Comparison: Parcels more than 2 km away from a station	9,336	26,214	16,878	
6. Difference (Treatment minus Comparison)	4,088	26,228	**DID: 22,140**	**13,968**

DID = difference-in-differences.

Source: Abiad and Adona (forthcoming).

Table 3.2: Aggregate Impact of MRT-3 on Land Values

	Total area within 1 km of MRT-3 stations (m^2)	Incremental increase in value due to MRT-3 (₱per m^2)	Aggregate increase in land values in impact area (₱)
Residential	9,497,232	13,900	132,011,524,800
Commercial	12,089,044	3,700	44,729,462,800
	Total increase in land values due to MRT-3		**176,740,987,600**

Source: Abiad and Adona (forthcoming).

Project phasing and value impacts

The evidence is compelling. But time is also a relevant measure in most things. And the question of how property values may change or grow over time, relative to the scheduling of key phases for major transit project investments, is another live and important question when approaching value capture concepts. In summary, theory and observation suggest three broad phases of land value impact relative to major transit projects.

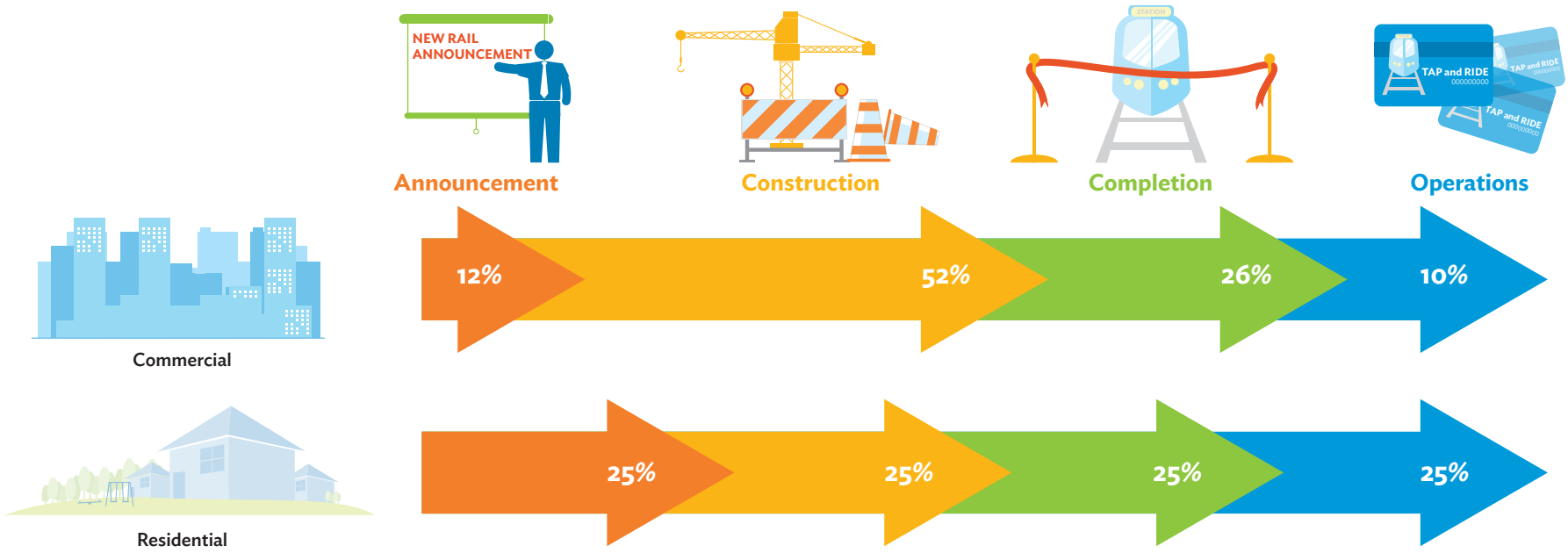
The first is at announcement of the project, at which time clever speculators or property investors would quite sensibly look to take advantage of any future changes in property value at a subject location by buying into that location while prices are still low.

The second key phase of value creation is around the start of project construction (or at signing of project contracts). At this juncture, stated project intentions are consolidated into concrete action, representing a higher level of confidence that changes in property value will happen and are worth trading for.

The third and perhaps most obvious phase of property value impact is after opening of the new transit station, route, or service enhancement. At this phase—what is often known in real estate terms as the "ready for occupancy" stage—the actual accessibility benefits of a project manifest themselves and become obvious to even the most slow-moving property market participants. One interesting aspect of this phase is that it essentially lasts into perpetuity (absent some dramatic change). Hence, the nature, timing, and cycle of property market change within this apparently never-ending post-opening phase is an intriguing set of questions. To summarize a complex situation, most rail-accessible local property markets should stabilize somewhat, at some point, after an initial burst of post-opening value growth.

Some evidence on value impacts at each project phase has been documented, with the disclaimer that empirical estimates of land value uplift are context-specific. Generally, strategies employed by these studies identify "treated" groups and counterfactuals, including specifications of intervention timing (announcement, construction, and operation of mass rapid transit systems). As such, effect estimates are specific to the counterfactual and are not directly

Figure 3.13: Project Phasing and Value Impact: Evidence from Manila's MRT-3



Source: Abiad and Adona (forthcoming).

comparable with previous studies mentioned in the introduction to this section. Some examples are now provided.

In Santiago, Chile, Agostini and Palmucci (2008) find that for residential properties within 1 km of the Santiago subway, values rose by 5% upon announcement of the project, and a further 4.3% upon the announcement of selected stations, compared to properties farther away.

In Charlotte, North Carolina, US, Billings (2011) finds a similar 4% uplift in single-family property values in neighborhoods within one mile of the Charlotte light rail line at the time of announcement compared to properties within a corridor that was ultimately not selected for the rail line. The increase in values for commercial properties is larger at 11.3%.

In Beijing, PRC, Yang et al. (2016) find evidence of land parcel values within 1 km of stations increasing about 3 times higher following mass rapid transit system plan announcement.

Moreover, even announcements of mass rapid transit upgrades translate into property value increases. Comber and Arribas-Bel (2017) estimate a 2.5% rise in residential values from improvements on the Crossrail in Ealing, London, United Kingdom.

Even during construction, properties close to future transit stations experience value uplifts. In Minnesota, US, Pilgram and West (2018) estimate the impact of an announcement is small and insignificant, but during construction the effect was a 2.5% increase in home values, and by the time the light rail started operations, properties within the rail corridor experienced a further 4.3% increase in value.

When transit stations open and rail lines commence services, the increases in land value are more evident. In Portland, US, the opening of the light rail on average increased property values by 10% with every 0.3 km closer to a station, compared to properties along a bus line. In Singapore, Diao, Leonard, and Sing (2017) reported that the opening of the Circle Line increased residential property values within 0.6 km of stations by 10.6%.

Finally, in Manila, Philippines, Abiad and Adona (forthcoming) provide further evidence on the impact on property values across phases of mass rapid transit projects. Of the total incremental increase in commercial land values, about 12% occurs at contract finalization; 52% at the start of construction, 26% at the completion of the project, and 10% over the long-term. For residential parcels, the incremental land value increases are more equally distributed across the same phases: a quarter at contract finalization; another quarter at the start of construction; a quarter at completion of the project; and a quarter over the long-term (Figure 3.12).

4. Land Value Capture in Action—Strategies and Successes

In this section, we paraphrase the LVC-related Asian success stories of Tokyo; Hong Kong, China; and Singapore. We also briefly summarize LVC-related initiatives, history, and context in the United Kingdom, Australia, and the US to reiterate the close relationship between transit and property at the emergence of electrified rail, and now in the 21st century. The section conveys key ideas emerging from real-world LVC-related activity, which provides many lessons on which developing Asian cities can build.

Hong Kong, China's "Rail + Property" model

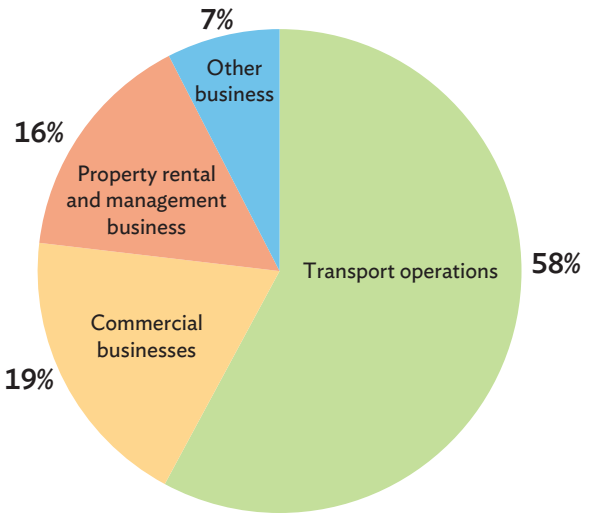
The "Rail + Property" ... strategy has sustained an ongoing, reliable and steady rate of mass rapid transit infrastructure delivery for well over 30 years, positively transforming Hong Kong, China's transport conditions and economy.

Hong Kong, China's Mass Transit Railway (MTR) Corporation invests in an integrated "Rail + Property" business model. A substantial proportion of organizational revenues is derived from property development and leasing activities year on year (Figure 4.1). The mass rapid transit operations business stream essentially breaks even from ticket revenues. Infrastructure costs for new rail sections and stations are covered by property-related revenues, usually generated from within the same fully integrated station and real estate development project. MTR's property activities traverse office, retail, and residential development, and most MTR-led developments incorporate all three property types in supportive combination (see Cervero and Murakami 2009; MTR Corporation 2017).

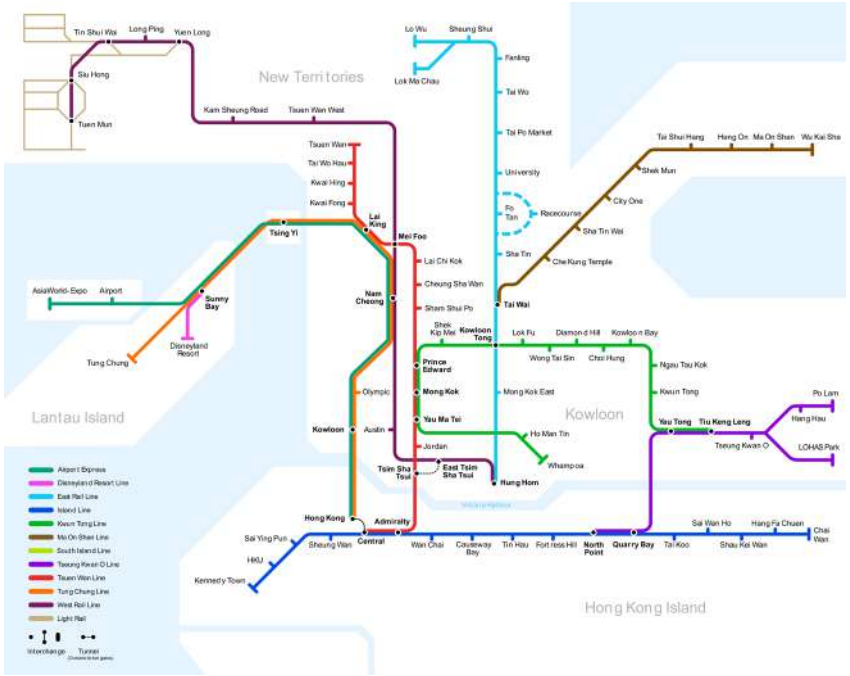
There is substantial institutionalized support from the Hong Kong, China government for MTR's business and infrastructure approach—in the form of land grants and rezoning. MTR acts as a master planner for its major projects, and very often (almost always) partners with private sector developers in delivering the overall development outcome in an intelligently phased manner.

The "Rail + Property" integrated MTR business and infrastructure strategy has sustained an ongoing, reliable, and steady rate of mass rapid transit infrastructure delivery for well over 30 years now, positively transforming Hong Kong, China's transport conditions and economy.

Figure 4.1: Hong Kong, China's MTR Revenue Shares, 2017



Source: MTR Corporation (2017).



MTR Systems in Hong Kong, China by Emphrase under Creative Commons Attribution 1.0 Universal Public Domain Dedication license.

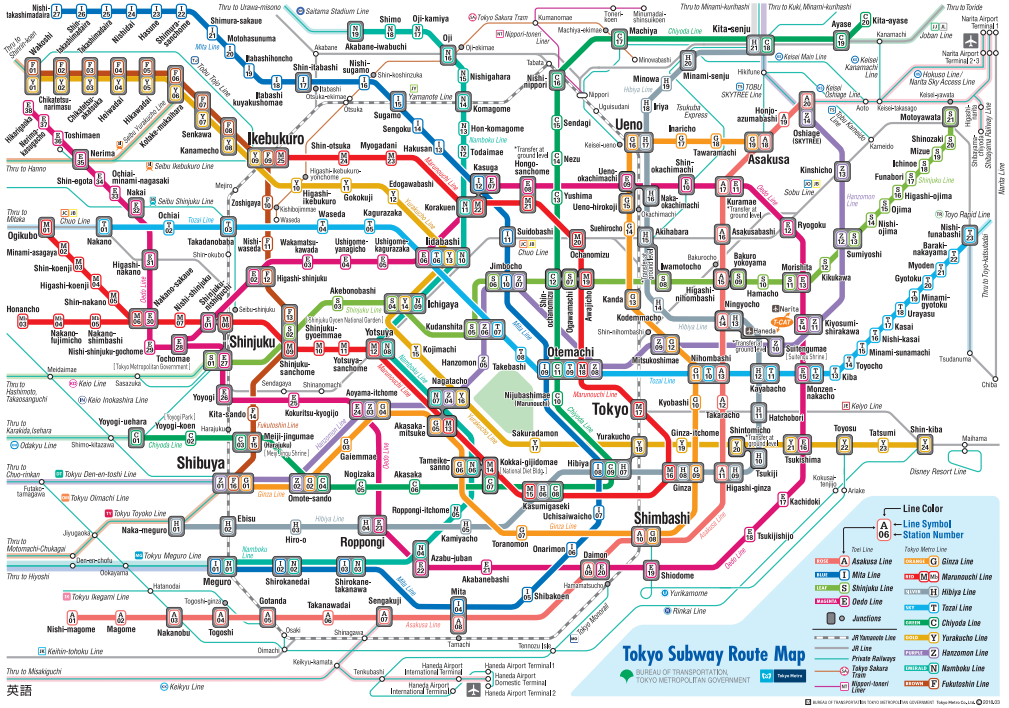
The role of rail in Japan's development

A major metropolis like Tokyo would not have been able to transition from a developing city into the world's top league of economic performance if not for a comprehensive rail-based transportation system, founded on a workable model for rail infrastructure investment linked to housing and commercial development.

> ***... Integrated rail investment was an inherent driver of economic development and positive metropolitan-scale change in Japan, rather than a side effect of investing in infrastructure after economic growth had been secured...***

In Japan, and especially Tokyo, these drivers have intersected in the business activities of private rail consortia and the Japan Rail companies over many decades. The Japanese rail and development success story looks very similar to the Hong Kong, China model on the surface, but there are distinctions and nuances, including the dynamic of a relatively large number of rail/property companies in Japan's case—all competing with each other to attract residents, businesses, and economic activities to their own lines, stations, suburbs, and developments (Cervero and Murakami 2009). These pressures evolved into a fully vertically integrated model in which rail companies not only develop land (and build and operate rail), but also operate any number of complementary business lines such as taxis, department stores, real estate sales companies, and so forth.

Perhaps the key lesson from Tokyo and Japan for large Southeast Asian cities like Bangkok, Jakarta, and Manila is that integrated rail investment was an inherent driver of economic development and positive metropolitan-scale change in Japan, rather than a side effect of investing in infrastructure after economic growth had been secured. It is different to imagine that the Tokyo we know today could ever exist in its current socioeconomic paradigm, absent an ultra-effective rail based movement backbone.



Tokyo subway route map provided by Tokyo Metro Co., Ltd. Approved (Approval Number 18-A054) (as of 22 January 2019).

Japanese cities like Tokyo are strongly structured around rail nodes, and rail companies have been the main developers of these TOD hubs (photo by Xin He via Getty Images).

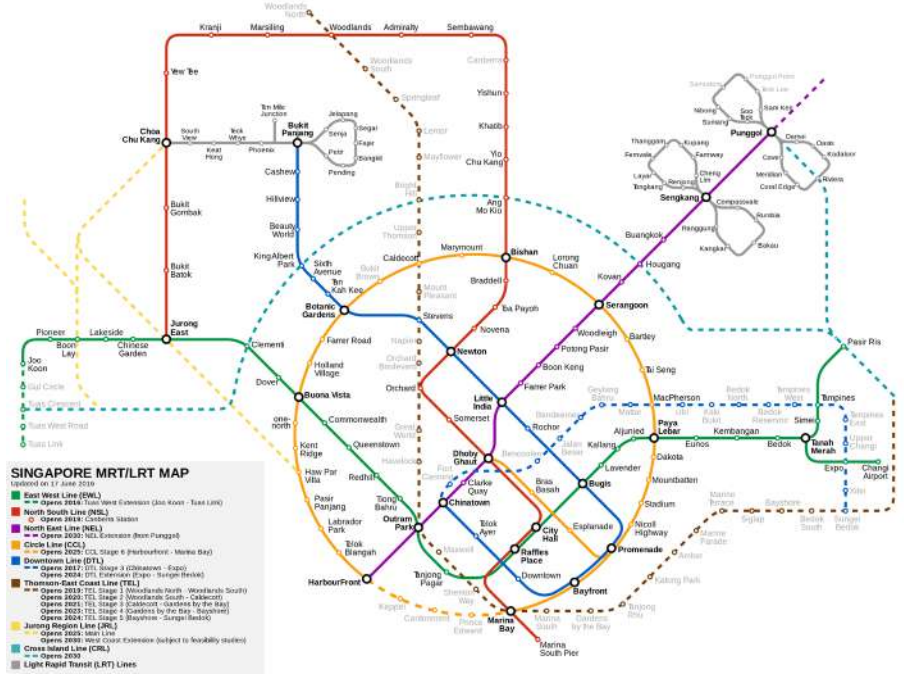
Singapore—Working the intersection between urban renewal and transit network expansion

Urban planners and transport strategists spend a lot of time talking about the holy grail of cities—an integration between transport, planning, housing, and other policy areas. Singapore has more-or-less achieved this integration. Singapore gets a lot of attention for urban policy, but its Urban Redevelopment Authority (URA) has perhaps been under-promoted and under-appreciated as a success story. Most sources on value capture do not speak to the role of urban renewal authorities as a potential pathway, nor do they specifically bring up the Singapore URA example, but this needs to change.

... The urban renewal authority mechanism deserves greater attention in the future of LVC-related discussions for Southeast Asia.

The strength of the URA in a value capture context is its ability to bring necessary actions to bear on a promising project or subject area. These actions include LVC-critical success factors such as master-planning; rezoning; and reliable delivery of basic infrastructure (street networks and public open space, among others); plus a proactive and cooperative relationship with the private development sector and with other government authorities involved in housing and transport infrastructure servicing. It is difficult to overstate the profound benefits of working all these levers, reliably and in seamless combination. In narrower LVC-related terms, the URA also reliably captures very substantial amounts of property value uplift—particularly through master-planning and up-zoning—and utilizes this value effectively and in coordination with other arms of the Singapore government within an infrastructure delivery context. In recent times, the URA has been the steward of several successful auction processes for development opportunities, in which the incoming bidder also delivers transit facilities.

The need for LVC-style infrastructure funding, the complexities of integrated land use and transport planning, and the demand for housing and renewal in cities like Bangkok, Jakarta, and Manila makes this particular success story—and the urban renewal authority mechanism—deserving of greater attention in the future within LVC-related discussions for Southeast Asia.



Singapore MRT & LRT System Map by Aforl under Creative Commons Attribution-Share Alike 3.0 Unported license.

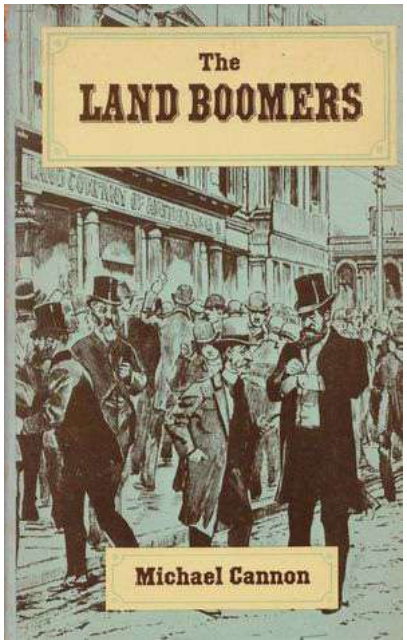
Construction of Bedok New Town, a residential-retail mixed development integrated with Bedok Bus Interchange (photo by catchlights_sg via Getty Images).

Melbourne—Getting it wrong by handing value over to speculators

History and recent foibles in Melbourne, Australia offer cautionary tales around land value uplift relative to the cost and demand for government-funded rail infrastructure.

The key lesson from Melbourne's experience surrounds the need to protect public value in rezoning and rail investment scenarios.

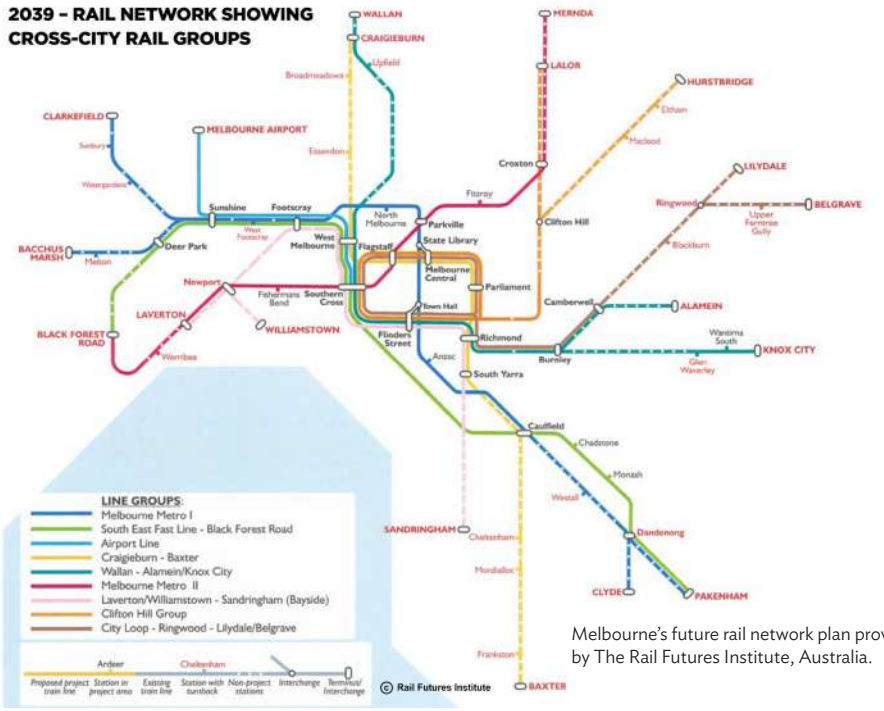
While it is reasonably well-known that Melbourne has an extensive tram and heavy rail network, less well-known (outside Melbourne) is the history of rail and tram network expansion in the late 19th and early 20th century, hand-in-hand with feverish land speculation and suburbanization. As the city grew and prospered, demand for spacious housing also rose, and new transport technologies offered the ability to live in a comfortable suburban setting while working in a classic city location in downtown Melbourne. Initial rail and tram expansions saw fervent responses in land markets. But rather than convert this opportunity into a strategic, structured, public interest-driven funding mechanism for rail delivery, murkier elements of society identified an opportunity to combine land speculation with corruption of government decision-making. Influential members of State Parliament were bribed to approve ever-more rail corridor expansion plans, into areas controlled by their bankrollers, or sometimes simply owned by themselves outright. While this produced the expansion of rail and suburban areas that defines Melbourne to this day, public outcry eventually led to a crackdown (Cannon 1995).



Source: Cannon (1973), front cover.

Fast forward 120 years, and recent moves to unilaterally up-zone the gargantuan Fishermans Bend former industrial area of Melbourne were decried in mainstream media after it was identified that (i) the up-zoning windfall had gone to speculators and landholders (often politically connected), while (ii) the area faced a massive taxpayer bill to deliver necessary and costly transit connections. Media claimed that the up-zoning without recourse to a windfall benefit levy was carried out in direct contravention of bureaucratic advice to government decision-makers. Fishermans Bend remains without a convincing and workable plan for the delivery of necessary transit infrastructure, while many land speculators have sold out their holdings and pocketed windfall gains.

The key lesson from Melbourne's experience surrounds the need to protect public value in rezoning and mass rapid transit investment scenarios.



Melbourne's future rail network plan provided by The Rail Futures Institute, Australia.

The United States—New interest in value capture, and a new mega-project exemplar

Much of the recent English-language vogue for value capture policy discussion stems from the efforts of US-based academics and practitioners. Indeed the very term "value capture" seems to have been a relatively recent coinage in the US.

> *... The relative sophistication of project equity arrangements and governance is a worthy and timely lesson emerging from the US...*

We may speculate that the concept re-emerged in the US because of the generally tight fiscal position of city and state governments, and the modest funding base for transit projects provided by the federal government. The US has usually been a difficult place to raise taxes, and transport projects are expensive. And so, if an alternative, nontax funding stream for transit projects didn't exist, then the US might be expected to invent one. But they did not—and much of the initial dynamism of value capture discussion in the US seems to have come from prominent academics like Professor Cervero of University of California, Berkeley, whose investigations into international transit systems, planning, and transit-oriented development (TOD) led quite inevitably to a discussion of the policy and funding mechanisms behind the transit success stories of Singapore; Hong Kong, China; and Tokyo (see Cervero and Murakami 2009).

More recently, San Francisco's Transbay Terminal project has provided an actual demonstration of property-driven value capture in a high-profile US exemplar. The Transbay Terminal project essentially involved redeveloping the undercapitalized landholding of a CBD-adjacent bus terminal for a mega-scale office and mixed-use development, with a portion of revenues from real estate going into the replacement of the bus facility and the provision for a future mass rapid transit station. This $2.2 billion project indicates the potential value of transit agency landholdings, and a new willingness in the US to very overtly badge projects as value "capture" initiatives. The Transbay Terminal project authority referred to itself frequently as a "joint powers authority" in which multiple stakeholders combined to manage from a jointly held equity base. The relative sophistication of project equity arrangements and governance is a worthy and timely lesson emerging from the US (see www.tjpa.org for further information).

The Salesforce Tower in San Francisco, California is part of the Transbay Transit Development hub integrating a transportation hub and multiple high rise buildings for commercial and residential use (photo by Michael Lee via Getty Images).

London—Metroland, Crossrail, and beyond

Similar to Melbourne's story, much of London's early 20th century suburban expansion rested on a concurrent development of housing and new towns in combination with suburban rail expansion into formerly rural areas. But unlike Melbourne's *ad hoc* experience, London's Metroland program and era saw a structured, sensible, responsible relationship between mass rapid transit delivery and housing delivery, controlled and managed by government agency oversight and following carefully developed plans.

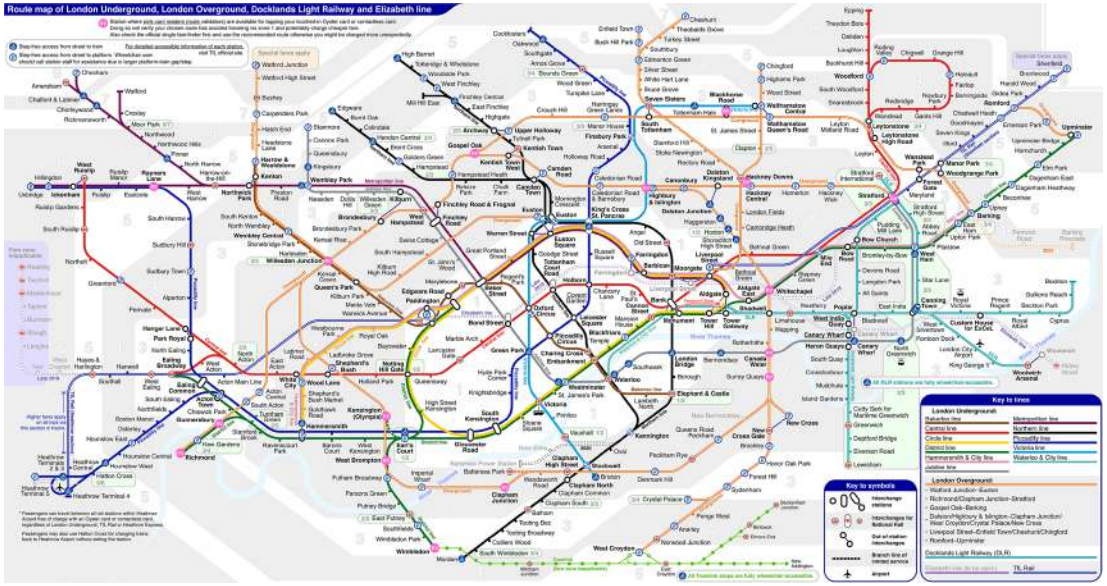
> ***...London's Metroland program ...saw a structured, sensible, responsible relationship between mass rapid transit delivery and housing delivery, controlled and managed by government agency oversight, according to carefully developed plans.***

Now in the 21st century, London's Crossrail project is one of the world's largest mass rapid transit infrastructure initiatives. Crossing from one side of London to another, Crossrail aims to connect key points, add much-needed capacity, and untangle the web of old-fashioned underground rail that covers the central areas of the metropolis. In doing so, Crossrail relies on a sophisticated multi-source funding arrangement that includes betterment levies and direct property activities, as well as tax increment financing in anticipation of future growth in tax revenue once opened (Figure 5.1). Crossrail therefore provides a visionary example in which a much-needed but complex and expensive mass rapid transit project has been underpinned by a progressive, strategic, open-minded approach to project funding.

Property owners and other major stakeholders seem to have been positive and welcoming of the project and its funding mechanisms—with government stakeholders and proponents apparently working hard to explain the benefits of the project, its necessity, and the fact that contributions made by beneficiaries are more than matched by benefits that will be generated once opened.

Welwyn Garden City, railway poster, circa 1930s
(photo by Science & Society Picture Library via Getty Images).

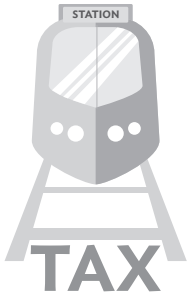
Map of Welwyn Garden City, Hertfordshire, England, 1926
(photo by The Print Collector/Print Collector via Getty Images).



Route map of London Underground, London Overground, Docklands Light Railway, and Crossrail by Sameboat under Creative Commons Attribution-Share Alike 4.0 International license.

5. Proven Land Value Capture Mechanisms

Although value capture concepts can seem relatively advanced and complex on first encounter, we suggest that a practical pathway to successful funding of major transit initiatives rests on five basic LVC-related mechanisms. These are outlined and dissected in this section. The mechanisms are complementary and mutually supportive, and leading Asian cities such as Singapore and Hong Kong, China actually tend to use "all of the mechanisms, all of the time"—to profound effect.



Mechanism A: Value Capture through the mainstream taxation system

A great number of value capture sources, such as Suzuki et al. (2015), speak of tax increment financing. But this is very often defined confusingly, for some reason. A simplified definition of tax increment financing might be the following:

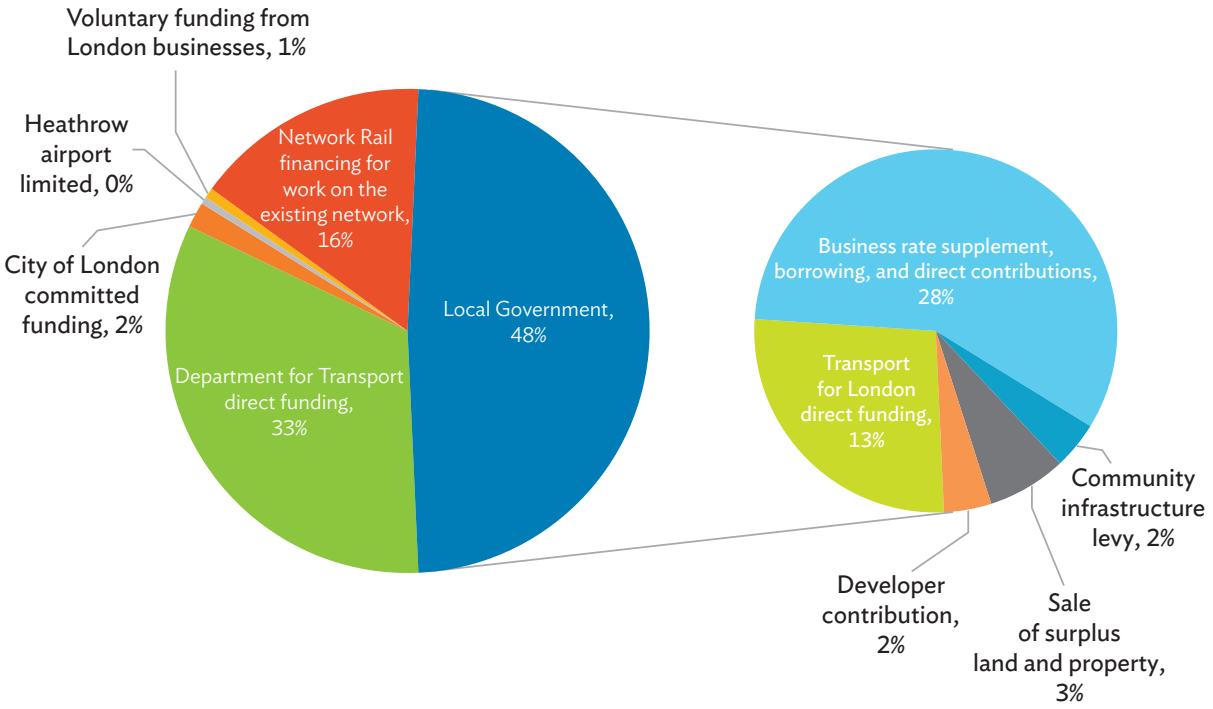
> Working within the existing taxation regime to identify potential tax take increases, as a consequence of the expansionary effects of major transit projects. The future increase in tax base can be utilized as a repayment stream over time, and/or borrowed-against to provide up-front funds for infrastructure delivery.

This mechanism and the potential for its use is clearly described in Yoshino, Helble, and Abidhadjaev (2018). Increases in property-related tax take (whether at a local government level or above) are perhaps more closely associated with impacts from transit initiatives, but as Yoshino, Helble, and Abidhadjaev (2018) show, other taxes such as business and income taxes may also rise in response to increased economic activity. When we refer to the existing tax regime we overtly and clearly distinguish from special fees and levies, enacted for one-off purposes (and covered separately under Mechanism B).

> ***... The estimation and reuse of increased tax take for transit infrastructure funding is a core concept and necessity if Mechanism A is to sustain programmatic investment and growth in mass rapid transit.***

Under an application of the above definition, our Mechanism A is basically either a tax increment financing strategy, or simply a structured process of tracking and gathering increased property taxes after opening of a stimulatory transit infrastructure facility. Either way, the estimation and reuse of increased tax take for transit infrastructure funding is a core concept and necessity if Mechanism A is to sustain programmatic investment and growth in mass rapid transit.

Figure 5.1: London Crossrail: Indicative Funding Breakdown



Source: Buck (2017).

FEE FOR SERVICE

Mechanism B: Special fees and levies

Mechanism B involves special fees or charges that target a specifically defined beneficiary base, as a fee-for-service to improve transport outcomes. In contrast to Mechanism A, special fees and levies under Mechanism B are not a broad or entrenched element of an overall taxation system—and, more prosaically, as fees-for-amenity they are simply not taxes (even though many people seem to get this issue confused). Mechanism B is defined as *new and specific levies on benefits and beneficiaries in accordance with estimates of benefit received*. Practical worldwide examples of Mechanism B include:

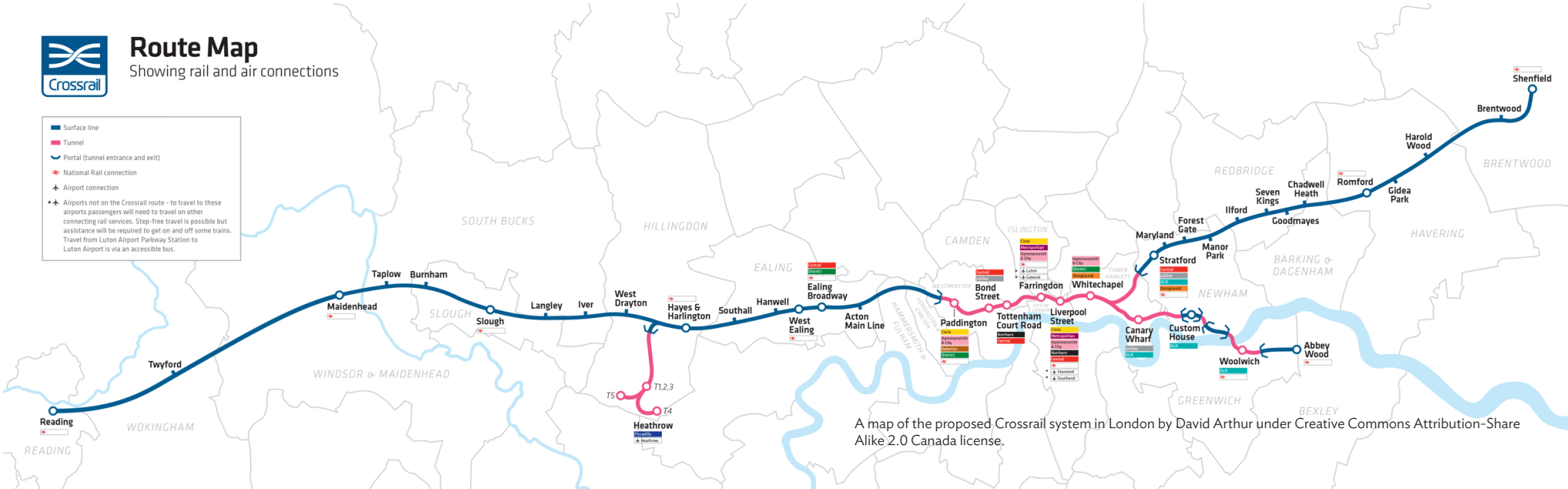
- Betterment levies for specific subject areas (and not beyond) levied on beneficiaries of a major transit upgrade (particularly based on increases in property value due to enhanced connectivity)

- Connection fees where a charge is paid by major property owners for physically integrating their property to a transit station (new or existing) via a new underground or aboveground walkway connection. The 'connection fee' should exceed the narrow cost of merely constructing the access point, and addresses the value arising from an increase in footfall brought by better connectivity to busy transit facilities

- Rezoning fees in return for the value increase achieved where allowable floorspace is increased substantially (and/or transitioned to higher and better uses)

> ***... Mechanism B involves special fees or charges that target a specifically defined beneficiary base, as a fee-for-service to improve transport outcomes.***

One aspect of all of the above pathways under Mechanism B is that transit agencies or government may be under greater expectation to provide clear and evidence-based information about the increase in property value and/or benefit received by subject stakeholders, relative to the special fee or levy they are requested to contribute. There is also an expectation toward clearer articulation of earmarking of betterment levies and connection fees funds into delivering transit upgrades at the location from which the fees were levied. By contrast, the Mechanism A reliance on the existing tax system implies, among other things, no particular need to communicate with subject area stakeholders and property owners, nor convey any basis for the tax revenues.



A map of the proposed Crossrail system in London by David Arthur under Creative Commons Attribution-Share Alike 2.0 Canada license.

Mechanism C: Auction of development rights

After lengthy discussion in value capture literature and beyond about the property value increases provided by transit connectivity, it is natural to expect that those opportunities could be put to market in much the same way as any genuinely competitive auction offers a sound test of true market value. And so *Mechanism C involves putting development opportunity and value associated with a new transit facility or line to sale, via open auction*.

As with the other mechanisms, the earmarking of funds raised through auction for actual transit infrastructure funding is a crucial link in a coherent value capture cycle. In practice, the development opportunity is very often packaged with delivery of a station facility, or even of an entire segment of rail track infrastructure, as part of the auctioning process. Incoming bidders pay for development rights, but with a commensurate infrastructure delivery obligation. This approach arguably simplifies the connection between value creation and realization on one hand, and infrastructure delivery on the other.

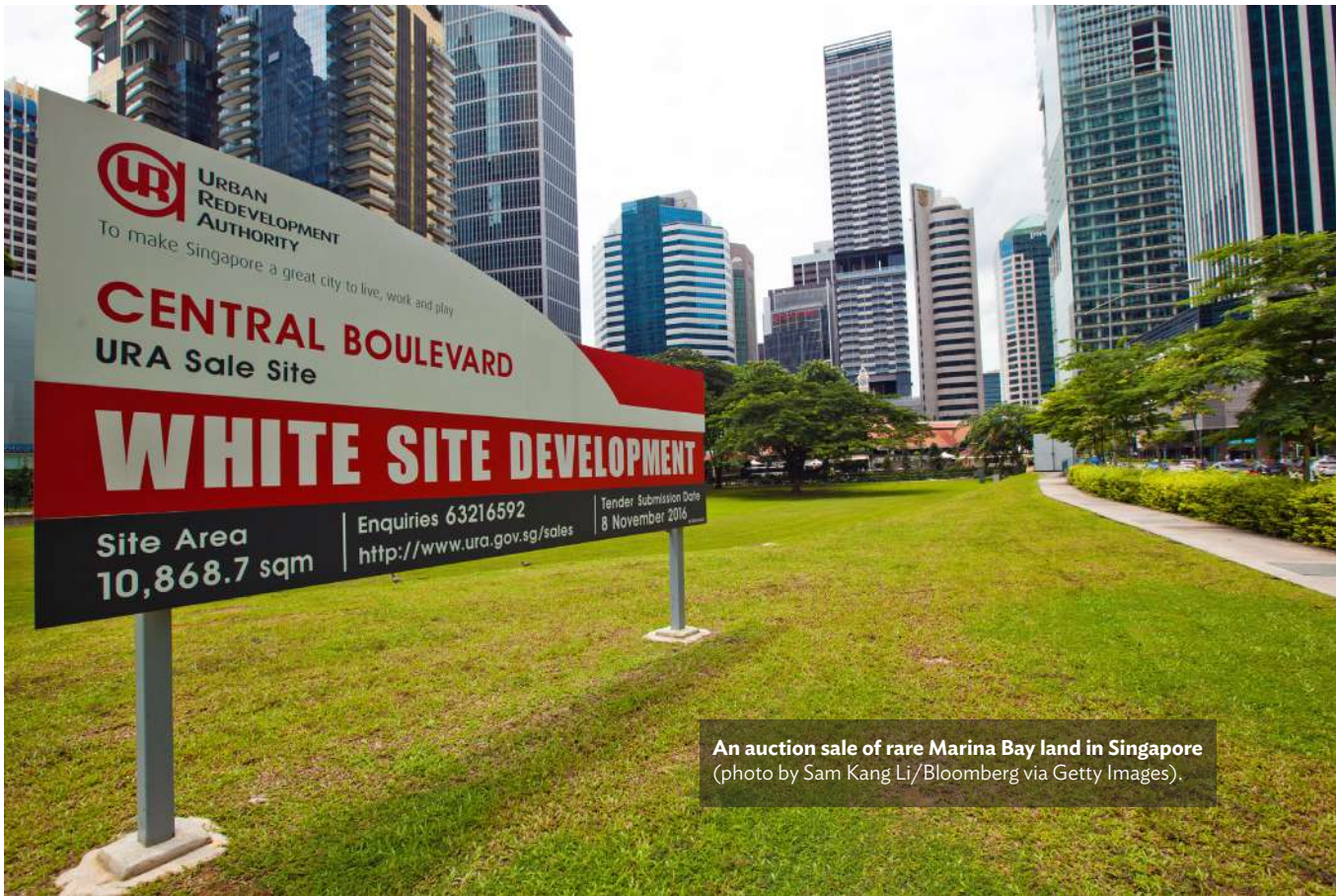
An auctioning exercise looks relatively straightforward at face value and dovetails neatly with PPP-related approaches that feature a strong emphasis on infrastructure delivery by private industry.

As with any auction, however, value realized by the seller (government in this case) is closely related to the number of active bidders competitively involved in the auction. In reality, major private sector developers with strong financials and a willingness and ability to deliver rail infrastructure as well as property tend to be relatively few, in even the most advanced economies.

... Mechanism C involves putting development opportunity and value associated with a new transit facility or line to sale, via open auction.

So proponents for a Mechanism C approach must realistically appraise the possibilities for legitimate competition and the prospects for achieving a fair value outcome for public assets at auction.

In any case, if the bundling of transit infrastructure delivery with real estate development rights is considered too complex in a given location or project, government stakeholders can still proceed to carefully auction-off the real estate opportunity (or land) alone, while reutilizing those sale funds for infrastructure delivery.



An auction sale of rare Marina Bay land in Singapore (photo by Sam Kang Li/Bloomberg via Getty Images).

Mechanism D: A comprehensive TOD and urban renewal agency (with value capture capabilities)

The mechanisms outlined in this report are delivery-focused rather than purely conceptual or theory-based. A specific agency, with targeted remit and appropriate capabilities, is usually (and arguably) a reasonable response in any situation involving the delivery of complex infrastructure, or other government services for that matter. Thus, with the intent to generate land value capture, an LVC agency could presumably perform relevant functions and deliver an outcome. But value capture, transit infrastructure, and associated property and planning issues are challenging and multifaceted. Many of the levers for achieving land value uplift or value capture are related to planning, zoning, property activity, value-through-design, and the overall strategic direction of a particular subject area. At the same time, many of these self-same issues and levers would be part of the mainstream remit of an urban renewal authority. Putting two and two together, it is perhaps time that parties involved in the value capture policy discussion recognize that value capture could be (and in some cases already is) achieved via:

> A comprehensive urban renewal authority featuring rezoning powers, master-planning capabilities, plus the intention to generate new property value—working with access enhancements and delivery of needed transit infrastructure. The urban renewal authority may also engage in the delivery of housing and public realm enhancements, and can partner with private sector developers on a site-by-site basis within their subject areas.

These capabilities are more-or-less the same as those seen in locations like Singapore (through their URA). Moreover, the broader suite of activities and capabilities inherent within an urban renewal authority also seem to address latent issues at-large within major developing cities like Bangkok, Jakarta, and Manila (where there are simply plenty of large sites that would benefit from urban renewal). An urban renewal authority in any of these three megacities could take on the critical role of developing (and showing strong commitment to) integrated land use and transport master plans.

... An urban renewal authority ... could conceivably deliver value capture and transit infrastructure, but also much needed precinct-based comprehensive urban renewal.

An urban renewal authority for these locations could conceivably deliver value capture and transit infrastructure, but also much-needed precinct-based comprehensive urban renewal.

The URA Centre, home of the Urban Redevelopment Authority (URA), the national urban planning authority of Singapore (photo by rolling writes under Creative Commons Attribution-NoDerivs 3.0 Unported license).

Mechanism E: Direct property—rail agency as developer in the 'East Asian' style

"Direct property" has long been a feature option within value capture discussion. East Asian rail agencies throughout Hong Kong, China; Singapore; Japan; and beyond arguably offer the most compelling and successful examples of "direct property" LVC. Hence, Mechanism E is defined as:

> A transit operator or agency involved in developing and trading property holdings associated with stations and precinct- or corridor-scale projects on a commercial basis, with the intent to use at least some of the profit from those activities for transit infrastructure and facility funding.

This should be a relatively straightforward and widely understood concept by now, but two additional points are worth making:

First, the involvement of a transit stakeholder in direct property activity and dealing does not preclude any of our other four mechanisms from being applied. Indeed, enacting an East Asian "Rail + Property" model may be a key enabler, very supportive of the other value capture mechanisms (particularly when we think of major TOD projects as requiring critical mass, or where station development is recognized as a catalytic exercise opening up broader property opportunity).

Second, within station environments or in very direct physical proximity to station facilities, it is usually useful to have the transit agency retain control of property holdings (for retail and so forth) so as to maintain necessary operational control and access. Put differently, the closer one is situated to a transit platform, the better it is to have property activities and holdings in the hands of a transit agency rather than other parties.

> ***... Mechanism E is defined as a transit operator or agency involved in developing and trading property holdings associated with stations and precinct- or corridor-scale projects on a commercial basis, with the intent to use at least some of the profit from those activities for transit infrastructure and facility funding.***

Within Mechanism E, we recommend that interested parties pay particularly close attention to the sophisticated and nuanced approaches currently used by the Japanese or other exemplars (Figure 5.2). Their approach to synergistic property and retailing mix is now very advanced, and closely interconnected with an understanding of the demographics and daily needs of transit passengers.

Figure 5.2: Selected Japan Railway Companies: Operating Revenue Shares, 2017

The number on top of each bar refers to the total revenue in billion yen.
Sources: JR East (2018); Keikyu; Keio Corporation (2018); Keisei Electric Railway (2018); Odakyu Electric Railway (2017); Seibu Holdings (2018); Tobu Railway (2017).

6. Adapting Proven Land Value Capture Mechanisms to Southeast Asian Megacities: Progress and Challenges

The five LVC mechanisms presented in section 5 have the potential for use in transformative transit planning and investment in Bangkok, Jakarta, and Manila. While successful urban planning often requires the use of several or all of these mechanisms, it is important to avoid a one-size-fits-all approach in different city contexts. Given economic, political, and institutional climates and capacities, challenges may arise that prevent efficient use of one or more LVC mechanisms. Identification of city-specific challenges to LVC mechanism implementation is important not only for the short term, where choice of the best-fit mechanisms will advance the state of transit investment, increasing urban accessibility and livability, but for the long term, as pinpointing a constraint to well-planned urban growth can serve as a guideline for future policy action and reform. Thus, one of the contributions of this report is to recognize the challenges each city might face when attempting to use a particular LVC mechanism (Table 6.1).

Of course, presenting general challenges and constraints to LVC on their own ignores considerable progress that has been made in Southeast Asian megacities on their way to comprehensive transit system network investment. A number of initiatives aim to increase LVC capacity, particularly in the realm of exploring innovative finance for planned mass rapid transit projects and in revision of tax policy.

Bangkok

Capital-intensive infrastructure projects involve large, upfront investments, and sustained infrastructure investment is needed to develop and maintain an adequate mass rapid transit network in Bangkok. The Thailand Future Fund Infrastructure Fund (TFFIF) is a novel fundraising mechanism that allows public actors to invest in multiple infrastructure assets operated by various state enterprises and government agencies under a new set of regulations issued specifically for the TFFIF. The goal of the TFFIF is to create a non-debt infrastructure investment mechanism through securitizing cash flows for greenfield and brownfield development projects. These cashflows are earmarked for investment in a mutual fund whose assets can be used only for reinvestment back into public infrastructure projects. For example, the first mutual fund will receive 45% of the toll revenue from two toll roads operated by the Expressway Authority of Thailand for a period of 30 years (Baker McKenzie 2018). Regulated by the Stock Exchange of Thailand (SET), TFFIF funds are permitted for transport infrastructure assets including mass rapid transit. Innovative funding modalities like the TFFIF could serve as a vehicle for value capture capability for TOD and urban renewal agencies described in Mechanism D.

Another potential avenue for mass rapid transit system finance in Bangkok is through Mechanism B, special fees and levies. The Property Windfall Tax is a draft bill proposed by the Fiscal Policy Office and approved by the cabinet in Thailand. The goal of the proposed tax is to alleviate the infrastructure spending burden on the government budget by recouping a portion of development costs through a levy on property value that has been inflated as a result of transport infrastructure projects. Both individual and corporate owners of commercial and condominium developments will be charged a fee every time ownership is transferred between the start of construction and completion of a nearby infrastructure project. The catchment area (the area under which property is subject to the levy) is in the range of 2.5–5.0 km around the new infrastructure, depending on whether the infrastructure is a railway, express road, airport, or seaport. The levy will be imposed in two periods: (i) from the signing of the infrastructure construction contract until project completion, land owners will be taxed on incremental property value every time ownership is transferred; and (ii) after the transportation infrastructure is operational, an additional, one-off fee will be charged. While progress has been made toward enacting the Property Windfall Tax, a long legislative process may delay its passing. Additionally, taxes on incremental value from infrastructure are low (capped at 5% of the incremental value) and the exemption floor for the levy is set high (properties worth less than B50 million, about $1.4 million, are exempt). This conservative approach to beneficiary funding is nevertheless a step forward in increasing the sources of funds for transportation infrastructure projects.

Jakarta

Jakarta's inaugural MRT line becomes operational in early 2019, with the estimated $1.7 billion cost of phases 1 and 2 of the MRT financed through a combination of soft loans from Japan International Cooperation Agency (JICA) and national and local government contribution. Considering the cost of the North-South MRT line that will be completed under phases 1 and 2, new and innovative funding mechanisms are being explored for future phases, which will cover an East-West MRT line.

PT Mass Rapid Transit (MRT) Jakarta, a limited liability company founded by the Jakarta provincial government, is the operator of the MRT system. PT MRT has expressed interest in exploring new business potential and developing non-fare box businesses—including retail, advertising, telecommunications, naming rights and property development—through PPPs (Freycinetia 2018). While the exact funding and PPP scheme for the East-West line of the Jakarta MRT has yet to be ironed out, there is opportunity for the use of Mechanism C, auction of development rights, and Mechanism E, direct property with rail agency as developer, in this phase.

The legal go-ahead for the use of PPP funding mechanisms is already in place in Jakarta; Presidential Regulation No. 38/2015 addresses the use of PPPs and designates transportation and urban facilities as infrastructure types covered by the country's PPP scheme.

In the alternative, local or other governments could take the route of Mechanism D, establishing an independent specific-purpose agency (something like a 'TOD Planning, Infrastructure Delivery and Financing Authority') that is able to manage the revenue flow from taxes or levies generated via value capture mechanisms, among other crucial activities. The formation of a special agency may assist to avoid incentive or coordination problems that impede TOD developments featuring enhanced mass rapid transit infrastructure. These problems include a local government's lack of ability to retain and locally disburse revenues from specific-area TOD development. In practical terms, this potential agency could be guided by the Integrated Transportation Master Plan for Jakarta and formed through a consensus of several key stakeholders, including PT MRT, PT JAKPRO (a Jakarta-owned property developer), and PT KAI (the state-owned railway operator), then run by highly skilled, commercially oriented public professionals (Syabri and Winarso, forthcoming).

Manila

The National Capital Region is beginning a phase of mass rapid transit uptick, with plans for the Mega Manila Subway; expansion of the PNR North and South commuter lines; expansion of LRT lines 1 and 2; and construction of a new MRT line 7. Given the increased growth in the regional transit system, sustainability of debt financing for these projects would improve with increased project and tax revenues accruing to the Philippine government.

The Malolos-Clark railway project, cofinanced by ADB and JICA, will support the construction of a 53 km section of a new railway line connecting Metro Manila and the regional center in Clark and the Clark International Airport, located in the Central Luzon Region around 100 km north of Manila. The new railway line is expected to cut the journey time by half (compared to existing public bus services) to less than one hour. A project to extend the project 55 km south of Manila to Calamba is also in the pipeline. For this project, the JICA design team (JDT) is conducting a feasibility study of the use of LVC for government revenue generation and loan repayment. Similar to the analysis of MRT-3 property values presented earlier in this report, initial estimates show that land value increases due to declines in travel time and cost to central Manila are almost twice as large as the project cost (JICA Design Team, personal communication). Particularly in megacities where an upsurge in mass rapid transit is required in a relatively short period of time, the ability to analyze potential land value increases is critical for the success of implementing LVC mechanisms in the near-term, on planned or ongoing infrastructure projects.

To capture part of this increase in land values generated by the new commuter line stations and increased access to central Manila, one option is the use of Mechanism A through making improvements to the property tax system. Such improvements are currently in motion. In the Philippines, the Local Government Code (LGC), National Internal Revenue Code (NIRC), and the Urban Development and Housing Act (UDHA) mandate the imposition

of property tax and tax on property-related transactions in the Philippines. However, property valuations (called the Schedule of Fair Market Values, or SMVs) are outdated, and local government units (LGUs) responsible for updating SMVs are not sanctioned for noncompliance. Despite a statutory requirement, LGUs fail to update and revise the SMV as basis for real property taxation for many reasons, including the unpopularity of taxation and fear of political backlash, lack of technical capacity, and cost of revaluation. Real property tax revenue has thus been declining as a share of local revenue and as a share of GDP. Proposed legislative changes would ameliorate foregone tax revenues through (i) adopting international valuation standards; (ii) adopting a single valuation base for local and national taxes; (iii) requiring mandatory updating of SMVs every 3-5 years; (iv) depoliticizing the approval of SMVs through recentralization of the approving authority to the Ministry of Finance; (v) setting up and maintaining a comprehensive database on property transactions and valuation; and (vi) considering other tax-related reforms, such as betterment taxes for national projects (Alvina 2018). Funded by a Japan Fund for Poverty Reduction (JFPR) grant, ADB is providing technical assistance in support of these legislative changes through the *Strengthening Tax Policy and Administration Capacity to Mobilize Domestic Resources* project.

Table 6.1: Land Value Capture Mechanisms and Challenges

Mechanism	Challenges		
	Bangkok	**Jakarta**	**Manila**
Mechanism A: Value Capture through the mainstream taxation system	• Politically difficult for property tax due to outdated land and property tax systems—the tax rate is unreasonably low and there are many exemptions • The tax system is very centralized, making the path of taxes from taxpayers to infrastructure investment from the government less transparent	• Underreporting of sale transaction prices is pervasive and taxable land value is infrequently updated, causing substantial losses of local tax revenue	• Local governments receive most of the existing LVC revenue via property taxes, but it is national government that provides most of the infrastructure • Revenues limited due to outdated assessments, inadequate systems for accurate property valuation
Mechanism B: Special fees and levies	• Draft Property Windfall Tax is an attempt at LVC, proposing a levy on property owners near infrastructure projects, but legislative process is slow • Many landowners near mass transit stations in Bangkok are low income and may be unable to pay fees and levies—arguments have been made for levies to be transaction-based to mitigate gentrification, but this structure limits LVC revenues	• Most LGUs are heavily dependent on transfers from central government because they have weak revenue-raising powers	• Lack of know-how/awareness on the part of LGUs to use the special levy mechanisms that are already in the legislation • Lack of incentive, since it is technically and politically easier to rely on national government to provide infrastructure funds
Mechanism C: Auction of development Rights	• Demand risk remains an issue from previous experience with auction-based development for metro projects in Bangkok	• Property market characterized by a concentrated number of large or powerful developers who can influence prices and supply	• Concentrated property and infrastructure development market means lack of competition • The lack of know-how from government side in assessing benefits to private sector makes negotiation and/or proper design of bid parameters/mechanisms challenging
Mechanism D: A comprehensive TOD and urban renewal agency (with value capture capabilities)	• Ineffective implementation of Urban Planning Act (no implementation of a specific plan since 1975 and Land Readjustment Act rarely implemented successfully) • Lack of spatial planning and no coordination across planning agencies	• Many agencies involved in the management of infrastructure and urban planning, leading to coordination problems • Infrastructure provision characterized by low quality of service and limited quantity or scope of services due to inter-agency coordination problems as well as lack of budget allocation, inadequate planning, and delays caused by the land acquisition process	• No agency to push through coherent urban/transport plans, and to coordinate across municipalities • In Metro Manila, the MMDA has the mandate for urban/transport planning and coordination, but currently focuses primarily on traffic management
Mechanism E: Direct property—rail agency as developer ("Rail+Property")	• Regulation on public transportation development does not allow transit authorities to acquire lands for other uses but for transit use, restricting TOD opportunities	• Incumbent operators in port and rail industries are SOEs, which may have lower entrepreneurial capacity relative to private agencies, and development competition is limited	• Lack of capacity and incentive for agencies like PNR to take a longer-term, entrepreneurial, revenue-maximizing perspective
Cross-cutting across mechanisms	• Local government and transit authorities often lack real estate development know-how because transit authorities cannot acquire lands for non-transit uses	• Substantial need for new infrastructure programs and initiatives, but also problems of availability and poor maintenance with existing infrastructure • Limited institutional capabilities, underdevelopment of key human resources, and lack of government funding capabilities	• Evaluation and selection of infrastructure projects narrowly and individually, rather than from a master plan perspective • Early announcements leading to "reverse LVC" where government has to shell out much more for land acquisition

LGU = local government unit; LVC = land value capture; MMDA = Metropolitan Manila Development Authority; PNR = Philippine National Railways; SOE = state-owned enterprise; TOD = transit oriented development.
Sources: Abiad and Adona (forthcoming); Abiad et al. (forthcoming); Anantsuksomsri et al. (forthcoming); Committee for Acceleration of Priority Infrastructure; Montalbo and Napalang (forthcoming); OECD (2012); Syabri and Winarso (forthcoming); Widjajati (2015); World Bank (2012b).

7. Moving Forward with Land Value Capture

LVC is a viable option for city transformation in Southeast Asia. A combination of short- and long-term actions can now pave a practical pathway toward building more and better mass rapid transit in growing Southeast Asian cities—by actively mobilizing key LVC and beneficiary funding mechanisms. Basic policy reform actions should be proactively considered for Bangkok, Jakarta, Manila, and beyond: to spur a new period of sustained growth in transit investment, with a conscious focus on integrated urban planning, high quality transit networks, and encouraging non-car, nonmotorized and pedestrian movement for dense yet highly accessible city areas.

The multibillion dollar question for government and multilateral development stakeholders is two-fold: What can we do right now? And what needs to be done for the future?

LVC's time has now come in Southeast Asia

Basic policy reform actions should be proactively considered for Bangkok, Jakarta, Manila, and beyond—to spur a new period of sustained growth in transit investment, with a conscious focus on integrated urban planning, high quality transit networks, and encouraging non-car, nonmotorized and pedestrian movement for dense yet highly accessible city areas.

On one hand, it must be recognized that LVC is a moderately complex subject, requiring skill, attention-span, careful policy discussion and adaptation, and development of technical capabilities. But it should also be acknowledged that this is a proven model, utilized successfully in many jurisdictions over a long period of time—to the profound betterment of transit funding and the cities in which it takes place.

We therefore recommend the time has come to work toward enactment of LVC and beneficiary funding ideas in Southeast Asia. One should refrain from characterizing LVC merely as an option or as something to be discussed. Mainstreaming into project and program action is now timely and pressing.

Barriers to LVC are more often informal, capacity-related, or conceptual rather than formal or structural

The authors, and others with an interest in this topic, have observed and heard a great many reasons given for not enacting LVC. But most of these reasons fit under the category of "we are not currently doing this, and so doing it would require some change." Absolutely. But the difficulty of some change can be vastly overstated and exaggerated.

Few jurisdictions have any specific legislative injunction against LVC mechanisms or approaches. In some cases the required legislation is already in place (e.g. the provision for special levies in the Local Government Code of the Philippines), but remains untapped. Stakeholders should try to begin moving forward within the many opportunities that are not specifically limited by legislative or regulatory barriers.

Empower existing government agencies to support LVC from within their primary organizational remit

The LVC discussion sometimes arouses a great deal of excitement among government departments, transit agencies, local government, and other stakeholders. Often the question of "who should lead this initiative" is raised. There is a straightforward answer to this question, namely that government organizations should support and provide leadership for LVC from within their core remit and primary areas of responsibility, and not far beyond.

Ministries are primarily responsible for regulation, policy development, and providing advice to key decision-makers. Therefore their appropriate role in LVC is just that—regulation, policy development, and providing advice to decision-makers. Local governments are responsible for local or area planning and localized property taxes, therefore their contribution to LVC should be delivered via supportive adaptation to area planning and localized property taxes. Transit agencies build and operate transit, and so their primary contribution lies in effectively building and operating transit, though perhaps with some complementary and strategically useful adaptations, such as taking on a slightly more proactive commercial property-related role.

Government stakeholders and organizations should focus on contributing to LVC and supporting it from within their primary responsibilities, or within new activities that remain strategically coherent and complementary to core activities. The more they do, the better. If government organizations need to take stock of their posture toward LVC, then they should perhaps do so through a brief 'review' process, then make sensible changes and adaptations as necessary, but continue moving forward with a focus on core functions that are supportive of LVC outcomes.

Enact LVC within current and upcoming projects as much as practical

Bangkok, Jakarta, and Manila are at slightly different phases of their mass rapid transit investment cycle. But all have clear and present opportunities for new investments and new projects in the months and years to come. LVC is basically a project- and program-level transit funding initiative. Current and upcoming projects offer a great opportunity to dovetail with any broader policy move in the direction of LVC.

Stakeholders should use upcoming projects, as much as practical, to test and apply LVC concepts—in particular through actual funding contribution to projects where that can be brought about.

Begin a value capture initiative by properly appraising all project benefits, and identifying all beneficiaries

The injunction that transit (or transport) projects should fully investigate and appraise all project benefits seems self-apparent, but is very rarely undertaken. More often, stakeholders tend to convince themselves that some benefits are accepted whereas others are not part of the traditional appraisal approach. This needs to change. A real and appraisable benefit, of any sort, is a legitimate component of transport project outcomes, and hence must be appraised and tallied against project costs, without exception. If current practices do not recognize this, they must evolve.

Undertaking a proper, comprehensive, and rigorous appraisal of project benefits is also a first and crucially important step in developing value capture outcomes. This is because it supports the identification of beneficiary groups and the level of benefit they are expected to attain. From this starting point, responsible beneficiary funding contribution schemes can be conceptualized and initiated, utilizing all relevant mechanisms.

Assume that all of the mechanisms are useful, particularly when working in combination

LVC-related discussions often derail when there is an attempt to choose between one or another pathway or mechanism at the exclusion of others. A common thought process seems to be that the 'easiest option' should be enacted, but not others. This is not the case, and such thinking needs to be avoided.

The baseline assumption should be that every effort is taken to mobilize each and all of the mechanisms, recognizing that they tend to address different pools of benefit and beneficiary groups. Indeed, many successful economies such as Hong Kong, China; and Singapore consistently tap all five LVC mechanisms as the need or opportunity arises. Working multiple mechanisms in intelligent combination is the best way to achieve a profound funding contribution and this is the ultimate aim.

Managing public value through nimble approaches to corridor zoning

Major mass rapid transit projects are ultimately public exercises—requiring careful stewardship of publicly owned assets, and taxpayer funds. Stakeholders have repeatedly raised issues around the timing of project announcements, the likelihood of land speculation activity, and the need to preserve the public interest by not overpaying for necessary corridor or project land. These are substantive issues and should be taken seriously.

International better practice on corridor stewardship tends to focus around securing zoning overlay treatments for corridors and station areas prior to any public project announcement. Once project announcements are made,

landholders quite understandably engage in normal property trading activities. If governments can secure some level of control over the corridor and its land requirements prior to making announcements, through the medium of transport corridor statutory zonings, then the possibility improves of protecting public value and avoiding overpayment for land. We recommend careful attention to these issues in project contexts. More research may be necessary.

Maintaining equity and fairness in public projects

The international literature, and discussions during ADB 2018 LVC-related workshops, frequently turned to issues of social equity and fairness in developing country project contexts. Although there are no easy answers, the authors recommend to major project stakeholders that careful consideration be given to issues of equality, fair-dealing, and pro-poor outcomes during major project or LVC initiatives.

One area of important action is the treatment of existing landholders, or of informal occupants of project lands. We recommend that in accordance with accepted best practice, all landholders and occupants must at the very least be recompensed in line with an independent valuation of their holding, and that due material consideration also be given to any costs of relocation (whether for residential occupants or businesses) in major project contexts. Any verifiable material economic loss for a project area occupant or landholder should be fairly recognized and appropriately compensated. Low income residents of the project area can be prioritized for any low-cost or subsidized housing produced within the overall project TOD agenda.

Rather than being seen as an additional cost, fair dealing and provision of due material consideration to project stakeholders should be seen as a natural action that smooths the process of adjustment to occupancy and ownership of relevant lands. It is also suggested that the level of public trust required for executing moderately complex initiatives such as LVC funding requires clear and unimpeachable standards of fair dealing in regard to affected occupants and landholders, as well as other stakeholders. Transparency and integrity must be supported by strong governance and enforced accountability.

LVC is an integral part of transforming city economies in the 21st century; the private sector and property owners have huge opportunities to gain via LVC progress

A central conceptual and practical plank of LVC is the existence of property value premiums to enhanced accessibility. This connects more broadly with a move to a 21st century city economy based on service industries, innovation, and people-to-people or business-to-business interactivity. Mass rapid transit, funded in part through LVC, drives value, growth, and economic interactivity through improved connectivity. Any fees, charges, or contributions made via LVC to mass rapid transit funding are only a relatively minor portion of the benefits received by beneficiaries—either directly, or less directly from better transit and growing cities.

In other words, property owners and the private sector have nothing to lose through LVC, and everything to gain. While it is agreed that the concept requires sustained discussion, explanation, and an evidence base, stakeholders need to move forward sensibly in the full knowledge that properly conceived LVC is a "win-win" scenario and an opportunity for the private sector.

Urban renewal authorities offer substantial opportunity to Southeast Asian developing cities, including but not limited to LVC

Urban renewal authorities can be a key enabler to LVC outcomes. But they have the additional benefit of delivering urban renewal and housing, which is much-needed across the rapidly growing, developing cities of Southeast Asia. Successful and skillful urban renewal authorities are welcomed by the private sector—as they provide infrastructure and service-delivery certainty and control levers such as land rezoning. They are logical partners for the private sector.

While the prevailing value capture literature has not devoted much attention to urban renewal authorities as a mechanism, they seem to offer substantial and multiple opportunities. It is recommended that stakeholders consider whether an urban renewal authority could make a contribution, in LVC and beyond, within cities like Bangkok, Jakarta, and Manila.

The role of LVC within major projects is set to grow, so multilateral lenders need to adapt their lending approaches

As much as multilateral organizations (including ADB) are sponsors of capacity-building and technical assistance for LVC, they are also project lenders and influential participants in project decision-making around funding arrangements for mass rapid transit. ADB and other international lenders therefore currently need to take stock and work through issues and expectations related to the inclusion of LVC funding sources in the project funding mix.

One way to do this could be to stipulate that lending requests include demonstration of a genuine effort to source funds through LVC.

The demand for further capacity-building

This report has sought to turn a new page for renewed and updated discussion of land value capture for major Southeast Asian cities. In doing so, we have refreshed some concepts, and developed new concepts or paradigms—such as the five mechanisms or the nomination of urban renewal authorities as a valuable mechanism with successful precedent. During discussions within the ADB 2018 LVC-related workshops, a range of challenges and needs were raised and identified by attendees. Moreover, it is clear that LVC funding outcomes are not necessarily an integral part of current project or government practice. Taking all of these contextual drivers into consideration, we recommend a further program of capacity-building in topics related to enlightened mass rapid transit project funding policy during 2019 and beyond. The capacity-building, research, and engagement program should delve in greater depth into the following issues at the very least:

- The economics of urban renewal as a potential self-funding LVC mechanism with other positive urban planning, transport, and housing benefits
- Integration of housing and other urban or transport planning needs and outcomes with LVC-related economic concepts and project initiatives
- The "design dividend" and the role of high quality design (for station facilities and other project components) in improving property values, property opportunity, and overall project value
- Tax reforms that may assist Mechanism A (particularly in the context of a pre-existing agenda for broad-based taxation reforms in the Philippines and elsewhere)
- Corridor control and transport corridor zonings as a workable tactic to maintain public control and integrity of public expenditure within major projects by ameliorating the worst excesses of speculative land trading activity and value leakage
- The contribution of network and service quality to transit's value added, which is supported by international literature but has been less discussed in the Asian context
- Reform and technical improvement for assessing property values aimed at improving the reliability, consistency, and accuracy of property valuations in Southeast Asian contexts
- Integration of LVC-related thinking and concepts within major mass rapid transit project initiatives currently being pursued by Southeast Asian governments, with a focus on promoting technical support related to LVC within real time project activities
- Programmatic approaches to mass rapid transit network development and investment—focusing on a steady, reliable, and predictable rate of mass rapid transit project investment over time, with the aid of multiple funding sources including LVC (in contrast to a boom-and-bust cycle of project funding and construction activity)
- Further developmental work on the relationship between project benefits more broadly defined (taking place within the 21st century urban economy) relative to opportunities in LVC, beneficiary funding, and

innovative project resourcing, characterized by careful incorporation of all project benefits and impacts, into project business cases, benefit cost ratios, or project funding strategies

- The relationship between LVC and other value capture or beneficiary funding concepts and possibilities, including properly pricing transit tickets to reflect traveler benefits from high-quality mass rapid transit

In addition to the technical and policy issues outlined above, the authors retain the strong impression that many LVC or transit project stakeholders simply need more information and more engagement with these concepts and the evidence base. Information provision in the near and medium term will be crucial for broadening and deepening the understanding and support for LVC and beneficiary funding concepts among their natural constituency.

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Sustaining Transit Investment in Asia's Cities

A Beneficiary-Funding and Land Value Capture Perspective

This report explains how proven methods of land value capture can help fund sustained urban transit investment in developing countries in Asia. It provides a primer on the importance of land value capture in urban planning and growth and identifies challenges to its use in Southeast Asian megacities like Bangkok, Jakarta, and Manila. The report combines technical analysis of land value increases arising from public mass transit investments with policy recommendations on the use of land value capture mechanisms in a developing country context.

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