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URBAN SYSTEMS STUDIES

WORKING WITH MARKETS: HARNESSING MARKET FORCES AND PRIVATE SECTOR FOR DEVELOPMENT

CENTRE for LiveableCities SINGAPORE

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Set up in 2008 by the Ministry of National Development and the Ministry of the Environment and Water Resources, the Centre for Liveable Cities (CLC) has as its mission "to distil, create and share knowledge on liveable and sustainable cities". The CLC's work spans four main areas—Research, Capability Development, Knowledge Platforms, and Advisory. Through these activities, the CLC hopes to provide urban leaders and practitioners with the knowledge and support needed to make our cities better. For more information, please visit www.clc.gov.sg.

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Clarke Quay and Riverside Point. Image courtesy of William Cho.

CONTENTS

LIST OF ILLUSTRATIONS

Diagrams

Exhibits

Photographs

FOREWORD

In just over five decades, Singapore has transformed from a colonial port city into the global city and endearing home that it is today. The liveability outcomes that Singapore has achieved – high quality of life, sustainable environment and a competitive economy – arose through good planning and governance. One key principle of Singapore's approach to good governance has been to work with markets by leveraging market mechanisms and partnering with the private sector.

Working with Markets: Harnessing Market Forces and Private Sector for Development examines this aspect in relation to land and infrastructure development in Singapore. While Singapore is by no means unique in trying to leverage markets and the private sector, the government has taken a pragmatic and nuanced approach to combining market and state in different sectors for successful outcomes for Singapore. Over the years, policies were adjusted to changing conditions. A strong government was needed to harness the benefits and manage the pitfalls of working with markets. This also meant that the government had to be entrepreneurial too, and develop a deeper understanding of markets and the private sector.

The Government Land Sales (GLS) programme is one of the most successful examples of public-private partnership (PPP) in Singapore. It is the main instrument for releasing land for private sector development to achieve economic and social objectives, such as providing office space, hotel rooms and retail space to support economic growth, conserving our built heritage and supplying private housing. The primary factor behind the success of the GLS as an instrument of urban development in Singapore was that the government, through the Urban Redevelopment Authority (URA), provided clear planning guidance and the assurance of planning permissions to private developers in an open and transparent tender process. This essentially reduced risks for the private sector and was especially important in the early years, when economic growth, and hence demand for development sites in Singapore, was still uncertain. This was how the pioneering Alan Choe, URA's first General Manager, persuaded businessmen, such as S. P. Tao who was in the shipping and trading business, to become property developers in Singapore and invest in the redevelopment of the Golden Shoe district in the 1960s and 1970s.

In carrying out the GLS, the government needed to know the real estate development market well, so that it could respond with appropriate policies. These included offering financial incentives to attract private sector participation in the early years, removing incentives and tightening land premium payment requirements when speculation emerged, and introducing controls to deter land hoarding. At the same time, policies such as the confirmed list/reserve list system and white zoning for sale sites had to be flexible enough to let the market determine the supply of properties to a certain extent, and allow the private sector to exercise creativity in developing the land.

In a small city-state with few natural resources, the government also used market mechanisms to set appropriate price signals, so that scarce resources like water could be used efficiently and remain sustainable. Pricing water right also enabled public sector agencies to be financially self-sufficient to carry out their operations effectively and invest for the future. At times, the government mimicked the private sector by setting up state-owned, but corporatised entities to effectively marshal much-needed resources for national development. For example, state-owned companies like Resources Development Corporation provided much-needed building materials to support the Housing & Development Board's massive housing development programmes in the 1970s and 1980s. This approach to working with markets has been taken a step further in recent times through selective PPPs, where private sector partners take on the role of delivering public infrastructure and services. Backed by a strong regulatory framework, PPPs have been put to good use in the desalinated water, NEWater and waste-to-energy sectors, allowing the government to tap on the private sector for innovative solutions and maximise value-for-money over the lifetime of the projects.

This book captures how and why working with markets has become, and remains, a key urban governance principle in implementing our development vision for Singapore.

Mrs Ow Foong Pheng
Permanent Secretary
Ministry of National Development

PREFACE

The Centre for Liveable Cities' (CLC) research in urban systems tries to unpack the systematic components that make up the city of Singapore, capturing knowledge not only within each of these systems, but also the threads that link these systems and how they make sense as a whole. The studies are scoped to venture deep into the key domain areas the CLC has identified under the Singapore Liveability Framework, attempting to answer two key questions: how Singapore has transformed itself into a highly liveable city within the last five decades; and how Singapore can build on our urban development experience to create knowledge and urban solutions for current and future challenges relevant to Singapore and other cities through applied research. *Working with Markets: Harnessing Market Forces and Private Sector for Development* is the latest publication of the Urban Systems Studies (USS) series.

The research process involves the close and rigorous engagement of the CLC with our stakeholder agencies, and oral history interviews with Singapore's urban pioneers and leaders to gain insights into development processes and to distil tacit knowledge which has been gleaned from the planning and implementation, as well as the governance of Singapore. As a body of knowledge, the USS series, which covers aspects such as water, transport, housing, industrial infrastructure, and a sustainable environment, reveal not only the visible outcomes of Singapore's development, but the complex support structures of our urban achievements.

The CLC would like to thank all those who have contributed their knowledge, expertise, and time to make this publication possible. I wish you an enjoyable read.

Khoo Teng Chye
Executive Director
Centre for Liveable Cities

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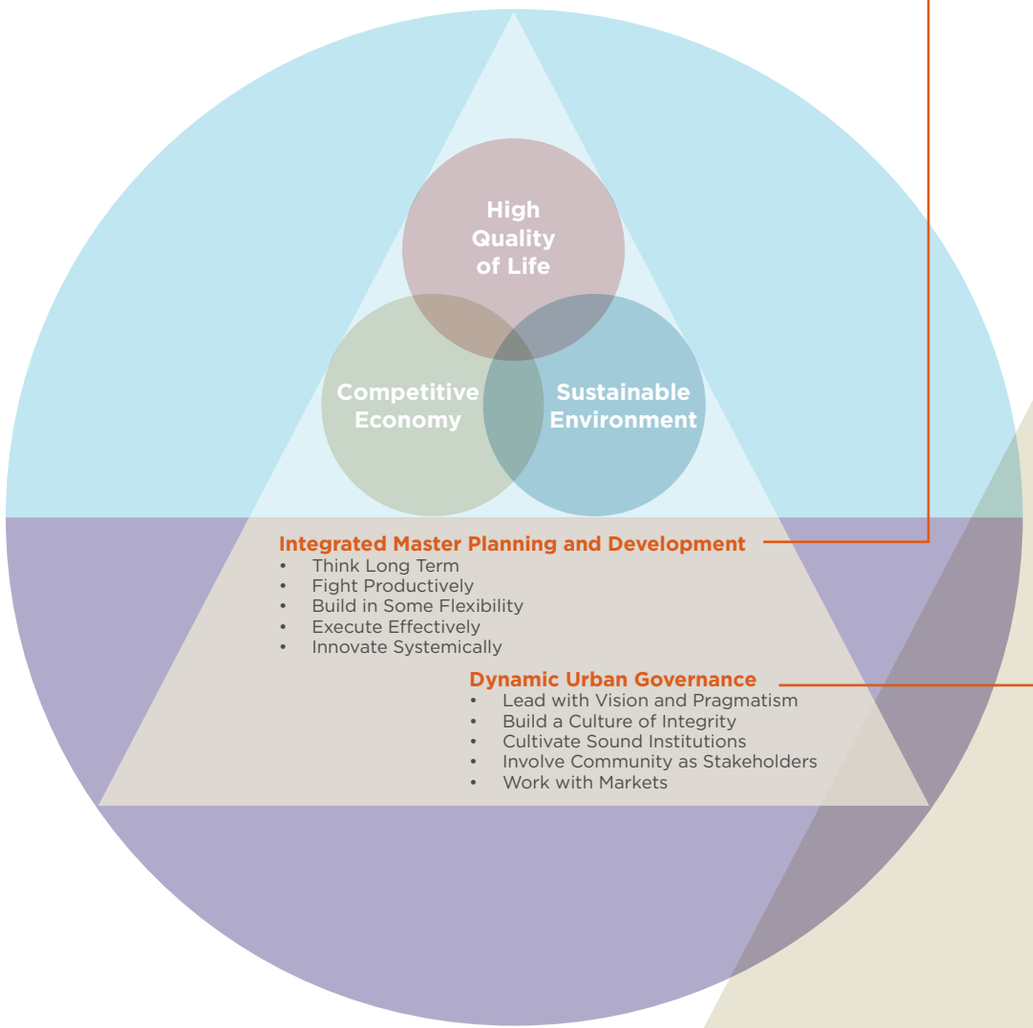
THE SINGAPORE LIVEABILITY FRAMEWORK

The Singapore Liveability Framework is derived from Singapore's urban development experience and is a useful guide for developing sustainable and liveable cities. The general principles under **Integrated Master Planning** and **Dynamic Urban Governance** are reflected in the themes found in *Working with Markets: Harnessing Market Forces and Private Sector for Development*.



Integrated Master Planning and Development

Build in Some Flexibility

While Singapore's Government Land Sales (GLS) programme is fundamentally a price-based open tender system of allocating land based on the highest bid received, there are also mechanisms that improve the system's flexibility and allow the state to guide developers' choices and priorities.

For instance, "white sites" allow developers more discretion on the type and mix of land uses. In situations where design quality and concept are of significant importance, such as for iconic and strategic sites, more emphasis can be given to these aspects via either the two-envelope "Concept and Price Revenue" tender system or the "Fixed Price Request for Proposal" system. The introduction of the Reserve List system in 2001 also gave the GLS programme more flexibility to respond to the market's land demand, since developers could apply to "trigger" reserve sites for tender without waiting for the state to do so.

(See Shaping Singapore: Urban Transformation Through Government Land Sales, p. 15)

Innovate Systemically

Singapore's partnerships with private players in the water industry helped to spur innovations that diversified and advanced our water resources, and grew the water sector and contributed to gross domestic product (GDP) growth. Substantial state research and development (R&D) funding for environmental and water technologies boosted innovation and capability development, while collaborating with private players in the course of Singapore's first NEWater public-private partnerships (PPP) project yielded the first major water recycling plant in the world.

By harnessing the innovative capacity of private companies, PPPs led to innovations in technical design and operations, such as energy efficiency at the Ulu Pandan NEWater plant. PPPs themselves represented a systemic innovation, as they were a different and novel way for the government to work with private firms to improve outcomes over the longer term.

(See Testing New Ground with Public-Private Partnerships, p. 107)

Dynamic Urban Governance

Lead with Vision and Pragmatism

Pricing water correctly, to reflect its true scarcity and strategic value, is important for the sustainability of water supplies. However, doing so requires political will and clarity, as it is politically popular to subsidise the consumption of essential utilities, and raising water prices frequently results in a public backlash.

Singapore's leadership has adopted a strict policy of avoiding consumption subsidies for water and electricity, and has instead priced water to deter overconsumption and wastage. The 1991 Water Conservation Tax reflected water scarcity and penalised heavier water users. The PUB pragmatic approach to water pricing also reflects its status as a public agency – it is not a profit-maximising private firm, and must balance multiple competing strategic, national, and public interests with the need to generate sufficient revenues to meet its operating and system costs. As these costs have increased, the government announced a substantial increase in water prices in 2017 – a politically unpopular move in the short term, but one that will put Singapore's water supply situation on a stronger footing in the decades to come.

(See Pricing Public Utilities and Services, p. 71)

Build a Culture of Integrity

In contrast to many other developing countries, Singapore established government-linked corporations (GLCs) in the 1960s and 1970s that were run largely according to commercial principles, and that did not enjoy special relationships with the government. These companies also stayed relatively corruption-free, and competed for government tenders on an open and transparent basis.

This was the result not only of harsh systems and regulations, as these were routinely circumvented and ignored in other developing countries at the time. The most important factor, however, was the existence of a culture of integrity, where public officers seconded to GLCs from statutory boards, and where ministries did not see it as an opportunity to get rich, but carried out their duties with care. The reasons for this were manifold – the tone set by Singapore's top leaders, such as the incorruptible Mr Lee Kuan Yew; the harsh legal penalties for graft and bribery; the powerful and vigilant Corrupt Practices Investigation Bureau; and the personal values of hard work and honesty amongst the majority of public servants.

(See Role of Government-Linked Corporations in Urban Development, p. 83)

CHAPTER 1

INTRODUCTION AND BACKGROUND

> (T)he lesson is that the free enterprise system, correctly nurtured and adroitly handled, can serve as a powerful and versatile instrument of economic growth.

Dr Goh Keng Swee, Singapore's first Finance Minister

Singapore's survival and success over the past five decades would not have been possible without the fruits of economic development. Social stability and progress during this time was supported by a strong economy that provided good jobs and wages to most Singaporeans. Strong economic growth also provided for better infrastructure and standards of living, as well as greater resilience and security.

Growth was not pursued for the sake of growth, but for its tangible impact on the people's lives. Gross domestic product (GDP) per capita at market prices in 1960 was $1,310 ($4,621 in constant 2010 S$); by 2015, this had grown to $72,711 ($70,704 in constant 2010 S$)[1] — among the highest in the world. As the economy grew, the people shared the rewards. The median monthly wage for trained employees in 1960 was only $120; in 2015, the median monthly wage was $3,949. Broad-based economic growth and an extensive public housing programme transformed a young and relatively unskilled population into a nation of homeowners.

One key determinant of success in economic development is the way governments work with markets. Almost all governments actively seek and encourage economic growth; however, not all find the appropriate balance of engaging, regulating, supporting, and collaborating with the private sector to lay good foundations for economic dynamism and growth.

HOW CAN GOVERNMENTS WORK WITH MARKETS?

The phrase "working with markets" captures the fine balance of successful public-private collaboration and engagement. Khoo Teng Chye, former CEO/ Group President of Port of Singapore Authority (PSA) and former Chief Executive of the Urban Redevelopment Authority (URA) and the national water agency, PUB, summarises this state-market balance as follows:

> *"'Working with markets' connotes the idea that the market is not perfect. As the Government, we have to work with the market, but we cannot over-simplify and leave everything to the market. Sometimes there is a temptation to say "there's a functioning market here, so I leave it to the market". Too often, leaving things to the market means "I just privatise everything, call for tender for everything".*
>
> *But that is the attitude of a lazy bureaucrat. It's not so simple, and it's certainly not what the early pioneers here did. Working with the market means you have to go out there and talk to firms and understand the market. You have to persuade them to do what is necessary, and you have to find ways to create successful outcomes for Singapore. Because the trick to working with markets is to create the right environment for the private sector. That means you must know how to tailor your policies to the circumstances. So we had one set of circumstances in the 1960s, and these had changed by the 1980s, and therefore the policies were tailored to reflect them."*[2]

Both markets and governments are imperfect and susceptible to failures of decision-making and action. No government can afford to, nor should, turn its back on private companies and markets. Conversely, governments cannot simply allow the unfettered operations of private enterprises when larger social or national interests are affected.

There are two key aspects of working with markets. The first involves engagement and partnerships with private enterprise – through well-structured public-private partnerships, sound regulation, providing good support through mutual learning, incentives, and collaboration. At times, this might involve the state taking on ownership of certain parts of economic activity, where the market has failed or is unable to produce the desired outcomes. Examples include the United States government's direct equity purchases of banks such as Citigroup, JP Morgan Chase, and

Goldman Sachs following the financial crisis in 2008. Less dramatically, Singapore established government-linked corporations (GLCs) in the 1960s and 1970s to facilitate economic development by filling gaps in sectors such as shipbuilding and air transport where the private sector was not prepared or able to do so.

The second aspect of working with markets involves harnessing market forces, such as competitive pricing and bidding, to allocate and set prices for scarce resources. Properly functioning markets are valuable sources of information on supply, demand, and pricing. Governments can use this information to design mechanisms such as auctions and tender systems, and to create the right incentives for companies to support broader national development objectives, such as improving construction productivity or sustaining a healthy property market. For instance, Singapore uses market-based mechanisms to value and allocate car ownership permits (Certificates of Entitlement), and to manage congestion by charging for road usage during peak traffic hours (Electronic Road Pricing).

Singapore's approach to using market mechanisms and private sector participation in the public policy arena was deeply influenced by its pioneer political leaders. In particular, Dr Goh Keng Swee, who was Singapore's first Finance Minister in 1959 and is acknowledged as the overall architect of Singapore's economy, has been credited with instilling in the civil service a mindset of economic thinking, and shaping the government's approach to combining government and markets. For example, when GLCs were established in the 1960s and 1970s – owing to a dearth of private sector expertise and capital at the time – to kick-start economic development and develop public infrastructure, Dr Goh made it clear that the GLCs would be subjected to competitive forces and would not receive financial subsidies from the government.

This approach probably also had its roots in Singapore's initially rocky start to independence, when it separated from Malaysia in 1965 and faced a bleak future. Singapore had to do better in allocating its scarce resources among many pressing needs. Efficiency would be Singapore's calling card in the global markets. As Singapore's first Prime Minister, Lee Kuan Yew, stated in his memoirs, "We had one simple guiding principle for survival: that Singapore had to be more rugged, better organised, and more efficient than others in the region. If we were only as good as our neighbours, there was no reason for businesses to be based here."[3]

Lam Chuan Leong, former Permanent Secretary for Trade and Industry, as well as Finance, pointed to "the free market sort of thinking" that Dr Goh left behind: "(W)e see the result of his decisions and his policies and that has a tremendous influence on the way we approach problems. We actually apply more economics doctrine in a much purer form than any other government we have seen."[4] While this approach was most clearly articulated in Singapore's economic strategies, the same underlying principles have influenced the thinking in other sectors where the government's hand was visible, from the sale of state land to the provision of water.

Singapore's largest power station, Senoko Power Station, in 1986.
Senoko Power Station was sold in 2008 by Temasek Holdings to a consortium comprising Marubeni Corporation, GDF SUEZ S.A, The Kansai Electric Power Co., Inc., Kyushu Electric Power Co., Inc., and Japan Bank for International Cooperation.

Image from the Ministry of Information and the Arts Collection, courtesy of the National Archives of Singapore.

At the same time, Dr Goh was very much aware that market forces sometimes had to be carefully managed to harness their benefits and avoid potential pitfalls, such as a highly uneven distribution of rewards. He cautioned that, " ... if our experience can be used as a general guide to policy in other developing countries, the lesson is that the free enterprise system, *correctly nurtured and adroitly handled*, can serve as a powerful and versatile instrument of economic growth" (emphasis added).[5]

Suppiah Dhanabalan, a former Cabinet Minister who helmed portfolios in National Development as well as Trade and Industry, and was Chairman of Temasek Holdings, pointed out that "(c)ompetition is good (but) it is good up to a point. And then we have got to ask ourselves also—is private sector operation the best way to run a public utility and should a public utility be subsidised? These are important questions that need to be asked."[6] For example, when the electricity and gas operations of the former Public Utilities Board (PUB) were corporatised into Singapore Power in 1995, the new entity owned the transmission and distribution networks, as well as most of the power generating companies. Singapore Power was eventually restructured to focus on the transmission and distribution business, and its generation companies were sold off. Singapore Power currently remains wholly owned by Temasek Holdings, an investment holding company of the Singapore Government.

EXAMPLES OF WORKING WITH MARKETS IN SINGAPORE

This Urban System Study (USS) focuses on the ways in which the Singapore Government has worked with markets to achieve urban development and liveability outcomes. There are many examples of this, from which we have selected four, as outlined below.

Sale of Sites / Government Land Sales

The state is the largest landowner in Singapore as a result of land acquisition and reclamation. The Urban Redevelopment Authority (URA) is Singapore's planning authority and the principal sales agent for state land. The government releases state land through public tender for private sector development through the Government Land Sales (GLS) programme, originally known as the "Sale of Sites" programme. Under the programme, the government provides developable land with the provision of essential infrastructure, planning parameters, policy guidelines, and sales conditions; while private developers bring their capital, expertise, business connections, and entrepreneurial capabilities to undertake the development projects. It has led to a strong partnership between the public and private sectors, underpinning the physical development of Singapore, supporting population and economic growth, and helping to maintain a stable and sustainable property market.

Pricing of Water

The supply of potable water by the national water agency, the PUB, is an example of a self-financing approach, where operating and capital costs are recovered through fees and charges. Singapore is land- and water-scarce, and the appropriate use of markets and price signals guides efficient resource usage and ensures greater sustainability. Rather than impose bans or fines, the government uses economic principles and price signals, such as the Waterborne Fee and Water Conservation Tax, and forms public-private partnerships (PPPs) in specific areas to improve cost efficiency and sustainability. While adopting a market-based pricing approach for water, the government also ensures that water remains affordable for lower-income families through targeted financial assistance.

Government-linked Corporations

Most countries have established state-owned companies in the course of their development journeys; however Singapore's GLCs are qualitatively different. In the early decades of Singapore's development, GLCs helped to accelerate the building of national infrastructure, including Housing and Development Board (HDB) flats for public housing, at a lower cost. For instance, when local companies formed cartels to pressure the government and raise prices, the government formed Intraco Limited to purchase essential materials such as cement and sand. Other GLCs supplied building materials, managed quarries, and supported technological innovation in the construction industry. These GLCs were run largely on a commercial and profit-driven basis, and many were sufficiently well-managed to be successfully privatised or divested later in the 1990s and 2000s.

Public-Private Partnership

PPPs were introduced in Singapore in the early 2000s as a strategic procurement tool, particularly for capital-intensive projects. PPPs offered another channel for the government to work with markets by tapping into the expertise and capabilities of the private sector in an integrated manner. The role of the private sector partner expanded substantially, from designing or building the items of infrastructure, to managing, operating, and maintaining them in order to deliver the services required by the government. Successful PPPs enabled the government to maximise value for money, compared to traditional procurement. Government agencies reaped further benefits, such as more gains in innovation, and a deepening and widening pool of private sector capabilities. Singapore did not use PPPs to plug financing gaps, but PPPs nonetheless helped to lessen the financing burden. Today, PPPs have emerged as the preferred form of procuring water, from NEWater and desalination, and waste disposal services. In other sectors such as sports infrastructure, however, the experience with PPPs has been more mixed.

CHAPTER 2

NAVIGATING THE STATE-MARKET RELATIONSHIP

> What is absolutely key to understanding Singapore's success in applying market systems to public problems is the centrality of the state in assessing, controlling, and regulating the market.

Lim Siong Guan, Singapore's former Head of Civil Service and Permanent Secretary of Finance

1950S TO 1970S – FROM COLONY TO INDEPENDENCE

Prior to Singapore gaining independence in 1965, economic development efforts were already under way. After achieving self-government in 1959, the new People's Action Party government had two major priorities: creating jobs for the unemployed as well as those who would soon be entering the workforce; and providing adequate housing for Singaporeans, many of whom were then living in urban slums and squatter communities.

To support economic growth, Singapore hosted a United Nations Development Programme (UNDP) Industrial Survey Mission, led by Dutch economist Dr Albert Winsemius, which in 1960 resulted in an Industrialisation Programme for Singapore. Dr Winsemius himself would remain a major player in Singapore's growth story, serving as economic advisor, and working closely with Finance Minister Dr Goh Keng Swee and the Economic Development Board (EDB), a government agency formed in 1961 to promote industrialisation and economic growth.

In the 1960s, most foreign companies had not even heard of Singapore, let alone considered investing there. To fulfil the need for jobs, the government welcomed all investments that created employment. In an era of anticolonial and nationalist fervour around the world, Singapore was a rare exception, welcoming both multinational corporations (MNCs) and Asian companies that produced everything from garments, textiles and toys, to hair wigs, salted eggs and mosquito coils.

At this early stage of nation-building, the government worked with the markets in conscious, direct ways. For instance, a range of state-owned companies was established to pursue activities that the private sector either was not prepared, or could not afford, to take on, but which were considered necessary for economic and national development. These included Sembawang Shipyard, National Iron and Steel Mills, Intraco, Development Bank of Singapore, Chartered Industries of Singapore, and Neptune Orient Lines. These companies accelerated and supported Singapore's economic growth by providing essential services such as air and sea transport and freight services, construction materials for housing and infrastructure, and the production of defence equipment to bolster Singapore's national security.

From the late 1960s and 1970s, as Singapore's economy stabilised and unemployment receded, Dr Goh identified four economic pillars — manufacturing, shipbuilding, tourism, and trade — to shore up demand in the face of the British military withdrawal, and further develop Singapore's economy. The government took a pragmatic, eclectic approach to working with markets where this was deemed to be in the national interest – intervening in, or even replacing, the market where necessary, while using competitive bidding and price tenders such as those applied to land sales.

1980S TO 1990S – RETHINKING THE ROLE OF THE PRIVATE SECTOR IN THE ECONOMY

In 1985, Singapore experienced its first recession since gaining independence. The government convened a high-level the Economic Committee to examine the reasons for the recession, develop strategies to revive the economy, and identify new directions for future growth.

From the early 1980s, economic policy and thinking in most advanced countries worldwide began to lean towards market liberalisation, privatisation, and a "retreat of the state", on the basis that governments were more inefficient and failure-prone than free markets. Most prominently, UK Prime Minister Margaret Thatcher and USA President Ronald Reagan sought to improve market flexibility by reducing workers' collective bargaining rights, and gradually amended and removed various government regulations over business activities.

Singapore's Economic Committee Report, published in 1986, reflected some of this economic thinking: the Committee urged the government to lower wage costs and promote flexible wages, and to allow a greater role for the private sector. To support the shift from labour-intensive production towards higher value-added and more capital-intensive industries, the National Wage Council – established in 1972 as a tripartite body comprising government, employers, and trade unions to formulate wage guidelines in line with long-term economic growth – implemented an across-the-board corrective wage policy in 1979. This was followed in the early 1980s by wage increases to encourage more efficient use of scarce manpower through automation. At this time, there was a period of labour shortages and significant wage increases, with real wage increases outpacing productivity growth, blunting Singapore's competitiveness.

Given that Singapore was becoming a more developed economy, the Economic Committee debated the extent of the government's involvement in the economy:

> *"The wider question is the extent of the Government's role in promoting economic development. Should it go beyond the traditional functions of a laissez faire government, providing defence and law and order? Certainly it should also provide infrastructure for businesses and education for the people. It also needs to promote general areas of economic activity, for example, by pushing the productivity movement to improve work attitudes, or identifying services as a promising growth sector to support. But should it start individual businesses, using public funds, which it feels are necessary to complement the economy? Should it try to identify winners to support?*
>
> *The Economic Committee's view is that it should no longer do so, except where there are special reasons, such as national security, to act. Existing government companies broke new ground when they were established, in unfamiliar areas where the private sector had no expertise. The economy was small, and there were many such opportunities for starting businesses. Nobody else was in a position to take them up, but the Government could see them, and had the resources to develop them. The Government was therefore justified in building up the Temasek, Sheng-Li, and MND companies as it did.*
>
> *Circumstances have now changed. The economy is larger, and the private sector is more developed. If there is an opportunity to start an enterprise, someone in the private sector will do so. If nobody does, it is probably because the possibility has been looked at and found unattractive. If the Government is to step in where the private sector has turned away, it needs to know something which the private sector does not. But the Government is unlikely to have the detailed and omniscient grasp of all sectors to identify which project to put money on, even if it knows which general areas should be promoted. New investments, and with them the impetus for growth, have to be the responsibility of the private sector."*[7]

Soon after the Economic Committee Report was published, the Public Sector Divestment Committee (PSDC), chaired by Michael Fam, published its 1987 report. The PSDC had been tasked to identify GLCs for divestment, design a divestment programme, and recommend implementation steps. The report reiterated the government's rationale for privatising GLCs. First, to withdraw from commercial activities which no longer needed to be undertaken by the private sector; second, to broaden and deepen the Singapore stock market by introducing new counters and releasing more shares in existing counters; and third, to avoid or reduce competition with the private sector.[8]

These developments marked a clear shift in the government's approach towards working with markets in the late 1980s and 1990s, which resulted in a broader and bigger role for the private sector.

2000S AND 2010S – MAKING MARKETS WORK BETTER

Looking back on the previous few decades of economic development and nation-building, Singapore's Head of Civil Service and Permanent Secretary of Finance, Lim Siong Guan, co-authored a paper with Harvard academic John Thomas, that analysed Singapore's use of markets to govern better:

> *"The hallmark of Singapore's use of the market has been strong government control and oversight. Private initiatives do not displace government unexpectedly or haphazardly — privatisation has taken place only when and where the government has become convinced that the private sector can do the job better. Government will*

test and determine where markets perform functions with social objectives. It applies the same rigorous standards to testing and evaluating market performance that it does to government policies."[9]

The late 1990s and early 2000s were also a period of heightened global and regional economic volatility. Singapore, due to its small size and open economy, was impacted by external crises such as the 1997-1998 Asian Financial Crisis and the September 11 terrorist attacks in the USA in 2001.

Led by Singapore's Ministry of Trade and Industry, a new Economic Review Committee (ERC) set out in 2001 to address this volatile new environment. The Committee's recommendations set the directions for Singapore's economic institutions in the early to mid-2000s: to embrace the reality of globalisation; tap global networks and markets; strengthen the position of local entrepreneurs as well as small and medium enterprises (SMEs); and redouble efforts to become a knowledge- and innovation-based economy. Unable to sidestep the impact of globalisation, Singapore would participate in this approach wholeheartedly; with efficient, open, and competitive markets seen as key to success. In the 2000s, there was a shift towards greater private sector participation in public sector projects and development.

Throughout the decades, two tenets have guided Singapore's approach to working with markets. First, except in exceptional cases of national strategic or security interests, economic agencies support and facilitate markets, but do not replace them. For instance, EDB's suite of assistance measures guides and supports private sector investment choices, rather than mandating lists of approved sectors. Agencies such as the Ministry of Trade and Industry and the Competition Commission of Singapore ensure that both the private sector and GLCs are subject to rigorous market discipline and competition. Second, economic institutions are fundamentally pragmatic and adaptive; not adhering strictly to any ideology, but always seeking the best balance of measures to address the situation at hand. While Singapore's economic policies and strategies have changed over the decades, the core importance of working with markets remains undiminished for sustaining a competitive economy and a high quality of life.

CHAPTER 3

SHAPING SINGAPORE: URBAN TRANSFORMATION THROUGH GOVERNMENT LAND SALES

> Working with markets is not a mechanical process. It required a lot of entrepreneurship on the part of the public sector to go out and win over the private sector to participate in the business of urban development. Alan Choe, the first General Manager of URA, with ideas about how to make Singapore a modern city, went around talking to the businessmen, encouraging them to bid for urban renewal projects. He persuaded shipping tycoon S.P. Tao to invest in the property business.[10]

Khoo Teng Chye, former Chief Executive of the Urban Redevelopment Authority (URA)

In 1965, a newly independent Singapore found itself faced with daunting urban challenges including a housing shortage, dilapidated infrastructure, and a high rate of unemployment. Rapid and extensive urban transformation was required to provide for high-rise apartments, offices, shopping developments and hotels to support the diversification and growth of the economy.

While the government could provide the land for development, it was aware that it lacked the expertise and capital required to independently resolve all the urban challenges. It was therefore imperative for the government to proactively engage the private sector and leverage its ideas, market knowledge, and financial strength to further the urban development of Singapore. One of the key mechanisms to engage private sector participation is the Government Land Sales (GLS) programme.

> *"The government [was] to provide the expertise, sites, infrastructure, social programmes including public housing and a favourable investment climate, whilst the private sector with its financial mobility and managerial skills [was] to undertake the economic projects — especially commercial buildings."*[11]
>
> Alan Choe, first General Manager of the URA

First launched in 1967, the GLS programme has been a concerted effort by the government to release land for private sector development. Over the last 50 years, the programme has progressed beyond its initial objective of urban renewal, to support other national planning and development objectives such as decentralisation and conservation. The GLS programme has also supplied various types of properties to support the growth of Singapore's economy. By 2016, a total of 1,624 parcels have been sold through the GLS programme, contributing 53% of hotel rooms, 38% of private housing, 40% of office space, and 48% of shop space in Singapore.

News reports on the Government Land Sales programme.

Image courtesy of the Urban Redevelopment Authority.

The key features of Singapore's GLS programme include:

a) Demand projection with built-in flexibility to cater for market uncertainty;

b) Strategic selection of sites based on national planning, development and economic objectives;

c) Clarity, openness and transparency; and

d) Conditions of sale to encourage financial prudence and to prevent undesirable market practices such as speculation and land hoarding.

Demand-based Programming

Rigorous demand projection exercises are conducted for the GLS programme to determine the supply quantum to maintain a stable and sustainable property market. The programme also incorporates innovative design features, such as the Confirmed and Reserve Lists, to build in flexibility to allow for unexpected market changes.

Strategic Selection of Sale Sites

The locations and land uses of the GLS sites are strategically selected to achieve national planning objectives and to meet the changing market demand for different types of properties over time. In the 1960s and 1970s, the GLS programme focused on city centre renewal and the development of financial and tourism industries through the provision of space for office, hotel, commercial, and recreational projects in the Central Area. In the 1980s, industrialisation and economic development encouraged the sale of warehouse and flatted factory sites; and the sale of conservation sites to reinforce the city's identity also became an important pillar of the GLS programme. Following the decentralisation vision which was part of the 1991 Concept Plan, the GLS sites were selected to facilitate the development of regional and sub-regional centres. In the new millennium, land sales focus shifted back to the redevelopment of the city centre with the creation of the New Downtown. At various times, particularly in the 1970s and early 1990s, land was released to satisfy citizens' aspirations for private housing.

Clarity, Openness and Transparency

One of the hallmarks of Singapore's GLS programme is its clarity, openness and transparency, which is crucial in gaining the confidence of both domestic and foreign investors.

The GLS sites are planned for release on a regular schedule. The detailed site information and land use conditions are made available for each sale site to allow potential participants, and the market as a whole, to be aware of the investment opportunities and the extent of supply that will be generated through the GLS programme.

GLS sale sites are provided with comprehensive infrastructure and services to the site boundary including roads, electricity, sewer lines, and water supply pipelines. All details of infrastructure and services connected to or affecting a sale site are provided in the sale documents. Where there are encumbrances and/or impositions on the developers, such as services diversion, the information is also provided as part of the sale conditions. This reduces the private developers' time and resources required to coordinate with multiple agencies for the infrastructure work, allowing for development of the land without any undue delay following the site acquisition.

GLS's transparency is also reflected in its clear rules and selection process. The tender evaluation criteria – whether it is a price-only tender or auction, or whether design and concept are factors for consideration – are also clearly conveyed to GLS participants.

Sale Conditions to Ensure the Successful Development of GLS Sites

With extensive private sector participation in the GLS programme, the government needs to understand and work with the market to achieve programme objectives, including obtaining a fair value for the land and ensuring on-time completion of development projects.

In light of market imperfections, control measures are built in the GLS sale conditions to ensure the financial integrity of developers and to deter undesirable practices such as speculation and land hoarding. These conditions include the specification on the payment terms, the project completion period, and the amount of investment interest to be held by the successful tenderer by project completion.

Since its launch in 1967, the GLS programme has leveraged on the strengths of both the public and private sectors to contribute to Singapore's urban development. The improved infrastructure and the wide range of industrial, commercial, residential, and recreational properties developed under the GLS programme have also reinforced Singapore's positioning as a global financial, commercial, and tourism hub, contributing to economic growth and employment generation in Singapore. The following sections trace the evolution of the GLS programme as a mechanism of working with markets to support Singapore's urban development over the past 50 years.

1960S: A NEW CITY CENTRE IS BORN – URBAN RENEWAL TAKES OFF

As Singapore became a prominent regional trading port in the early 1900s, it experienced rapid population expansion and a severe housing shortage. In 1965, there were only 250,000 proper housing units available for 350,000 families.[12] Three quarters of the population lived in the city centre along the Singapore River, with many squeezing into dilapidated shophouses.

Commercial and warehousing activities proliferated along the river banks and, despite its prime location, the city centre was packed with urban slums and rundown buildings that were prone to fire hazards and sanitation threats. Traffic was congested and infrastructure underdeveloped. The fragmented private land ownership also limited the scope for new development.

An overcrowded living environment and poor infrastructure impeded investment. With a high post-war birth rate and an influx of immigrants seeking jobs in Singapore, the unemployment rate reached 10% and was set to rise further when Britain announced its military withdrawal east of the Suez Canal from 1967.[13]

Congested pedestrian walk in the Central Area before redevelopment.

Image courtesy of the Urban Redevelopment Authority.

Renewal and redevelopment of the city centre was urgently required for the nascent state to accommodate the population, to improve the infrastructure, and to create more jobs.

In 1966, to support the urban renewal effort, the government boldly introduced the Land Acquisition Act to allow public agencies to acquire land for public purposes at reasonable compensation rates. With most of the land parcels in the city centre then being small and divided among different owners, large-scale comprehensive development was not possible. The Act freed up prime land in the city centre; and the government could amalgamate acquired land with other state land in order to comprehensively plan and develop the city centre.

Government Land Sales as an Engine for Urban Renewal

The Urban Renewal Department (URD) of the Housing and Development Board (HDB), which later became the Urban Redevelopment Authority (URA), was tasked to implement the urban renewal plan for the city centre. To achieve the social, urban, and economic objectives of urban renewal, the URD introduced a Sale of Sites (now GLS) programme: through a fair and transparent open tender process, the government made land available for the private sector to bid for, and then to develop, based on the Master Plan[14] and stipulated urban planning guidelines.

Creating a public-private alliance was a strategic decision made from the beginning of the programme. It was a bold experiment which differed from the common urban renewal practices in other countries at the time, where urban renewal was typically a piecemeal government effort to clear urban slums.

In Singapore's context, the URD's role focused on two aspects, as explained by Alan Choe, the Head of the URD in 1966, and later the first General Manager of the URA in 1974: "Firstly, the master planning for relocation, to take care of the social needs of the people affected by the redevelopment programme. And secondly, to invite the private sector with their experience and money to go into private projects to help the economic development."[15]

The GLS programme provided the private sector with viable business opportunities to develop residential, commercial, recreational, and office buildings in prime locations. The people could benefit from the improved built environment and increased employment opportunities;

and the proceeds from land sales could support the government's other urban development projects including resettlement, land acquisition, and reclamation. These projects would add value to prime land in the Central Area, inject more variety and dynamism into the urban renewal programme, and facilitate economic development in the direction of the government's Master Plan.

Guiding and Incentivising Private Sector Participation

In implementing the GLS programme, a key challenge was to promote it to the private developers, who were unfamiliar with the concept. In the late 1960s, two-storey shophouses offered the predominant commercial and office spaces. Building major shopping complexes, department stores, and office buildings were considered large-scale projects requiring large amounts of capital. At the same time, urban slum clearance was ongoing. Developers had reservations and considered it risky to build new high-investment buildings in rundown areas when there was uncertainty over when the surrounding slums would be cleared.

To address investors' concerns and to mitigate development risks involved with undertaking these projects, the government provided detailed guidance and attractive incentives to encourage private participation in the GLS programme.

Clarity, Openness and Transparency

The first GLS programme was launched by the URD in 1967, with 13 land parcels released for sale. The programme was publicised in local newspaper advertisements to provide notice to potential tenderers. Comprehensive site information would be provided, including details on the infrastructure and services that were connected to or affected the site, including those for roads, plants, electricity cables and water pipelines. Sales sites could be affected by encumbrances including graves that had not been cleared or soil contamination from previous uses such as petrol stations. These encumbrances bear serious implications on the future development potential and the land value. The government also ensures that all these details are accurately determined and communicated in the tender documents. Developers were allowed four months to prepare and submit their proposals. A clear timetable indicating the stage-by-stage slum clearance schedule was also provided to boost investor confidence and to allow better project planning.

The construction of high-rise buildings was encouraged by the URD to intensify land use on the valuable Central Area prime land; the concept was, however, new to most developers. The government therefore provided detailed information and guidance to developers via display models, simulated plans, and brochures with general site details and proposed development drawings. The simulated drawings illustrating high-rise concepts provided the necessary visual guidance for private developers.

To offer more guidance to potential tenderers, especially overseas developers who were unfamiliar with the Singapore property market, a guide value for each GLS site was listed in the subsequent tenderer notice advertisement as a reference.

To ensure openness and transparency, GLS tender conditions provided clear specifications on the evaluation method and criteria, to create an equal playing field for all developers. The tender conditions also listed comprehensive information such as planning parameters and urban design guidelines, including details on the site boundaries, allowable use, plot ratio, access arrangements, connectivity, height control, and other parameters. These provisions provided certainty to private developers on what they could and could not do with each site.

Attractive Financial Incentives

In the 1960s, Singapore was in the infancy of its physical development. The concept of GLS was new to investors. The government identified the need to increase the attractiveness of the GLS programme by offering financial incentives to developers to ease their cash flow constraints and to increase the development projects' commercial viability.

One of these incentives allowed the successful tenderer of a GLS site to make instalment payments for the land price. Upon signing the Building Agreement[16],the successful tenderer was required to make a down payment of 20% of the tendered land premium, inclusive of the 5% deposit upon tender. The remaining 80% of the premium could be paid by instalments over a 10-year interest-free period. Development charges[17] were waived for these projects. Permanent residential rights were also offered to foreign investors participating in the land sales.[18]

Upon completion of the development, property tax payable was pegged at 12% per annum, which was significantly lower than the prevailing tax rate of 36% which was applicable to other properties. To encourage high-rise construction in land-scarce Singapore, optimising land use and creating a signature city skyline, the developer/owner could also apply for property tax refunds for a period of six months, with an additional period of one month for each storey of the development project. The package of concrete financial incentives was instrumental in attracting participation in the relatively new urban renewal GLS programme.

Agency Collaboration and Support

Urban renewal projects and the GLS programme were implemented by the URD. Other government agencies and departments also collaborated closely with the URD to support the execution of the programme.

The URD worked with the Ministry of Finance to offer property tax concessions for the programme, with other departments in the HDB to resettle the residents who were affected by the urban renewal programme, and with the Public Works Department (PWD) to provide for roads, infrastructure, and services such as water supply and drainage up to the boundaries of the sale sites.

One common concern of developers was the duration and complexity of the planning approval process, which could tie up capital and constrain cash flow. The URD worked with the Planning Department to accelerate planning clearance for projects on GLS sites. The government also ensured vacant possession of sites to successful tenderers within three months of the building plan approval, to facilitate project commencement and development.

With the economic objectives of the GLS programme in mind, the URD also worked closely with the Economic Development Board (EDB) and the Singapore Tourism Board (STB) to identify development demands in Singapore, especially in the fields of tourism development and commerce. The close working relationships between the URD, the EDB, and the STB not only aligned development projects on GLS sites to meet economic development objectives, but also provided confidence for private sector developers to participate in GLS programmes.

Influencing Development Outcomes to Achieve Planning and Other Objectives

For the GLS programme to achieve national planning, development, and economic objectives, the government had clear development outcomes in sight. Site selection, sale conditions, and tender evaluation methods were all developed strategically to influence the development outcomes of GLS sites.

Strategic Site Selections

When it started, the GLS programme made available sites on which to build the infrastructure required to stimulate economic development. Working closely with the EDB and the STB, the URD identified the demand for properties that could support the promotion of foreign investment and tourism - an industry that could rapidly generate employment opportunities. This was critical in the late 1960s, as the government needed to address the unemployment and economic challenges associated with the British military withdrawal, which had previously provided about one-fifth of the country's GDP and one-sixth of the employment. The first three GLS programmes from 1967 to 1969, therefore, focused on making available land for essential facilities including office buildings, hotels, and shopping complexes to support the tourism and service industries.

To provide new office space to support the growth of commerce, the prime location of Shenton Way was identified as an extension of the Central Business District (CBD). In the second GLS programme in 1968, more than 10 sites designated for office development were released for sale along Shenton Way and at the Golden Shoe financial district. The completed projects included Robina House, Shing Kwan House, Shenton House, the UIC Building, and the OCBC Centre. The 52-storey OCBC Centre at Chulia Street, designed by the world renowned architect I M Pei and completed in 1976, was the tallest building in Southeast Asia at the time. These developments along Shenton Way provided prestigious office space and facilitated the formation of "the Wall Street of the East". With these redevelopment projects, the skyline of Singapore was completely transformed.

OCBC Centre.
The site of the OCBC Centre before redevelopment with a row of three-storey buildings built before the 1900s. The OCBC Centre, 52 storeys high, was the tallest building undertaken by the private sector under the Urban Redevelopment Authority's Sale of Sites programme. It stood as a living testimony to the confidence of investors in Singapore as a commercial and financial centre.

Image courtesy of the Urban Redevelopment Authority.

To promote tourism, the URD carefully selected GLS sites to supplement the incumbent tourist belt – Orchard Road. The Havelock Road area was identified for hotel developments after clearing old factory warehouses. As a result of the first GLS programme in 1967, King's Hotel, Miramar Hotel, and the Apollo Hotel were developed, attracting private investment into the area. Sites at the Kallang Park area were released to provide space for recreational, entertainment, and exhibition uses to support Singapore's budding tourism industry. Recreational projects, including the Wonderland Amusement Park, Leisure Dome, and Kallang Theatre, were all completed in the 1970s. Wonderland was then the largest amusement centre in Singapore and was reported to attract more than 10,000 people every night when it first opened.

The construction of shopping centres was also planned for in the early GLS programmes. The site for the People's Park Complex was a congested bazaar with makeshift hawker stalls before it was released in the first GLS programme in 1967. The People's Park Complex was Southeast Asia's first modern, world-class multi-use building offering shop space, office space, and residential apartments. The 1969 GLS programme offered more office space, supplemented by shopping, entertainment, and residential spaces in the form of mixed-use buildings, including Marina House, International Plaza, Textile Centre, and Eng Cheong Tower. These comprehensive development projects not only met the market demand for office space, but also injected vibrancy and nightlife to the Central Area with their shopping and housing elements.

Sale Conditions and Tender Evaluation

While the government provided incentives and concessions to attract private sector participation in the GLS programme, it understood that the market was not perfect and that controls were needed to influence the development outcomes.

The government specified tender evaluation criteria in the sale documents. Besides price, design merits and potential economic returns of the projects formed part of the tender selection criteria to encourage better design and development ideas. The planning parameters and guidelines provided in the sale conditions not only served as guidelines to developers, but also provided the government with a level of control over the quality of the built environment. Within the specified parameters, developers and architects could exercise their discretion to express creativity in the design elements. They could adopt or amend the URD's simulated guide plans, or propose alternative development plans.

One critical consideration of the GLS programme is the prevention of land speculation and hoarding. From the very beginning, the government made it mandatory for the successful tenderer to maintain at least a 50% controlling stake in a GLS project before its completion. Besides deterring land speculation, the requirement for maintaining a minimum investment interest in the project also provided an incentive for the developer to strive for better building quality and economic viability of the property, particularly in a booming property market. Furthermore, under the tender conditions, a minimum gross floor area was required to be completed within a Project Completion Period (PCP). This ensured the timely supply of the required properties to meet the demand and planning objectives.

Achieving "Win-Win" Outcomes

The two facets of the GLS programme – the concessions to attract private sector participation and the controls to influence development outcomes – worked in tandem to achieve the planned objectives.

> *"The Government Land Sales programme is a successful public-private partnership. The URA made it attractive to the private sector by facilitating the plan-approval process and providing financial incentives including tax exemption and instalment plans. At the same time, the URA carefully monitored the design and development outcomes. For example, when there were zero high-rise buildings or commercial towers along Shenton Way in the late 1960s, Alan Choe drew up a detailed urban design plan showing how the new buildings would come up in the concept of podiums lining up at the correct height. This design can still be seen today along Shenton Way. This did not happen automatically. It happened only with detailed planning and effective execution."*[19]
>
> Khoo Teng Chye, former Chief Executive of the URA

The government succeeded in attracting private sector participation in urban renewal of the city centre. The enhanced living environment, improved infrastructure, and much needed office buildings, hotels and shopping complexes, facilitated the attraction of talents, investors, and tourists into Singapore. The urban landscape and city centre skyline were rapidly transformed. The private sector benefited from the opportunity to develop projects in the prime city centre location; the public enjoyed the benefits of more employment opportunities and improved living and working conditions.

Shenton Way.
Before urban redevelopment, Shenton Way was used mainly for warehousing, storage and hawking purposes. By the mid-1970s, Shenton Way had become the main financial and international trade centre of Singapore.

Image courtesy of the Urban Redevelopment Authority.

1970-1973: SUPPLY CONSTRAINTS – SCALING DOWN OF LAND SALES

In the early 1970s, surging demand for construction activities in Singapore resulted in a strain on labour supply and a shortage of construction materials. In light of the capacity constraints, the government froze major GLS programmes from 1970 to 1973. Only selected parcels were sold in those years to meet the specific demands of tourist project development, business resettlement, and financial district connectivity.

Sale of Tourist Project Sites to Balance Recreational Project Locations

In 1971, four sites were offered for sale for tourist project developments outside the Central Area along the southern coastline of Singapore – two at Pasir Panjang Road and two at Nicoll Drive. These sales were targeted to balance the locations of recreational projects, which were formerly concentrated in the Kallang Park area in the late 1960s. The two 15-year lease sites sold at Pasir Panjang Road were on reclaimed land located approximately 10 km from the Central Area. The projects materialised as the Pasir Panjang Paradise Restaurant and the restaurant/bowling alley project, Club 88.

GLS for Resettlement of Businesses

One obstacle of consolidating developable land was the resettlement of the original land users. The resettlement task was especially challenging in the densely populated Central Area, which was also the major shopping and commercial centre occupied by many shophouses, within which many tradesmen and professionals practised their businesses. For this land to be acquired for redevelopment, these businesses would require alternative office and shop spaces.

While the HDB constructed public housing flats to resettle evicted residents, the URD developed centres for the resettlement of businesses.

GLS sites were also sold for the building of resettlement centres. One Chin Swee Road resettlement site was sold via negotiation under the GLS programme between 1970 and 1973 to the Thong Chai Medical Institution, a charitable institution providing free medical services to all, when its original premises were acquired for conservation. The 18-storey

The site of the Fook Hai Building before and after redevelopment.
The Fook Hai Building is the first experiment of its kind where businesses affected were encouraged to form a public company to finance a project in a cooperative manner and in accordance with plans and proposals approved by the Urban Redevelopment Authority.

Image courtesy of the Urban Redevelopment Authority.

Selegie Complex and the 10-storey Colombo Court were also built on sites sold under the GLS programme in the early 1970s to house resettled businesses and professionals. The site released for Colombo Court was strategically located within close proximity to Parliament House and other government buildings in the Central Area. Many law firms and related professionals that occupied nearby shophouses were relocated to this modern building.

When a group of some 200 shopkeepers of Hokkien and Hainanese origin were offered cash compensation or alternative accommodation for resettlement, they formed a working committee and indicated their preference for redeveloping a site in the same area themselves, because of their close community ties and established connections. A site at South Bridge Road and Upper Hokkien Street was sold to this group by negotiation. These shopkeepers demonstrated their entrepreneurial spirit and resourcefulness by securing their own financing to develop the 20-storey Fook Hai Building at a cost of $15.9 million.

Sale of Air Rights for CBD Connectivity

In the early 1970s, more office buildings along Shenton Way were constructed and businesses moved in to this business district. The intersection of Shenton Way and McCallum Street was dominated by the UIC Building, Shenton House, Robina House, Shing Kwan House, and the DBS Building, four of which were projects on GLS sites. Instead of a land parcel, the URD sold "air rights" on a 30 year lease to allow for the private sector to develop an overhead pedestrian-cum-shopping bridge connecting these buildings across Shenton Way.

The 539.6 m^2 air rights sale resulted in the Golden Bridge project. The fully air-conditioned overhead bridge provided a safe and comfortable pedestrian crossing to serve the office workers' needs. The overhead bridge effectively segregated pedestrian traffic from vehicular traffic, eased traffic congestion at Shenton Way, and connected developments on both sides of Shenton Way. Additionally, the ancillary shopping space on the Golden Bridge added vibrancy and a better property mix to the business district.

Golden Bridge at Shenton Way.
Spanning Shenton Way, the completed Golden Bridge was a fully air-conditioned pedestrian-cum-shopping bridge, which effectively segregated pedestrian and vehicular traffic.

Image courtesy of the Urban Redevelopment Authority.

1974-1982: GLS EVOLVES FURTHER IN AN ERA OF RAPID URBAN DEVELOPMENT

Sale of Small Office Sites

On 1 April 1974, the URD was separated from the HDB to form an independent statutory board, the URA, to continue the renewal and redevelopment of the city centre. This organisational change provided the URA with more autonomy and flexibility to define its priorities, as well as more effectiveness in realising its mission. In conjunction with the formation of the URA, the fourth GLS programme was launched, offering 10 sites for private development.

The fourth GLS programme was very successful as the acceptance level of the programme increased after the first three sales. While the first GLS programme in 1967 launched 14 sites, received 14 tender offers and accepted only seven, the fourth GLS received 117 tenders for the ten parcels advertised for sale.

The changing economic conditions and the positive market response allowed the URA to withdraw incentives that had been employed to attract private developers in the first three sales: property tax concessions and certain residential rights were removed; the percentage of the premium required for the down payment was increased; and an 8.5% interest rate became applicable on instalment payments.[20] This rate was further revised to 10% in the mid-1970s, and to 1% above the average prime rate of major local banks in the 1980s to reflect the prevailing market conditions.

The first three GLS programmes focused on providing sites for large-scale comprehensive development projects, while the fourth GLS offered small-sized parcels. For example, the parcels' sizes in the first GLS programme ranged from 1,793 m^2 to 25,288 m^2. By contrast, the fourth GLS divided an office site at Middle Road and Manila Street into five smaller parcels of approximately 500 m^2 each. Smaller-sized office sites required less capital investment. This allowed small-scaled private developers with less financial resources and more modest requirements to participate in the urban redevelopment process. In addition, the properties also provided space to accommodate tenants and users that did not require a large floor space.

The five small office sites were sold to five different developers with different architects appointed to each project. Through planning and design controls, the URA coordinated the external façade designs of the five individual buildings to achieve a harmonious finish. The five eight-storey buildings – ICB Enterprises House, Lee Kai House, Midland House, Chiat Hong Building, and Bright Chamber – offered a total of 15,485 m^2 of modern commercial floor space, enhanced the land use efficiency, and fulfilled the demand from a specific market segment.

View of the fully completed "five-in-one" project at Middle Road.

Image courtesy of the Urban Redevelopment Authority.

Sale of Sites to Support Singapore's Industrialisation Drive

From gaining independence in 1965 until the early 1980s, Singapore experienced rapid modernisation and economic expansion at an average annual growth rate of 10%.[21] Major industrial estates were established to attract foreign direct investments and multinational corporations to locate their regional headquarters in Singapore. Airport and seaport development was emphasised to support these industries, paving the way for Singapore to become a transport, container, and tourism hub.

The GLS programme supported these economic strategies by working with private developers to deliver sufficient industrial and commercial properties. Within the four years from 1977 to 1980, a total of 520,000 m^2 of land parcels were sold, more than the combined total of 420,000 m^2 sold from 1967 to 1977.[22]

The Sindo Building combined showroom, warehouse and factory space under one roof.

Image courtesy of the Urban Redevelopment Authority.

The first site for an industrial building under the GLS programme was sold in 1979 for the construction of the six-storey Sindo Building at Tannery Lane, providing a mixed-use space for factories, warehouses and showrooms under one roof. More sites were released for the construction of warehouses and flatted factories in subsequent GLS programmes, including those for DBS Land Warehouse, Intraco Warehouse, Gordon Industrial Building, and Eunos Warehouse Complex.

The sites sold under the GLS programme for warehouses and flatted factories have been located mainly in two regions – on the western side at West Coast Road-Clementi Road, and on the eastern side at Eunos Link-Kaki Bukit Road-Genting Lane. These locations are close to expressways and main container hubs near the Tanjong Pagar container terminal or Changi Airport, which helps to facilitate the traffic flow of goods and equipment. Some sites are also located in areas that are accessible to densely-populated housing estates, to facilitate ease of labour recruitment for the industrial and logistics occupants. Examples include the GLS site for the Merlin Industrial blocks of flatted factories next to the Eunos MRT station and the site for the Richfield Industrial Centre near Paya Lebar Way.

Industrial properties previously built on GLS sites were of varied sizes in terms of site area to cater to the business requirements of enterprises of different scales. For example, the Civic Terrace Warehouse occupied just 3,485 m^2 whereas Eunos Warehouse took up as much as 23,605 m^2.

Between 1979 and 1982, a total of 291,112 m^2 of warehousing space and 99,383 m^2 of industrial floor space were contributed by sites sold under the GLS programme.[23]

New Singapore Horizons: Transforming the City Centre Skyline

To facilitate Singapore's development as a global financial centre as envisioned in the 1971 Concept Plan, the GLS sites allocated for office space during this period were strategically located around the Golden Shoe area – the financial and business district of Raffles Place, Cecil Street, Robinson Road, Shenton Way, and Anson Road – as well as around the Golden Mile area between Beach Road and Nicoll Highway and the Marina Centre.

From the 1978 sale onwards, to expand the pool of potential investors, the URA launched overseas advertisements for the GLS programme. Documents and plans were disseminated to interested parties both locally and overseas. With the assistance of Singapore Airlines' overseas offices and the Ministry of Foreign Affairs' overseas missions, information on GLS investment opportunities reached developers in Thailand, Hong Kong, Japan, Indonesia, Malaysia, Philippines, Taiwan, Kuwait, and Bahrain. Private developers responded favourably to the GLS promotional efforts. The

exhibition of plans and models at the URA Building drew a steady stream of interested architects and developers, including some from overseas.[24] The press conference for the seventh GLS in 1978 was attended by an unprecedented crowd of local and international journalists.

The importance of appropriate design was emphasised in the awarding of GLS office sites in the financial district. The Golden Shoe area was designed to be a "tight streetscape" with podium structured buildings, while the Golden Mile stretch provided for more "free-standing buildings" with more design freedom for architects.[25] Tenderers submitting proposals for these sites often supplemented the land premium and concepts with photographs, perspectives, and architectural models. For example, five sites in the 1979 GLS sale were awarded not to those tenderers offering the highest premiums, but to those who submitted more outstanding designs.

Architectural models and perspectives submitted in the seventh Sale of Sites programme.

Image courtesy of the Urban Redevelopment Authority.

Strict sales conditions were attached to the sale of sites under a buoyant property market to prevent speculation and to ensure that the required building qualities were delivered within specified timelines. From the seventh GLS onwards, successful tenderers were required to retain more than 30% investment interest in the office and/or shopping components of the building for ten years.[26]

The design emphasis and the stringent tender conditions succeeded in providing timely, high-quality, landmark office buildings in the city centre, including the OUB Centre, Cecil Court, GB Building, The Gateway, The Globe, 78 Shenton Way, and the IOB Building. Furthermore, private landowners in these development areas also responded to the redevelopment initiative. In 1982 alone, 17 redevelopment projects initiated by private landowners were approved or under construction in the Golden Shoe area.[27] The combined efforts from the public and private sectors not only provided the much needed office space to support business development in the city centre, but also defined Singapore's Central Business District skyline.

By 1983, ten years after the formation of the URA, the GLS programme had achieved significant results in providing developable space for private developers to support the nation's economic growth and urban development. A total of 143 projects had been developed on 166 land parcels sold under the first 11 GLS programmes, generating about $9 billion in investment value, including the land premium. In the same period, the GLS sites had contributed approximately 25% of office space, 68% of shopping area, and 22% of hotel rooms in the Central Area.

RECLAIMED LAND CREATES COMPREHENSIVE DEVELOPMENT OPPORTUNITIES

Four sites that were strategically located on reclaimed land at the southern tip of the city were launched for sale in the seventh Government Land Sales (GLS) programme in 1978. As the land was unencumbered, comprehensive planning was possible. The sites were sold to provide an opportunity to further develop facilities including hotels, offices, shopping centres, and recreational amenities as an extension of the "tourist belt" from Orchard Road-Bras Basah Road to this new Marina Centre area.[28]

Reclaimed land for the development of the Marina Centre area.

Image courtesy of the Urban Redevelopment Authority.

Model of Marina Square.

Image courtesy of the Urban Redevelopment Authority.

The four sites were awarded to one tenderer who proposed to integrate the sites as one mega development project. The master developer proposed to provide hotel, residential, commercial, social, and recreational space in one development for both local residents and foreign visitors. The plan materialised as Marina Square, and was made up of three hotels, one shopping centre, and other facilities occupying a total site area of 92,196 m^2. To construct a linking platform between the buildings, 1,201 m^2 of air rights were also sold under the GLS programme. The linking platform not only segregated pedestrian and vehicular traffic, but also provided public space for outdoor events at the prime location.

Two additional land parcels which complemented the four Marina Square sites were later sold in the ninth GLS programme in 1980. These two parcels were developed into a further multi-use hotel/office/retail building, Le Millenia Singapore[29],to further enhance the transformation of the city landscape.

1983-1990: RECOVERY FROM RECESSION AND THE NEW FOCUS OF GLS

Dealing with Market Failure with Pragmatism

Between 1983 and 1985, the property market in Singapore slowed down. In 1985, Singapore's open economy encountered its first major post-independence recession after almost two decades of rapid growth. The recession significantly impacted the property market and led to a hotel glut in Singapore. During the boom years, a number of high-end hotels were constructed on GLS sites in the city centre in anticipation of rising tourist numbers and higher consumer spending. These hotel projects, including the Regent Hotel, Amara Hotel, Furama Hotel, Excelsior Hotel, and Concorde Hotel, were mostly completed between 1983 and 1985, and all suffered high vacancy rates during the recession.

While the government allowed the "invisible hand" of market forces to guide investment decisions and allowed time for the market to adjust to a changing external environment, it also worked with the private sector to tackle the recession challenge. Under the GLS programme, a number of measures were implemented to assist private developers to weather the recession.

First, the supply quantum of land was adjusted to respond to the adverse market conditions. The GLS programme was paused for three years from 1983 to 1985 when land and property prices were falling[30], with no supply of state-owned land for industrial, commercial, or residential uses during this period.

Second, the government provided a concession package worth $1.3 billion to assist private developers. This package relaxed the formerly stringent Project Completion Period conditions imposed during the boom years.[31] Projects from the seventh to the eleventh GLS programmes, scheduled for completion after 1982, were granted an additional 35% of the original construction period as an extension, and were subsequently granted an additional five-year extension after the expiry of the 35% extension period. Liquidated damages for failing to meet the completion timelines for intermediate stages were waived by the URA. The Development Charge, a tax levied on the land value enhancement due to the granting of planning permission for proposals such as land use rezoning or an increase in plot ratio, was reduced from 70% to 50% of the enhancement in value.[32] A three-year moratorium on outstanding land premium payments to the URA was also granted for eligible GLS projects.

The scheduled completion dates for major development projects were allowed to be postponed to stagger the supply of property floor space, and to provide more time for developers to complete the partially constructed projects. This eased the developers' cash flow constraints brought about by the unsatisfactory sale of property units, and allowed them to have sufficient funds to continue the construction work that was in progress. Even though this concession implied the deferment of land premium collection by the URA, it provided the necessary time and conditions to allow for the completion of the projects to avoid unfinished or abandoned buildings that could mar the city's urban landscape.

In spite of these relief measures, some developers were still unable to proceed with the GLS projects for which they had tendered. For instance, the People's Park Chinatown Development, which was awarded the Chinatown Point site in the 1979 GLS programme, declared bankruptcy and was wound up in 1986.[33] In 1987 the stalled project was re-tendered and continued when taken over by City Development Ltd (CDL). Similarly, Superland Development Ltd had commenced the development of the Rahardja Centre project on two sites sold in the 1980 GLS programme in the Marina Centre area, until cash flow difficulties halted the project in early 1984. The development was taken over by Pontiac Land Group and completed as Le Millenia.[34]

Reflecting on the recession experience, the government realised that by allowing instalment payments for GLS sites, it was actually acting as a financier to private sector developers. As the URA was not equipped to assess the creditworthiness and financial status of developers, they realised that this kind of financing role is best left to financial institutions. The GLS conditions were therefore modified, with at least 5% of the intended tender premium required as a deposit upon tender submission. The instalment scheme was withdrawn in 1988, with full payment required within 90 days from awarding the tender. These new payment terms were formulated to ensure that developers were in a sound financial position to undertake the development project, i.e., either they had the financial resources or were considered creditworthy by the lending institution.

Post-recession Developments

Recovering from the 1985 recession, the GLS programmes in the late 1980s provided for more recreational facilities, convention space, and office buildings, especially those in line with the Mass Rapid Transit (MRT) plans to meet the increasingly sophisticated demands of the Singapore economy.

The first post-recession GLS programme was held in 1986, releasing 11 sites on the reclaimed land in Marina South to create a "hub of recreational and leisure activities" as an extension of the Golden Shoe commercial core.[35] As the land was reserved for future long-term development, the sites were tendered out under short-term leases. The projects on these GLS sites were developed into the Superbowl bowling complex, food centres, and a golf driving range, among other recreational uses. These facilities contributed to the recreational options for Singaporeans.

As the EDB had identified the convention business as an important growth segment for Singapore's economy, the 116,925 m^2 land parcel in the Marina Centre area was launched in the 1987 GLS programme for the integrated development of an international exhibition and convention centre, a shopping mall, and office towers. The project was developed into the largest mixed-use property in Singapore at that time, Suntec City, with more than $1 billion in investment value. As the first dedicated exhibition centre in Singapore, Suntec City was envisaged to enhance Singapore's status as a global business, exhibition, and convention centre.

By the late 1980s, major MRT stations on the North-South Line had been completed. Marina Bay station, the last station on the North-South Line, was operational in 1989. Nine stations on the East-West Line from City Hall to Tanah Merah were also opened in the same year. Prime sites near these MRT stations were released under the GLS programme for office and commercial use. For example, three highly accessible sites near the Bugis, Raffles Place, and Orchard stations were offered in the 1989 GLS programme. These sites were developed into Bugis Junction, Caltex House, The Exchange, and Lane Crawford Place (now Wheelock Place). These GLS projects capitalised on their accessibility to the MRT, and generated modern office and commercial spaces in the city centre to meet new demand after the property market recovered from the recession.

Three prime sites near MRT stations were sold in the 1989 GLS programme.

Image courtesy of the Urban Redevelopment Authority.

"The Chance of a Lifetime": Conserving Built Heritage

The importance of conserving Singapore's built heritage has been observed from the very beginning of the city centre's redevelopment. The historic ethnic districts of Chinatown, Little India, and Kampong Glam in the Central Area were largely conserved. By the late 1980s, society had an even greater appreciation of the importance of heritage preservation and historical site rehabilitation. The public also had higher expectations of the built environment beyond a concrete urban jungle, in the search for a cityscape that can reflect Singapore's distinctive multicultural identity.

> *"I'm pleased that we redeveloped the city when there was a chance to do it... And the big heritage sites in the city, like Fullerton, we left those alone. That was the chance of a lifetime."*[36]
>
> Lee Kuan Yew, founding Prime Minister of Singapore

Conservation was facilitated by land reclamation. Reclaimed land in the Marina Centre and Marina South areas offered new land for development for commercial, office, and recreational uses; thus enabling planners to designate more land in the Central Area for heritage conservation. The GLS programme was also leveraged to involve the private sector in this process. In 1987, a GLS site was sold for extension of the landmark Raffles Hotel. In the same year, the first batch of 36 conservation shophouse units at Tanjong Pagar was sold under the GLS programme.

Tanjong Pagar Conservation Project: entire area and individual shophouses.

Image courtesy of the Urban Redevelopment Authority.

The GLS sale of conservation sites received an overwhelming response from the private sector. A second batch of 161 units for conservation shophouses at Tanjong Pagar was released for private sector restoration in the 1988 GLS programme, followed in 1989 by the 2.15 ha $54 million conservation project sale site at Clarke Quay for shopping, entertainment, recreational, and cultural uses, and the 1.43 ha $26.8 million CHIJMES site at Victoria Street in 1990 for cultural, arts, shopping, and recreational facilities.

By working with the private sector, the government's continued conservation efforts paid off. The areas including Tanjong Pagar, Chinatown, Clarke Quay, Little India, and Kampong Glam were revitalised, and their cultural charm restored. Many of these sites were restored for restaurants, retail shops, association premises, and office use, and the owners enjoyed enhanced property and rental values. The conserved sites were attractive to tourists, added vibrancy to the districts, and provided more commercial and recreational space in the city centre.

1990S: MEETING NEW DEVELOPMENT NEEDS

URA's Changed Role as a GLS Agent

The GLS programme was established by the URD in 1967, when the URD was tasked with acquiring parcels of land in the Central Area and amalgamating them for sale to private developers. In 1974, the URD became the URA, a separate statutory body under the Ministry of National Development (MND). This provided greater autonomy and flexibility in implementing urban renewal programmes. The URA continued to acquire and amalgamate parcels of land in the CBD for sale for private development. As the URA owned the land that was put up for sale, it retained the sale proceeds and also retained surpluses held in land stock.

During the recession in the mid-1980s, the URA carried out a strategic review of holding land for future land sales. The land sales programme was susceptible to market condition changes, and holding land would incur high holding costs, including property tax and management and maintenance costs. At the same time, there was some public perception that the URA was profiting from land sales.[37] To concentrate fully on its role as master planner and facilitator of renewal and redevelopment, the URA decided to return to the state all of its 102 ha of raw and undeveloped lands on 1 April 1987.[38]

The land acquisition functions of various public agencies were consolidated into the Land Office, now the Singapore Land Authority (SLA), under the Ministry of Law.[39] The Land Office took on the role of representing the government as the landowner, including the appointment of GLS sale agents.

The URA, with its expertise in selling land to meet planning and redevelopment objectives since the 1960s, remained a principal agent for the sale of state land, although it no longer kept the proceeds of land sales. In addition to selling sites for commercial, hotel, private residential, and industrial developments, as well as sites for special uses including heavy vehicle parks, conservation shophouses and recreational sites, the URA also assisted the MND in planning and managing each GLS programme for private residential and commercial sites.

On 1 September 1989, the Planning Department and Research & Statistics Unit of the MND became part of the URA. The new URA was tasked to be the dedicated national planning and conservation authority. At the same time, as many of the GLS sites for private housing were located within or near HDB towns, in areas planned by the HDB or affected by the HDB's plans, it was decided in 1989 that the HDB should also act as a sale agent for some of these sites. The URA and the HDB are paid agency fees by the SLA, in its role as the custodian of state land, for the successful sale of sites under the GLS programme.

Subsequently, in the early 2000s, the government experimented with having more GLS agents and appointed the SLA and the Land Transport Authority (LTA) to sell a number of GLS sites on a trial basis. The SLA and the LTA in turn outsourced the work of preparing and conducting the sales to a small number of private firms. The objective was to see if competition among more government agencies and private agents could result in lower agency fees paid by the government for land sale services. The private agents might also introduce innovative ideas and value-add to the land sale service, and the government might benefit by tapping into the expertise and network of private agents.

After experimenting with outsourcing the sale agency work for five sites, the government concluded that the benefits of outsourcing, in terms of value-adding and injection of additional expertise by private sales agents, were insignificant. There was also no evidence of cost savings. Most important was the finding that, because of the close nexus between the planning and land sales functions, land sales should be conducted by agencies which are responsible for planning the areas where the sites are located, vis-à-vis the URA and the HDB.

DETERMINING THE FAIR MARKET VALUE OF INDUSTRIAL LAND

Revenue generated by Government Land Sales (GLS) programmes is deposited to the state's past reserves to build up a financial buffer for Singapore to meet crisis needs. To safeguard the past reserves, Singapore's Constitution was amended in 1991 to provide for the financial responsibility of an elected President, whose approval is required for the government to use the past reserves. This institutional design excludes land revenue from the government's budgetary expenditure, ensures that the reserves are used prudently, and prevents the government from selling state land for revenue to meet its budgetary needs.

Within this institutional safeguard, the GLS proceeds have still created benefits for society. First, the land sales revenue in the past reserves can be invested and up to 50% of the net investment returns can be available for the government's budgetary spending to serve the public.[40] This can incentivise the government to invest the reserves pragmatically. Second, with the President's approval, the past reserves have been used to fund land-related expenditure, including land reclamation, underground space creation such as for the Jurong Rock cavern, and land acquisition for the HDB estate upgrading such as under the Selective En bloc Redevelopment Scheme (SERS).[41]

To safeguard the value of state land and reserves, the government is required to sell state land at a fair market value established by the Chief Valuer or through market mechanisms such as a competitive tender process.[42] This principle is also applicable to government agencies that require land for development to accomplish their missions. Agencies including the Urban Redevelopment Authority (URA), the Housing and Development Board (HDB), and Jurong Town Corporation (JTC) returned surplus undevelopable land to the state in the 1980s, and would be required to purchase land from the state at fair market value.

> *"State land is priced by the Chief Valuer based on fair market value, in accordance with market conditions and established valuation principles."*[43]
>
> Khaw Boon Wan, former Minister for National Development 2012

Establishing a fair market value for commercial and residential land was more straightforward than for industrial land. The former could find reference from the URA's past GLS programmes, while industrial estate land was allocated directly to the JTC under the Ministry of Trade and Industry (MTI). In the 1991 Budget debate in Parliament, then Deputy Prime Minister and Minister for Trade and Industry, Lee Hsien Loong, proposed to leverage market forces more in estimating a fair market value for industrial land by providing "certain chunks [of land] for the private sector to develop".[44]

This proposal was accepted. Up to one-third of the annual industrial land quota was planned to be tendered out for the private sector to develop, so as to provide a more accurate reflection of the market price of industrial land.[45] The URA introduced 60 year lease industrial site tenders in the 1992 GLS programme. A 10.2 ha site at Tuas Extension, and a further 6 ha at Kaki Bukit, were offered for light and general industrial developments. These parcels were selected to be of similar sizes to those purchased by the JTC from the Land Office. This kind of exercise was to be continued. Besides Tuas and Kaki Bukit, industrial land parcels at Woodlands, Sembawang, Eunos, Choa Chu Kang, Ubi, Boon Lay, and Pioneer were also tendered out in the subsequent years, so as to provide more accurate benchmarks for industrial land pricing.

Meeting Private Housing Aspirations

While public housing had successfully accommodated most of society's housing needs in Singapore, an increasingly affluent public embraced rising aspirations for private housing options.

In the third GLS programme in 1969, the first dedicated parcel for a private condominium project was sold for the 38-storey Pearl Bank Apartments development. Subsequently, GLS sites continued to be offered for private condominium projects, including Hillcrest Arcadia and Grangeford.

The Pearl Bank Apartment building.
It was the tallest residential block in Southeast Asia at the time of its completion in 1976.

Image courtesy of the Urban Redevelopment Authority.

Since 1978, with accompanying property boom periods and growing market optimism, Singaporeans' aspirations for private housing increased as the economy progressed and incomes rose. The 1978 and 1979 GLS programmes released more residential sites for the construction of condominiums including Arcadia, Horizon Towers, and Orchard Bel-Air. Some of these residential projects attracted residents and injected vibrancy to the city centre, complementing the Central Area redevelopment efforts.

By 1980, expectations of Central Provident Fund (CPF) monies becoming applicable for purchases of private residential properties further increased demand for such housing. The URA launched the up-to-then largest GLS for private housing in 1981, making available developable land for private residential projects across the island. Residential parcels totalling 428,776.50 m^2 in land area were awarded in a wide variety of locations, including Loyang Avenue, Bedok South, East Coast, Upper Ayer Rajah Road, Yio Chu Kang Road, and Mountbatten Road, with the projects completed between 1985 and 1988. The GLS release of private residential land was temporarily paused for the latter part of the 1980s in light of the 1985 recession, and was resumed in the 1990s.

By that time, the majority of Singaporeans owned their homes. Housing was no longer considered a basic necessity, and people sought more quality and variety in housing options. In this new era, an important objective was to offer a variety of high quality housing. The rapid increase in demand for private housing led to quickly increasing private housing prices. In order to curb the escalating prices, and to increase the variety of private housing forms to meet the public's demand, the government increased the supply of land for private residential use via GLS programmes in the early 1990s. These included those sites sold for waterfront housing at Robertson Quay, Tanjong Rhu, and Bayshore Road; those sold for executive suites and serviced apartments at Orchard Road; and those for landed housing at Sixth Avenue, Holland Grove Drive, and Kew Drive; as well as cluster housing concepts which integrated condominium-styled facilities in landed housing. As a whole, the 1994 GLS programme offered 25 parcels for private residential development, providing about 2,700 units.[46] This was expanded in 1995 to 40 parcels offering 3,151 units. The URA further announced in January 1996 that it had reserved sufficient land for 100,000 private housing units to be constructed between 1997 and 2001.

The market, however, was imperfect: the strategy of increasing supply did not result in lower prices. Private housing prices continued to rise with the increase in supply. Using 1990 as the base year, the URA Private Property Price Index (PPPI) increased from 100 in 1990 to 123.1 in 1992, and reached 283.6 in 1996.[47] It was observed that developers bid higher prices with every private housing site that was released, resulting in even higher selling prices for the housing units even before they were built.

Tanjong Rhu.
Tanjong Rhu was transformed from a polluted shipyard and ship repairing area into a much sought after waterfront residential enclave through the government Land Sales (GLS) programme.

Image courtesy of the Urban Redevelopment Authority.

In 1996, the government decided that, in addition to increasing supply through the GLS programme, it was necessary to introduce anti-speculation measures. Thus, in May 1996, the government announced a slew of property market cooling measures, which included adjustments to capital gains tax, stamp duties and Singapore dollar loan restrictions for foreign buyers. Housing prices, however, did not fall immediately. The PPPI only started to fall to 259.8 when the 1997 Asian financial crisis struck the region. The 1997 crisis caused another recession, during which the authorities froze land sales via the GLS programme. No private residential sites were made available for sale during 1998 and 1999.

In 1999, when the property market began to recover, the GLS programme resumed with increased levels of planning under a "transit-oriented development" concept to house people near transport nodes, especially MRT stations. The convenience of living near MRT stations proved to be popular. The URA therefore allocated "high- to medium-density housing" at these sites, including Bishan 8 near Bishan MRT Station, Sims Ville near Aljunied MRT Station, and East Meadows and D'Manor near Tanah Merah MRT Station. This concept has been retained in subsequent sales of residential sites, including sites near Tanjong Pagar, Kovan, Lakeside, and Tanah Merah MRT Stations. These private residential sites offered convenience of transit and access to facilities near major stations.

Auction Mechanism for the Sale of Small Landed Sites

By the 1990s, the proportion of landed residential property in Singapore had declined with an increase in the supply of non-landed housing. Additionally, there was insufficient private freehold land available to meet the demand for landed housing. The government first sold large parcels of landed residential sites at Sixth Avenue and Gentle Road on 99-year leases, but found that, because each site was built by one developer, the housing designs tended to be similar and uniform with little variation. To allow for more participation in landed housing development, especially by small developers and individuals aspiring to own a piece of landed property, and to create the opportunities for more variety in landed housing design, the URA first sold small subdivided residential land parcels in 1993 at Kew Drive.[48] The tenders, however, were still dominated by major established developers who won the lion's share of the parcels on offer. Hence in 1994, for the last phase of the sale of Kew Drive sites, URA adopted a dual approach of auctioning some parcels followed by tender for the remaining parcels.

Auctions were perceived to be more open and transparent than the tender system, providing more certainty to developers as the results of an auction are instant. Interested bidders have the opportunity to outbid others and have certainty with regards to the result, provided they have sufficient financial backing. Developers interested in securing a number of adjacent parcels would have a higher chance of obtaining these parcels than they would under a tender system. Less experienced small developers and homeowners could use auction bids as live guide values as the auction progresses. Smaller land parcels requiring less financial investment allowed more developers to participate in this process, thus avoiding any potential collusion which might depress the bidding price. This also allowed for developers to provide a wider range of designs, increasing the attractiveness of the neighbourhoods.

Encouraged by the good response and positive feedback on the sale of small subdivided parcels at Kew Drive, the URA sold other subdivided landed residential parcels at three more locations – Eastwood Park, Chuan Green, and Sembawang Greenvale – from 1995 to 2010, also using the dual auction-cum-tender approach.

AUCTION VERSUS TENDER IN THE SALE OF GLS SITES

Tender was the main sales mechanism for the Government Land Sales (GLS) programme until 1993. In a sale by tender, a site is launched for sale on a certain date and the tender typically closes about four to six weeks after the launch date. On the tender closing date, developers bidding for a site submit their bids in sealed envelopes into a sealed tender box before the tender closes at 12 noon that day. After the tender closes, the tender box is opened and the bids evaluated. The site is awarded to the highest bidder provided the bid price meets the government's reserve price for the site.

At an auction, each site is put up for open bidding, one at a time. Interested parties bid for the site at a bidding venue by indicating their intention to purchase the site, usually by raising assigned identification number cards, at a certain price called by the auctioneer. The site is sold to the highest bidder when there are no other bids above his bid price.

Sale by auction was introduced in response to the request of the Real Estate Developers Association of Singapore (REDAS). The URA found that the auction method is more suitable for certain sites, including small parcels for landed housing, conservation shophouses, and land for heavy vehicle parks. As such sites normally attract many interested parties, auctions of such sites are likely to be sufficiently competitive. If there are too few participants, there are concerns of uncompetitive bidding or collusion between bidders, which might result in the government not receiving a fair price for the land.

Small parcels for landed housing, conservation shophouses, and land for heavy vehicle parks are quite homogenous, to the extent that the bidders are normally indifferent to which parcels they buy. An auction, therefore, has the advantage that it would also allow interested parties to bid for subsequent sites put up for sale at the same auction, if they are unsuccessful in bidding for sites auctioned earlier. This would not be possible in a sale by tender, when the tenders for all the sites being sold would close at the same time. Staggering the closing of tenders for the sites would make the sale process too lengthy, as each tender requires a tender period of four to six weeks.

Another advantage of the sale of sites by auction is that bidding is transparent, which allows bidders to more accurately gauge market value. If one party is determined to secure a site, he can ensure he is successful by outbidding all other parties. This is not possible in a sale by tender as each participant is bidding "blindly".

A sale by auction also allows the bidder more certainty that he can purchase a number of contiguous parcels. This is sometimes necessary, for example, in the case of a buyer wanting to buy three shophouse parcels in a row for hotel use. This is not possible in a tender given its "blind" nature.

The URA had been cautious, however, in extending the use of auction to the sale of large sites, as it was concerned about the issues of uncompetitive bidding and collusion. In the early 1990s, there was a case of 20 large developers colluding in an auction of government land in Hong Kong, resulting in the government auctioneer stopping the auction midway through the process.

In 1994, the URA experimented with using an auction to sell two parcels of medium-sized sites for private housing priced at $26 million and $33 million, respectively. Although the sites were successfully sold, none of the larger developers participated. The feedback was that they were not in favour of the auction method as they did not want to be seen in public to be pushing land prices up. Also, the decision-making structure of some

AUCTION VERSUS TENDER IN THE SALE OF GLS SITES

Continued ...

development companies did not allow for dynamic decision-making on the auction floor. This outcome was surprising as the auction method had been proposed by the industry association, REDAS.

Over the last few years, there have been suggestions from some segments of the industry to use the auction method for all GLS sites, including very large sites. This is because there have been a few tenders where the winning bid exceeded the second highest bid by a large margin, which has at times been as much as 30%. It was felt by some that auctions could prevent such over-bidding. This suggestion, however, does not seem to have the support of the industry as a whole. The gap between the top two prices in a tender does not necessarily indicate that if the same site was sold at auction, the selling price would have been lower, as the second highest bidder might have raised his bidding price in response to other parties bidding higher amounts. There seems to be no conclusive evidence whether sale by tender or auction would lead to higher land prices.

Decentralisation of Commercial Centres

The continued development of the Central Area since the early days of urban renewal brought with it traffic congestion and vehicle parking difficulties. To alleviate these problems, the government began to initiate the decentralisation of commercial activities, with a number of suburban shopping centres planned and constructed. The GLS sites for commercial uses were released for the development of Liang Court, Parkway Parade, and Katong Shopping Centre. The planning and construction of the MRT system in the 1980s also provided more conducive conditions in the transport system for such decentralisation.

Liang Court, constructed in the 1977 Sale of Sites programme.

Image courtesy of the Urban Redevelopment Authority.

The Concept Plan of 1991 had anticipated a long-term projected population of four million. To sustain economic growth and quality of life, the development of regional, sub-regional, and fringe centres was necessary.[49] Three regional centres – Woodlands, Jurong East, and Tampines – were envisaged to provide jobs closer to home, thus offering a better work-home balance for Singaporeans. The GLS programme also evolved to facilitate this strategy. For example, to enhance Tampines' positioning as the hub of the East Region, a number of land parcels near the Tampines MRT station were identified for sale for commercial use.

Similarly, sites near the Buona Vista sub-regional centre and Changi Point were earmarked for sale for development. More recently, a number of commercial sites were sold next to the Jurong East MRT station to form a critical mass in the Jurong Gateway for the formation of the second CBD. The GLS programme is therefore an important mechanism to realise the decentralisation plan.

Fringe centres such as Novena and Lavender, at the border of the city centre, were also developed to become activity hubs near the transit stations to serve nearby residents with shopping and eating facilities. Developed on a GLS site, Novena Square offers 96,000 m^2 of office and shopping floor space near the Novena MRT station, with convenient pedestrian links to the Tan Tock Seng Hospital and office buildings such as Goldhill Plaza and Revenue House, contributing to the vibrancy of the Novena fringe centre.

Building with Flexibility with "White Sites"

In the mid-1990s, a new planning concept of "white sites" was implemented for the GLS programme. On the white sites, the URA would list a range of permitted uses, and developers would have the discretion to decide on the type or mix of uses and the respective amounts of floor space, as long as the total did not exceed the total permissible gross floor area (GFA). No differential premium would be charged if developers changed the type, mix, or quantum of uses during the lease period.[50] This pro-business concept was designed to better meet market demand and provide flexibility for the private sector to adjust to changing market conditions.

Sites at China Square were among the first "white sites" offered for sale in 1995. These sites consisted of conservation shophouses and modern buildings. A mix of land uses was created, offering office, shopping, food and beverage, arts and culture, and conservation spaces. As an extension of the CBD area, the land use flexibility provided by "white sites" at China Square was intended to add liveliness and attractiveness to the Central Area.

"Purely white" sites could, however, create challenges for urban planners. In China Square, developers provided what they perceived was required by the market at the time of development to maximise the profit for their own project, with less consideration for the longer-term sustainability

of the whole precinct. A large proportion of the space was used for restaurants, retail and offices; while housing was absent and hotel space was limited. With no residents and few visitors, the site at China Square lacked vibrancy at night. Another case was the "white site" in the new financial district at Marina Boulevard fronting the bay. The developer chose to opt for residential development (The Sail@Marina Bay) and a very minor retail quantum (about 2% of the GFA), so no provision was made for the much needed office space in the Marina Bay area.

Learning from these experiences, when URA tendered out subsequent "white sites", it stipulated in the sales conditions a certain percentage GFA for a particular use, in order to enhance land-use planning at the macro level, and to realise the longer-term planning intention for the area. For instance, for the tender of the Marina Bay Financial Centre (MBFC) white site in 2005, URA specified that at least 60% of the maximum permissible GFA was to be used for office space. The remaining GFA could be used for complementary uses such as hotel, residential, recreational, or entertainment uses. This prevented developers from building only residential apartments instead of incorporating office space in this prime location, thereby realising the vision of building a world-class financial centre.

2000S: REDEVELOPING THE CITY, OPENING UP NEW GROWTH AREAS

Dynamic Management of GLS Supply

A key consideration in the planning of each GLS programme is the amount of supply needed to meet future demand for the various types of properties, so as to support economic growth and ensure the stability and sustainability of the property market. A market-based methodology is adopted in the determination of each GLS supply quantum. Quantitative models, such as econometric models, are employed in the projection of future demand for the various types of properties. The methodology also factors in the natural vacancy rate and other sources of supply, including committed pipeline supply from all developments which had been planned but not completed, and potential supply from private land sources that had not yet been accounted for.

The methodology, however, is sometimes not as dynamic as fast-changing market conditions require. For example, the GLS programmes were often frozen with "zero supply" during economic recessions. In the immediate post-recession years, the economy might recover but the property market usually remained uncertain for a while. The government would be cautious in releasing land supply until it received clear market signals, which can be subject to time lags, thus impeding market recovery.

In 2000, to be more dynamic in responding to market conditions, the frequency of the GLS programme was increased to twice a year. In June 2001, the GLS Reserve List System was introduced to supplement the Confirmed List of GLS sites that would be sold on scheduled predetermined dates, injecting more flexibility to the GLS supply.

GLS sites on the Confirmed List are launched for sale at predetermined dates, usually for sites more urgently required for development to meet strategic objectives or to initiate the development of key strategic areas. Meanwhile, the Reserve List overcomes the need for the government to make adjustments to the GLS programme midstream, as it allows greater scope for the market to adjust supply to meet demand.

The Reserve List sites would not be released immediately. Instead, developers could indicate their interest in certain parcels of land to the government with a minimum price that they would be willing to pay. An open tender would be triggered if: (1) the developer's committed minimum price – 5% of which would be required as a deposit, subsequently reduced in 2010 to 3% subject to a $5 million cap – is acceptable to the government, considering the government's reserve price; or (2) if there is more than one application from unrelated parties with minimum bid prices close to the government's reserve price within a reasonable period. The minimum price would then be made public without identifying the triggering party. The developer who triggered the site must participate in the tender, or would lose his deposit. The Reserve List system provides the market with greater flexibility to adjust supply to match demand. Being led by demand, it allows the GLS programme to be more responsive to rapid changes in uncertain economic conditions.

This system actively invites market feedback on the location, type, and use of land, to allow for more robust and responsive supply-side management of land sales. It ensures that certain land parcels are made available when the market indicates demand, increasing market certainty and investor confidence.

> *GLS has evolved a lot over the years. We have introduced many innovations and made many changes, I think you probably won't find a country that has made so many changes, basically improvements, to its land sale system over the last few decades. The pressure was always on me as someone responsible for GLS to improve, improve, improve, adapt to the times. If you go and study another country, you will not find one where they constantly try to improve on something the way we do.*[51]
>
> Choy Chan Pong, former Senior Advisor of the URA

This system proved to be useful. During periods of recession and economic uncertainty after the dotcom bust in 2000, the September 11 terrorist attacks in New York in 2001, and the SARS outbreak in 2003, the Confirmed List of residential and commercial site sales was suspended from October 2001 to the first half of 2006. This suspension was welcomed by the market as it stabilised property prices. Developers identifying opportunities could still activate the Reserve List to purchase sites for development.

RESERVE PRICES IN THE SALE OF GLS SITES

When the sale of Government Land Sales (GLS) sites began in the late 1960s, the government provided a "guide value" for each site in its sale document. As the sale of government land was new to the market, it was felt that bidders would benefit from having access to this information. After the close of a tender, the government's Chief Valuer still had to conduct an assessment of whether the highest bid in the tender was of fair market value. If not, the site would not be awarded to the highest bidder.

The practice of having a guide value was discontinued in 1974 when it was felt that the market had become sufficiently familiar with the GLS programme. However, the practice of having the Chief Valuer assess the bids for the award of sites continued until 1992, when the government decided that the Chief Valuer should determine his own valuation for the site without the benefit of reviewing the bids submitted.

The procedure was then changed to one in which the Chief Valuer would submit a sealed envelope containing his valuation of the site, termed the Estimated Market Value (EMV), into the same tender box where all the bidders would submit sealed envelopes containing their bids. The government sale agent, for example, the URA, would open the tender box when the tender closed and tabulate all the bids and evaluate them against the Chief Valuer's EMV.

The site would be awarded to the highest bidder if his bid exceeded the government's reserve price, which is typically 85% of the EMV. Under certain circumstances, however, there could be justification for making an award when the maximum bid is below 85% of the EMV.

There have been suggestions from the industry to make the reserve price known before the close of a tender to allow better transparency and facilitate bidders' decision-making; however, the government's preference has been to not announce the reserve price.

There could be a number of reasons for the government's stance on this. First, there have been a couple of occasions when making the reserve price public did not end favourably. One such occasion was the sale of conservation landed housing at Townerville in 1990. The government's main objective in the sale of these properties was to give young professionals a chance to own private landed properties. Hence it made known the reserve price of each of the houses for sale to guide individual bidders in bidding for the properties. The individual bidders, not being very savvy in valuing properties, all bid around the reserve prices. Unfortunately, Far East Organisation, which was more bullish about the market, bid for all the properties at prices substantially higher than the remaining parties. As a result, Far East Organisation was awarded all the units, and no individual was successful in buying a unit.

The second case was in 1992 when the government first attempted to sell the large site at the corner of Orchard Road and Patterson Road for a hotel development. Again, the government released the reserve price to guide bidders, given the rarity of a hotel site sale in Orchard Road. Unfortunately, the market felt that the reserve price was too high and no bids were placed. This case illustrates one disadvantage of revealing the reserve price to the public. If it was not made public, the government could still evaluate any bids against the Chief Valuer's EMV. Even if the highest bid was less than 85% of the EMV, the government could make an assessment of whether the bids better reflected the fair market value of the site, and therefore award the site.

A New Downtown Milestone – Sale of the Marina Bay Financial Centre Site

In 1971, the government decided to reclaim land to the south of the city for future growth, in anticipation that limited land would be available for development, or even redevelopment in the existing city. Planning for the long term, the land reclamation in the 1970s provided urban planners with time to develop a world-class plan for the New Downtown to be developed into a world-class business, financial, and entertainment hub.

In the early 2000s, the Singapore Government identified that the existing CBD at Raffles Place was physically and technologically lagging behind the needs of the new economy, as well as in terms of infrastructure. Not only was space a constraint, with skyscrapers jostling for room, but even the Grade-A offices in the CBD were beginning to pale in comparison to the ultra-modern facilities and technological features in other international financial centres around the world, such as London, New York, Tokyo, and Hong Kong. With their small floor plans, low ceiling heights, older technology, and narrow mix of uses, Singapore's office stock could not meet the advancing needs of the financial industry.

It was clear that Singapore needed to quickly build up a critical mass of new, state of the art office space with larger floor plans and modern infrastructure and facilities, integrated with a good mix of complementary lifestyle uses, such as quality housing, hotels, retail outlets, and entertainment and dining establishments, to compete with other global financial centres. Otherwise, Singapore could lose its status and edge as an international financial hub.

The government decided that the usual process of selling individual sites of the typical size, each yielding about 100,000 m^2 of GFA, would take too long to achieve the critical mass required for the new business and financial centre (BFC). Such an approach might also not result in an optimum mix of uses required for a modern BFC necessary to cater to the lifestyles of those working in the financial sector.

The URA thus identified a large parcel of land on unencumbered reclaimed land in Marina Bay for the development of the new BFC. The waterfront site is a natural extension of the existing CBD and is highly accessible. This was one of the most significant land sales in the history of the GLS programme. It was the largest in terms of the total allowable GFA at 438,000 m^2, and in terms of estimated land price amounting to $2 billion. The concept was to sell the site to a master developer who would be given the opportunity and flexibility to plan, design, and phase the development of a modern BFC.

Given the high land price and to lower the developer's risk, URA, for the first time, introduced a flexible payment scheme – an option scheme to reduce the upfront payment that had to be paid by the developer. This scheme allowed the developer to buy the land parcel in phases. The developer only needed to commit to, and pay in full for, a portion of the land in the first instance, and then pay a fee for the option to acquire the rest of the site within a specific period at a price according to a predetermined formula. It was the first time that such an option scheme was used anywhere in the world for the sale of such a valuable piece of land. Furthermore, an 18-year overall Project Completion Period (PCP) was granted, allowing developers to develop and pay in phases according to market demard.

Given the critical need to successfully sell the site and the challenging market conditions in the early 2000s shortly after the Asian financial crisis, September 11 terrorist attacks, dotcom bust, and SARS outbreak, URA decided that it needed to market the BFC site aggressively, both locally and internationally. This led to the most extensive marketing campaign ever conducted for a GLS site. URA held exhibitions at international real estate tradeshows and spoke at international real estate conventions, at venues including Cannes, Dubai, Hong Kong, Seoul, Shanghai, Sydney, Miami, and Tokyo, and visited the offices of major international developers to generate investor interest in the BFC site.

Showcasing Downtown at Marina Bay at international tradeshows.

Image courtesy of the Urban Redevelopment Authority.

Marina Bay Financial Centre.

Image courtesy of Erwin Soo.

To attract developers to undertake this development task, the URA worked with various stakeholders to implement key infrastructure for the area. The government also committed $300 million to develop associated facilities, including a 1.5 km waterfront promenade and a 280 m pedestrian-cum-vehicular bridge to further enhance accessibility.

The Marina Bay Financial Centre (MBFC) reserve site was launched for public tender on 1 March 2005 after it was successfully triggered for sale. There were nine bids representing interests from Hong Kong, Indonesia, and Singapore. When the tender closed on 7 July 2005, the site was awarded, at the value of approximately $2 billion, to an international consortium comprising Hongkong Land Group Ltd and Cheung Kong (Holdings) Limited, both based in Hong Kong, and Keppel Land Limited of Singapore.

Phase 1 of the MBFC was developed with 244,000 m^2 GFA. This was almost 2.5 times the minimum GFA of 100,000 m^2 required by the conditions of sale for the site to be built in Phase 1, and more than half the total GFA required for the entire MBFC project. The consortium chose an eight-year option period to purchase the remaining GFA of 194,000 m^2. As the economy and the office market improved, the consortium quickly exercised the option in 2007 to purchase the remaining GFA under Phase II. Phase I comprised two office towers and one residential block which were completed in 2010, while Phase II comprised one office block and one residential block which were completed in 2013. The construction of the MBFC provided the much needed prime office space to cater for the expansion plans of top financial firms as Singapore's economy grew, contributing to Singapore's endeavours in becoming an international financial hub.

Rejuvenating Orchard Road

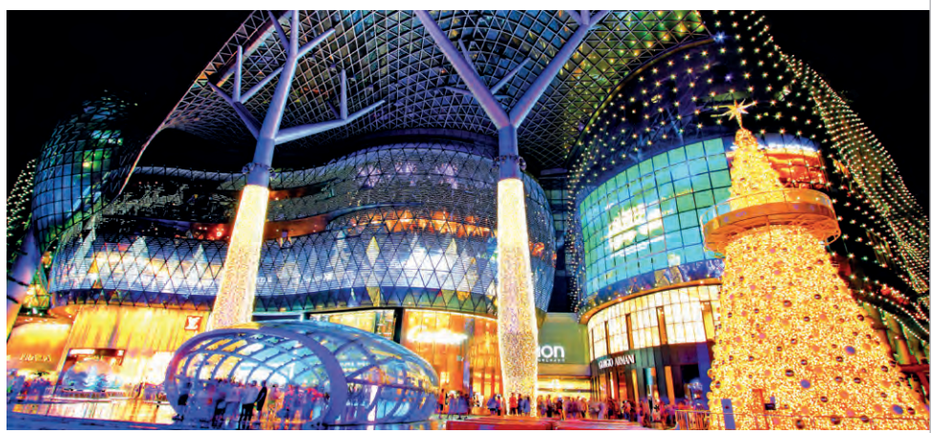
Orchard Road has been a world-renowned shopping street since the 1970s. Nevertheless, by the 2000s it was beginning to look tired, with limited new development opportunities. Owners of the existing buildings were reluctant to invest in refurbishing their buildings because of the economic slowdown at the beginning of the new millennium.

As a strategy to catalyse the rejuvenation of Orchard Road, the URA decided during 2005 and 2006 to release three prime sites for commercial development. The URA had kept the sites in reserve and had only used them for surface car parks, waiting for the time when new development was needed in Orchard Road.

To promote more dynamic developments on these sites, the URA relaxed their guidelines to allow more dynamic pop-out facades along Scotts Road, and for building owners to expand their shopping podiums up to their respective boundaries. Incentives were also introduced to allow for more attractively designed outdoor kiosks.

These sites were sold and developed into three new shopping malls – ION Orchard (sold in December 2015 with 126,000 m^2 GFA), Orchard Central (sold in January 2006 with 36,000 m^2 GFA), and 313@Somerset (sold in August 2006 with 39,000 m^2 GFA). The ION Orchard site is integrated with Orchard MRT station, allowing it to become the gateway to Orchard Road and a signature retail development, also incorporating high-end apartments. With space set aside for events, it also became the focal point for major celebrations and festivities along Orchard Road.

These three successful new developments prompted the owners of other properties to refurbish their buildings, contributing to the revitalisation of Orchard Road, and making it a more compelling destination, bustling with life, vibrancy, and an enriched shopping experience.



ION Orchard.

Image courtesy of Wenjie Zhang.

INFLUENCING THE MARKET WITH THE PROJECT COMPLETION PERIOD

The Project Completion Period (PCP), which makes up part of the Government Land Sales (GLS) programme's sale conditions, is designed to discourage speculation or land hoarding, or delays in project completion by tenderers waiting for a future price surge. Upon the awarding of a GLS site, the successful tenderer is required to execute the building agreement to develop the sale site, construct the development, and obtain a Temporary Occupation Permit (TOP) for the development within a specified PCP. This requirement is an important feature of Singapore's GLS programme and provides an additional lever for the government to influence market supply.

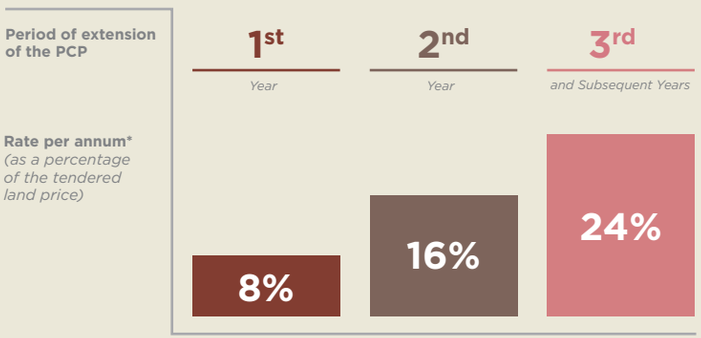
During past periods of recession, such as in the mid-1980s, the PCP was extended to stagger the supply, and so reduce the developers' burden of holding unsold completed units. Conversely, as part of the market cooling measures in 2010, the PCP for private residential sites sold under the GLS programme in that financial year was shortened from six years to five years to ensure a stable supply of residential units.[52]

Prior to 1 May 2000, under the tender conditions, developers failing to meet the PCP timelines would be required to pay liquidated damages to the government at a rate of 2% of the land premium per month of delay in the completion of the project. To enhance the effectiveness of the PCP, the liquidated damage clause was replaced by a mechanism allowing developers to apply to their respective GLS agents for a PCP extension at a premium.

This decision to make the shift from liquidated damages to an extension premium was based on two considerations. First, a liquidated damages clause could be potentially unenforceable if it was interpreted as a penalty to punish the defendant for failing to meet contract terms, instead of as a clause to compensate the innocent party for damages suffered by them. Enforcing an extension premium is more straightforward in legal terms. Second, an extension premium is required prior to the PCP deadline, while liquidated damages will only apply after the stipulated completion date. The former is therefore more effective in encouraging developers to detect and resolve problems early to prevent project delays.

Project Completion Period (PCP) Extension Premium Rates

Any PCP extension given will be subject to payment of an extension premium based on the following schedule of rates:



* The rate may be revised from time to time
Source: Urban Redevelopment Authority

MEETING SHORT-TERM OFFICE NEEDS WITH FLEXIBLE TRANSITIONAL OFFICE USE

In the late 2000s there was a shortage of office supply, which was identified as a short-term phenomenon. To address this challenge, the URA sold its first short-term lease of 15 years for transitional office use next to Newton MRT station. The transitional offices were low-rise buildings with basic designs which allowed for shorter construction timeframes to meet immediate demand, and with shorter leases which lowered the land cost, thus translating to lower rental rates for end users.

Apart from releasing sites for transitional office use, the URA also worked closely with the Singapore Land Authority (SLA) to identify a list of vacant state-owned properties that could be made available to the market on short-term leases for interim office use. To prevent the depletion of the existing stock of office space, the URA announced in May 2007 that it would temporarily disallow the conversion of office space to other uses in the Central Area.

The market reacted positively to the site at Newton, and appreciated the proactive responses by the URA and the government to address pressing business needs. Subsequently, other interim office sites were sold at the city fringe.

Tender Award Systems Valuing Urban Design and City Identity

In the new millennium, Singapore strived to become a distinctive city with a unique identity. While urban design guidelines allowed private sector developers to respond to broad planning and urban design parameters, price-based competitive award methods, such as tender and auction systems, could not differentiate the quality of the architectural design for the development.

In 1997, the URA conceptualised a “two-envelope system” (a Concept and Price Revenue Tender system made up of one Concept envelope and one Price envelope) for GLS sites at strategic locations, in which non-price qualitative aspects of a proposed development are vital to the evaluation of the tender. In the prequalification process, business development concepts and architectural and urban designs of the sites were evaluated by a Concept Evaluation Committee (CEC), with sufficiently high-quality concepts shortlisted and qualified to be evaluated by bid price.

Following the 1997 financial crisis and weak economic conditions, the sale of residential and commercial sites on the GLS Confirmed List was suspended in the early 2000s. It was not until 2005 that a 2004 Reserve List parcel along Victoria Street was triggered for sale and became the first site sold under the “two-envelope system”. The site was offered for the development of an urban entertainment centre: the original development, Iluma, was later revamped and renamed Bugis+.

The system ensured that urban design and business concepts were emphasised, but it was expensive for participants to bid for these sites as the preparation and evaluation process was time-consuming. Only limited developments at iconic and strategic locations were sold using this system. Apart from the Bugis+ site, the system was used for the sale of the Collyer Quay site (Fullerton Heritage), the Beach Road site (South Beach), and the Stamford Road/North Bridge Road site (Capitol), facilitating the achievement of urban design excellence on strategic sites in Singapore’s built environment.

Marina Bay Sands Integrated Resort.
The Integrated Resort was developed on a GLS site sold via the Fixed Price Request for Proposal mechanism.

Image courtesy of Jason Goh.

Another tender award system used in the GLS programme which values concept and design is the Fixed Price Request for Proposal system. This system was used in an exceptional case – the 2005 sale of the two Integrated Resort (IR) sites at Marina Bay and Sentosa. As these two IR sites were of strategic importance to Singapore's development, especially in relation to the architectural designs and appeal to tourists, the land price was fixed upfront.[53] The concept and design, business strategy, and economic spin-off made up the selection criteria.

For example, the 20.6 ha IR site at Marina Bay, with a GFA of 570,000 m^2, had its land price fixed at $1.2 billion when the Fixed Price Request for Proposal system was launched in 2005. The selection was based on a combination of tourism appeal (40%), architectural concept and design (30%), development investment (20%), and the track record of the operator (10%). The site was awarded to Las Vegas Sands Corporation, and the unique design of Marina Bay Sands made it a major new landmark of Singapore. The Fixed Price Request for Proposal system had secured an outstanding product with multiple economic spinoffs and placed Singapore as an important international convention destination.

CHAPTER 4

PRICING PUBLIC UTILITIES AND SERVICES

> (Pricing water properly) was a difficult decision because very few countries have done it and it affects every household. But it is the way to make people take water seriously, take conservation seriously, to minimise wastage and abuse.

Lee Hsien Loong, Prime Minister of Singapore

In Singapore, the government applied market principles to price public utilities and services, create incentives, and shape consumer behaviour. Underlying the government's approach was a philosophy of long-term financial sustainability. This translated into aiming for cost recovery as far as possible, and this was implemented in a number of ways. Where there are existing markets, market pricing is generally applied to avoid unwarranted market distortions. In some sectors, such as healthcare, tiered copayment is applied to discourage excessive and unnecessary usage. At an operational level, the government has been constantly seeking ways to deliver public utilities and services in a more cost-effective manner, whether through mission-driven statutory boards or private sector partners.

Fees and charges set by the government are guided by three key principles put in place by the Ministry of Finance (MOF). The first is "the user pays" principle: costs should be fully recovered from users and cross subsidies should be minimised. Full costs can include direct costs such as labour, materials, and other operating costs, as well as indirect costs such as utilities, rental, supporting services, and cost of capital. Where justified, fees may be set higher than costs to discourage excessive usage, or set below costs to subsidise a merit good or service, such as education.

The second principle is "the Yellow Pages rule", which makes reference to the well-known business telephone directory. According to this principle, the public sector should assess the necessity of directly providing any goods and services that the private sector already provides, and which would be listed in this phone directory.[54]

The third principle is to "keep pace with cost changes": fees and charges should be adjusted in line with necessary cost changes, even as the public sector strives to be cost-effective. Nevertheless, when necessary, the government has frozen or capped increases in fees and charges. This occurred, for example, between 2007 and 2009: in 2007 when the Goods and Service Tax (GST) rate was increased from 5% to 7%; and in 2008 when the economy was in a downturn.

At one end of the spectrum, a market pricing approach usually accompanies deregulation. In the electricity sector, for example, contestable consumers – mainly large commercial and industrial users – can buy electricity in a wholesale electricity market, while households and small businesses continue to pay a regulated tariff.

Singapore also uses an economic formula approach to setting certain fees, such as public transport fares which are guided by the Public Transport Council's (PTC) fare review mechanism. This mechanism seeks to balance affordability for commuters with the commercial sustainability of operators such as SMRT and SBS Transit. Permit auctions (through the Vehicle Quota System) and usage charges (through Electronic Road Pricing) are also used to allocate vehicle ownership and manage road usage to relieve road congestion. The pricing of water is another prime example of the government applying the pricing mechanism for long-term sustainability.

WATER PRICING FOR COST RECOVERY AND DEMAND MANAGEMENT

Despite receiving abundant rainfall, Singapore is one of the world's most water-stressed countries. One key constraint has been the lack of land for water catchment areas. Flooding was a familiar occurrence in earlier years, while a prolonged drought in Singapore and neighbouring Johor, Malaysia, led to several months of water rationing during 1963 and 1964. In addition to the water supplied from local catchments, Singapore had historically imported water from Malaysia.

The supply of potable water by the national water agency, the Public Utilities Board (PUB), is an example of a self-financing approach, where operating and capital costs are recovered through user fees and charges. Unlike countries where subsidies for water consumption can lead to wasteful behaviour, in land- and water-scarce Singapore, the use of markets and price signals guides efficient resource usage and ensures financial sustainability. Rather than impose bans or fines, the government uses economic and price signals such as the water tariff and Water Conservation Tax (WCT) to guide consumer behaviour, and recovers the full cost of water production without broad consumption subsidies. At the same time, this is balanced with broader social considerations, such as the use of targeted financial assistance to help households cope with rising costs.

In 1963, the PUB was established as a self-funded statutory board under the Ministry of Trade and Industry (MTI) to take on the responsibilities of providing water, electricity, and piped gas. PUB had the mandate to charge for its products and services in order to recover its operating costs and raise funds for infrastructure investments. When the Ministry of the Environment (ENV) was formed in 1972, it took on the responsibilities for sewerage and drainage systems that had previously been implemented by the Public Works Department. In 2001, the sewerage and drainage departments of the ENV were merged with the PUB, making PUB the national water agency responsible for the entire water system in Singapore. At this time, the PUB was also transferred from the MTI to the ENV. To better reflect its expanded portfolio, the ENV was renamed the Ministry of the Environment and Water Resources (MEWR) in 2004.

Since the 1960s, the government has invested heavily in expanding Singapore's water infrastructure and resources to build up local water resources. As early as the 1960s, Singapore's first Development Plan set expectations that capital expenditure for water infrastructure would be at least partially recovered from the collection of water tariffs.[55] At that time, the water sector was split into three distinct categories – water supply, flood alleviation, and sewerage – with different levels of potential for cost recovery.

By early 1969, the government had completed expansion works at a cost of $27 million for the Seletar Reservoir[56], one of three existing reservoirs within the protected catchment in the Central Reserve area. With Singapore's first Water Master Plan drawn up in 1972, the PUB expanded Peirce Reservoir, and developed new unprotected water catchments

such as those in Kranji, Pandan, Murai, Poyan, Sungei Seletar, and Bedok. Waterworks, as well as distribution networks and storage facilities, also had to be upgraded and expanded.

Throughout the 1970s and 1980s, the PUB was setting new records in capital investment in infrastructure for utilities. By 1979, the PUB expected to spend $543 million over the next decade to develop schemes to increase water storage, treatment, and distribution.[57] In 1985, this expenditure increased to $250 million in expenditure for water development projects alone, from an overall investment budget of $873 million which also included electricity and gas projects.[58] The PUB also issued bonds, and took loans from the World Bank and Asian Development Bank to fund its rapid expansion.

Ministry of Environment's Kim Chuan sewage treatment works at Airport Road in 1983.

Image from the Ministry of Information and the Arts Collection, courtesy of the National Archives of Singapore.

Between 1993 and 1997, a further $533 million was spent to upgrade the water infrastructure.[59] At the same time, the ENV was responsible for developing, improving, and maintaining the sewerage and drainage systems, which were funded directly by the government through general tax revenues, as well as by the waterborne fee and sanitary appliance fee. This continued until the reorganisation of the PUB in 2001.

The water tariff was progressively increased to encourage water conservation and support the investments by the PUB (Exhibit 1). Properly pricing water required strong political commitment from the government, as acknowledged by the Prime Minister, Lee Hsien Loong: "(It) was a difficult decision because very few countries have done it and it affects every household. But it is the way to make people take water seriously, take conservation seriously, to minimise wastage and abuse."[60]

Water consumption had risen from an average of 88 million gallons per day (mgd) in 1966 to 114 mgd by 1972. Under the existing tariff structure at the time, domestic water was priced at a flat rate of $0.80 per 1,000 gallons (about $0.18 per m^3), meaning that the PUB was effectively subsidising every consumer. When a severe drought occurred in Singapore in 1971, Lim Kim San, Singapore's first Environment Minister and Chairman of the PUB from 1971 to 1978, initially favoured encouraging people to voluntarily save water; however, stronger measures were required. In 1973, the flat rate water tariff was replaced with a four-tiered water tariff scheme for domestic users. High volume users were charged higher rates to further discourage over-consumption. The tiered pricing scheme was later extended to the non-domestic sector in 1981 but subsequently removed from the non-domestic sector in 1986.

In the following years, the water tariff continued to see several price hikes, which consumers, unsurprisingly, found difficult to accept.[61] In the face of rising water consumption, however, it was considered a more palatable solution than resorting to water rationing. By 1986, there were three tiers for domestic water users – $0.53 per m^3 for monthly consumption below 20 m^3, $0.75 per m^3 for monthly consumption between 20 and 40 m^3, and $1.10 per m^3 for monthly consumption over 40 m^3. Non-domestic users were charged a uniform tariff of $1.10 per m^3.

EFFICIENT WATER PRICING FOR LONG-TERM SUSTAINABILITY

In 1991, the government introduced a Water Conservation Tax (WCT) to be levied on top of the water tariff to encourage water conservation. The rationale was that, while charging cost recovery rates through the water tariff covered the cost of meeting water demand, it did not fully reflect the scarcity value of water in Singapore. The WCT was initially levied at 5% on households consuming more than 20 m^3 per month, with 10% levied on water usage by non-domestic and shipping sectors.[62]

Despite the imposition of the WCT and other measures such as public education campaigns to save water, Singapore's daily per capita water consumption continued to grow unabated, reaching 172 L per capita per day in 1995 (Exhibit 2). Water remained subsidised for the domestic sector at the time; however this could not be sustained over the long term. A water pricing review was initiated in 1997 by then Deputy Prime Minister, Lee Hsien Loong, who had previously overseen PUB as Minister for Trade and Industry. The water pricing review introduced the economic concept of long run marginal cost pricing to maximise efficiency. This meant that the water price should not only allow for the full recovery of production and supply costs from the water tariff, but it should also reflect the marginal cost of producing the "next drop" of water, after all the rainwater had been used. The costs associated with production and distribution range from the rainwater collection, reservoir management, raw water treatment, NEWater production, desalination, and maintenance of the islandwide network of distribution pipes for treated water, to the operation and maintenance of public sewers and treatment of used water.

Translating the pricing concept into implementation, however, posed some difficulties. NEWater – ultrapure reclaimed water – was not yet available on a large scale. The PUB's former Deputy CEO for Policy and Development, Chua Soon Guan, elaborated, "(Estimating the marginal cost) was not so straightforward. In 1997, before NEWater was introduced, the next drop was actually desalination. At that time, the available technology was the traditional distillation or flash distillation, which used heat to evaporate the water and leave salt behind. It may seem simple, but actually it was very expensive because you would need to use a lot of energy to heat up the seawater. But at that time, it was the only source of the next drop of water (after using all the rainwater) that we had. So, we priced the next drop based on the cost of flash desalination. But the cost was easily more than $3 per m^3."[63]

Eventually, the water price, including the WCT, was revised to about $2 per m^3 for the higher domestic tier. As the water price charged was pegged to the long run marginal cost and would exceed the production and supply costs (average cost) incurred by the PUB, it was felt that the difference should be collected as a tax, specifically in the form of the WCT, and accrue to government revenues, rather than PUB, a self-funded statutory board. In this way, the PUB could continue to cover its costs without being seen as making "excessive" returns, while the WCT could be channelled to wider benefits. The water price is also reviewed regularly by the PUB – although not necessarily implemented as price changes – based on the anticipated investments required in the long term under the Water Master Plan for Singapore.

Exhibit 1:

Changes in Water Tariff since 1972

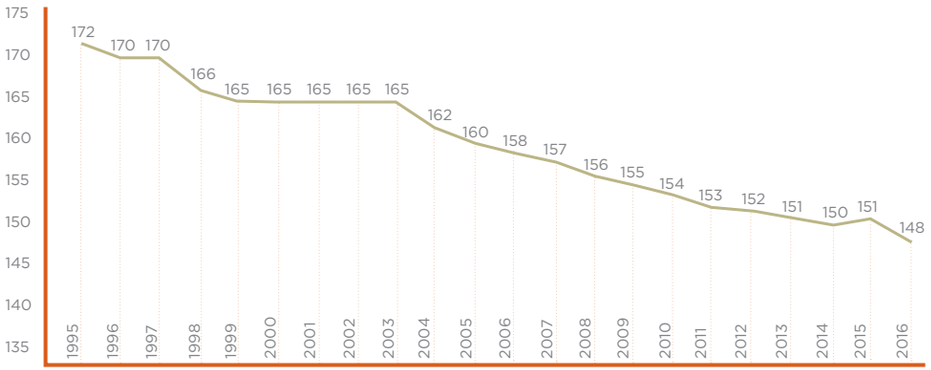
Category	Tier (m^3 per month)	Water Tariff ($ per m^3)										
		1972	1973	1975	1981	1983	1986	1993	1997	2000	2017 (from 1 July)	2018 (from 1 July)
Domestic	0 – 20	$0.18	$0.22	$0.30	$0.35	$0.24	$0.53	$0.56	$0.73 (10%)*	$1.17 (30%)	$1.19 (35%)	$1.21 (50%)
	20 – 25				$0.45	$0.57	$0.75	$0.80 (10%)	$0.90 (20%)			
	25 - 40		$0.26	$0.40								
	40 - 50				$0.75	$0.95	$1.10	$1.17 (10%)	$1.21 (25%)	$1.40 (45%)	$1.46 (50%)	$1.52 (65%)
	50 - 75		$0.33	$0.50								
	>75		$0.44	$0.66								
Non-domestic	0-5000	$0.33	$0.44	$0.66	$0.75	$0.95	$1.10	$1.17 (15%)	$1.17 (25%)	$1.17 (30%)	$1.19 (35%)	$1.21 (50%)
	>5000				$0.85	$1.10						

Note: The Water Conservation Tax rate applicable at various tiers is indicated in brackets.
Source: The Centre for Liveable Cities, Singapore. (2012). Water: From Scarce Resource to National Asset. Urban Systems Studies Series. Singapore: Cengage Learning Asia; Tortajada, C. (2006). Water Management in Singapore. Water Resources Development, 22, 227-240; the PUB website.

Exhibit 2:

Domestic Water Consumption in Singapore from 1995 to 2016

(per capita household consumption in litres per day)



Source: The PUB. Annual Reports, various years.

Underlying the price review was the government's push for a sustainable and secure water supply. Singapore was reliant on the limited supply from domestic catchments and imported water from Johor, while water consumption remained stubbornly high. NEWater and desalination had yet to be proven as economically feasible. The precarious water situation was a cause for deep concern within the government. Chua elaborated: "When we price water, it is to reflect the full incremental cost of producing more potable water (likely by desalination and NEWater), so that consumers are conscious of the scarcity value of the water they use. The revision in water price will also enable the PUB to cater to future demand, strengthen Singapore's water security, and continue to deliver a high-quality and reliable supply of water."[64]

As a statutory board holding a monopoly in water supply, the PUB has to address the tensions between its two main roles – generating revenue for financial sustainability at the agency level, while promoting water conservation for the national agenda. When a number of statutory boards such as the Telecommunications Authority of Singapore were corporatised or privatised in the 1990s, the government also considered the PUB as a candidate for privatisation. Eventually, the gas and electricity supply functions of the PUB were liberalised, but the water portfolio remained with the statutory board. Former CEO of the PUB, Khoo Teng Chye, explained: "The bottom line is important for efficient operations, but that's not (the PUB's) main concern. And that's one reason I guess the PUB did not corporatise, because we felt that it has a strategic role to play."[65]

The water pricing formula was restructured gradually over a four-year period starting in 1997. The WCT was adjusted to be imposed from the first drop, as a percentage of total water consumption. By 2000, the water price was increased to $1.52 per m^3, comprising the water tariff of $1.17 (for monthly consumption not exceeding 40 m^3) and the WCT of $0.35.[66] When NEWater was launched in 2002, it provided another source of water. However, the production of NEWater is limited by the amount of used water collected and, to exceed this limit, desalination is still required in the longer term. Hence the computation of marginal cost – the cost of the "next drop" – considered the costs of both methods. NEWater itself, which was supplied primarily to industrial users such as wafer fabricators, was exempted from the WCT.

The new water pricing structure appeared to have some impact on reducing water consumption, which fell to 165 L per capita per day in 1999, and has since been on a general downward trend (Exhibit 2). Fiscal incentives were also provided to industrial consumers to encourage them to install water conservation facilities.

Other non-economic measures have played a part in conserving water and sustaining the PUB's revenues, such as the minimisation of unaccounted-for water (UFW) which arises from water loss from leaks, illegal draw-offs, inaccurate metering, improper accounting, etc. Between 1990 and 2007, by replacing old pipes, using better pipe materials, optimising pipe pressure, and active monitoring of leaks, UFW was reduced from 9.5% to 4.4%. This translated into $200 million from water sales that would otherwise have been foregone.[67] Non-economic initiatives to reinforce the water conservation message included the compulsory installation of water-saving devices such as constant-flow regulators and self-closing delayed action taps in non-domestic premises, and low-capacity flushing cisterns in residential premises.

Currently, the water pricing formula is made up of three components – a water tariff (that accrues to the PUB to fund the cost of water production and distribution); WCT (to encourage water conservation and which accrues to government revenue); and a volumetric waterborne fee and sanitary appliance fee based on the number of sanitary units (collected by the PUB to offset the cost of operating and maintaining the sewerage system). This pricing model has enabled the PUB to finance its operating costs, as well as a large portion of its investments in the water and used water infrastructure through its capital reserves. The long run marginal cost of water has been reviewed by the PUB. Additionally, the PUB has issued bonds to finance its capital expenditures.

Following a hiatus of 17 years, the government announced that the water price would be increased by 30% over two phases in 2017 and 2018 (Exhibit 1). This round of increase was attributed to the rising cost of developing and operating the water supply system – such as costlier desalination, higher treatment costs for used water, and water pipes that cost more to build and replace, especially where more tunnelling was required – in order to secure water supplies before Singapore's second water agreement with Malaysia expires in 2061. Much of the low-hanging fruit of new technologies such as NEWater and desalination had been reaped, while emerging technologies needed time before they could be proven to be commercially viable. Between 2000 and 2015, the PUB invested $7 billion in water infrastructure, an average of about $430 million every year, and this was anticipated to almost double to $800 million every year between 2017 and 2021.[68] The sanitary appliance fee was also subsumed into an increased waterborne fee.

The pricing approach is also moderated by broader social interventions. Through the GST voucher scheme known as Utilities-Save (U-Save), the government provides lower and middle income Singapore households in public housing with quarterly rebates to offset their utilities bills. The rebates were distributed to some 840,000 households in 2016. Ranging from $180 to $260 annually, the rebates can help offset, on average, about three to four months of utilities bills.[69]

Some investments, which were considered more akin to public goods[70] and benefited society broadly, were funded directly by the government. One example is the stormwater drainage system throughout Singapore; its use cannot be tied to any specific users. Another example is the Deep Tunnel Sewerage System (DTSS) which was partially funded by the government. The DTSS served as an underground superhighway for used water which streamlined the collection, treatment, and reclamation of used water at centralised water reclamation plants, and freed up land for other uses. Completed in 2008 at a cost of $3.4 billion, Phase I of the system consisted of a 48-km-long, deep sewer tunnel running from Kranji to Changi (the Changi Water Reclamation Plant), two deep sea outfall pipes, and 60 km of link sewers.[71]

Similarly, the capital expenditure on the sewerage network – which is needed to safeguard public health – has been borne by the government through its operating revenues. However, the volume of used water, and hence the volume that required treatment, could be determined by individual water users. In this case, the PUB collects waterborne fees and sanitary appliance fees to offset the costs of treating used water and maintaining the used water network.

CHAPTER 5

ROLE OF GOVERNMENT-LINKED CORPORATIONS IN URBAN DEVELOPMENT

> When we accelerated the building programme to build 25,000 to 30,000 flats a year, there were not enough supplies of building materials in the market. The only solution was to create our own resources for the essential building materials.

Yao Chee Liew, former Deputy CEO (Building and Development), HDB

THE HOUSING AND URBAN DEVELOPMENT CHALLENGE AND THE ROLE OF GLCS

In 1959, the incoming People's Action Party government faced a severe housing crisis which was inherited from previous administrations. From 1947 to 1960, 20,907 units of public housing had been built by the Singapore Improvement Trust, a housing agency established by the British colonial administration. These were insufficient to house Singapore's population of about 1.6 million in 1960. Most Singaporeans then lived in rented sleeping cubicles, urban slums, or squatter settlements.

The Housing and Development Board (HDB) was established by the government in February 1960 to ramp up the speed and scale of public housing construction. Under the leadership of its first Chairman, Lim Kim San, the HDB built 54,000 flats during its first five years of operation. These flats were small and basic, but had piped water and clean sanitation, and provided a hygienic living environment. Within a brief timeline of 10 years, the HDB had resolved the housing crisis.

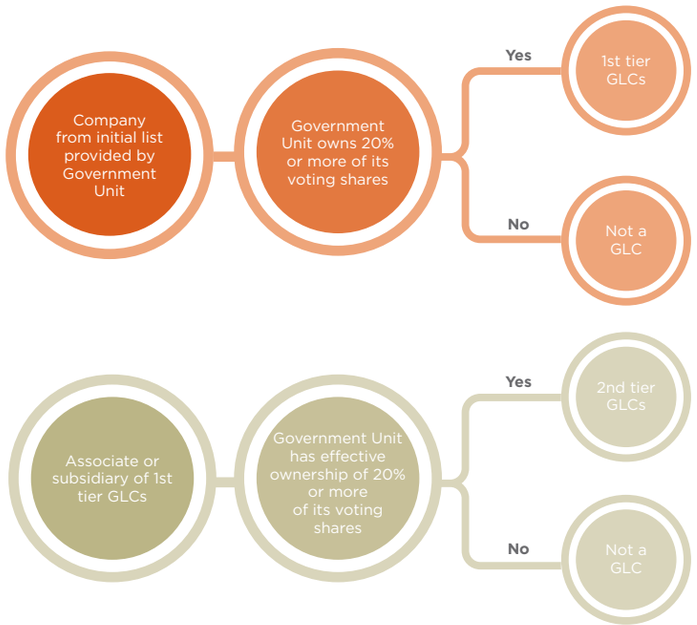
The speed of the HDB's success is even more impressive considering the challenges and crises it faced: thorny issues such as land acquisition and resettlement; public suspicion of living in high-rise places; and crises such as the Bukit Ho Swee fire on 25 May 1961, which destroyed thousands of huts at a squatter settlement and left 15,000 people homeless. Responding swiftly, the HDB built many low-cost flats in just nine months, and 8,000 more flats over the following four years.

The HDB's successes are commonly attributed to several factors, including its sole responsibility for public housing and the far-reaching mandate from then Prime Minister Lee Kuan Yew, which allowed effective resource planning and land supply; its management of the entire supply chain from design and planning, land clearing and site preparations, to construction and sale; and the strong support it received from other government agencies such as the Public Works Department (PWD) and the Public Utilities Board (PUB).

Another less-often cited factor in the success of Singapore's rapid housing and infrastructure construction was the government's willingness and ability to establish state-owned and government-linked corporations (GLCs) to undertake activities also carried out by the private sector, to supplement the capacity and capabilities of the private sector, and to take on risky functions for which the private sector was not equipped. These GLCs did not have a very visible public profile – as Singapore Airlines or DBS Bank had – but they collectively made significant contributions to Singapore's built environment.

Exhibit 3:

Definition of a Government-Linked Company[72]



Statutory boards at the time would supplement the private sector's limited production and service capacity by undertaking activities such as material production themselves. There were relatively few experienced local private building consultants at the time, so the PWD served as an in-house construction engineering and design consultant to most government ministries and agencies, except for the HDB which had its own technical capabilities. The HDB also produced industrial products such as steel rods, tiles, bricks, sand, granite, and concrete, and provided heavy duty construction equipment for lease to smaller contractors.

Former Deputy CEO (Building and Development), Yao Chee Liew, joined the HDB in 1963 and retired in 1998. He recalled the early years when there was an acute shortage of public housing in Singapore and how the HDB rapidly built its capabilities to achieve the goals of the Home Ownership Scheme:

> *"At that time HDB was a one-stop shop. When we accelerated the building programme to build 25,000 to 30,000 flats a year, there were not enough supplies of building materials in the market to meet such high demand. The only solution was to create our own resources for the essential building materials, namely coarse and fine aggregates commonly known as stones and sand.*
>
> *For coarse aggregates we set up the Mandai granite quarry, one of the biggest in South East Asia. For concreting sand we opened a mechanised sand quarry in Bedok area where the sand content in the soil was more than 70%. In fact we kept digging and from a hill it became a reservoir, now known as Bedok Reservoir. We also set up a brick factory in Bukit Batok to produce modular facing bricks in order to promote modular dimension designs for HDB flats.*
>
> *Apart from building materials, on many occasions we needed to exhume thousands of old graves and cremate the remains for New Town development. Because of the sheer volume ... no crematoriums in Singapore, both public and private, were in the position to meet our needs as they were designed to cater for fresh bodies only. Therefore we had no choice but to design and build a crematorium and a columbarium in Mandai for the ashes and remains. As you can see, work in HDB was very challenging and exciting."*[73]

The large scale and rapid building of infrastructure and housing undertaken by the PWD and the HDB could not have succeeded as well if not for the institutional flexibility allowing them to undertake resource production activities themselves.

Apart from this, the government also established companies in the areas of housing and development. There were many such companies, but this section will focus on two – the Resources Development Corporation (RDC) and Pidemco – to illustrate the operations, roles, and cultures of GLCs at the time.

RESOURCES DEVELOPMENT CORPORATION

In the 1970s, the government became concerned about increases in the prices of construction and building materials despite sluggish growth in construction demand. The Resources Development Corporation (RDC) was incorporated in 1976 as a wholly-owned subsidiary of the Ministry of National Development Holdings (MND Holdings). The RDC's key focus in the 1970s and 1980s was to ensure the adequate supply of building materials such as sand, crushed granite, and asphalt premix to support government construction projects, including those by the HDB and the PWD.

The RDC also took over the management of several state quarries that produced granite and sand. These quarries were located at Gali Batu in Woodlands, Pulau Ubin, and Bukit Timah. In turn, the RDC managed the overall site safety and operations, and sublet the mining and blasting work to private contractors. Despite the safety precautions taken, this was specialised and sometimes hazardous work. The HDB and its building contractors would purchase raw building materials, such as stones, from the RDC for use in the construction of the HDB flats and for supporting infrastructure such as walkways.

Bukit Timah Quarry in 1988.

Image from the Ministry of Information and the Arts Collection, courtesy of the National Archives of Singapore.

In the early 1980s, the RDC stepped up production following a capital injection from the government. Production volumes for bricks, sand, and quarry products doubled from 1980 to 1983. The RDC increased its capacity by installing larger rock crushers at the quarries and seeking additional engineering manpower from neighbouring countries, including Indonesia and the Philippines, to make up for manpower shortages in Singapore.

Apart from domestic quarries, the RDC sourced building materials from outside Singapore as part of its commercial needs. Former RDC Managing Director, Quek Teo Heng, recalled:

> *"So we had to go to several islands and sources in the region. I was with my manager in a little sampan boat, going round the islands, hopping from one to the next. I think back about how my role as MD of the company involved all these tasks, and nobody even asked if I could swim or not! But we took the job seriously."*[74]

Eventually, the RDC identified a suitable Indonesian joint venture partner for sand and materials supplies, so these efforts were not in vain. The RDC also sought alternatives to traditional building materials; for instance, substituting crushed granite fines for sand in the manufacture of premixed concrete. This worked for low-grade concrete, but not for higher-quality concrete required for multistorey construction.

By the 1980s, the RDC had begun to participate, as a subcontractor and material supplier, in government infrastructure construction projects, ranging from roads and airports to schools and the Mass Rapid Transit (MRT) subway. For instance, RDC collaborated with Japanese companies such as Sato Kyogo to build stations and raised structures for the MRT system. The RDC supplied precast concrete beams and building materials, while its foreign partners provided the bulk of the engineering and construction capabilities and expertise. The RDC also worked with other foreign companies of the 1980s, including Kumagai Gumi, for instance, to construct buildings at the Nanyang Technological University (NTU) for staff accommodation. This was the RDC's first building contract, as it had previously focused on constructing roads, bridges, structures, and drainage.

At this time, the HDB was developing expertise in precast technologies through collaboration with foreign engineering companies such as White Industries (Australia), GTM Coignet (France), SGE (France), Shimzu (Japan), Daewoo (Korea), and Partek (Finland). The RDC likewise supplied these companies with materials such as crushed aggregates and stones. The HDB also engaged two world-renowned experts in precast technology, Dr CW Yu and Dr Alfred Yee, to catapult its technological advancement.

Relations with Private Contractors

As a private company, the RDC was able to make commercial decisions more flexibly and quickly than large statutory boards like the PWD and the HDB. It was not bound by the same tendering and procurement processes as government agencies, but was responsible and accountable to its Chairman and board for its financial performance and compliance with applicable laws and regulations. This flexibility and speed allowed the RDC to get things done quickly.

Relations between the RDC and private contractors were occasionally rocky, as the RDC was often successful in outbidding other contractors. There was some unhappiness on the part of private contractors because the RDC had its own concrete plant and its own quarry, whereas most other contractors had to buy stones from the RDC or from Malaysia. Ultimately, however, commercial considerations prevailed, and the RDC and its competitors grew together. Quek Teo Heng recalled:

"There was one incident in the early 1980s, when all the private contractors boycotted the PWD tender for the annual contract to lay asphalt premix. The RDC was the only company to tender, and won all the contracts for the whole island. We were in trouble because our plant could not handle the production capacity. We managed to talk with our competitors, and sublet some of the work to them. They had to survive too, so they accepted the deal.

RDC also worked with many subcontractors. And we took our hats off to these people. They were really good. They initially didn't know anything but they learnt and did the job. All of them became very successful. For instance, when I first started at RDC, one contractor was a lorry driver who transported ready-mixed concrete. Later he founded a company, Woodlands Transport, and became very successful. You see his trucks everywhere. We all started out together. And when we grew, they grew also."[75]

Because the RDC had its own quarry and was able to submit very competitive bids, private companies and contractors knew that they could not tender too high a price for government contracts. This helped to keep construction industry costs lower. By ensuring an adequate supply of construction materials, the RDC also helped to prevent Singapore's housing and infrastructure needs from being held hostage by local or foreign suppliers of materials.

Construction of HDB flats at Nee Soon in 1983.

Image from Ministry of Information and the Arts Collection, courtesy of National Archives of Singapore.

Transparency and Non-corruption

Many RDC employees were former staff of government agencies such as the PWD, and drew upon their years of experience in building and public works. However, to avoid any possible accusations of bias, the RDC employees were treated just like any other private contractor, and had no special relationship with the Ministry of National Development (MND) or the HDB. The MND did not interfere with the RDC's operations and activities. While the MND appointed a representative to the RDC's Board of Directors (in line with accepted practice by a major shareholder), there was no direct line of reporting from the MND to the RDC, and the RDC made its own commercial decisions.

How did these former government officers navigate the boundary between the public and private sectors? Quek Teo Heng's candid and sincere response suggests that the answer lies not in rules, legislation or organisational structure, but rather in the values and culture of its people:

"Actually, to be honest, I also don't know [how we stayed relatively corruption-free]. Those days, we're asked to do, we just do. That's all. In the early days – around 1953 – I worked for the colonial government. My bosses were all British. In Singapore, we've got very obedient civil servants. When you're told to do a job, you just go and do it. In the early days, when you work with the government, it's a prized job. So we valued our jobs.

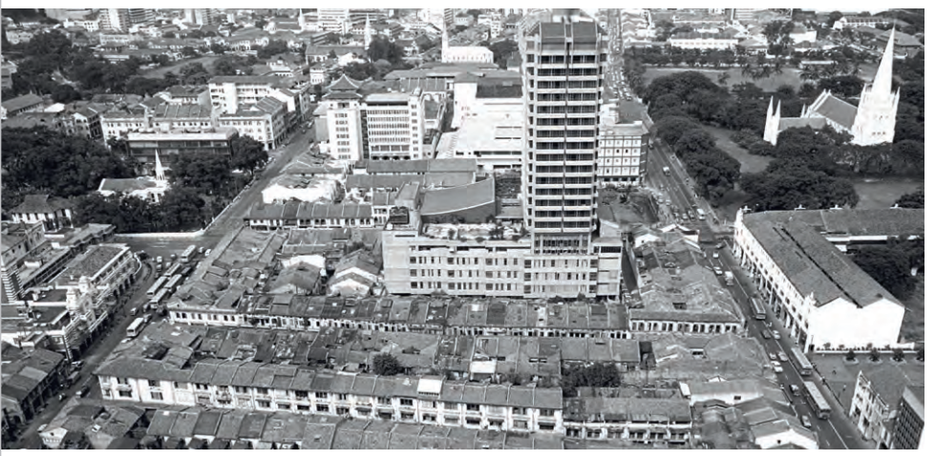
Corruption was a problem in some parts of the industry but we didn't get involved in any of this. Actually, even though I was in RDC, my work culture was like it was in the government. Every public project we did had to be awarded via competitive tender, and there was no special treatment for RDC. The lowest bidder got the contract."[76]

PIDEMCO

In the 1970s and 1980s, the Urban Redevelopment Authority (URA) built various resettlement centres for businesses, including Beauty World, Funan Centre, Blanco Court, and Cuppage Centre. These centres housed the many small and medium businesses whose premises or land had been acquired by the state for public purposes such as comprehensive redevelopment.

However, the transition from shophouses and makeshift stalls to bright, modern shopping malls with glass shopfronts was not smooth for many small merchants and businesses. They were not used to such premises,

and many did not know how best to display their goods, or how to promote themselves to customers. Eventually, the government decided to compensate commercial resettlement cases in cash, rather than with alternative shop units in resettlement centres or the HDB towns.



Shophouses along Hock Lam Street and Chin Nam Street in 1976, before being cleared for redevelopment.

Funan Centre, a URA resettlement centre, was built over the site in the early 1980s. Some of the businesses in the shophouses were temporarily relocated to the nearby Capitol Shopping Centre built by the URA.

Image from the Ministry of Information and the Arts Collection, courtesy of the National Archives of Singapore.

Funan Centre at Hill Street in 1989.

Image from the Ministry of Information and the Arts Collection, courtesy of the National Archives of Singapore.

In 1989, the URA, reconstituted as Singapore's land use planning and development agency, formed Pidemco, an acronym of "Property Investment, Development and Estate Management Company", to hold and manage those commercial properties formerly owned by the URA.

"Pidemco was not the result of any grand strategy or policy", reflected the first Pidemco Holdings Chairman, Prof Hong Hai. "Over the years, the URA had inherited many buildings, many of them fairly old. These properties collectively were worth several billion dollars, and they wanted to manage this portfolio on a commercial basis. The URA wanted to concentrate on its regulatory functions. And so they set up a company – Pidemco – to separate and corporatise the property ownership and management functions."[77]

Pidemco sent the URA regular updates and reports, but otherwise the URA did not intervene in Pidemco's day-to-day management. Prof Hong explained that the board and management were given a lot of autonomy: "There was an understanding. URA appointed the board so the board is in charge." Where appropriate, Pidemco's management took bold decisions such as divesting and redeveloping properties, re-branding, or entering new market segments such as property development. Pidemco rejuvenated many of these buildings, such as renovating and rebranding Funan Centre into a successful information technology (IT) and electronics mall.

Nonetheless, as a wholly-owned subsidiary of the URA, certain sensitivities had to be managed appropriately. Pidemco had to make decisions on a commercial basis, but could not be brutally commercial. Prof Hong Hai explained:

> *"I don't remember doing anything that was not commercially viable for the sake of 'national service'. But because we were owned by URA, there was some expectation that we would still not be 100% commercial within Singapore. When we raised rents in some of the buildings we owned, I remember getting a note from then Finance Minister, Richard Hu, suggesting that we should not raise rents so sharply. Actually, we were just raising it to market level, but people would complain to their Members of Parliament that the government was raising their rent. So we were a private company, with some constraints, but they were not crippling constraints. After a while, people got used to the idea that the government charged market rates, and sometimes even higher-than-market rates.*

The other thing was that our management team was made up of largely former civil servants. We couldn't really have a freshly fully-commercial background because they were transferred from the URA. In the beginning, they were a little bureaucratic, but as time went on they turned out to be very good."[78]

WORKING WITH PRIVATE COMPANIES IN PUBLIC HOUSING DEVELOPMENT

The RDC and Pidemco were both GLCs, but they were established for very different reasons – the former, to carry out commercial roles that the private sector could not perform at the required scale; the latter, to ensure commercial discipline and management over assets previously owned by the state. Evidently, GLCs served a variety of functions, and allowed the government to calibrate a bigger or smaller role for markets as circumstances changed.

Apart from establishing GLCs, which were substantially or wholly owned by the state, the Singapore government also introduced various policies and initiatives to work with private companies, in the area of construction and urban development.

As Singapore's biggest purchaser of construction materials and services, the HDB spearheaded various initiatives and programmes in the 1970s and 1980s to enhance the expertise and professionalism of the construction sector. The HDB maintained stockpiles and production units that supplied its contractors with materials such as bricks, cement, steel rods, and tiles. For instance, by 1974, the HDB's brick plant was the largest in Southeast Asia, and, by 1982, had established its first mechanised sand quarry with a monthly capacity of 200,000 tonnes.[79] The HDB also provided interest-free financing to help smaller contractors compete for their projects, subject to a loan cap of one-fifteenth of the contract value.

At the same time, the government established the Construction Brigade in 1981 as part of civil defence. The initial group of 1,500 enlistees underwent a nine-month trades training course, and worked on construction sites for 18 months with full market wages. Shortly after, the Ponggol Technical Institute was upgraded and renamed the Construction Industry Training Centre in 1983. These initiatives encouraged the development of a Singaporean construction industry workforce.[80]

Other policies helped to raise industry standards. In 1973, the HDB introduced the Merit Star Scheme to reward private contractors with high professionalism and efficiency. Firms with consistently good performance were awarded stars. Each star provided a 0.5% tender preference, capped at a maximum of five stars, which meant that a Merit Star company could be awarded an HDB contract even if its bid was slightly higher than a competitor with no stars. HDB would also remove contractors' stars if they performed badly.

In 1982, the Core Contractor Scheme offered HDB-registered contractors who had at least $500,000 paid-up capital and a minimum of five Merit Stars a guaranteed minimum workload of 1,000 flats per year for a period of three years. This scheme was based on similar successful schemes in Japan and South Korea. It provided the HDB's Core Contractors with more certainty and predictability of workflow, giving them the confidence to make capital investments and employ qualified workers.

Both the Merit Star and Core Contractor schemes were terminated in 1988 and replaced with a scheme whereby contractors could bid for a package of three building projects to be delivered over a 40-month period, thereby also providing some stability of workflow.

WORKING WITH MARKETS TO ESTABLISH PREFABRICATION TECHNOLOGY

In 1980, the first successful prefabrication contract was awarded to build three and four room flats in Hougang, Tampines, and Yishun. Prefabrication technology involves the production of building components off-site in factories, and then transporting them on-site for assembly. This was a turning point in the Housing and Development Board's (HDB) building programme, greatly reducing dependence on manual labour and increasing site productivity. The Pinnacle@Duxton achieved an engineering breakthrough, as almost the entire 50 storey building was modularised and prefabricated off-site.

Briefing on prefabricated and conventional construction works at the HDB's Bukit Panjang site in 1985.

Image from the Ministry of Information and the Arts Collection, courtesy of the National Archives of Singapore.

However, former HDB Deputy CEO (Building), Sng Cheng Keh, explained that this did not happen overnight or by accident. It was the product of a long journey by both the HDB and private sector contractors, working together to build capacity and expertise. HDB first tried to introduce contracts for prefabrication work in the 1960s, but this did not take off due to the high upfront capital expenditure required to purchase the forms needed to cast the building components.

As construction productivity issues became more pressing in the 1970s, the HDB tried again. The goal of prefabrication was to reduce reliance on transient foreign workers, and to minimise the on-site work that required skilled workers. However, prefabrication required more capital and know-how. Local contractors did not have the capital, expertise, or risk appetite to supply precast concrete, so the HDB sent their engineers and architects overseas to the United Kingdom to study. By the mid-1970s, however, this second attempt had also failed because the required facilities and equipment were beyond the means of most contractors.

In the 1980s, the HDB attempted yet another round of prefabrication contracts; this time with support from a range of firms from Australia, France, Japan, and Korea, among others, and some local contractors engaged in partial prefabrication building. Through mutual learning and research, the HDB and its contractors acquired the skills required to use prefabrication in the construction of buildings.

Former HDB Chief Structural Engineer and Deputy CEO (Building Group), Lau Joo Ming, recalls the balance of the HDB's engagement, support and, finally, withdrawal from the market that led to success:

> *"I was heavily involved in structural work. Through my designs, I made the components more buildable. Back then, there were few examples of prefabrication in Singapore, so HDB had to provide guidance with the designs.*
>
> *We moved to prefabrication partly due to cost savings. HDB budgets are very sensitive, because the selling price must be affordable to the target group. If construction costs keep rising,*

WORKING WITH MARKETS TO ESTABLISH PREFABRICATION TECHNOLOGY

Continued ...

we will have problems. So we try to aggregate orders for materials like sand and granite to lower the cost. But we cannot be a 'hero' for too long, or people will start seeing us as a villain.

We really worked with the contractors. In the 1970s and 1980s, we did a lot to move them towards precast formwork. HDB invested in the modular metal forms, and then rented them out to contractors. We even went to China to source cheaper metal forms.

So we actually went into the market to do R&D through design, procurement, and even to running things ourselves. Along the way, some of these contractors really grew with us. But HDB also needs to know the best time to move out of the market. After some time, once the contractors gain confidence and experience, the enterprising ones will want to use their own forms, and do things themselves."[81]

Sng described the importance of open and transparent engagement, while staying impartial and professional:

"We met our contractors and suppliers regularly, informing and working with them on our Building Programme. We gave them advance information, such as the number of units to be built, the building resources and skilled workers required for the next few years. This allowed them to plan and allocate resources to meet our needs and provide feedback.

We set clear priorities - quality, cost effectiveness, constructability, maintainability, and construction safety. If the contractors proposed alternatives, they had to satisfy these key considerations. Their proposals should also be tested and used under local conditions. Any proposed new technologies, systems or construction materials, if accepted, would be tested on a pilot basis before implementation on a wider scale as part of HDB's risk management.

We worked with the contractors and suppliers on construction productivity and site safety concerns, as well as addressing ground issues such as the capacity of precast component suppliers, lack of experienced tower crane operators, or even skilled tilers.

Overall, it is regular communication and engagement with contractors and suppliers that helps HDB fulfil its commitment to provide quality and affordable public housing."[82]

The Pinnacle@Duxton.
The building complex was largely prefabricated off-site.
Image courtesy of William Cho.

Driving Industry Innovation

While the term 'innovation' was not commonly used in the 1970s and 1980s, the HDB evidently played a significant role in the promotion of research and innovation to solve building challenges and meet building needs. As a large-scale producer with economies of scale, the HDB was perfectly positioned to mainstream new technologies throughout the industry, through its own adoption of such technologies.

HDB, the Building and Construction Authority (BCA), and the MND allocated some funding for promoting research and development (R&D). Apart from financing, former HDB Chief Structural Engineer and Deputy CEO (Building Group), Lau Joo Ming, emphasised the mutual interdependence of the HDB and the private building and construction sector, and the role of the HDB in building R&D:

> *"Along with delivering sufficient flats, we have to upgrade the industry – so that we can deliver, so that the quality is there, so that the productivity is there, so that the capacity and capability are there. We never give up this challenge – upgrading the industry, increasing productivity, improving the quality, these were part and parcel of our mission.*
>
> *To encourage innovation and adoption of new technologies, HDB established Construction Technology Private Limited (Contech) in 1980 to pioneer the use of new equipment and systems, and demonstrate their effectiveness to private contractors.*
>
> *We have our own R&D centre; I call it the 'Master Lab'. We can look at design problems and bring in expertise from universities, with our architects and engineers. After that, we can try to replicate the solution within Singapore, or even outside the country. We have done work on areas like solar panels, lift upgrading, and ways to make HDB flats cooler. We worked with companies, and innovated together, and then with the suppliers to develop jointly and bring the products here. So the patent may be a joint patent, but we leave the commercialisation to them."*[83]

Other examples of incentive-driven partnerships with the building industry included the BCA's Green Mark Award, to encourage higher efficiency and sustainability in building design and construction. This encouraged and rewarded the private sector to see itself as a key partner of the government in the move to save resources and costs.

While seeking to build up domestic companies' expertise, Singapore did not neglect the important role of foreign companies with better technology and skills. Almost all PWD and HDB tenders were open to all qualified bidders, both foreign and local. Many local contractors were displeased, because large foreign companies that were supported by their own governments also submitted bids. There was little choice, as the smooth completion of large infrastructure and building projects had to take priority. Foreign firms were involved in a variety of major projects, from land reclamation to sand filling, prefabrication contracts, and the planning of major infrastructure such as airports.

PRIVATISATION, CORPORATISATION, AND THE CHANGING STATE-MARKET RELATIONSHIP IN THE 1980S TO 2000S

While agencies such as the HDB, the PWD, and the URA sometimes built up mutually beneficial but arm's length relationships with private companies, some companies expressed unhappiness with the dominant role of GLCs in several sectors of the economy. For instance, in the 1970s, the Singapore Contractors Association frequently complained that the government was competing against them through its GLCs.

A turning point came in the wake of an economic recession in 1985-1986, which resulted in the bursting of a construction bubble in Singapore that had built up steadily during the early 1980s. Property prices plunged, the construction industry shrank drastically with the loss of 23,400 construction jobs in 1986, and prices of building materials fell. Competition for projects was fierce, and the value of projects awarded dwindled. The government accelerated many public projects and infrastructure works to support the construction sector, but private sector involvement was weak.[84]

Despite the weak economy, most GLCs were not a drain on public finances. At the end of 1985, only seven of the 71 first-tier[85] GLCs which were in full operation had accumulated losses. Nonetheless, the government believed that it was time to divest some of its stake in state companies. The high-level Economic Committee outlined the shifting economic circumstances within Singapore, and the need for privatisation and divestment to allow a broader role for the market:

"While Singapore has always been a free enterprise economy, the free enterprise has not all come from the private sector. The government, through government-owned companies, has directly invested in some sectors of the economy – SIA, DBS Bank, and defence industries. By and large, these companies have thrived and prospered, in fair competition with the private sector. They have contributed significantly to the growth of the economy.

However, now that the companies have succeeded, the government should have no parochial interest in them. Provided they continue to be profitable, well-run companies, it makes no difference to Singapore whether they are owned and managed by the government or by the private sector. To the government, the advantage of selling off these companies, for a fair price, will be that civil servants can be freed to concentrate on their primary jobs of administering the country, instead of diverting their energies to running the companies. It will also put an end to complaints from the private sector about special treatment and unfair competition, which will arise no matter how correctly the government companies are dealt with. The government's intention to divest itself of these companies is therefore a wise one."

Shortly after, in 1987, the Public Sector Divestment Committee (PSDC) outlined a proposed approach for the divestment of a significant number of GLCs. Forty-one businesses were nominated for partial or full divestment, six for further review, and 43 for continued government participation, for strategic or security reasons, or due to their significant social objectives.

The PSDC opined that internal control by the government as a shareholder had to be distinguished from external control by the government as a regulator, and that external control was sufficient to keep companies in check. In this context, it recommended "a policy of robust privatisation where initiative is decentralised and order is maintained through adequate monitoring, control and direction. [...] as many GLCs as possible should be privatised. Exceptions are those with foreign government participation, those which exist for a specific project or serve in-house needs, those which have a social rather than a commercial mission, and those which are presently not attractive to investors."

The PSDC advocated a bold yet nuanced strategy for divestment. Some key principles recommended in their report were:

- The first priority for divestment should be companies earmarked for public listing. The second should be companies of which the government is not the dominant shareholder and with a target of total privatisation. The third priority should be companies of which the government is the dominant shareholder and with a target of partial privatisation.
- There is no need for a fixed schedule or phased timetable for privatisation. Instead, GLCs should: (a) be tasked to prepare for privatisation as soon as possible; and (b) choose the timing that is most advantageous for them to privatise.
- A high-level central authority should be designated to oversee the process of divestment.
- To start from the premise that all GLCs that are to be privatised can be fully privatised, then work backwards to identify exceptions to this rule.
- To privatise the less sensitive GLCs first, e.g., Sheng-Li first-tier companies can be left until later, so focus on non-defence-related GLCs first.
- In companies where government shareholdings are of a large and strategic size, shares should be disposed of in one block to fetch the best price.
- To guard against losing public wealth through the underpricing of shares for sale, there can be a pilot sale to test the market first, or there can be a selective tender to encourage competitive offers for the block of shares.
- Weaker GLCs should be nursed back to health before attempted privatisation.
- To deal with stakeholders such as employees and the public in a way that will remove anxiety, safeguard their legitimate interests, and be seen as fair and undisruptive.
- Prompt action should be taken to change the composition of the GLC boards by introducing new directors from the private sector. This can be an avenue for spotting executives who can be entrusted with the leadership of GLCs in future, or can help in the search for new successor owners for the GLCs.
- To avoid service disruptions, GLCs with special privileges or government franchises could be allowed to continue enjoying the franchises and privileges for a fixed period after privatisation, following which the government will put the franchises out for tender and withdraw the special privileges.

As part of the broader move towards divestment, the RDC was a part of Temasek Holdings. The RDC was later divested, and listed on the Singapore stock exchange. As a listed company, the RDC's motives and culture had to change. As former managing director of the RDC, Quek Teo Heng recalled the vast difference in challenges faced by the RDC in Singapore and abroad:

> *"Profit became more important. Every year, we would have a public meeting and our shareholders would ask us questions. After RDC was publicly listed, we tendered for more overseas work, such as World Bank projects. We won a highway project in Papua New Guinea, for instance. It was a totally different experience. There were villagers who still used bows and arrows. When we arrived, we found that there was only one Australian company supplying premix and quarry stones. They had a monopoly and they tried to frighten us by quoting a very high price for the stones; three or four times higher than the Singapore price. We realised that they did not use granite; they used river stones and crushed them. So we decided to bring our own crusher down. We were awarded the job. After that, the Australians came to us and persuaded us not to bring our crusher over. They agreed to supply whatever stones we wanted, at whatever price. They knew that they would face competition the moment we brought our crusher there.*
>
> *It was quite lawless there. I usually visited about once or twice a year. The jobsite was up in the hills. One day my partner asked me to visit the site with him, but I couldn't because I had too much work. On the way to the job site, his car was stopped and he was robbed! Coming back from the site, he was robbed again! They took everything, including his clothes.*
>
> *Another job we secured was in Bangladesh, to build a highway to the Indian border. That was also very tough. We could not get materials. There were no rocks in the area, only mud and clay. So we had to make bricks from the clay first, then crush the bricks and use that for road construction. That was the local practice, and we followed it, all the way to the border across very rough terrain. One of the biggest challenges we faced was persuading our engineers to go overseas. Many faced family problems. I even got a firing from one of their wives, who called me up and asked: "Why are you sending my husband to China?" The Tiananmen Square episode was ongoing and she was worried."*[86]

In 1997, the RDC was acquired by SembCorp and delisted from the stock exchange. The various assets were sold, including the quarry, as well as the various operations such as asphalt premix production. "Perhaps, by this time, the RDC had served its purpose," opined Quek, who retired in 1993. Many large projects were now being built by international companies and consortiums, many from Korea, Japan, and China. Shortly after, in 1999, the PWD was corporatised as a development consultancy, and renamed CPG Corporation in 2002.

Meanwhile, throughout the 1990s, Pidemco engaged in private sector residential development such as Leonie Gardens in Singapore; as well as overseas projects such as Hotel Equatorial in Yangon, Meritus Westlake in Hanoi, and the Sheraton Suzhou Hotel. On 18 December 2000, it was announced that Pidemco Land would merge with DBS Land to form CapitaLand Limited, following a majority vote by DBS Land shareholders in favour of the move.

By 2002, the government had divested about 60 GLCs, particularly those without potential for international growth or which no longer served a strategic purpose. The role and purpose of GLCs in Singapore's economic and urban development had changed fundamentally, in line with the maturity of its private sector and the greater emphasis on economic flexibility, free markets, and innovation associated with private enterprise in the 1990s and 2000s.

CHAPTER 6

TESTING NEW GROUND WITH PUBLIC-PRIVATE PARTNERSHIPS

> The government remained responsible to end users for the overall service delivery, although the ownership of the PPP facilities resided with the private sector.

Koh Boon Aik, Senior Project Director of the PUB's Engineering Development and Procurement Department

Over the years, the Singapore Government has deployed a broad range of mechanisms to work with markets. Contrary to the governments of most newly independent states in the 1960s and 1970s, the Singapore Government embraced market thinking and the participation of the private sector in public projects. The government – particularly through its statutory boards – planned and implemented public infrastructure. The private sector was typically contracted to provide the materials, manpower and skills to build, and to sometimes design, and occasionally operate, parts of the infrastructure. On the other hand, the services associated with public infrastructure were usually delivered directly by the respective public sector agencies. Basic utilities such as power plants, water treatment, sanitation, and sewage treatment, as well as solid waste disposal, were provided directly by government departments and statutory boards such as the Public Utilities Board (PUB).

The government also relied on corporatised entities to develop, manage, operate, and maintain public infrastructure and services. Although such entities were government-owned, they were largely subjected to the forces of market competition. As Singapore's first Finance Minister and later Deputy Prime Minister Dr. Goh Keng Swee explained, the government expected state-owned enterprises "to be efficient, to make money, and expand whenever feasible".[87] In this way, the government could retain control while reaping operating efficiencies. For example, when the MRT system first began operating in 1987, it was initially operated by Singapore MRT Limited, a wholly government-owned company. This same approach was applied robustly to public-private partnerships (PPP) in later years.

When Singapore was struck by its first post-independence recession in the mid-1980s, it prompted a change in government thinking to allow the private sector to take the lead in exploiting economic opportunities. Up until then, statutory boards and government-linked corporations (GLCs) had dominated the roles of developing infrastructure and delivering services. The 1985 Economic Committee called for the government to scale back its direct involvement in business, and to deregulate or privatise certain sectors, such as telecommunications and electricity.[88]

The government's subsequent divestment exercise was guided by the 1987 report by the Public Sector Divestment Committee (PSDC). For example, public sector involvement in the construction sector was scaled back. Unlike many privatisation programmes elsewhere, divestment in Singapore was not targeted at revenue generation for the state. Instead, privatisation was seen as a way to help keep costs low; the assumption was that profit-maximising private sector companies had a greater incentive to be efficient. Nevertheless, the government retained substantial ownership in some corporatised entities in strategic sectors.

By the 1990s and 2000s, there was a further shift towards greater private sector participation in public sector projects and state-led development. This was aimed at deriving even better value for money for the public budget. As the Singapore economy matured in the 1990s, the capacity of the private sector, especially that of GLCs, had also deepened considerably. One example was the privatisation of waste collection in Singapore in the mid-1990s.

In the area of public procurement, the Ministry of Finance (MOF) had introduced the Best Sourcing initiative in 2004 under its Economic Drive programme. This Economic Drive was launched against a background of an increasingly volatile and darkening global economy. Although Singapore had begun to recover from the 1997-98 Asian Financial Crisis, the global economy was soon buffeted by the bursting of the dotcom bubble and the September 11 terrorist attacks in the USA. The outbreak of severe acute respiratory syndrome (SARS), and the Iraq war led by the USA in 2003, dealt further blows to the Singapore economy. Up until then, Singapore had been enjoying several years of budget surpluses, but budget deficits[89] began to occur in the early 2000s as the government adopted a countercyclical budgeting approach to fend off economic headwinds.

Under the Best Sourcing initiative, ministries and public sector agencies were encouraged to adopt a more focused value-for-money approach towards procurement. This called for an optimal balance of benefits and costs based on the total cost of ownership, rather than simply taking up the lowest upfront cost option. The MOF introduced market testing of non-strategic functions delivered by public sector agencies to assess if their services could be delivered more efficiently and cheaply by alternative providers, compared to providing the services in-house. Where the services that could potentially be outsourced had no directly equivalent service provider in the private sector, Best Sourcing served as a "mechanism to develop the marketplace".[90] By March 2007, the MOF reported that 23% of the public sector's non-strategic functions had been market tested, resulting in 70% of these functions being subsequently outsourced to the private sector.[91]

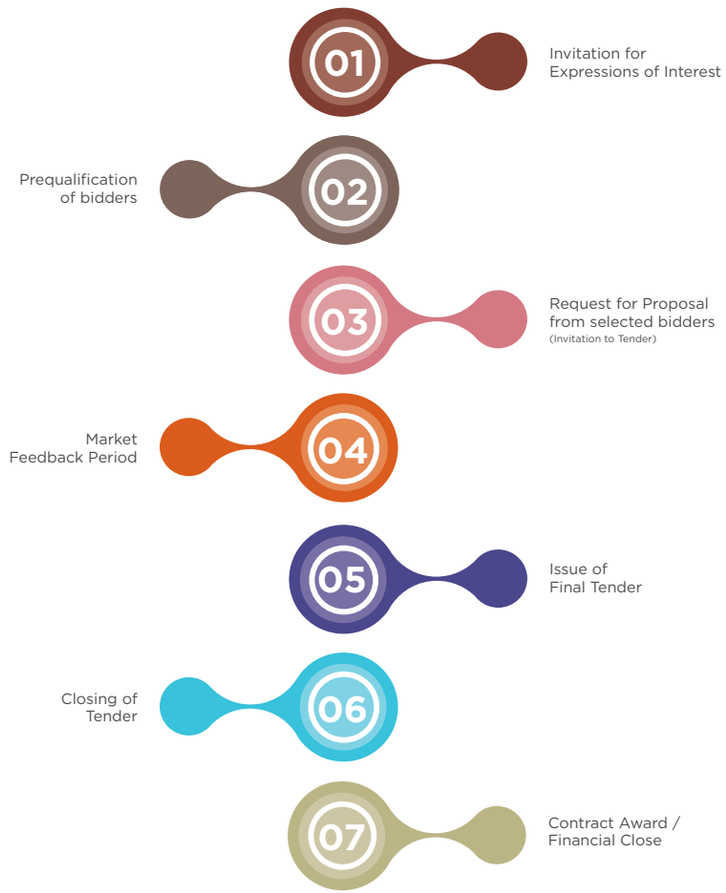
In a similar vein, the MOF formally introduced PPP in 2004 as a specialised mode of procurement under the Best Sourcing framework, launching a handbook to guide ministries and public sector agencies in using PPP. Moh Wung Hee, then Director of the PUB's Best Sourcing department, recalled that, towards the end of 2004, the MOF had invited the PUB, as a pioneer in the use of PPP for procurement, to share its PPP experience with various public sector agencies and ministries. The MOF referred to PPP as "long-term partnering relationships between the public and private sectors to deliver services".[92] It also served as a new approach to increase private sector involvement in the delivery of public services. In particular, PPP could be used when the delivery of service required the development of new physical infrastructure or assets. At the time, public sector agencies were encouraged to consider using PPP for development projects that exceeded a benchmark of $50 million.[93]

With a PPP, the public sector would focus on acquiring the services on the most cost-effective or value-for-money basis, rather than on directly investing in, owning, maintaining, and operating assets. Typically, the private sector partner would take on the financing, design,

construction, and operational risks in the project; while the public sector agency managed the political and regulatory risks. While in traditional procurement, the services required at different stages of a project – design, building, operations, and maintenance – would be procured from various private sector service providers, under a PPP these would be integrated into one private sector partner. Unlike in fully fledged privatisation, the ultimate responsibility for service delivery under a PPP would remain with the government. In some cases, the government would in fact be the sole buyer of the services of a PPP.

Exhibit 4:

PPP Procurement Process



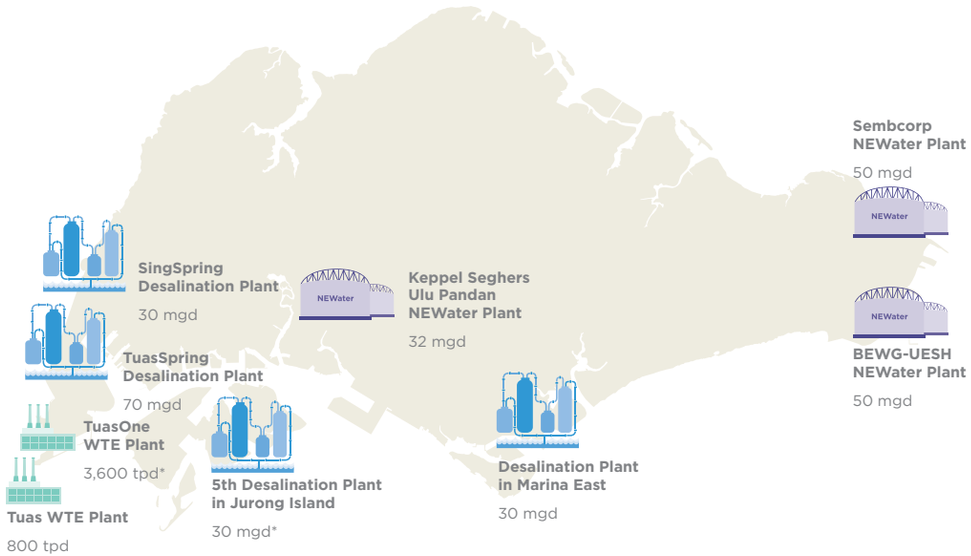
A PPP structure allowed externalities that occur in traditional procurement – those benefits or costs experienced by third parties that are not reflected in market prices – to be internalised by the private sector partner. For example, integrating facility design, construction, operations, and maintenance under one entity would incentivise the private sector partner to take a long-term perspective, and ensure that the facility was well designed to be cost-efficient and financially viable over its contract life. On the other hand, contracting different parties to design, build, and operate could mean that each service provider would have less incentive to align their interests or to ensure that their work was well integrated with that of the other parties.

Singapore was a relative latecomer to the PPP system, which since the late 1980s had gained popularity in developed economies such as the United Kingdom and Australia, as a means of delivering public services, especially for cash-strapped governments. Unlike many authorities that turned to PPP when public budgets fell short, the Singapore Government took a longer-term view of PPP as a means of reaping efficiency gains over the project lifecycle, and of capitalising on the private sector's capacity for innovation. At the same time, a pipeline of PPP projects in Singapore could help to bolster project financing, which was seen as a potential growth segment for the finance sector.

In Singapore, the water and waste management sectors were the first to embrace PPP. The early 2000s saw a flurry of PPPs being explored and implemented with varying degrees of success. The first PPP to be successfully launched was a $260 million project by the PUB in 2003 for the supply of desalinated water, and others have followed. Exhibits 5 and 6 show details of selected PPPs in Singapore. While the focus of this section is on the use of PPP for water and waste management infrastructure, it includes a discussion on PPP in social infrastructure, namely the Singapore Sports Hub.

Exhibit 5:

Water and waste-to-energy (WTE) PPP Projects in Singapore



*	*Planned or under construction*
mgd	*Million gallons per day*
tpd	*Tonnes per day*

Exhibit 6:
Selected PPPs in Singapore

Project	PPP Structure	Public Sector Agency	Private Sector Operator	Duration (Years)	Award Date	Operational Date	Capital Cost	Capacity
Marina East Desalination Plant	DBOO	PUB	Keppel Infrastructure Holdings	25	Dec 2016	2020	$400-500 mil (est)	30 mgd
TuasOne WTE Plant	DBOO	NEA	Mitsubishi Heavy Industries-Hyflux consortium	25	Sep 2015	2019	$750 mil	3,600 tpd
2nd Changi NEWater Plant *(BEWG-UESH NEWater Plant)*	DBOO	PUB	BESIN-UEN consortium	25	Sep 2014	Dec 2016	$170 mil	50 mgd
2nd Tuas Desalination Plant *(with integrated on-site power plant)*	DBOO	PUB	Tuaspring (Hyflux)	25	Mar 2011	Sep 2013	$890 mil*	70 mgd
Singapore Sports Hub	DBFO	Sport Singapore	Singapore Sports Hub Consortium	25	2008 *(Financial close in 2010)*	2014	$1.33 billion	Sports Hub
Changi NEWater Plant	DBOO	PUB	Sembcorp Utilities	25	Jan 2008	May 2010	$180 mil	50 mgd
Tuas WTE Plant	DBOO	NEA	Keppel Seghers Engineering	25	Dec 2004	2009	$160 mil	800 tpd
Ulu Pandan NEWater Plant	DBOO	PUB	Keppel Seghers Engineering	20	Dec 2004	Mar 2007	$80 mil	32 mgd
Tuas Desalination Plant	DBOO	PUB	Singspring (Hyflux)	20	Jan 2003	Dec 2005	$260 mil	30 mgd

*Note: * Capital cost for the integrated desalination cum power plant.*
Source: Compiled from various sources.

PPP AMID PRIVATISATION; HARNESSING COST EFFICIENCIES

In the waste management sector, the Environment Ministry went through a privatisation exercise for waste collection services in the mid-1990s, amid the wave of privatisations during that decade. Previously, a waste collection unit under the Environment Ministry was responsible for collecting and disposing solid waste from households. The motivation behind privatisation was to leverage market discipline to reap efficiency gains, and to keep costs low. The Ministry took a two-step approach to privatisation. First, its waste collection arm was corporatised in 1996. A few years later, the public waste collection scheme was put in place. Waste collection rights in various geographical sectors of Singapore were put up for competitive tendering by pre-qualified private waste collection companies. At the same time, regulatory and licensing conditions were put in place to ensure that service standards were met, while a transparent fee structure was established. These measures helped to bring about efficiency improvements in service provision, while households and trade premises enjoyed a lower average waste collection fee.

By 2001, the Environment Ministry was planning to build a fifth incineration plant – also known as a waste-to-energy (WTE) plant – to replace Singapore's first incineration plant at Ulu Pandan, which by then had been operating for close to three decades and was due to be decommissioned. Given the limited space in Singapore, incineration or WTE, which reduced the volume of waste by as much as 90%, had been adopted as the main waste disposal method. Landfills on the mainland were gradually phased out. The Ulu Pandan plant, together with three other incineration plants at Tuas, Senoko, and Tuas South, were built, operated, and owned by the Environment Ministry, and later by the National Environment Agency (NEA), a statutory board formed in 2002 when the ministry was reorganised as the Ministry of the Environment and Water Resources (MEWR). The Tuas South WTE plant – the largest built and operated by the government – was completed in 2000.

Following the privatisation of waste collection, the government wanted to attract private sector participation for the fifth WTE plant to further raise the operational efficiency of the waste disposal sector, and to boost the environmental engineering industry in Singapore. At the opening of the Tuas South WTE plant in November 2000, the then Acting Environment

Minister, Lim Swee Say, announced that the Tuas and Tuas South WTE plants, which accounted for 70% of the incineration capacity at that time, would be privatised within five years.[94] At the same time, the existing subsidy for disposal fees or gate fees – the charge levied on a given quantity of waste received at a waste disposal facility – would be reduced.

The fifth WTE plant would be designed, built, and operated by a private operator through a Design, Build, Own, and Operate (DBOO) model. The WTE plant, sited next to the NEA's existing Tuas South plant, would have a capacity of 800 tonnes per day. A shortlist of pre-qualified bidders was identified. Under the DBOO model initially structured by the Environment Ministry, the private operator would take on the responsibilities of designing, financing, and operating the plant; while the quantity of waste going to the WTE plant was left variable. Bidders would compete on disposal fees, which would be capped at the tendered price of the successful bidder for up to five years, subject to certain technical and commercial specifications. The thinking then was that, with more than 7,000 tonnes of waste generated each day, the plant would be assured of receiving a constant waste stream.

Despite the government's interest in opening up the waste disposal sector and the fact that a market sounding exercise was conducted prior to the tender, the open tender for the fifth WTE plant in June 2001 failed to attract much interest from the private sector. The only formal bid, submitted by Keppel Fels Energy and Infrastructure, a unit of government-linked conglomerate Keppel Corporation, proposed an unexpected zero price cap for the disposal fee.[95] However, Keppel Fels' bid came with a condition that they intended to restrict the WTE plant to accepting waste only from their own public waste collectors or from collectors of their choice. In effect, the plant would be turned into an in-house facility, rather than one open to all waste collectors and serving a broader public interest. This led the government to eventually reject the bid, and call off the tender for the fifth WTE plant, indicating that a re-tender would occur at a later date.[96]

While the unsuccessful tender was partly attributed to the lacklustre economic climate, one key lesson from the government's first formal attempt at PPP was that too much risk had been placed on the private sector. Despite the fact that about 90% of waste was incinerated in Singapore, the initial DBOO model proposed by the Environment Ministry did not give a private operator any contractual assurance on the volume of waste to be disposed. The combined capacity of the four WTE plants owned and operated by the Ministry at the time was already over 8,000 tonnes a day[97], leading to fears of overcapacity in the industry. This uncertainty was compounded by the government's push to raise recycling rates, which would reduce the volume of waste to be incinerated.

The demand risk of an uncertain and non-guaranteed waste stream, in volume and quality, for the PPP WTE plant proved to be too much to bear for a private operator.[98] As Loh Ah Tuan, former Director-General for Environmental Protection and the NEA Deputy Chief Executive Officer, explained, " ... somehow, we failed to consider an important factor; the guarantee (on the quantity of waste to be disposed at the incineration plant)."[99] A guaranteed waste stream was a particularly crucial factor, especially when the project potentially called for a high capital investment of between $600 and $800 million.[100] As a comparison, the 2,100 tonne per day Senoko WTE plant cost $560 million to construct in 1992[101]; while the Tuas South WTE plant, with a larger capacity of 3,000 tonnes per day, cost $890 million in 2000.[102]

Summing up the private sector's viewpoint, the then President of SembCorp, Wong Kok Siew, was reported to have said, "Why would we want to take the risk of building a new plant for the future, when we know that the waste figures are coming down? A plant that is already up and running will fit our goals better."[103]

Following a review of the DBOO scheme, the tender was again launched in 2004 by the NEA, which had been established in 2002, but this time with a full "take-or-pay" structure. The tender received a better response from the market, attracting bids from both local and international firms. Under the revised structure, the government would bear the demand risk by entering into a "take-or-pay" agreement over a 25-year period with the private operator to purchase the full incineration capacity at a pre-agreed price set through the tender. In return, the DBOO operation would bear the financing and operational risks, and would be required to meet performance indicators on the quality of the incineration process and the service quality level to waste collectors.

Keppel Seghers Tuas WTE plant.
Keppel Seghers is the only private operator of WTE plants in Singapore.

Image courtesy of Keppel Corporation.

The NEA awarded its first PPP to Keppel Seghers Engineering, an environmental technology division of Keppel Integrated Engineering (KIE), a subsidiary of Keppel Corporation, to design, build, and operate the WTE plant from 2009 to 2034. Theirs was the most competitive bid submitted, with a first-year price of $61 per tonne. Built at a reported cost of $180 million[104], the 800 tonnes per day Keppel Seghers Tuas (KST) WTE plant began operations in October 2009, while the Ulu Pandan plant was decommissioned in the same year. KIE expected the KST plant to generate revenues of $450 million over the life of the PPP contract.[105] In 2010, the plant ownership was transferred to a business trust with the same majority shareholder and operator, and was the first green infrastructure trust listed on the Singapore Exchange.

This PPP was followed in 2008 by the government's plan to divest its Senoko WTE plant, built in 1992, via a newly listed or existing infrastructure business trust/fund through a multistage tender process. The key objectives were to "encourage competition and further improve efficiency in the waste management sector through greater private sector involvement and also to create investment opportunities for the public to invest in the infrastructure sector."[106] The Senoko plant was eventually sold to KIE at an indicative price of $462 million, with the acquisition completed in August 2009. Under the tender terms, KIE would provide incineration services to the NEA for 15 years, commencing on 1 September 2009. KIE would also be responsible for maintaining and repairing the Senoko plant, and upgrading its flue gas treatment system.

Singapore incinerated 2.83 million tonnes of solid waste in 2015, accounting for 37% of total waste generated.[107] In September 2015, the NEA awarded a DBOO contract to a consortium of Hyflux and Mitsubishi Heavy Industries for Singapore's sixth and largest WTE plant to date; the TuasOne WTE plant, with a capacity of 3,600 tonnes per day. Located on 4.8 ha, it is also the most land-efficient WTE plant to date. The facility is expected to run for 25 years from 2019 to 2044.

MITIGATING TECHNOLOGY RISK THROUGH PPP

In parallel with the MOF's Best Sourcing initiative, the national water agency, PUB, was already exploring a PPP for desalination. Alongside the NEA, the PUB became one of the first public sector agencies to embrace PPP when it launched a tender for a $260 million desalination project under a DBOO arrangement in November 2001. In the mid-1990s and 2000s, PUB was undergoing several organisational changes, including the corporatisation of its electricity and gas portfolios as well as its transfer from the Ministry of Trade and Industry to the Environment Ministry, and subsequent merger with the Environment Ministry's sewerage and drainage departments in 2001. Since then, the PUB has become responsible for managing all aspects of the water cycle in an integrated manner, from sourcing, collection, purification, and supply of drinking water, to the treatment of used water and its reclamation into NEWater, as well as stormwater drainage.

In addition to local catchment water and imported water from Johor, the PUB and the Environment Ministry had been exploring alternative sources of water for Singapore – such as desalination and recycled water – since the 1970s under the first Water Master Plan. The first water reclamation plant was commissioned at the Jurong Industrial Waterworks in October 1974; however, the technologies then available were considered unreliable, costly, and commercially unproven. The pilot plant was closed after 14 months.[108]

It was not until the 1990s that the technology for treating and reclaiming "used water" – the PUB's term for sewage – had improved significantly, with the production of better quality membranes used in the purification process. The cost of membranes had fallen by as much as 50%, making water reclamation economically feasible.[109] The PUB set up a prototype demonstration plant for recycled water of 2.2 million gallons per day (mgd) at Bedok in May 2000, which helped to present the economic case for using reclaimed water. Two years of intensive trials and testing of the high-grade reclaimed water – later called "NEWater" – followed. Two NEWater plants were built by contractors in Bedok and Kranji in 2003, based on the PUB's design, and a further plant was later designed and built in Seletar by the private sector in 2004.

At the same time, the PUB was studying the feasibility of producing potable water through seawater desalination. Given that one of Singapore's water agreements with Johor was due to expire in 2011, and bilateral negotiations were facing difficulties, desalination was seen as a strategic source of water that could replace imported water. In 1999, the cabinet gave approval for the construction of a 30 mgd desalination plant. Singapore now had two additional sources of water, through NEWater and desalination, creating the country's third and fourth "national taps" (the country's main water sources) respectively.

Over the years, the PUB had worked with the private sector in various ways, ranging from outsourcing of construction based on in-house designs (i.e., build-to-design), to outsourcing of design and construction to the private sector (i.e., design-and-build). In 2004, the PUB underwent a major reorganisation. This included the formation of a Best Sourcing department to take charge of project management and execution of all of the PUB's engineering projects. Prior to this, the projects were segregated and managed by various departments in charge of water, drainage, and sewerage. The task of upgrading and developing new water, used water, and drainage infrastructure fell to the Best Sourcing department. The PUB had been investing steadily in water infrastructure and, by then, had one of the largest portfolios of public infrastructure projects, by number and value, within the public sector. Between 2002 and 2007, the PUB's total capital expenditure amounted to some $5.2 billion.[110] The Best Sourcing department soon expanded its sourcing methods to include PPP.

The development and operating model for Singapore's first desalination plant has undergone a few changes since the idea was first mooted. Although the PUB had studied the technology and economic feasibility of desalination, it had not before built or operated such a plant. Moreover, there were competing seawater desalination technologies at the time. The then conventional technology was multistage flash distillation (MSF), based on thermal distillation; although newer, less energy-intensive thermal methods such as multi-effect distillation (MEF) were being developed. At the same time, the industry was seeing the emergence of membrane technologies, such as seawater reverse osmosis (SWRO) which forces seawater through membranes at high pressure to separate salt from water.

The PUB had earlier identified MSF – the tried and proven solution in the Middle East at the time – as the desalination technology for Singapore. In the late 1990s, the PUB submitted to cabinet its plan to construct a dual-purpose MSF desalination and power plant at an estimated cost of $1 billion, together with a smaller SWRO pilot plant.[111] The plan for a desalination plant in Singapore was approved by the cabinet in 1999. In 2000, however, the PUB revealed its plans to allow the private sector to develop the larger desalination plant and propose the most suitable desalination technology that would meet the agency's standards, while the PUB would continue to develop a smaller SWRO plant. A year later, the plan had evolved into a single 30 mgd desalination plant in Tuas to be built, owned, and operated by the private sector; and the PUB initiated a DBOO scheme in 2001 for Singapore's first desalination plant. The DBOO project was later managed by the PUB's Best Sourcing department.

Despite improvements in technology, desalination remained a more energy-intensive process than water reclamation, and required high capital investments. While the process to reclaim used water consumed 1 kW h per m^3, desalting seawater consumed 3.5 kW h per m^3.[112] This prompted the PUB to consider working with the private sector to determine the most cost-effective option over the project life cycle – rather than simply seeking to minimise the upfront construction cost of the plant – through a competitive tender using a DBOO structure. An equally important factor was that, by then, the PUB had accumulated substantial technical and engineering experience and expertise to allow it to confidently manage a private operator.[113]

The tender for the 30 mgd desalination plant in Tuas was launched in November 2001. The term of the DBOO contract was set at 20 years, with the choice of desalination technology left open to the private sector. From an initial field of 11 pre-qualified bidders, four tenders were eventually received when the tender closed in May 2002. As it turned out, the bids that the PUB received tended to focus on SWRO as the proposed desalination technology. Bids were evaluated on the basis of their levelised water price – the net present value of unit-cost of water produced over the lifetime of the plant – based on future projected payments over the project life; compliance with the technical, financial, commercial and legal requirements of the tender; and the bidder's technical and financial capabilities.

In January 2003, the PUB awarded the tender to SingSpring Pte Ltd, a consortium comprising local water treatment firm, Hyflux Ltd (70%); and Ondeo Degremont (30%), part of the French utility conglomerate, Suez. The contract would run from 2005 to 2025. Hyflux had won an earlier contract to equip the PUB's demonstration plant in Bedok. SingSpring

submitted the lowest bid of $0.78 per m^3 for the first year, significantly undercutting its competitors whose bids ranged from $0.96 to $1.40 per m^3.[114] SingSpring's price surprised the industry as, based on existing technologies and stringent water quality standards set by the PUB, prices were expected to be around $1.00 per m^3.

At the time, Hyflux Group Executive Chief and President, Olivia Lum, was reported by the local news media as saying that Hyflux could offer such a low price because it would build, own, and operate the plant itself, while most of the proprietary membrane systems would be built by the company.[115] Although SingSpring had won the tender on the basis of its lowest bid, the actual payment from the PUB would be adjusted to take into account other variable costs. Despite the withdrawal of Hyflux's consortium partners – first Migrant, a US energy giant, six months before the tender closed, and then Ondeo Degremont, shortly after the tender was awarded – the SingSpring desalination plant, which had cost an estimated $260 million to construct, was able to commence operations by the end of 2005.[116]

For reclaimed water, or NEWater, the PUB was already familiar with the reverse osmosis technology and had acquired operational experience from numerous trials and from its three NEWater plants in Bedok, Kranji, and Seletar, built in the early 2000s. Hence, when the PUB decided in 2004 to adopt the DBOO model for the fourth NEWater PPP plant at Ulu Pandan, it specified the technology to be used – a multi-barrier treatment process consisting of microfiltration, reverse osmosis, and ultraviolet light disinfection. The 20-year contract for the 32 mgd Ulu Pandan NEWater plant was won in December 2004 by Keppel Engineering. PUB's decision to adopt a PPP approach was further bolstered by Keppel Engineering's first-year price of $0.30 per m^3.[117] Among the bids received for this PPP project, Keppel Engineering offered the most competitive price for the supply of NEWater to the PUB. It was believed to be lower than the cost at which PUB was producing NEWater at the time at its older plants.[118]

The PUB's former Director of Best Sourcing, Moh Wung Hee, elaborated:

> *"By that time we had already built and operated three NEWater plants, with proven competency and reliability. So with that experience gained from those plants, PUB had established a variety of processes for the reclamation of used water. So with NEWater, we knew we were confident and we moved in a bigger way. And the Ulu Pandan NEWater plant was the biggest at that time - bigger than the other three – and it was big enough for private sector involvement. So, PUB decided to invite private sector participation to leverage on the synergies gained from PUB's expertise and resources and that of the private sector. This would enhance production efficiency and keep the cost of NEWater affordable.*
>
> *So PUB brought in two things. First, the technology and the private sector, which we believed would keep the cost of NEWater affordable. And the facts proved us right. When the price came in, I thought that it was better than what we had expected, cheaper than what we had expected. Because the profit-driven private sector was motivated to fully optimise their operations. There are other objectives for the private sector, such as to build credentials to go overseas, which they did eventually. Companies like Keppel, Sembcorp, Hyflux, had already been involved in other projects with PUB. Now they got involved in PPP."*[119]

The Ulu Pandan NEWater plant commenced operations in 2007. As Singapore gained operational efficiencies and economies of scale in NEWater production, the price of NEWater fell progressively from $1.30 to reach $1.00 per m^3 by April 2007.[120]

Hyflux SingSpring Desalination Plant, the first of its kind in Singapore (left); Hyflux Tuaspring power plant, co-located with Tuaspring Desalination Plant (right).

Image courtesy of Hyflux.

Keppel Seghers Ulu Pandan NEWater Plant.

Image courtesy of Keppel Corporation.

Sembcorp Changi NEWater Plant, located on the rooftop of Changi Water Reclamation Plant.

Image courtesy of Sembcorp.

Since 2007, the PUB has partnered the private sector in PPPs for two other desalination plants in Tuas and Marina East, as well as two additional NEWater plants in Changi. PPPs have delivered over $2 billion in combined investments in capital assets in the water sector. As a former Director of the PUB's Best Sourcing and Water Supply departments, Koh Boon Aik's assessment of PPPs was that they offered "good value" and "yielded very competitive rates for supplying water to the PUB", compared to the public sector comparator which estimated the cost of the PUB implementing the project itself.[121]

At 70 mgd, the second desalination plant in Tuas, which was awarded to Hyflux, was more than double the capacity of the first plant. The first-year price secured had also dropped to $0.45 per m^3. The Tuaspring desalination plant also featured an innovative solution to enhance operational efficiency by integrating a 411 MW on-site combined cycle gas turbine power plant to supply electricity for desalination.

Similarly, the first-year prices of the subsequent NEWater plants in Changi, which use the same stringent purification and multiple barrier treatment process pioneered by the PUB, were below that of the Ulu Pandan facility. SembCorp's Changi NEWater plant was completed in 2010 over two phases, and preserves land by being housed on top of the PUB-owned Changi Water Reclamation Plant. Used water treated by the water reclamation plant is channelled to the 50 mgd NEWater plant for further purification. The second 50 mgd NEWater plant at Changi was similarly sited above the Changi Water Reclamation Plant. It was also the first to involve a foreign company through an 80/20 consortium formed respectively by Beijing Enterprise Water Group International (BEWGI) and local environmental engineering company, UES Holdings.

A 30 mgd PPP desalination plant to be built in Marina East would be the first in Singapore with the ability to treat seawater and fresh water from the Marina Reservoir, using seawater reverse osmosis and other advanced membrane technologies. Reflecting the more challenging conditions and more advanced technologies required at Marina East, the tender was won by Keppel Infrastructure, with a first-year price of $1.078 per m^3. The plant is expected to be operational by 2020. In contrast, the third Tuas desalination plant, with a capacity of 30 mgd, was structured as a Design and Build contract, with the PUB owning, operating, and maintaining the facility so as to continue to build up operational experience within the agency.

Water recycling and desalination will meet a larger proportion of Singapore's water demand in the future. By 2060, water consumption is expected to more than double from the current 430 mgd. NEWater is expected to provide up to half of Singapore's water demands by 2030, and up to 55% by 2060. A further 30% is expected to be supplied by desalination.[122]

STRUCTURING WATER AND WASTE PPPS; CHALLENGES AND RESPONSES

Both the PUB and the NEA adopted a similar DBOO structure, with a "take-or-pay" approach for their respective PPPs in desalination/NEWater water supply and waste disposal services. Under this approach, the government, as the off-taker, would pay the private operator for the full capacity of the plant at the tendered price, regardless of actual utilisation. The government would remain the sole buyer of the services, or regulate the prices paid by end users. The private operator would typically form a special purpose vehicle to undertake its obligations under the PPP. Project financing was the responsibility of the private operator, and was typically secured through a mix of equity and debt financing.

Tan Yok Gin, the PUB's Deputy Chief Executive of Operations, also pointed to the overriding need to ensure the resilience and reliability of the water operations, when considering the PPP model. This explained why PPP was applied selectively to those segments of the PUB's water operations that were considered less risky. Water plants work as a network under a pressurised system, and the supply from one plant could be diverted to compensate if another plant fails. On the other hand, water reclamation was not thought to be suited for PPP, as used water travelling by gravity could not be easily redirected from one water reclamation plant to another.

Tan elaborated, "We know that anything you put to the private sector, you can't control the possibility that they can fold at any time. So if they fold, what happens? Does that mean that we stop drinking water? We look at it as a system, and make sure that if one plant goes down, we still have other plants. But if the plant is so important that if it goes down, and then you are deprived of the services, then that risk is too high."[123]

In the case of the WTE plants, while the private operator was obliged to deliver the service to all public waste collectors at the tendered price, the actual disposal fees paid by waste collectors at various WTE plants were set by the government. Currently, the disposal fees for the existing WTE

plants have been set at $77 per tonne, with the exception of the Senoko plant in the northeast, which charges $81 per tonne. This is aimed at redistributing a larger share of the overall waste disposal load to the three WTE plants in the western part of Singapore than would have otherwise occurred. For the desalination and NEWater plants, the PUB was the sole off-taker for the water produced.

Over time, the government, particularly PUB, improved at working with the private sector to evaluate and implement PPP projects. While the first DBOO for the SingSpring desalination plant took some four years from tender and contract award to the plant's commercial operation date, subsequent PPPs typically commenced operations within a shorter time frame.

The provision of water supply was safeguarded through a Water Purchase Agreement (WPA), while the equivalent for waste incineration services was the Incineration Services Agreement (ISA) (Exhibit 7). Among other things, the agreement specified the technical requirements, service performance standards, compliance with environmental regulations, and the commercial terms and conditions. The government set clear requirements for performance and outcomes in terms of measurable quality and quantity to be delivered by the PPP, while the private sector had the flexibility to decide how these requirements would be met. A tripartite agreement – also referred to as a step-in agreement – involving the financier(s), the government, and the private operator, laid out the conditions under which the financier(s) and the government could step in and take over the WTE plant, such as when the private operator was in default or insolvent.

Under the DBOO structure, the private operator would receive various payment streams from the government (Exhibit 8). The private operator would be shielded from the risk of uncertain demand through capacity payments or capital cost recovery payments received for making the water production (or incineration) capacity available to the government. An output or operating and maintenance (O&M) payment was provided for the actual amount of water produced (or waste incinerated) in accordance with the specified standards. The capacity payment was intended to allow the private operator to recover fixed costs, such as capital costs and fixed O&M costs, which would be incurred independent of the actual amount of water produced (or waste processed). On the other hand, the output payment covered the variable costs of running and maintaining the plant, and was based on the actual quantity involved.

To manage the longer-term risks of certain future cost changes, some indexation was built into the payment model. In particular, the fixed and variable O&M payments were indexed to Singapore's Consumer Price Index (CPI). For the energy-intensive desalination/NEWater plants, the payment model included an additional energy charge comprising fixed and variable components. This was intended to compensate the private sector for the fixed cost of procuring electricity as well as the variable cost of electricity which fluctuated with the quantity of water produced. Similarly, the energy charge was indexed to the price of 180 centistoke high-sulphur fuel oil (180-CST HSFO), a benchmark price used for electricity pricing in Singapore.

This was in contrast to a WTE plant, where electricity is produced, rather than consumed, during the incineration process. Electricity in excess of the plant's consumption – which could be as much as 80% – could be exported to the grid under a power purchase agreement which specified the contracted unit of electricity exported. For example, the KST plant generated about 22 MW of electricity per day. At the time, the government was also in the process of liberalising and restructuring the electricity sector. This meant that the price of electricity was no longer set by the government at a regulated tariff, but fluctuated according to demand and supply in a competitive wholesale electricity market – the national electricity market of Singapore – with various power generation companies.

However, this would have created an uncertain revenue stream in electricity exports for the private operator. In order to reduce uncertainty under the PPP, the private operator would receive a fixed electricity generation payment for selling the excess electricity generated in the wholesale electricity market on behalf of the NEA. The payment compensated the private operator for investing in the electricity generation facility and making the electricity available. The resulting electricity revenue, which was variable, would accrue to the government.

The performance of the PPPs was benchmarked against quantifiable outcomes. As the MOF's PPP Handbook explained, the ability to specify the outputs of a PPP involved "the art of defining the end without being prescriptive on the means for meeting these outputs."[124] For the WTE plants, this included available incineration capacity; environmental indicators such as ash quality and flue gas; and plant service levels such as environment, health and safety standards, and plant turnaround time for inspection and maintenance. For the NEWater and desalination plants, the PUB put in place a comprehensive monitoring and audit system to conduct regular checks on water quality as well as the operation and maintenance of the plants. Audits are also conducted regularly by the PUB's internal and external auditors to ensure that the plants' operations and maintenance meet the specified standards.

Exhibit 7:
DBOO Structure

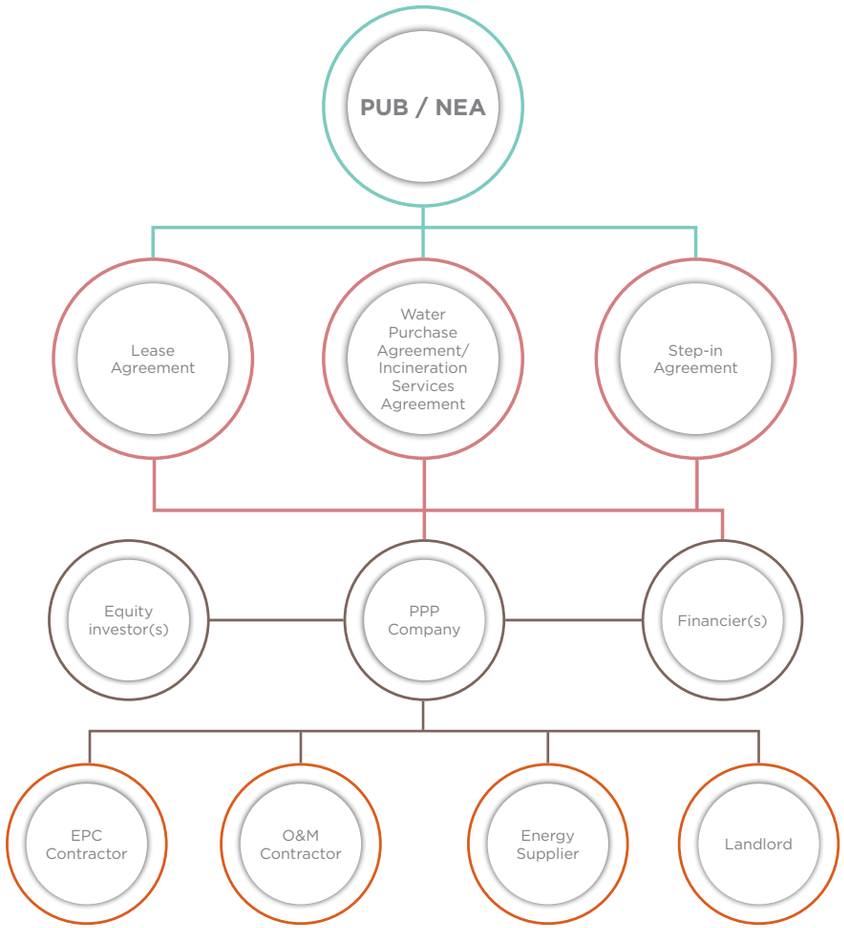
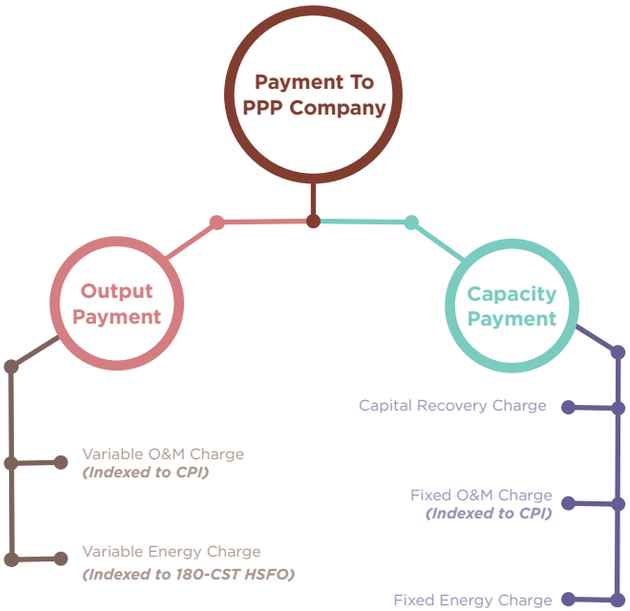


Exhibit 8:
DBOO Payment Structure



INJECTING INNOVATION; DEVELOPING NEW MARKETS FOR SINGAPORE AS A 'HYDROHUB'

In addition to raising efficiencies and reducing overall life-cycle costs, PPPs also injected certain elements of innovation from the private sector, some of which were exhibited in the technical design and operations. For example, in order to save energy and reduce operating costs, Keppel Seghers designed the Ulu Pandan NEWater plant to incorporate an interstage recovery turbine between the first and second stages of the reverse osmosis process. This enabled the recovery of 20% to 40% of the energy typically lost in the second stage.[125] The company was also able to develop a compact plant, occupying only 2.6 ha, by building the reverse osmosis systems on top of the water tanks to save space. Further efforts to save energy led Keppel Seghers to install a 1 MW peak solar photovoltaic system, covering about 10,000 m^2 of roof space at the Ulu Pandan plant.[126] Completed in February 2013, the photovoltaic installation was considered the largest in Singapore at the time and received the Solar Pioneer Award from the Energy Innovation Programme Office.

Similarly, the KST WTE plant, which was also a project under Keppel Seghers, was designed to be one of the most compact WTE plants in the world. The facility, with the capacity to process 800 tonnes of waste per day, occupied only 1.6 ha, and employed Keppel Seghers' in-house technologies such as the air-cooled grate and flue gas cleaning system.[127] In comparison, the larger 3,000 tonne per day Tuas South WTE plant, completed in June 2000, occupied 10.5 ha of land.[128]

Another key economic spinoff from the government's PPP initiative was a broadening and deepening of private sector expertise – both local and international – in the water and environmental sectors. By the early 2000s, environmental technologies had been identified as a key economic segment that Singapore was well positioned to exploit. Singapore had already developed a track record for being at the forefront of innovative solutions in water and waste management, which included the Marina Barrage, Deep Tunnel Sewerage System, and Pulau Semakau, an environmentally sustainable offshore island landfill. The overall vision was for Singapore to become a "hydrohub", a term coined by the Economic Development Board (EDB) to describe Singapore as the global hub where advanced technologies for water treatment could be developed and applied. At the same time, a pipeline of PPP projects in Singapore could help to bolster project financing, which was seen as a potential growth segment for the finance sector.

The government-directed funding for research and development (R&D) was channelled to key areas identified as having the most potential to yield economic benefits for Singapore, including environmental and water technologies. Between 2006 and 2011, $470 million was set aside to fund innovation and capability development in the industry.[129] The Environment and Water Industry Programme Office, led by the PUB and the EDB, was formed to steward the R&D funding and spearhead efforts to grow the identified industries.

PPP projects in the water sector helped to anchor interest from international players in Singapore, some of whom were keen to clinch projects that could be showcased for future projects. At the same time, PPPs provided opportunities for local companies to develop and commercialise cutting-edge technologies and solutions, and gain valuable operating experience. For example, the 11 pre-qualified bidders for Singapore's first desalination DBOO project included several international companies, such as AES Corporation, Bechtel Enterprises, Mirant Corporation, Ondeo, Mitsubishi Corporation, Union Fenosa Internacional, IDE Technologies Ltd, and Vivendi Water SA. Many formed partnerships with local firms for the project.

Referring to the first NEWater PPP project, Khoo Teng Chye, former CEO of the PUB, explained, "(It was) the first major water recycling plant in the world, and there was tremendous interest from all over the world. And, the reason was that they wanted it as a reference project."[130] The experience gained in Singapore could be used to compete for projects elsewhere. At the same time, the growing environmental and water sector in Singapore meant that the government had a wider pool of private sector players to work with.

Not all PPP projects in Singapore have gone according to plan, however, despite the government's intention to leverage private sector expertise through PPPs. In the early 2000s, the government also turned to PPP when it decided to redevelop the old National Stadium at Kallang. The plan was to turn it into a commercially run integrated sports and lifestyle hub, comprising multi-use facilities for sports and other events, as well as commercial and retail space. One key factor in the government's consideration of PPP was the expectation that the private sector would have the capacity and expertise to inject vibrant event programming for sports and entertainment, as well as the commercial sense to run well managed lifestyle attractions, and integrate them with the design and operation of the sports hub. In contrast, the old government-run National Stadium had been relatively underutilised outside of major sports, cultural, and national events. Constructed at a cost of $1.33 billion, the Singapore Sports Hub is one of the largest social infrastructure PPP projects in recent years.

After a lengthy project development and tender assessment period, the 25-year PPP contract was awarded to a consortium led by construction firm Dragages Singapore. However, some aspects of the project have not played out as anticipated by the government, partly due to the impact of the 2008-2009 global financial crisis. Although the project survived with new financing arrangements, it was not until June 2014 that the Sports Hub finally opened its doors to the public, more than three years later than originally planned.

As the PPP was expected to deliver services as well as "soft outcomes" related to the venue's programming, such as a thriving sports and entertainment ecosystem and a vibrant lifestyle hub, a complex revenue-sharing framework had to be put in place to enable appropriate risk-sharing between the government and the private operator. The project also involved constructing new facilities, upgrading existing infrastructure, and managing multiple subcontracts. Since its opening, the Sports Hub was dogged by issues such as the subpar pitch at the new National Stadium, the paucity of sporting and entertainment events, and controversy over naming rights. This had led some to question the initial decision to deliver the project as a PPP.

WORKING WITH THE PRIVATE SECTOR TO DEVELOP THE SPORTS HUB

While Singapore was not the first to use the public-private partnerships (PPP) method to develop sports facilities, the Singapore Sports Hub, which cost $1.33 billion to build, was certainly considered one of the largest such projects worldwide. The project was recognised with several awards in 2010, including Project Finance International's Asia Pacific Awards "PPP Deal of the Year", Asiamoney's "Best Project Financing" award, and Euromoney's "Deal of the Year". The Sports Hub has also garnered architectural awards, such as the "Sports Building of the Year" at the World Architecture Festival (WAF) Awards in 2014.

The plans for the Sports Hub first took shape in early 2001 with the release of the Report of the Committee on Sporting Singapore.[131] It was envisioned to be a fully integrated sports, entertainment and lifestyle hub for everyone in Singapore, with three key objectives – (i) an integrated lifestyle hub for world-class sports and entertainment events; (ii) a viable public-private business model; and (iii) a national icon and global landmark – and six related desired outcomes. Compared to the relatively underused National Stadium, the Sports Hub was expected to be vibrant and abuzz with both sports and entertainment events.

By 2004, the government decided that the project should be driven with private sector involvement – through a Design, Build, Finance and Operate (DBFO) structure – to create a commercially viable and customer-oriented Sports Hub. The project team within the government was led by the then-Singapore Sports Council (SSC)[132] and Ministry of Community, Youth and Sports (MCYS).[133] At the time, the government had anticipated that the private sector partner could be appointed by 2006, and the construction completed by 2010.

National Stadium at the Singapore Sports Hub.

Image courtesy of Jason Goh.

This was followed by a two-year period of feasibility studies, project development, roadshows and market sounding in Singapore and overseas, and a pre-qualification stage to identify eligible bidders. By the time the official Invitation-to-Tender (ITT) for the Sports Hub was launched in July 2006, the bidders had been whittled down to three consortiums. In line with the vision for the Sports Hub, the appeal of sports, leisure and entertainment programming had the highest weighting of 40% of overall scoring in the tender evaluation. However, soon after the closure of the ITT stage, the project specifications were changed to include a new public water sports centre to be located where the 38-year-old Oasis building stood, and the shortlisted consortiums had to re-submit their proposals to meet the revised specifications.

WORKING WITH THE PRIVATE SECTOR TO DEVELOP THE SPORTS HUB

Continued ...

In January 2008, the Singapore Sports Hub Consortium – subsequently incorporated as SportsHub Pte Ltd (SHPL)[134] – was announced as the preferred bidder. The SHPL was then expected to reach financial close for the PPP project by finalising its project agreement with the government, the financing model with its creditors and equity partners, and agreements with its subcontractors. However, the project was caught flat-footed by the onset of the global financial crisis and the collapse of Lehman Brothers in September 2008. Global capital and debt markets quickly dried up. As its original financiers pulled back, the Sport Hub project – like many others at the time – was left with significant shortfalls in funding.[135]

During this time, several financing options were explored within the government, including providing a government loan. As the financial markets regained some stability in mid-2009, the project looked at bank debt financing again. However, in the wake of the crisis, the banks' appetite for risk was still low, and the new financing structure eventually put in place involved more lenders and higher borrowing costs. It was also subjected to a balloon repayment in the tenth year, with some limited form of government refinancing protection. The project finally achieved financial close in August 2010, more than two years later than anticipated.

The PPP structure for the Sports Hub was expected to have a few key advantages over traditional procurement. It spread out the government's fiscal resources and planning capabilities, instead of having to set aside large amounts of capital during the construction period. A well-designed PPP would also enable efficient risk-sharing, allocating risk to the partner with the greatest incentive and ability to manage it at the lowest cost. By requiring the key partners in the consortium to become equity holders, they would all be aligned to the long-term success of the Sports Hub. Under the DBFO structure, the SHPL would bear the design, construction and facility management risks for the Sports Hub for 25 years, giving it a strong incentive to have a well-designed project to maximise operating efficiency and minimise operating costs, reducing overall life-cycle costs.

There was also greater incentive for the private sector partner to introduce innovative solutions. For example, one of the attractions of the SHPL's proposal was the consortium's intention to set up a "Premier Park Foundation" to reinvest some of the Sports Hub's commercial revenues to fund future events, activities and facilities. Lastly, PPPs were seen as a good way of bringing market discipline to bear on public services and infrastructure development.

The Sports Hub had a complex PPP structure to share risk and rewards between SHPL and the government. Under the PPP, the SHPL financed the building, operating and maintenance costs of the Sports Hub using debt and equity. In turn, it received annual availability payments (when the facility was fully functional and available for use) and service payments (when services were rendered up to agreed standards) from the government over the operational years of the contract. In 2008, the net present value of the total payments that the government would make over the 25-year tenure was expected to add up to $1.87 billion.[136] At the end of the PPP contract, the various facilities of the Sports Hub would be transferred to the government at no charge.

WORKING WITH THE PRIVATE SECTOR TO DEVELOP THE SPORTS HUB

Continued ...

On top of availability and service payments, the SHPL would generate third-party commercial revenue from various sources, such as sporting and entertainment events, naming rights, commercial rental, advertising, and car parking fees. The profits from such third-party revenues would be shared in varying proportions between the government and the SHPL. This was unlike most PPP contracts where the private operator's main (usually only) source of revenue was government payments. The idea was to incentivise the SHPL to host events at the Sports Hub, particularly sports-related events and services where it would receive a larger revenue share.

The Sports Hub PPP revenue model was in contrast with PPP projects such as those in France which had also reached financial close during the global financial crisis.[137] The Le Mans stadium project which cost about €100 million was based on a concession scheme where the concessionaire bore the potential risk of low revenues resulting from poor match attendance. The €325 million Grand Stade de Lille stadium[138] project mixed availability fees independent of match attendances paid by the Greater Lille Metropolitan Council, with revenue from additional non-football events held at the stadium.

While typical PPPs tended to have clear, measurable deliverables, such as quantity and quality of water supplied, delivering and measuring desired "soft outcomes" such as a thriving sports and entertainment ecosystem and a vibrant lifestyle hub, proved much harder. Given the iconic nature of the project, problems at the Sports Hub came under the spotlight. Differing expectations between the government and SHPL have also magnified some of the risks.

One example was the National Stadium pitch, which initially proved problematic to maintain while running various sporting and entertainment events. The sale of naming rights – particularly, the naming rights for the Sports Hub itself – also became a point of contention between the government and the SHPL. The event programming for the Sports Hub also seemed to be at risk as the media reported on a paucity of events that was partly blamed on high rental costs. Part of the high costs, such as the hefty cost of converting the retractable seating in the National Stadium, could be traced to the innovative design of the Sports Hub itself. The issue of high rents even affected the 2016 National Day Parade, which used the Sport Hub as the venue.[139]

While some of the issues could be viewed as teething problems, the problems that have surfaced, alongside the difficulties of sharing financial, operating, and reputational risks, has raised questions about the viability of the PPP model. As then Acting Minister for Community Development, Youth and Sports, Chan Chun Sing, put it, "... the development of the Sports Hub is not just an iconic infrastructure project... What we require is the software to do the programming by the private sector and, more importantly, the "heart ware" by the people sector to want to take this project forward."[140]

LESSONS FROM SINGAPORE'S EXPERIENCE

In Singapore, the motivations for PPPs seem driven less by specific financing needs and more by value-for-money objectives that are harder to define. From Singapore's experience, it would appear that PPPs worked best in situations where the scope of responsibility was narrowly defined, and performance parameters were clear and measurable. Following the initial flurry of PPP projects in the first half of the 2000s, the pipeline of PPP projects – other than desalination, NEWater, and WTE plants – has largely dried up, underscoring the challenges of making PPPs work.

One challenge of making PPPs work was identifying the segments which would benefit from a PPP structure rather than traditional procurement or outsourcing, and where the potential pitfalls of PPP could be reasonably managed. For example, when the electricity market was liberalised, the grid operator – a natural monopoly – was unbundled from power generation. Singapore opted to retain the grid operator as a state-owned entity, while opening up the power generation sector to the private sector and corporatised entities. On the other hand, in the water sector, the PUB decided not to use PPP in the development of used water reclamation plants. For example, the Changi Water Reclamation Plant, which housed two PPP NEWater plants on its rooftop, was built in 2008 under a Build-to-Design contract.

Where the delivery of public services is involved, the government has to be cognisant of the fact that it has ultimate responsibility for ensuring the service delivery. The PUB's Koh emphasised that, "(the government) remained responsible to end users for the overall service delivery, although the ownership of the PPP facilities resided with the private sector."[141] Often, the government would be the sole or main buyer of the services of the PPP entity, as has been the case for the PPPs in water supply and WTE services.

PPPs also demonstrated the trade-offs that can arise between competition and coordination in deciding the scope to be handed to the private sector. In a traditional procurement model, where project segments such as construction are put up for bidding separately, the market tends to be more competitive, however the public sector agency bears the burden of coordinating among disparate segments and service providers. On the other hand, the more services that are coordinated under a PPP, the harder it becomes to identify a private sector partner able to deliver all the requirements. This seems to have played out in the tender for the Sports Hub PPP.

The problem of information asymmetry that exists between the regulator and the regulated entities also exists between the public sector agency and the private sector operator in a PPP. In this context, it becomes important for the public sector agency to retain some technical and operational capabilities. Moh, former director of Best Sourcing at the PUB, explained this, "When you delegate execution to a party who is not under your direct control, you actually need to be more skilled. You need to know what he needs to know. You need to know the technology involved. You need to know the dynamics involved in their businesses. So that you can anticipate in advance what are the potential issues, potential outcomes, potential changes, whether they are because of legal, business, or technological reasons."[142]

For example, the PUB decided in 2015 to develop the third desalination plant in Tuas under a Design-and-Build arrangement, so that it could accumulate operational experience in running and maintaining desalination plants. The NEA already had a long history of operating incineration plants – and continues to do so – when it launched its first PPP for the Tuas WTE plant. The ability to step in if necessary, and continue the operations of the facilities to prevent service disruptions, gave the PUB and the NEA greater confidence to use PPPs.

A related challenge has been in the appropriate and realistic division of risks and responsibilities between the public and private sectors. This does not mean that all responsibilities and risks should be transferred to the private sector, but rather that there is "an optimal sharing of responsibilities and risks between the public and private sectors."[143] In the case of the NEWater, desalination, and WTE sectors, the allocation of risks, such as financing, design, construction, O&M, demand, and regulatory risks, could be shared clearly and appropriately between the public sector agency and private sector partner. For the Sports Hub, its complex risk-and-reward framework reflected the challenges of allocating risks appropriately.

The government was also cognisant of the fact that both sides were in for the long haul in a PPP. While financial incentives and penalties could shape the behaviour of the private sector partner, it could not replace the need to build a strong partnership between the public sector agency and private sector operator. For example, both the PUB and the NEA made a point of sharing their expertise and experience to help train the staff of

their private sector partners, especially for early PPP projects. Similarly, financial rewards might not be sufficient if the PPP lacked a conducive environment in which to operate. For example, while high rents might have made it difficult for the Sports Hub PPP to attract international sporting events, the lack of market demand in Singapore could have also played a role among factors.

CHAPTER 7

WORKING WITH MARKETS TO ENHANCE LIVEABILITY AND SUSTAINABILITY

The four areas featured in this study are distinct and different in many ways. Each illustrates key dimensions of how the Singapore Government seeks to work with markets to improve public outcomes.

Water and land are critical factors of production, and their proper allocation and pricing are essential for economic and national development. Here, the government adopts market and pricing principles, while making space for appropriate levels of private sector participation, to ensure that important resource markets function effectively, for the benefit of society as a whole. In these cases, government policies seek to augment the market, rationalise prices, and maintain effective segmentation between the roles of the private and public sectors.

For instance, the Government Land Sales (GLS) system lays down clear rules and processes for the tender of state land, and enables the private sector to make investment decisions with greater certainty. The PUB's system of water pricing and private sector partnerships is not based blindly on free market ideology, but instead achieves a careful balance between strategic interests, market discipline, and promoting water conservation and prudence.

At other times, government initiatives have gone beyond the creation of market rules and systems, to more direct ownership and partnership. The sections in this study on government-linked corporations (GLCs) and public-private partnerships (PPPs) illustrate the often complex relationships between government entities such as the HDB, the PUB and the PWD on the one hand, and corporate entities on the other. Government officers have to walk a fine line, ensuring that they understand fully and engage closely with the relevant companies, while remaining at arm's length and above board. Over the years, the government has learnt from experience, and its approach to GLCs and PPPs has evolved.

The wave of privatisation and divestment in the 1990s, followed by the introduction of broad market regulations to ensure a level playing field, such as the Competition Act in 2004, marked a transition from state ownership to state regulation and facilitation of corporate entities. Similarly, Singapore's approach to PPPs developed and matured following the experience of complex and often challenging projects such as the Singapore Sports Hub.

Thus broadly conceived, working with markets has been a stable feature of Singapore's development journey; it is a core urban governance principle that has underpinned the growth of a liveable and sustainable city over the decades.

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WORKING WITH MARKETS: HARNESSING MARKET FORCES AND PRIVATE SECTOR FOR DEVELOPMENT

The term "working with markets" captures the fine balance of successful public-private collaboration. The first aspect involves engagement and partnerships with private enterprises through sound regulation and well-structured public-private partnerships. The second involves harnessing market forces, such as competitive pricing and bidding, to set prices for and allocate scarce resources. This study examines four aspects of working with markets in the context of land and infrastructure development in Singapore.

The physical development of Singapore has been underpinned by the Government Land Sales programme, through which the government sets clear urban planning guidance and sells land with assured planning permission to reduce risks for private development. The government also used price signals for scarce resources like water to guide efficient resource usage and promote financial sustainability. Singapore's government-linked corporations (GLCs) – operating on commercial principles – helped to accelerate the building of national infrastructure at lower cost, manage state assets efficiently, and allow public sector agencies to focus on their core functions. Working with the private sector was taken a step further when public-private partnerships were introduced as a strategic procurement tool to maximise value-for-money in delivering infrastructure and services in some capital-intensive sectors.

Singapore has taken a calibrated approach to balancing markets and state – intervening in markets, applying market mechanisms, and partnering private enterprises – to develop into a liveable and sustainable city.

"What is absolutely key to understanding Singapore's success in applying market systems to public problems is the centrality of the state in assessing, controlling and regulating the market. The hallmark of Singapore's use of the market has been strong government control and oversight. Private initiatives do not displace government unexpectedly or haphazardly - privatization has taken place only when and where the Government has become convinced that the private sector can do the job better. Government will test and determine where markets perform functions with social objectives. It applies the same rigorous standards to testing and evaluating market performance that it does to government policies."

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