

CHAPTER 5

Planning to Overcome the Constraints of Scarcity

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Planning for Singapore's land use and urban development is fundamentally about overcoming the physical constraints of a land-scarce island city-state. After independence in 1965, we started with 580 sq km of land, and only managed to expand it to the current modest 719 sq km after many years of land reclamation efforts. On this small island, besides having to cater to the wide-ranging land demands of a city, we also have to put aside land to meet the needs of a state, such as land for defence.

Yet, we have not done too badly despite the constraints. Within five decades, we have produced a dramatic transformation of the living environment. When we achieved independence in 1965, we had almost two million people crammed in the city centre, with serious problems of unemployment, squatter colonies, overcrowding in the city centre, and shortage of basic utilities and housing. 2015 was Singapore's 50th anniversary, and we celebrated a very different outcome with a population two-and-a-half times bigger. Singaporeans live in clean, lush and beautiful housing estates supported by world-class infrastructure. We are one of the most competitive economies in the world, and are linked to the world through a well-connected aviation hub and one of the world's largest ports. We are also regularly ranked as one of Asia's most liveable and greenest cities.

Planning Philosophy

Without doubt, we owe much of this success to the vision, values and ideas of Mr Lee Kuan Yew and his team of founding leaders in the 1960s. Post-independence, their first priority was to provide a safe and liveable environment, where the population could aspire to have decent jobs, good housing, and a clean and green environment. This was achieved through respecting the rule of law, embracing meritocracy and racial diversity, supporting an open economy to welcome foreign trade and investment, and building good schools and universities to train a skilled workforce. From the nation-building efforts, we inherited a planning philosophy that places emphasis

on people and their quality of life, underscored by good governance that makes plans possible.

This was also a generation of visionary leaders, with an uncanny ability to look beyond the many pressing preoccupations of the day to plan for the long term. Before sustainable development became fashionable, our planning governance already incorporated long-term sustainable principles that delicately balanced economic, social and environmental outcomes. For instance, the Air Pollution Unit was set up in Singapore in 1971, and we only welcomed investment in industries that passed the environmental tests of the unit. It must have been a difficult decision then for a poor economy that was in desperate need for jobs, but an important one that kept our environment clean for the long term.

A Long-term Land-use Planning Framework

These governance principles are encapsulated in a strategic long-term land use plan known as the Concept Plan. Besides being a spatial land use plan, the Concept Plan is an important planning framework to ensure there is sufficient land to meet long-term growth while providing a good quality living environment.

The first Concept Plan was drawn up in 1971 (Figure 1). This was the first strategic long-term land use plan that decided where land would be set aside for future

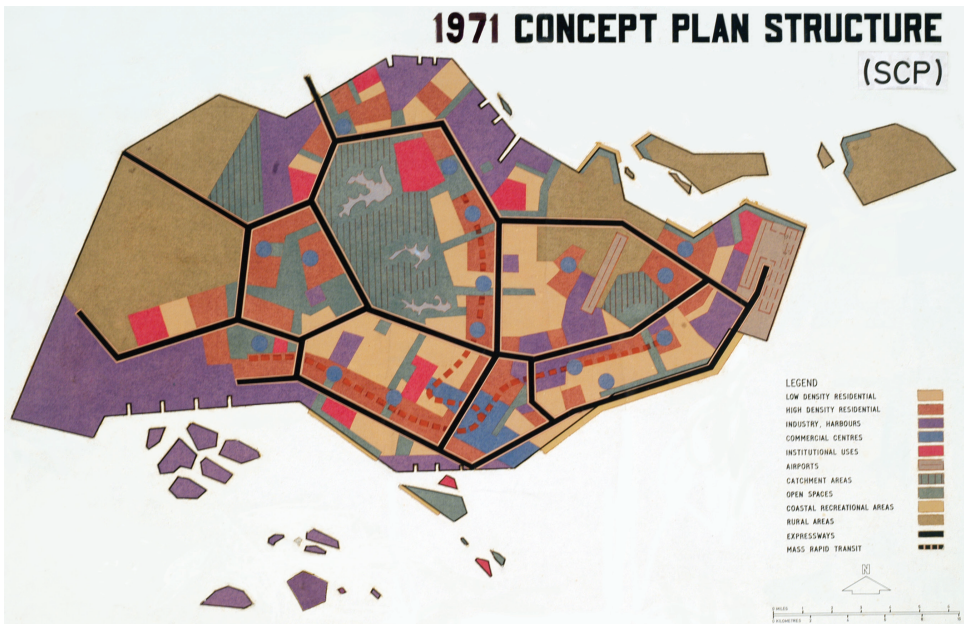


Figure 1. Singapore's 1971 Concept Plan.

Source: Urban Redevelopment Authority.

townships, industrial parks, the financial centre, the airport, port, etc. It was a simple but powerful plan that defined the skeleton of Singapore's urban structure today.

The 1971 Concept Plan went through successive reviews and revisions in 1991, 2001 and 2011. These reviews involved many Ministries and agencies, and provided a Whole-of-Government platform to make strategic decisions on the long-term deployment of land. While the Urban Redevelopment Authority administers the Concept Plan, long-term land use decisions are taken collectively in government.

For this reason, the Concept Plan review process has inculcated within the government the discipline of constantly re-assessing Singapore's long-term needs, and always looking out for opportunities to create and safeguard land for the future, and for future generations. A vivid illustration of the significance of this approach is the land reclamation at Marina Bay, which started in the 1970s. In the early 2000s, at a time when the Singapore economy was going through a sluggish phase of growth, the land provided space for a seamless extension of our existing Central Business District (CBD), and gave Singapore a "second wind" to boost its ambition to become a global financial centre. The Marina Bay story reminds one of the Chinese saying—前人种树, 后人乘凉—one generation plants the trees, while later generations enjoy the shade.

This tradition of planning for the future continues with the current intention to eventually move the City Terminals and Pasir Panjang Terminal to Tuas, and the more recent announcement to re-locate the Paya Lebar Airbase. These are big moves which will free up large tracts of land; 1,000 ha of land along the southern coast in the case of the ports, and 800 ha of land in the case of the airbase. The latter will also lift the height restrictions for future developments in the eastern part of the island. The two areas will probably not be needed until beyond 2030, but the massive work needed to make them available has already been set in motion.

This ability to plan and implement land use for the long term is the hallmark of Singapore's urban planning, and the envy of many city planners. In essence, this is what sustainable development means—that we safeguard important resources to meet the needs of future generations. The same discipline extends to our land sales programme, where sale proceeds are locked up in the national reserves as a resource for the future, and not in the budget of the current government. This effectively removes the temptation for any government of the day to use land sales as an instrument to grow its budget.

The Concept Plan also serves an important function to balance the distribution of land among future competing economic, social and environment needs of Singapore. This way, despite the pressing needs of land for development, it gave us the confidence to protect land for both conservation districts and nature reserves for the future. In the 1980s, during a period of rapid urbanisation, the ability to project our long-term land needs allowed the government to conserve seven significant historic areas—Chinatown, Kampong Glam, Little India, Boat Quay, Clarke Quay,



Figure 2. Preserving our built heritage in the heart of our city.

Source: Urban Redevelopment Authority.

Cairnhill, and Emerald Hill, and saved 3,200 heritage shophouses from the wrecking ball. Similarly, we have been able to set aside 9% of our land for parks and green spaces, including four nature reserves. Notably, the Central Catchment Nature Reserve is one of the very few protected tropical forests in the heart of a city. The reserve is a source of rich biodiversity, and it is fascinating that we are still finding new and unnamed species in the area. How we plan our city is a reflection of the collective values of our society. The land we set aside for conservation and biodiversity is a significant expression of the importance that our society attaches to heritage and the environment.

Transparency in Implementation

The strategies in the Concept Plan are implemented through the Master Plan. This is a comprehensive and progressive document that maps out in detail the permissible land uses and intensity of all land in Singapore. While the Master Plan is not uncommon in other cities, the transparency with which the Master Plan is implemented is another distinction of our planning governance framework.

The Master Plan is an open document easily accessible online, and more recently through mobile applications. It is backed by statute and, together with a set of clear

development control guidelines and development charges, ensures transparency in our development approval process and proper governance for the State to have a fair share of development gains. The Plan is reviewed every five years to ensure that we factor in changes arising from local and global trends, and that our plans remain relevant to address future challenges and meet the needs of Singaporeans. The Planning Act states that it is mandatory to exhibit the reviews and open them to public views and comments. The review of the Master Plan in 2013 was exhibited over an eight-week period both at the URA City Gallery and online. The exhibition attracted 71,000 visitors, while the online version received almost 160,000 visits. While it is not always possible to have planning solutions that satisfy everyone, these public engagements are important to help us make more informed decisions to strike a balance among the diverse interests of society. It is also an avenue for government to garner public support for difficult, but necessary, planning policies and decisions.

Finding Our Own Solutions

Singapore occupies a unique position as the only island city-state in the world. Unlike most countries, we have only one city and nowhere to sprawl beyond our island's boundary. Ironically, this gives us an ideal environment for urban innovation. Our only way to succeed is to have the courage to find our own solutions to our problems, even if it means having to face some short-term pains for long-term good. Some of these solutions may even seem draconian because they have never been tried anywhere else before.

In 1975, we became the first city in the world to successfully implement a road congestion pricing scheme. To avoid the traffic gridlocks seen in many cities, we imposed a fee on vehicles entering the CBD to moderate the demand for road space. This was replaced in 1998 by the current Electronic Road Pricing (ERP) system. Many visiting policy makers have seen and expressed admiration for the system, but would always concede that it is politically impossible to implement it in their own cities. The ERP remained a uniquely Singapore solution for many years, and has only been adopted in recent years in cities like London and Stockholm.

With this same spirit of innovation, we have found our own solutions in other areas. These are some examples:

Public Housing

Over 80% of the Singapore population lives in public housing today. The public housing scheme started in the 1960s with the intention to resettle slum dwellers in the congested city centre. It also served to provide affordable home ownership to help a disparate migrant population of diverse racial background sink roots in Singapore

and develop a national identity. Today, it has evolved to provide citizens with sophisticated housing nestled in vibrant and inclusive towns that offer a good quality and attractive living environment.

The newest public housing town in Punggol offers a glimpse of the future of public housing. It is designed to be much more environmentally-friendly than our older towns, and is immersed in a beautiful environment with lush greenery, canals and water bodies. At a time when citizens in cities globally grapple with the high cost of housing, the public housing scheme in Singapore offers a range of good, affordable housing to citizens from different income groups.

Greenery

Despite rapid urbanisation, Singapore is rich in greenery and urban biodiversity. The provision for greenery and biodiversity has been key in our urban planning and development approach, and stems from the conviction that nature and biodiversity can play an instrumental role in uplifting the human spirit within the urban environment. We do not have a hinterland to provide respite from the city, and so we integrate greenery deeply into our urban landscape. The sustained work done in this area over almost five decades has produced in Singapore a distinct identity, and few visitors would today challenge our claim to be a tropical City in a Garden. In 2010, in an acknowledgement of Singapore's achievement in this area, the UN Convention for Biodiversity partnered Singapore to conceive the Singapore Index on Cities' Biodiversity as a tool for cities to monitor and assess the progress of their biodiversity conservation efforts.

However, what we have achieved in this area cannot be taken for granted. The city is an artificial construct, and maintaining nature in the urban environment requires continued resolve, ingenuity and hard work. The current network of park connectors is an example of the continued efforts in innovation that is required in this area. The network is now 300 km long, and has expanded our space for greenery and leisure substantially using very little land.

Given our land scarcity, the continued efforts to green Singapore will have to depend to a large extent on such strategies to "borrow space" for greenery. Two areas of innovation will be key. The first is to closely integrate greenery with our waterways and reservoirs, and transform them into beautifully-landscaped streams and lake parks to expand our space for leisure and havens for biodiversity. The second is to weave greenery into our buildings. In the past 10 years, thanks to rising demand from a society that appreciates nature, the adoption of skyrise greenery in new developments has increased in tandem. We have also stepped up our policies to incentivise the adoption of skyrise greenery or to mandate it in some areas. The greatest impact of this effort is making it mandatory in selected parts of the city for affected landscape to be replaced as skyrise



Figure 3. Bishan-Ang Mo Kio Park—transforming our environment through green and blue integration.

Source: NParks.

greenery on new developments. When Japanese architect Mr Toyo Ito was interviewed in Singapore a few years ago, he asked this question: “Is the building of the future one big tree?” This is certainly something that we hope to work towards.

Water Management

Our water scarcity has ironically made us one of the most advanced cities in the area of water management. In the 1960s and 1970s, Singapore relied heavily on imported water from Malaysia. By investing in water technology and adopting an integrated approach to water management, we have developed a diversified and sustainable water-supply strategy that significantly extended our water catchment areas, and developed recycled water and desalinated water as two new sources of water.

Singapore is now one of the few countries in the world to harvest urban storm-water on a large scale for its water supply. Since 2011, we have increased our water catchment area from half to two-thirds of Singapore’s land. The ultimate aim is to increase the catchment area further to 90% of the land surface.

Marina Bay is a good showcase of our expertise in this area, where a single water body now serves multiple functions as water storage, resilience protection against floods, and a community recreational space. The Bay is a fresh water reservoir with a water catchment area of 10,000 ha, or one-seventh the size of Singapore in the heart of the city. The barrage that separates the reservoir from the sea serves as a tidal barrier to prevent flooding in low-lying areas in the city. At the same time, the iconic Bay doubles up as a beautiful waterfront for our new downtown and a venue for leisure and water sports.

Meeting Changing Aspirations

A city is a living machine that evolves continually. In our compact city environment, the complexity is multiplied many times. The work to plan and overcome the challenges of our city never stops.

But the fundamental planning question is about how we can make Singapore more liveable to meet the changing aspirations of the individuals living in the city. When we were a poor economy in the 1960s, the main aspiration was to have a job to provide for the family. But today's citizens have much more complex needs. Besides a good job, they also want time for themselves, time for family, a stronger sense of participation in the community, and active, green, healthy living.

In the last review of the Master Plan in 2013, we posed fundamental questions on how we meet these aspirations in six areas: the economy, housing, community, recreation, transport and identity. The review proposed a well-received plan to bring jobs closer to homes, and to make Singapore a city for all ages that is green, healthy, connected, and strong in community interaction and spirit.

In particular, two key thrusts in the plan will in the long term bring about fundamental changes to enhance liveability.

The first is to accelerate efforts to create new job centres closer to homes, outside the traditional CBD and the industrial area in the western part of our island. The work has already started with some success. In the east, Tampines Regional Centre and Changi Business Park are already established employment hubs. In the west, the Jurong Lake District has been shaping up well since 2008. There are also job clusters at one-north, Paya Lebar Central, and Novena. A new area of focus is the North Coast Innovation Corridor that spans Woodlands Regional Centre and the Punggol Learning Corridor and Creative Cluster. There is an exciting opportunity here to closely integrate the future campus of the Singapore Institute of Technology with a business park for creative high-tech industry. It will provide high-value jobs and opportunities for life-long learning for residents in the north and north-east. When fully completed, the overall effort to bring jobs closer to homes will allow more flexibility to configure future work-life requirements, and will be an important contributor to quality of life.

A second key thrust is to enhance mobility options in the city. Singaporeans are by now familiar with the much publicised effort to invest aggressively in public transport infrastructure. The plan is to double our rail network by 2030 so that eight in ten households can reach a train station within a ten-minute walk. There has also been ongoing effort to enhance the overall public transport capacity with more trains, buses and increased frequencies. We have at the same time announced a National Cycling Plan to build a network of cycling paths to provide a greener, healthier mobility option. When the infrastructure is in place, we can aim for a “car-lite” alternative, where we place emphasis on mobility solutions rather than private car ownership. It will give us a very different city that prioritises the public realm for people and quality of life.

Beyond these fundamental changes, the Master Plan also continues the ongoing efforts to build more inclusive, greener, and active public spaces to encourage community interaction and participation. This is an area that we have done well in in our town planning, but which we will continue to innovate to adjust to the changing demographics in our society. With an ageing population, we will have to put in more effort to make our living environment more age-friendly, and provide facilities to enable our seniors to age-in-place. Kampong Admiralty, which is being developed, is a good example of the ongoing experimental efforts to encourage social interactions and active living through design and integration of communal spaces. When built, it will be a one-stop hub with social and healthcare facilities, dining and retail outlets, wide community spaces, generous green features, and studio apartments all under one roof.

In other incremental ways, we are test-bedding exciting new ideas in new development precincts such as Marina Bay, Jurong Lake District, and the Punggol Eco-Town. This precinct development approach allows us to integrate solutions across developmental agencies to produce much better outcomes with new or existing technology. In successive precincts, we are setting ever higher benchmarks to make them more liveable, more inclusive, and more carbon-friendly through better urban planning and designs, better technology, and better community involvement efforts.

Singapore in Another 50 Years

As we celebrate Singapore’s 50th anniversary, a natural question to muse over is what Singapore will look like in another 50 years. Clearly, the future is for us to create. The lesson from the past is that Singapore’s future success will depend largely on our continued ability to plan and innovate for the long term to offer an attractive liveable environment to attract ideas, technology, and capital. Innovation is not just about having good ideas. It is also about our collective resolve to take hard decisions to do the right things for the long term, and for future generations.

There are many challenges that we will need to address, such as maintaining Singapore's economic relevance to the rest of the world, the changing demographics and expectations of the population, climate change, resource scarcity, etc. Incremental efforts at innovation will not be sufficient in the long term, since there is a limit to how much we can continue to optimise solutions in an environment of finite space. We will need to explore new paradigms to reshape the city, and to rethink the way we live, work and play. In this regard, the current advancement in disruptive technology in a wide range of areas offers new exciting opportunities. The current progress in autonomous vehicles, for instance, will make it possible to totally re-imagine how we plan, develop and manage mobility in the near future.

This need for continuous innovation and rejuvenation makes Singapore a well-positioned city for exciting human invention, creativity, and ingenuity. It provides immense opportunities to develop and test-bed new ideas in a compact city setting. However, in our search for solutions, we must always remember that planning for the city is not just about optimising space, resources, and infrastructure. Ultimately, the planning philosophy of our city's founding leaders still rules—it is all about people. Indeed, the success of Singapore as a sustainable compact city ultimately rests on the people's continued commitment to the vision, and our future living environment depends on the choices we make as a society. Key to strengthening our capacity to plan future success will involve harnessing our collective energies to make Singapore not just a sustainable city, but a sustainable home.