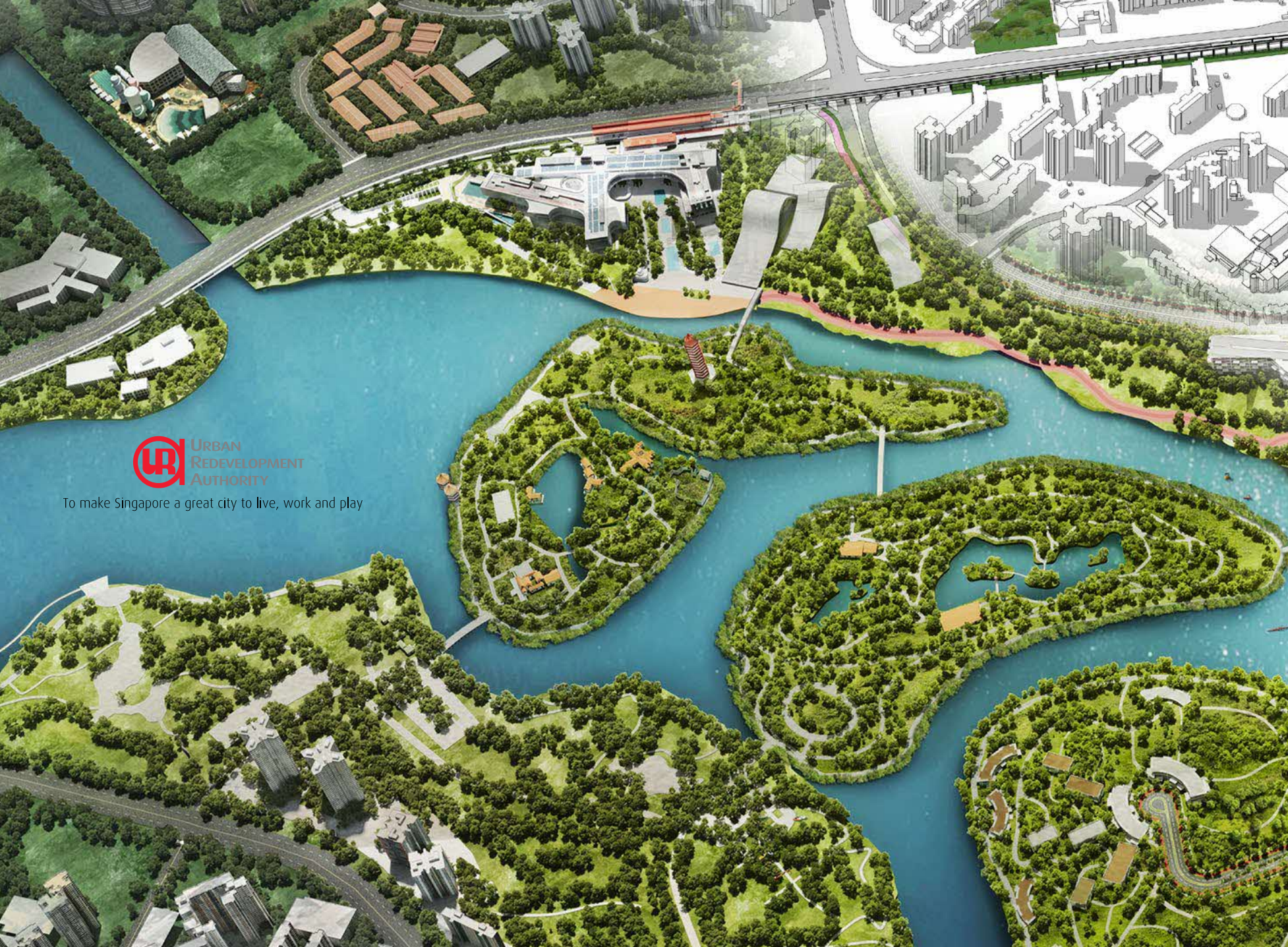




To make Singapore a great city to live, work and play

FROM PLANS TO REALITY



FROM PLANS TO REALITY

SINGAPORE URBAN DESIGN GUIDEBOOK

FROM PLANS TO REALITY

SINGAPORE URBAN DESIGN GUIDEBOOK



FOREWORD

SHAPING SINGAPORE BY FORTUNE AND DESIGN

In his seminal book, *London: The Unique City* (1934), Steen Elier Rasmussen contends that London's unique and informal qualities were shaped by fortune rather than by design. Unlike other European cities that were carefully planned and regulated, London's organic growth was in response to practical needs and opportunities rather than a grand vision. This astute reading still endures seeing how London can grow, densify, introduce new typologies to the city, retain much of its historical architecture, and remain economically competitive.

Singapore, a unique city – with excellent public goods, urban design and architecture – I would argue, is shaped both by fortune and design. The city is one of the most economically competitive and development-friendly cities in the world while maintaining a high degree of public goods in its built environment, overturning the assumption that such non-profit provisions repel investments and stifle development.

As a small city-state with no natural resources and hinterland, meticulous planning and robust developmental controls have produced a city so evidently unique, green, liveable, diverse and inclusive. Again, this disproves another commonly held belief that curtailing absolute developmental freedom stifles creativity and breeds monotony and uniformity. The Urban Redevelopment Authority of Singapore has achieved this unusual feat through decades of focused and tenacious work, deploying a deft combination of incentives and controls, and calibrating

the degrees of freedom for developers and architects through civic-minded urban design guidelines and cunning enticements.

A good and conspicuous example of this combination of enticement and control is the generous sky terraces that punctuate and straddle the city's highrise towers. These lushly planted shared spaces at height are precious green open spaces for people, especially in a high-density city like Singapore. Having designed and realised many highrises in the world, I have often been asked how this is possible in Singapore when it proves so intractable elsewhere. The answer lies precisely in the combination of opportunity and vision. URA incentivises developers to build these sky terraces by exempting these areas from the maximum permissible GFA of a development site. This is further made more attractive to developers by the introduction of a desirable design element to the highrise typology which is synonymous with efficient repetition and stacking of identical floors.

What is often unacknowledged is URA's ideation of these sky terraces in highrises as urban designers, a practice best described as a bridging discipline that brings together planning and architecture. Once this element is conceived, designed, and tested, always in consultation with stakeholders of the built environment, they are then written into development controls and urban design guidelines for a particular sale site or an area of interest in the city. This is then given architectural expression by architects and designers and realised by developers.

These precise yet suggestive controls and guidelines give developers the clear developmental parameters and certainty they look for and freedom and opportunity for architects to realise their social role as designer in providing generous design elements of the city.

The Design Advisory Panel (DAP), devised by URA, is another important tool to ensure quality and exactitude in the interpretation of the guidelines and subsequently, the construction and delivery of the project. In my experience, the DAP is like a peer review panel of the great and the good of the industry, holding us architects and actors in the built environment to the highest standards, not only in what is built but who and why we build for.

This book, the fourth in a series by URA, documents this ambitious and noble effort, outlining, in great detail, the strategic thinking and tactical instrumentation involved in making Singapore what it is today and what it will be in years to come. It proudly showcases the inclusive and collaborative nature of this process, knowing well that the city at its very essence is a space for public good and any action towards this goal requires consensus, galvanised in this great endeavour by fortune and by design.

Christopher C. M. Lee

*Principal, Serie Architects
Design Critic in Architecture, Harvard University
Graduate School of Design*

October 2024



PREFACE

UNCOVERING THE IMPLEMENTATION INSTRUMENTS FOR URBAN DESIGN

This fourth book caps the Urban Design Guidebook series that started with the first two books published in 2023. It is an integral part of the series because for urban design plans to be brought to fruition, practitioners need to understand the various instruments that can be employed.

There are two main sections to this book:

1. Implementation instruments
2. Case studies

Urban design is a highly collaborative profession involving the planning authority, developers and buildings owners (who could be either from the private sector or public sector), design professionals and the community (which would also involve interest groups). Urban design work has to therefore consider the interests of all these groups and strike a balance to ensure that projects can get implemented.

Developers rightly are concerned about their bottom-line and profit margins without which development cannot proceed. Development or redevelopment projects are opportunities to bring about public good such as better connectivity, public space and greenery, and a better mix of uses to provide more housing options to the city, jobs, amenities and vibrancy.

Developments involving heritage buildings can breathe new life into buildings faced with obsolescence, ensuring that even as the city grows and rejuvenates with new buildings, these heritage buildings can continue to

act as important links to the community's shared history and a lasting legacy for future generations.

Hence, a critical component of the work of urban designers entails formulating implementation instruments to realise development projects according to the urban design plans. One of these is to develop incentive schemes to provide bonus gross floor area to developers to encourage them to provide desirable elements such as balconies or communal landscape areas.

Similarly, to make it palatable to developers to provide covered walkways, sky terraces or privately-owned public spaces, these areas are normally exempted from being computed as gross floor area. Providing cash grants is another way to encourage owners and developers to provide specific public goods such as underground pedestrian links between developments to form a network of all-weather sheltered connectivity to underground MRT stations.

Singapore's land sales programme, referred to as the Government Land Sales (GLS) programme, has played a key role in the country's urban development. URA acts as the land sales agent for the government. This function within URA is instrumental in ensuring that state land would be developed according to the plans prepared by URA. Urban design guidelines including public good provision are translated into technical conditions of tender which the successful tenderer of the land has to comply with.

Similarly, the Development Control function within URA carries the critical lever of ensuring that development plans submitted are in compliance with URA's guidelines and the tender conditions of the sale of the sites.

Collaboration between URA and the design professionals and developers involves discourse and debate. For strategic sites, the projects are put through a peer review process. Design Advisory Panels comprising private and public professionals with the relevant experience are set up by URA where such discourse and debate take place with the developer and his architect with the objective of guiding the design process to achieve high quality outcomes for the city (people) and the project (developer and users).

Case studies provide precedents to understand the varying scales and scope, and the impact of urban design work. This book attempts to demonstrate how the various urban design elements described in:

- Book 1: A Distinctive & Delightful City
- Book 2: A Green & Liveable City
- Book 3: A Connected & Inclusive City

are used in whole or parts in various urban design projects. They also describe the various implementation instruments employed.

The case studies include projects in existing parts of the city both in historic cores or established parts of the city as well as greenfield sites to show the limitations and opportunities in making incremental improvements or embarking on loftier ambitions.

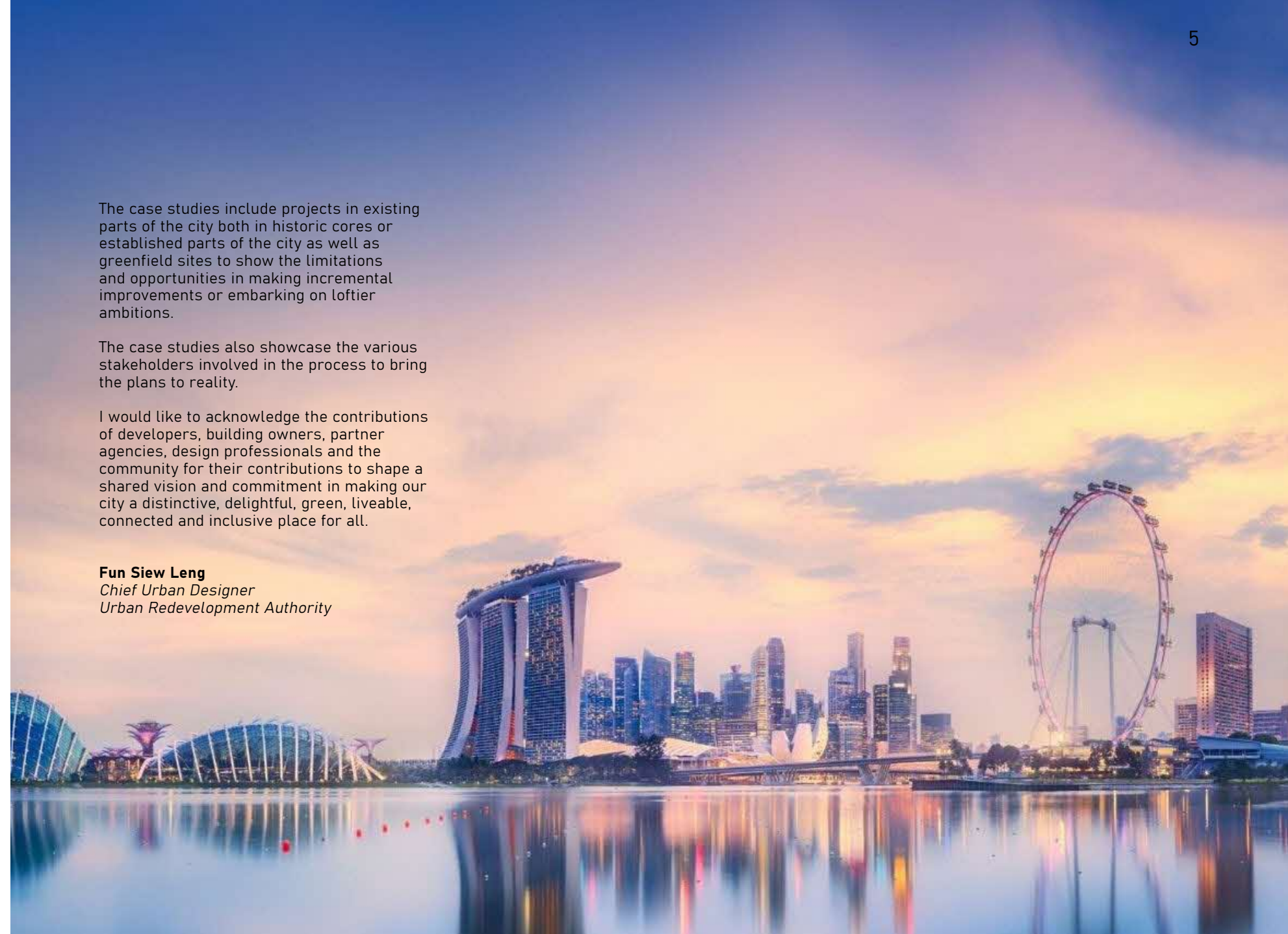
The case studies also showcase the various stakeholders involved in the process to bring the plans to reality.

I would like to acknowledge the contributions of developers, building owners, partner agencies, design professionals and the community for their contributions to shape a shared vision and commitment in making our city a distinctive, delightful, green, liveable, connected and inclusive place for all.

Fun Siew Leng

Chief Urban Designer

Urban Redevelopment Authority



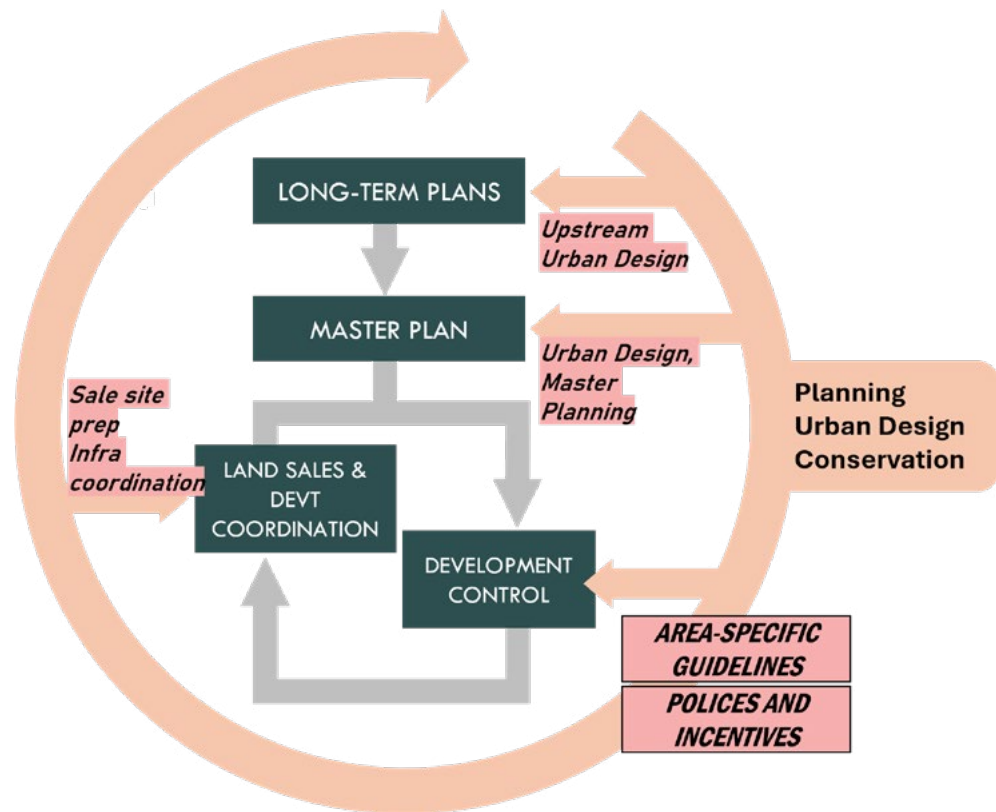


Part 1 The planning cycle

This section looks at the process by which URA translates plans into reality, through its integrated functions of planning (long-term and near-term), land sales, development coordination and development control.

It also delves into how urban design is involved in each step of the cycle from upstream to downstream planning, from advanced simulations and environmental studies to detailed sale site preparation work.

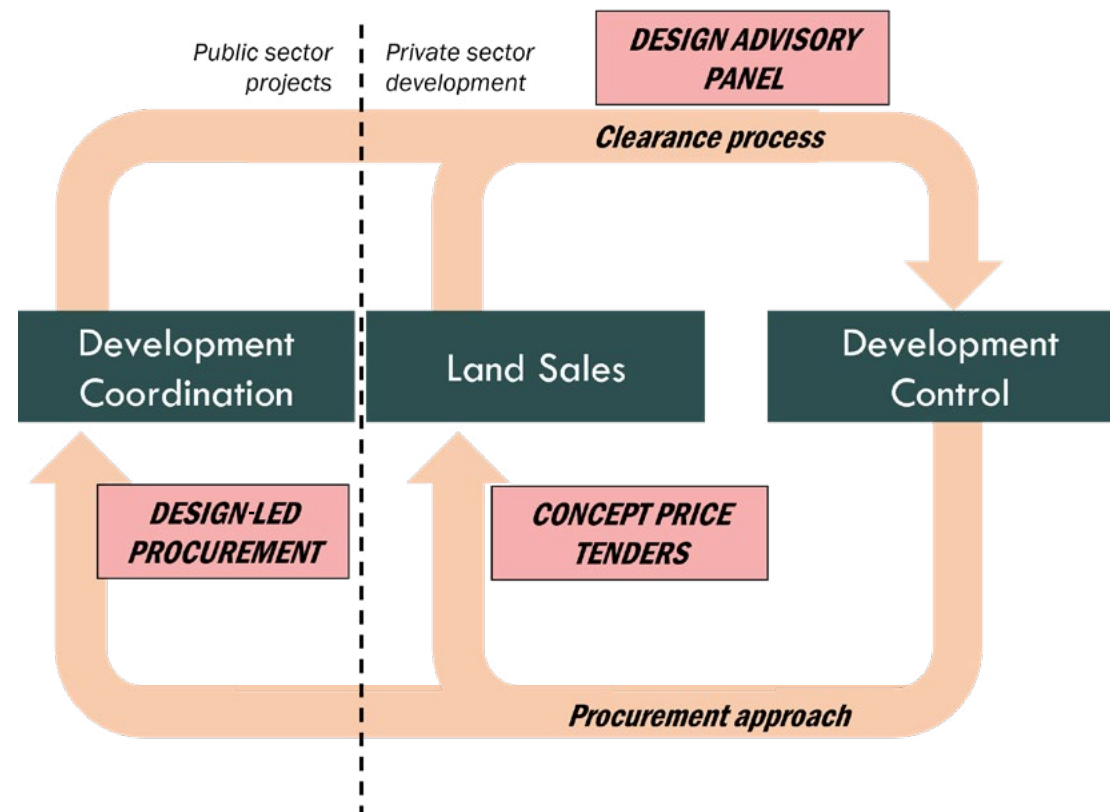
Special attention will be paid to two implementation instruments used to influence better urban design outcomes, namely the formulation and administration of area-specific guidelines, as well as policies and incentives.

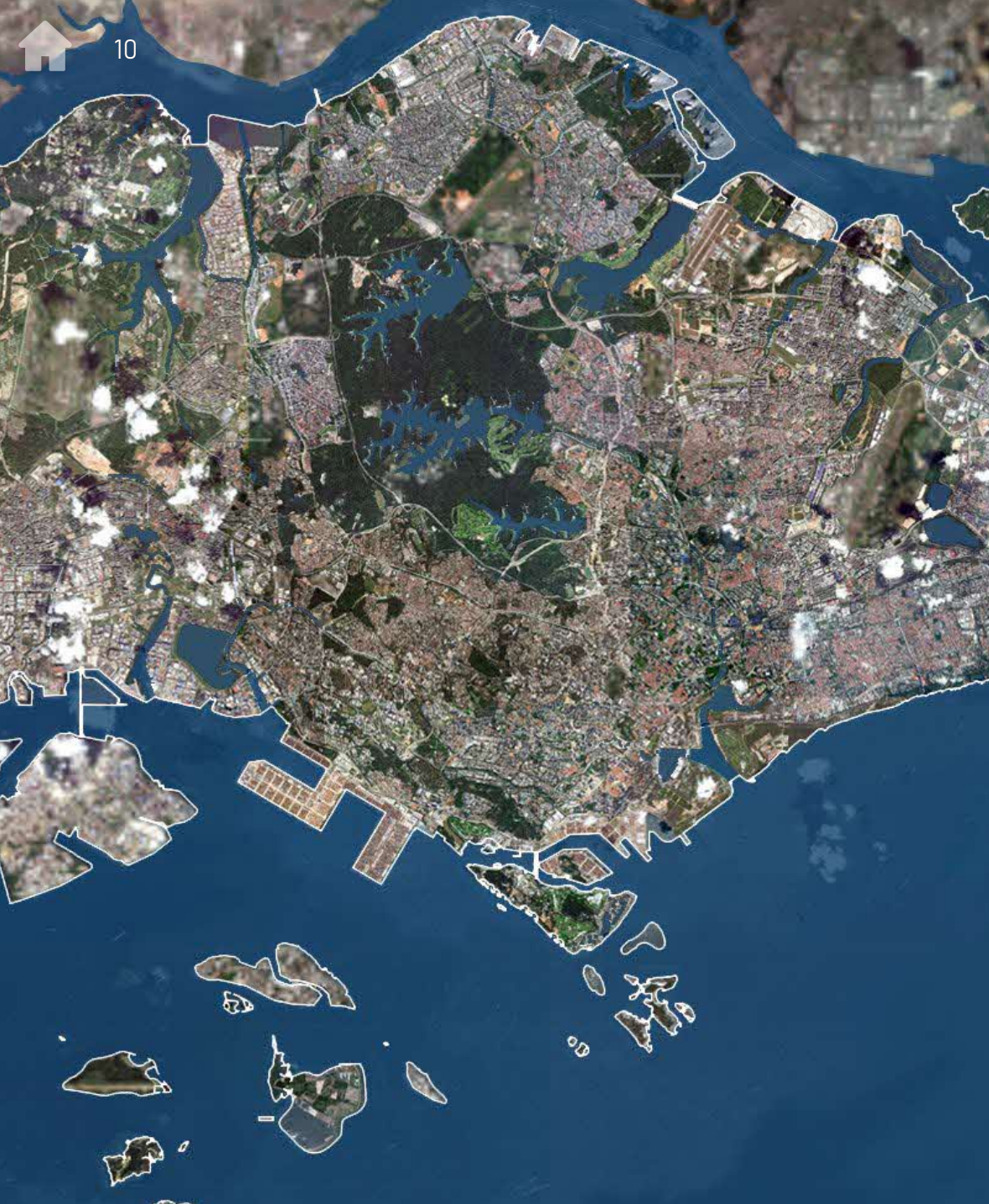


Part 2 The development cycle

This section delves deeper into the downstream processes of preparing land for sale, coordinating development, and development control. Urban design plays a key role in preparing the development conditions, and reviewing the submitted designs to ensure compliance.

Additional implementation instruments covered here include the use of Concept Price Tenders and Design-led Procurement methods ensure better design outcomes n private and public sector projects, as well as the use of the Design Advisory Panel to guide the approvals and design development process.





1.0

The planning cycle

The planning cycle refers to the upstream and downstream processes of planning and coordination that is overseen by the Urban Redevelopment Authority (URA) in Singapore.

The integration of the Long-Term and Master Plan processes, land sales and development control functions within URA allows it to ensure the translation of plans into reality in an orderly and concerted way.



London (2X)



NYC (1.7X)



Hong Kong (1.5X)

1.0.1: Translating plans into reality: URA's core functions

The Urban Redevelopment Authority (URA) is the national land planning and conservation authority in Singapore. It takes a long-term, careful planning approach to ensure that Singapore's limited land area is able to support the needs of current and future generations.

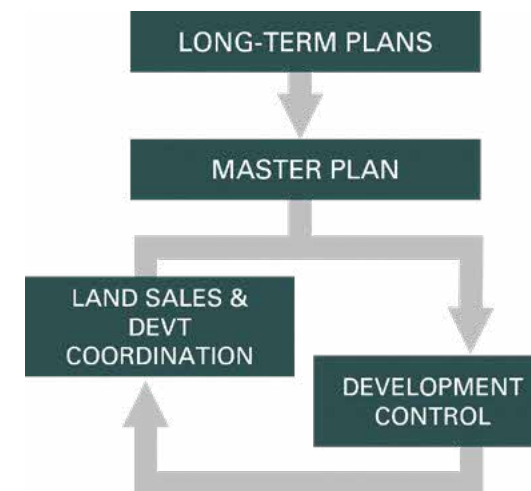
Singapore faces the challenge of fitting in all the uses of country into the limited land area of a geographically small city – only 734sqm, smaller than cities like London, New York and Hong Kong. Land must be set aside for critical functions such as air and sea ports, military areas, and water supply.

URA plays the role of master planner to ensure sustainable use of Singapore's limited land resource, carefully balancing the demands and trade-offs between different land uses.

URA's plans are guided by a systematic planning and development framework, which comprises the key components of planning and development management.

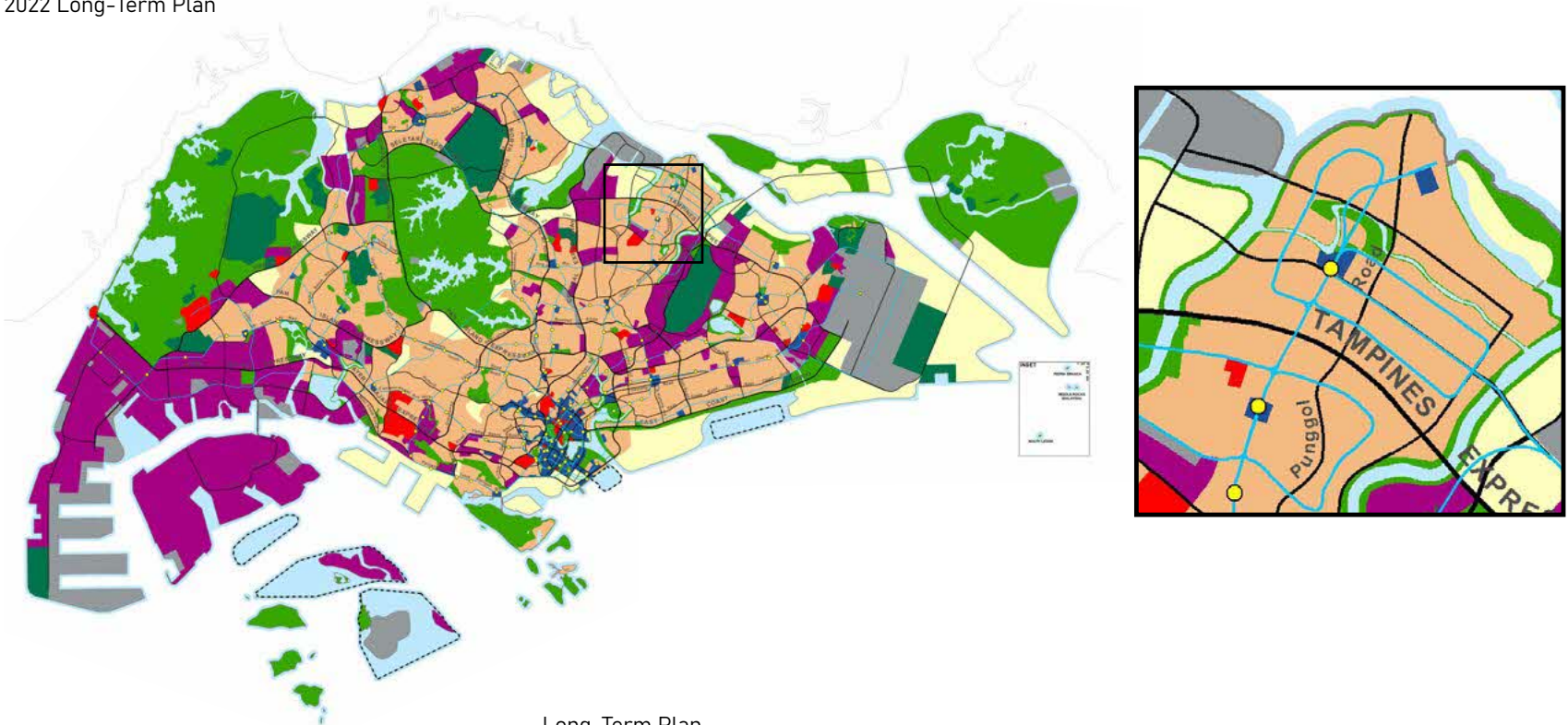
These four components form a planning cycle, of which URA directly oversees and manages each step to guide the development of Singapore strategically and sustainably.

The planning cycle





2022 Long-Term Plan



Long-Term Plan

The Planning Cycle starts with the formulation of Long-Term Plans, which guide the long-term development of Singapore, mapping out strategic land uses and infrastructure needs over a 50-year horizon. They are reviewed every 10 years to safeguard land for a quality living environment, based on evolving trends and market demands.

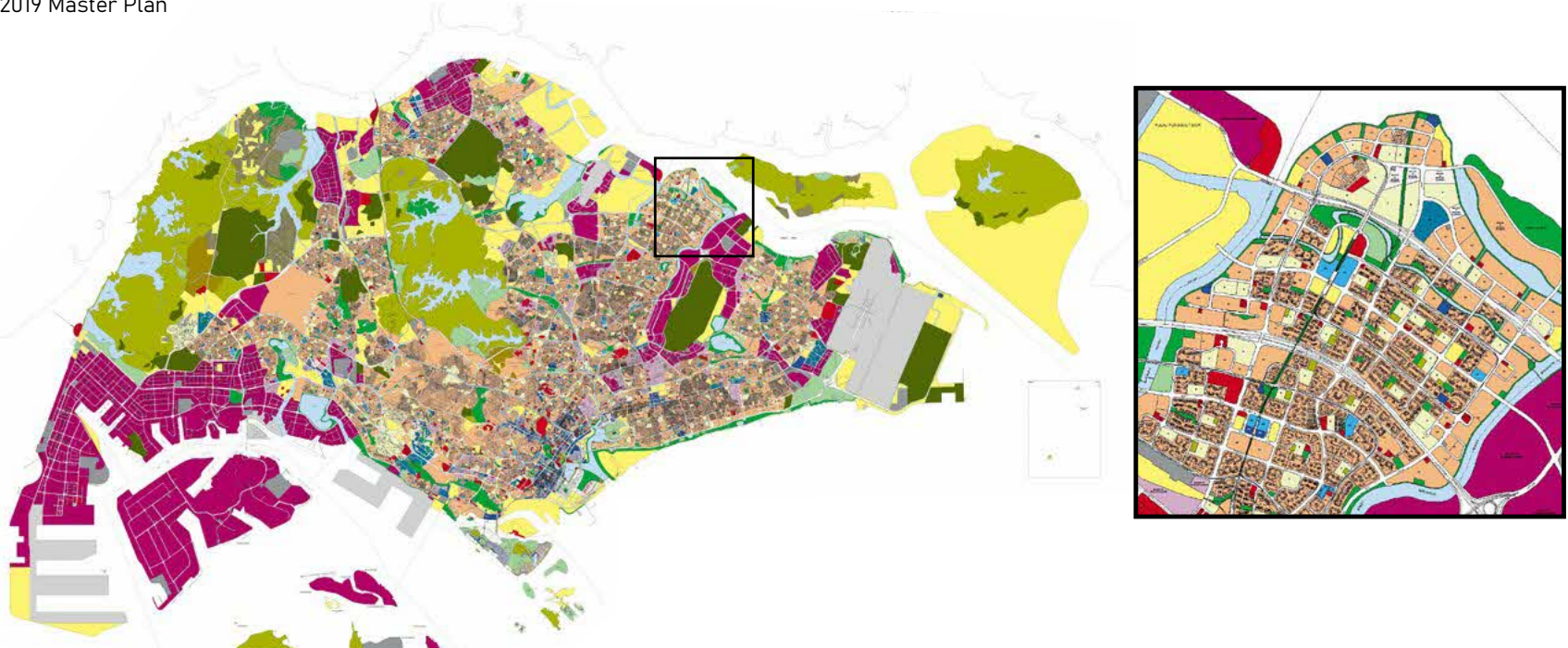
URA embarked on a year-long public engagement effort in the Long-Term Plan Review of 2022 to involve Singaporeans in

reimagining the country's future together, to ensure that the plans were shaped based on their aspirations and hopes.

Past Long-Term Plans are known as Concept Plans, which transformed Singapore from a developing nation to a developed one in less than 50 years, since gaining independence in 1965. The first Concept Plan was developed in 1971 with the help of the United Nations, which was instrumental in shaping the structure of the city and guiding its development over time.



2019 Master Plan



Tips for reading the Master Plan

- The colours represent different land uses, e.g. beige for residential, blue for commercial and red for institutional. Yellow indicates reserve which means the specific land use has not yet been determined.
- Numbers in each site represent the gross plot ratio, indicating the maximum allowable intensity for the land parcel measured in gross floor area or(GFA) divided by its site area. A number of 5.0, for example, indicates the overall GFA of five times the site area.

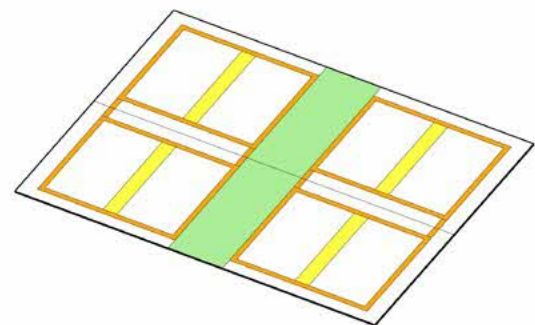
Master Plan

The strategies of the Long-Term plan are translated into the Master Plan which is in turn reviewed every five years. It seeks to guide the development of land and property across Singapore. It does so by showing the permissible land use and density to facilitate urban growth and development in a transparent and orderly manner.

The Master Plan is a statutory land use plan which guides development in the medium term over the next 10 to 15 years. It also provides a transparent and open platform for developers,

land owners and others in understanding the planning intention of future plans for every site in Singapore, providing assurance and certainty for the property market.

The Master Plan is supported by Special and Detailed Control Plans (SDCP), such as the Parks and Waterbodies Plan, Building Height Plans and Conservation Areas and Monuments.

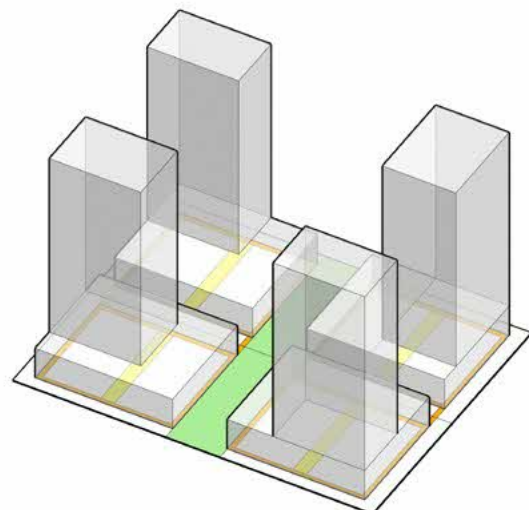


Planning and preparation of land parcels for sale.

Land Sales and Development Coordination

The planning and urban design intentions of the Master Plan are translated into development opportunities through URA's land sales and development coordination efforts.

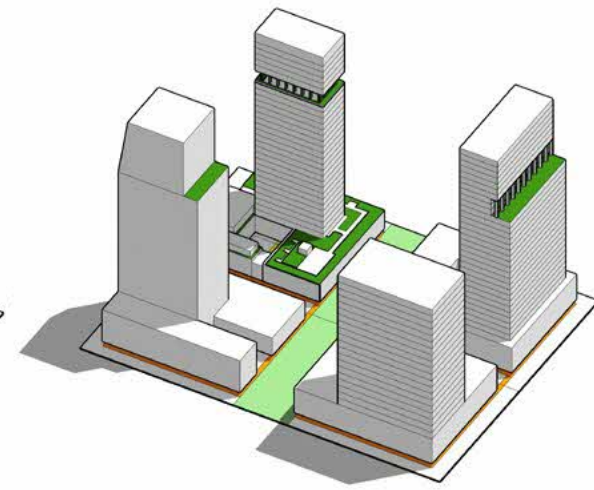
URA acts as an agent for the State to sell parcels of land for development, based on the parameters defined in the Master Plan. As the government is the majority land-owner in Singapore, the Government Land Sales (GLS) programme is a powerful tool in ensuring that development of the city is carried out in a timely and orderly fashion.



Development of planning and urban design parameters like density and height.

As the appointed land sales agent, URA prepares the technical conditions of tender (TCOT) by studying and finalising the allowable land uses, intensity and urban design parameters for every site. URA also prepares the land for development, ensuring that road access and utility services would be ready.

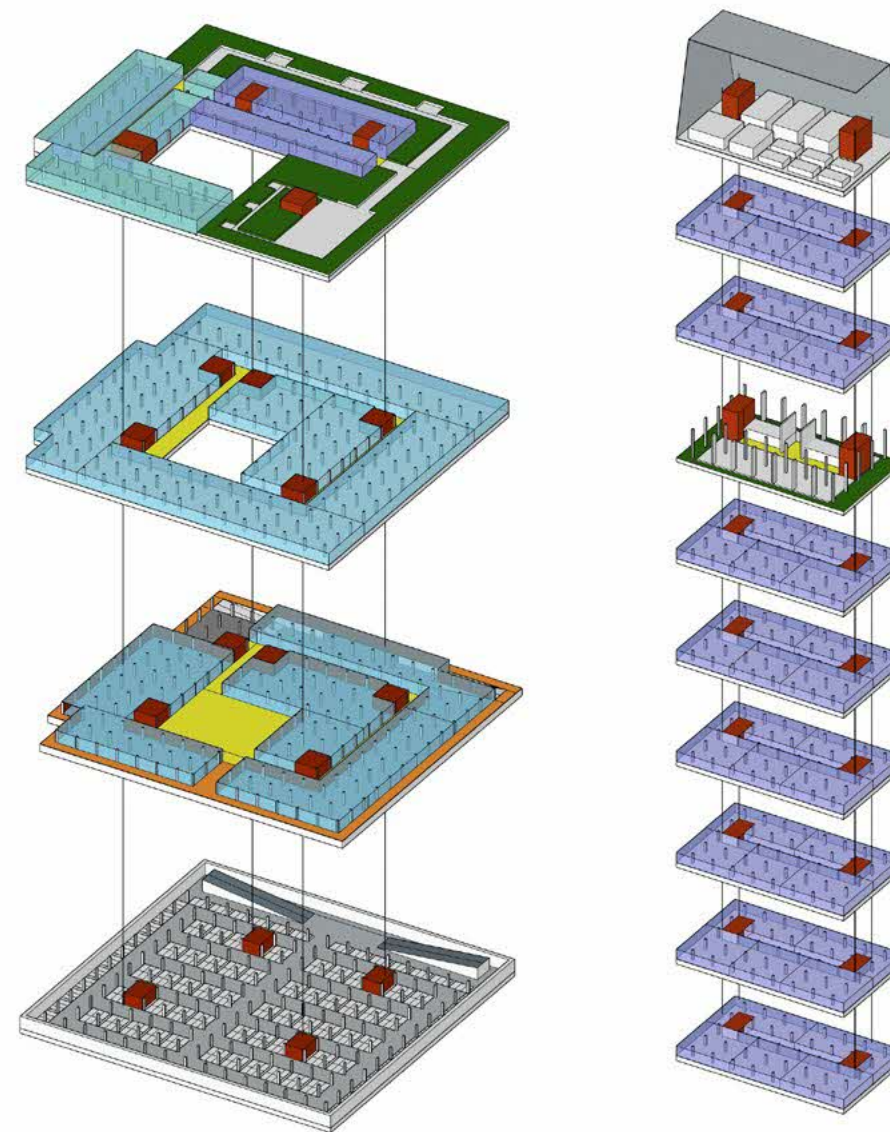
GLS is used to direct development to strategic locations at the right time for the right uses, responding to market demand and ensuring enough supply for the long term.



Staging of land parcels for sale according to market demand.

URA releases available land parcels under the GLS programme every six months under a confirmed and reserved list. The confirmed list fixes a date for the launch, while the land parcels on reserved list will only be made available through application.

URA also coordinates the development of land by other public sector agencies, such as HDB for public housing and JTC for industrial uses, by similarly preparing the development conditions for every site.



Guidance of design development as part of Development Approval process.

Development Control

URA's development control function closes the loop on land sales and development efforts, allowing URA to review and approve all development applications to ensure compliance with the Master Plan as well as the technical conditions of tender.

Under the Planning Act, it is mandatory for all land owners who wish to undertake development works on the land or property to submit plans and drawings for URA's approval before works can be carried out.

It is this unique combination of all four functions that allows URA to firstly develop the overall plans for the city, prepare the detailed development guidelines, then sell or allocate the land for development and ensuring development plans are in accordance with the planning and urban design intention.

This systematically ensures that the plans developed for Singapore are translated into reality.

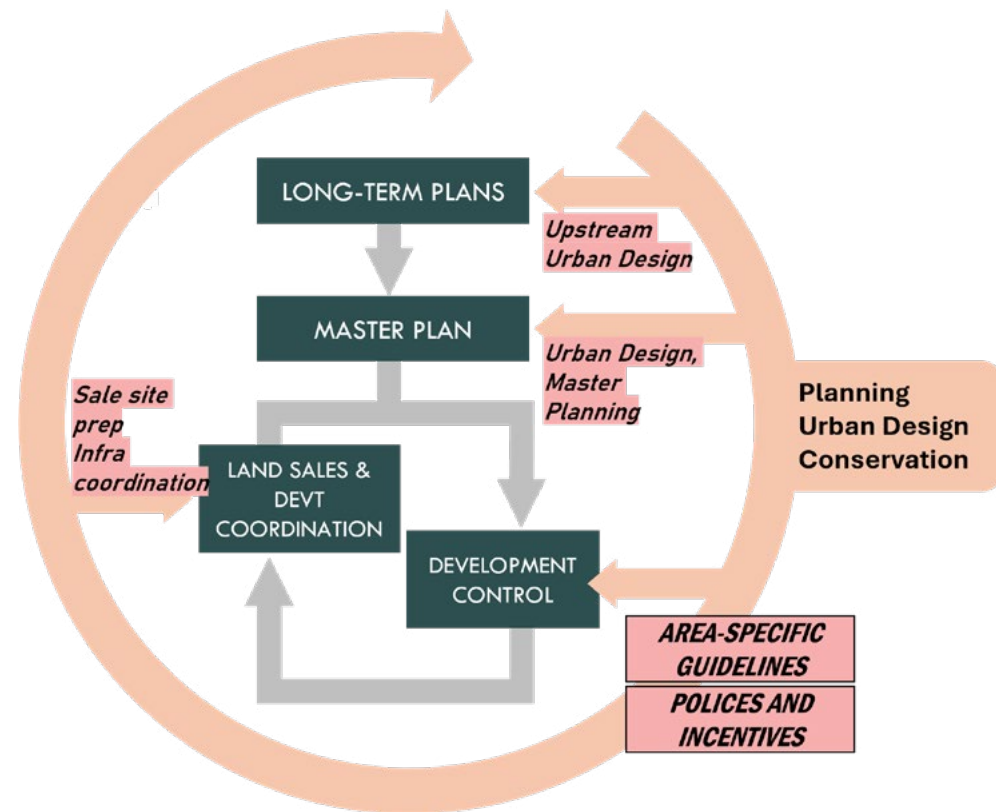


1.0.2: Shaping the built outcome through urban design

One of the main roles of the urban designer is translating plans and policies into built outcomes, or giving three-dimensional expression to two-dimensional plans. Hence the work of the urban designer is needed to inform planning studies and decisions.

Urban designers within URA are intimately involved in every step of the planning cycle. The diagram on the right shows how this happens from the upstream to downstream stages:

- At the upstream plan-making stages, the urban designer translates land use and density plans into massing outcomes for visualisation and analytical studies, e.g. for microclimate studies; and
- At the downstream development coordination and approval stages, the urban designer establishes guidelines to regulate development, prepares land tender conditions, and reviews development applications for compliance.



What does urban design look at?

The work of urban design is multi-dimensional and complex, dealing with the wide-ranging issues and inter-connected systems that make up cities function today.

One way of understanding the work of urban design is to see it as the bridge between planning and development. Urban designers translate planning parameters into development results, acting as 'architects' of the city to shape desirable outcomes for the city.

At the same time, urban design coordinates across many diverse disciplines to shape the final built environment, encompassing buildings and all the spaces between them. Urban designers therefore have to navigate across different realms of expertise, to bring together planning, architecture, engineering, landscape design, and even land and development economics, social and cultural factors to bring about positive change.

Cities are also layers of urban fabric and social memories built up over time. In guiding development efforts in built up areas, urban designers have to operate across space and time to find compatible outcomes, breathe to find new life into ageing fabric while managing the pace of change. To this, urban designers are reminded to keep in mind the impact of their work has on the lives of everyday people.

The butterfly effect describes the notion that even small actions can have non-linear impacts on complex systems. This is especially true of urban design work in cities.

With the advent of modelling and analysis tools, the impact of design can now be quantified and directed more strategically towards helping the city cope with challenges such as climate change and an ageing society. While the work of urban design is never-ending, cities are also never-ending sources of creativity and inspiration. The work of urban design in Singapore continues today ever so to meet the challenges of today and tomorrow.



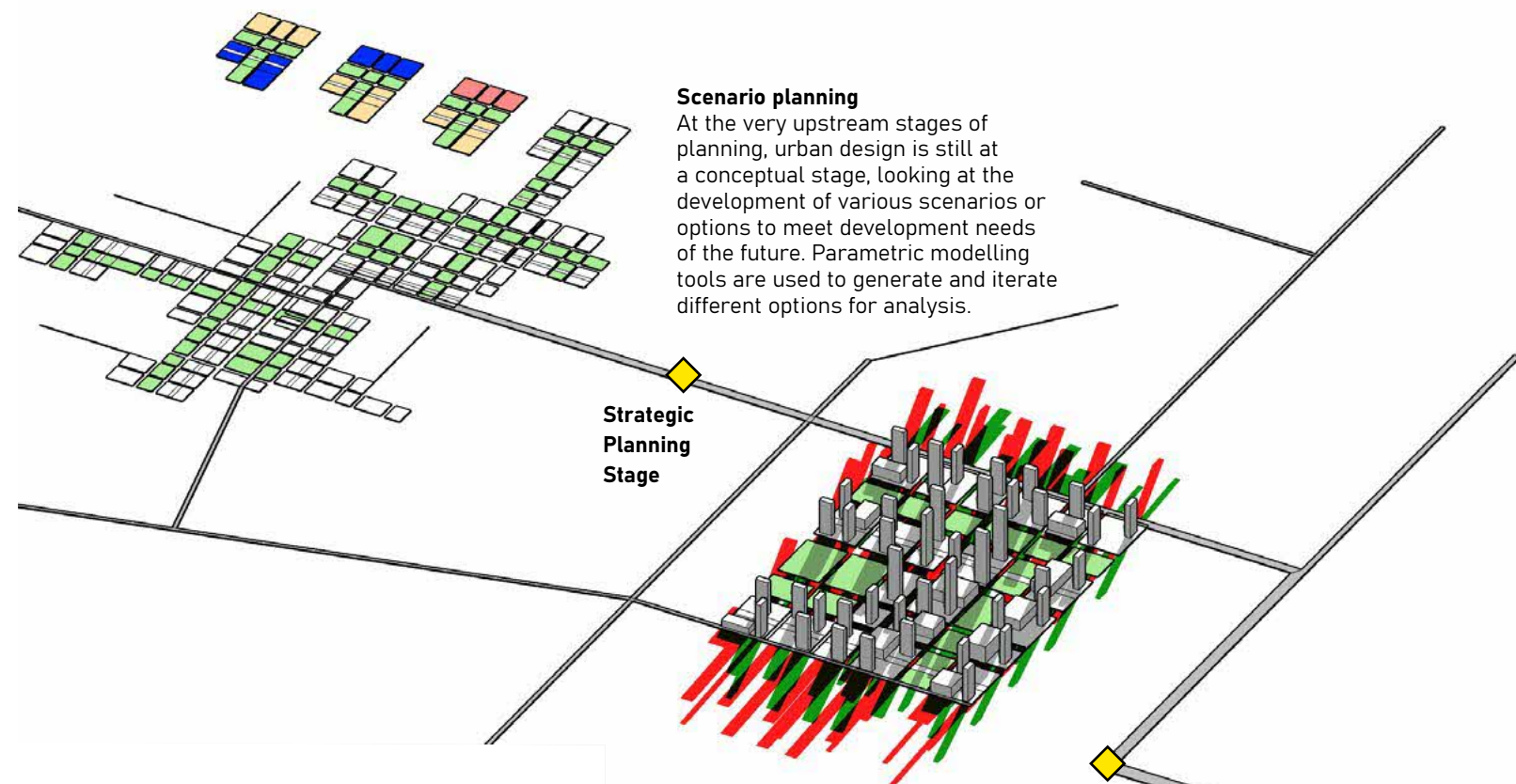
CONTEXTUAL



HUMAN-CENTRIC



IMPLEMENTABLE

**Scenario planning**

At the very upstream stages of planning, urban design is still at a conceptual stage, looking at the development of various scenarios or options to meet development needs of the future. Parametric modelling tools are used to generate and iterate different options for analysis.

Strategic Planning Stage

How urban design supports the planning cycle

As the three-dimensional expression of plans and policy, urban design work takes place at every stage of the planning cycle to inform planning considerations at each stage.

The above diagram maps out urban design work from the upstage to downstage phases of planning and coordination in Singapore.

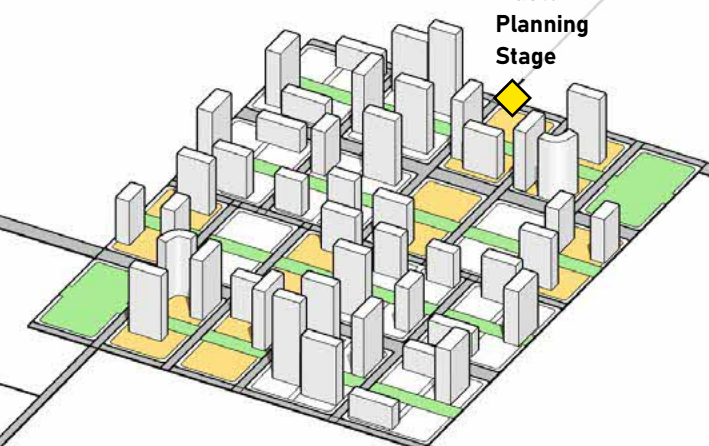
Strategic studies, analysis and iteration

Different options on density, layout and even typology are tested on various liveability metrics, such as access to services, walkability, microclimate, etc, to ensure that the development parameters are appropriate.

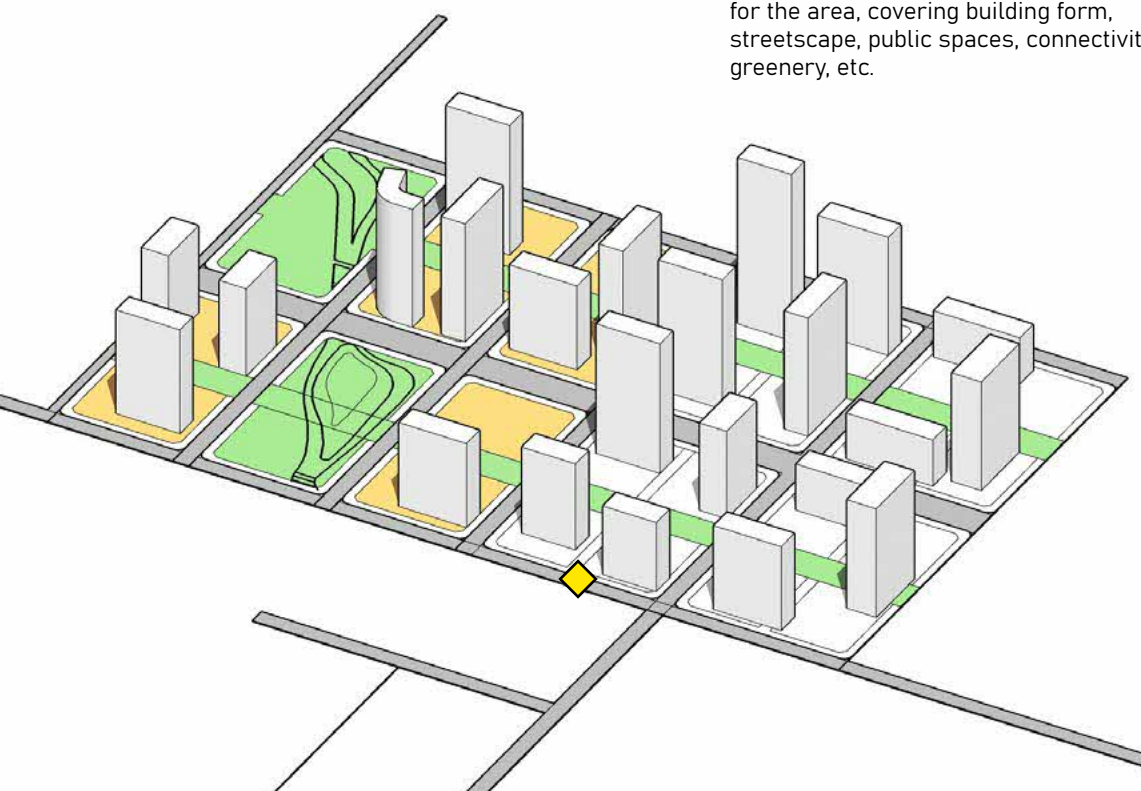
Masterplanning

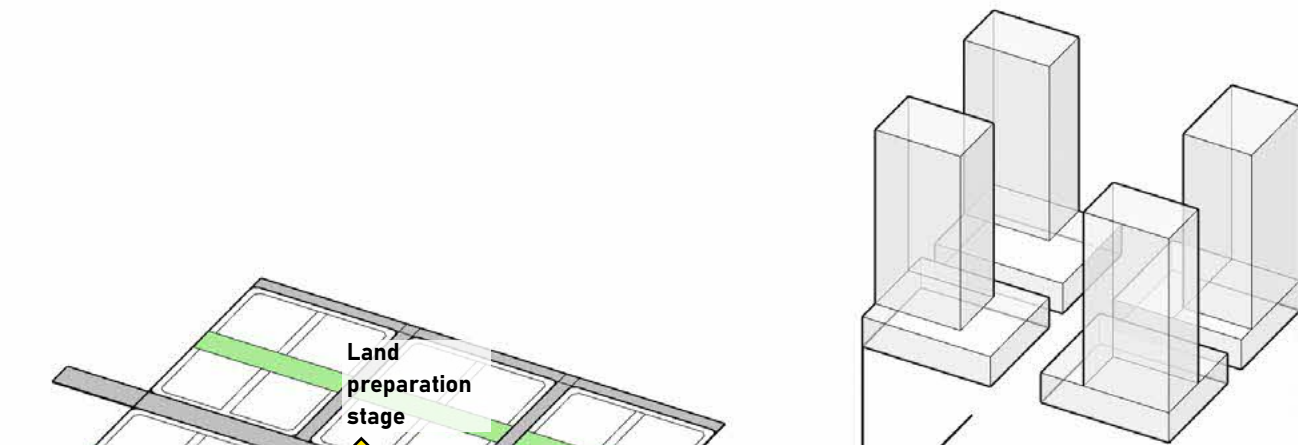
As new areas are opened up for development, urban designers undertake masterplanning for the area. They carry out conceptualisation and visioning to develop cohesive ideas and strategies for the area. They also have to undertake comprehensive site analysis of the site and understand the trends and market forces that will influence development.

Master Planning Stage

**Urban design guidelines e.g. building form, streetscape, public realm, etc**

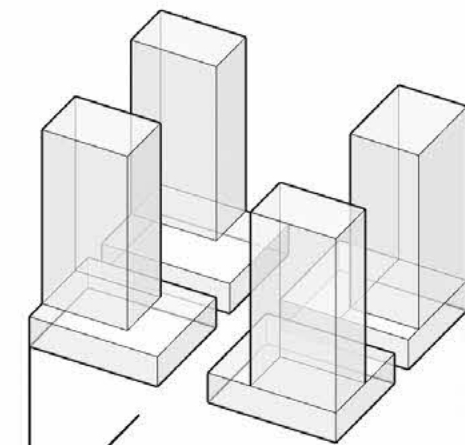
Urban designers then draw up plans and guidelines at various scales that are holistic, integrated and functional, which will coordinate the entire built outcome for the area, covering building form, streetscape, public spaces, connectivity, greenery, etc.



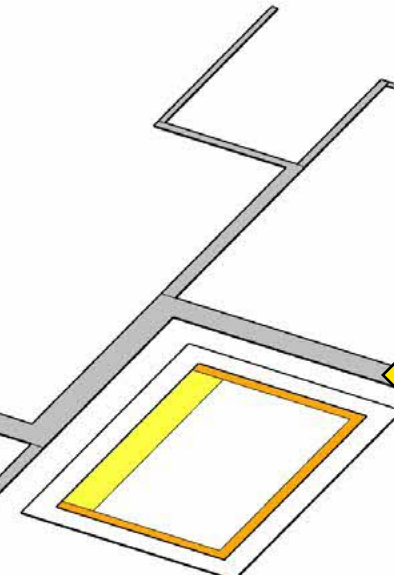
**Land preparation stage****Land preparation**

During or after the masterplanning stage, URA commences preparation of the land to support development. For greenfield areas, this may include the work of laying new roads, drainage, water and power supply.

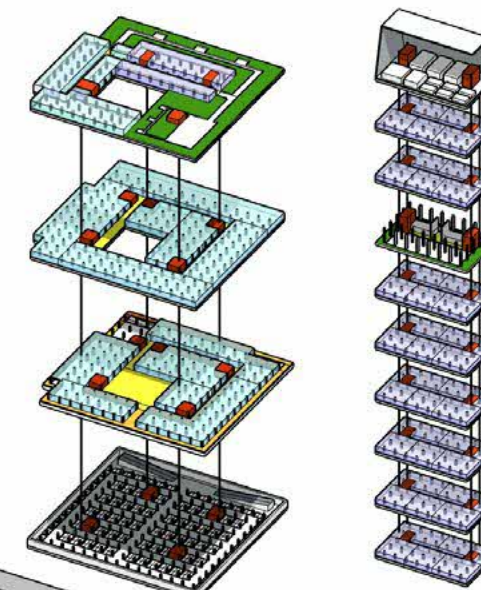
Urban designers work with infrastructure agencies to coordinate the layouts of these services in line with the desired streetscape and connectivity outcomes. For example, the sizing of roadside tables to fit desired walking, cycling and landscaping space.

**Land sales stage****Sale site preparation**

At this stage, the land parcels are prepared for sale and development by URA. Urban designers help to prepare detailed urban design conditions and control plans for each site as part of the sales package, so that the requirements are clearly communicated to the successful tenderer or developer of the land.

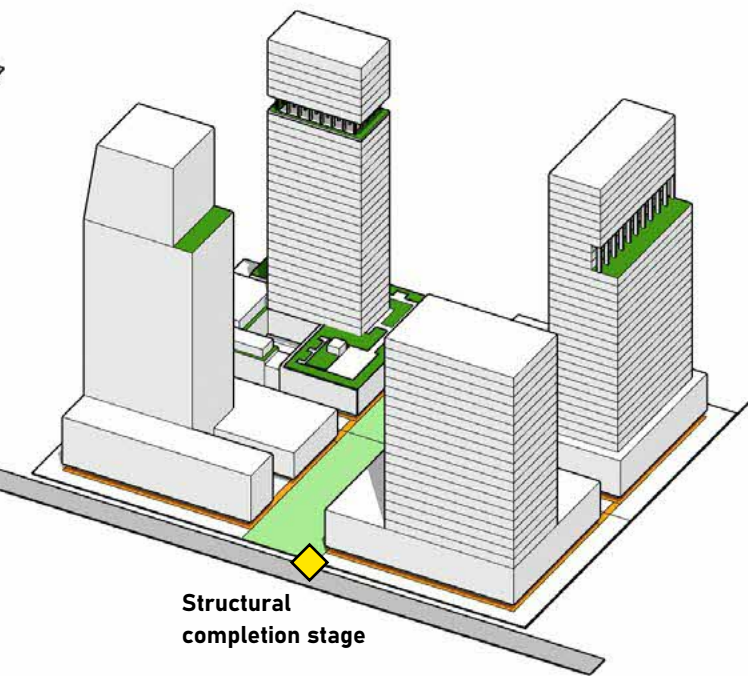
**Land Sales Award**

Land is sold under the Government Land Sales (GLS) programme managed by URA. For special land sales mechanisms like Concept-Price Tenders or Fixed-Price Tenders, urban designers are involved in the evaluation process to select the best proposals for the site.

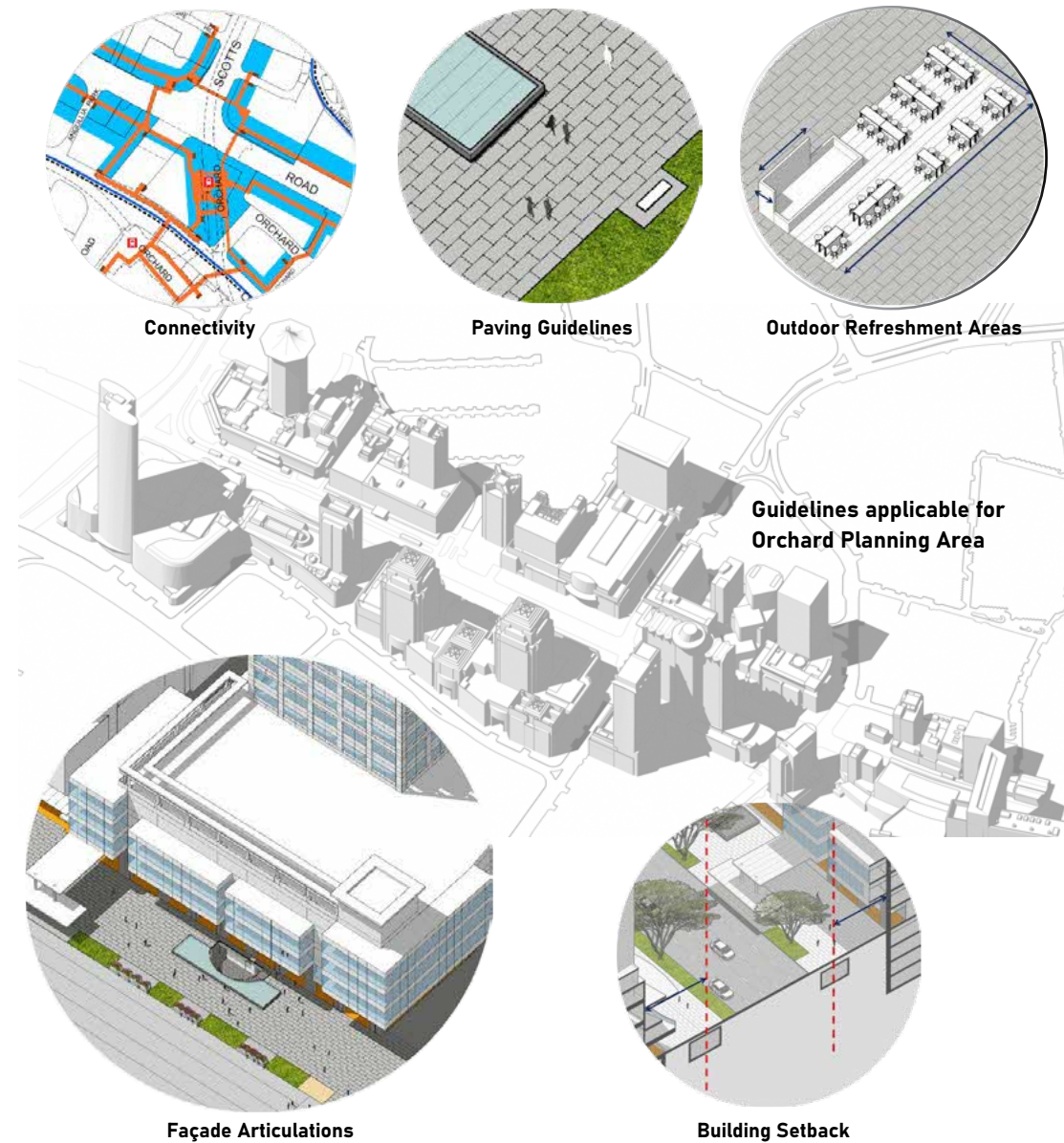
**Design development and approvals stage**

After successfully bidding for the site, the Successful Tenderer appoints an architect, also known as the Qualified Person (QP), to develop the design proposal and make submissions to URA for approval.

Urban designers will review the 2D and 3D plans and drawings to ensure that the design complies with the sale site requirements.

**Structural completion stage****Statutory completion**

After completion of construction, urban designers may be required to perform site checks before the Temporary Occupancy Permit (TOP) or Certificate of Statutory Completion (CSC) can be released.



How urban design supports the planning and development cycle

1.1: UD implementation instrument: Area-based guidelines

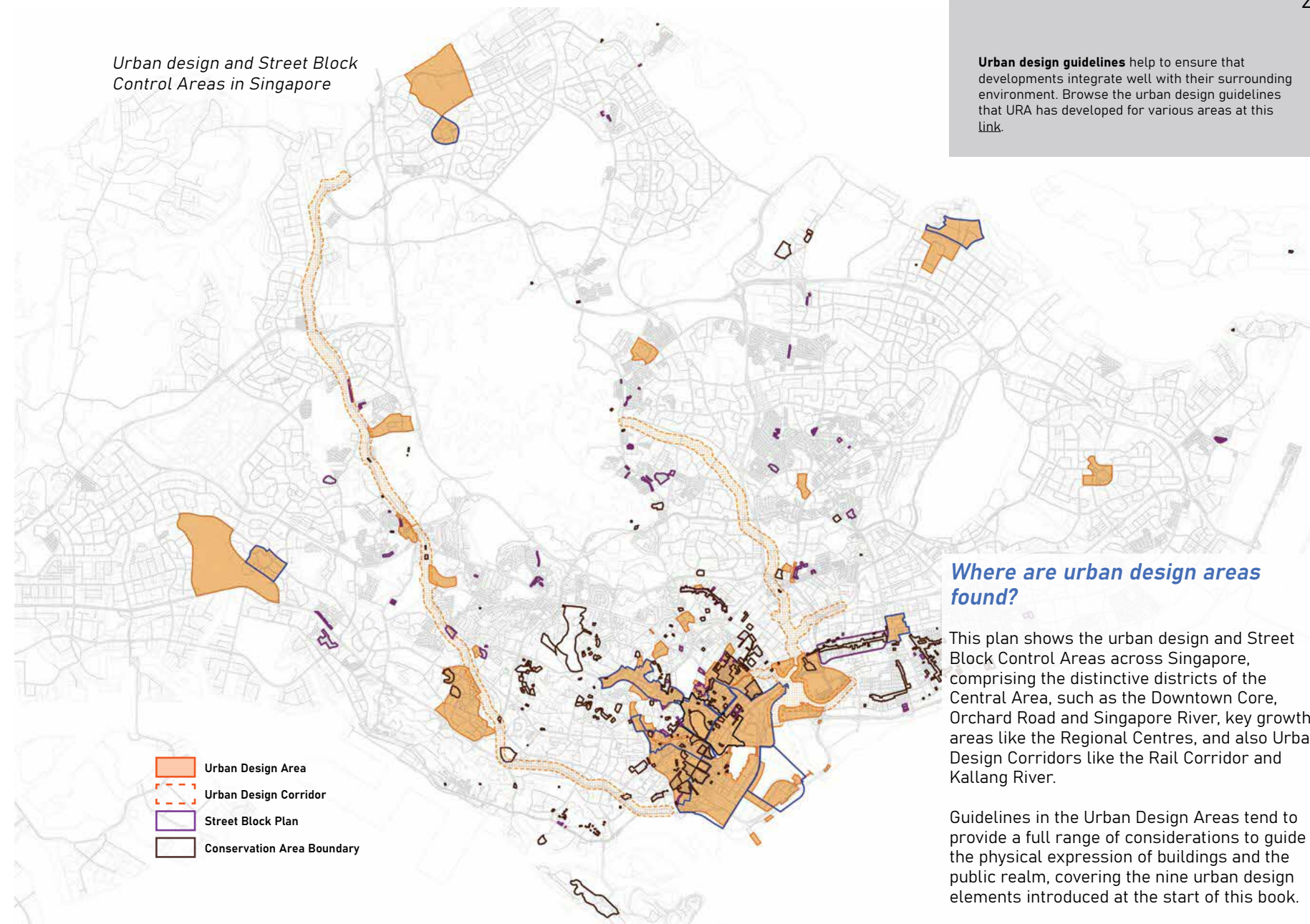
The work of urban design goes beyond the usual planning instruments such as zoning and development controls to provide deeper, contextual and sometimes more technical guidance for developments in key areas.

While development control guidelines provide the basic stipulations on land use, intensity, height, set backs and connectivity requirements, to ensure orderly development according to the Master Plan, deeper guidance is often needed in many built-up areas that require a contextual response, e.g. to respond to topography, heritage or unique building typologies, or challenging integration requirements, e.g. transit oriented developments.

In certain cities, this can take the form of secondary plans which provide more detailed policies for designated areas, sometimes considered a second layer of the official plan.

In Singapore, this takes the form of urban design areas and areas with Street Block Controls. The difference between both is that urban design areas tend to be larger and have more comprehensive layers of guidance, while Street Block Control areas tend to be smaller street blocks where only a few development parameters need to be clarified.

Urban design and Street Block Control Areas in Singapore

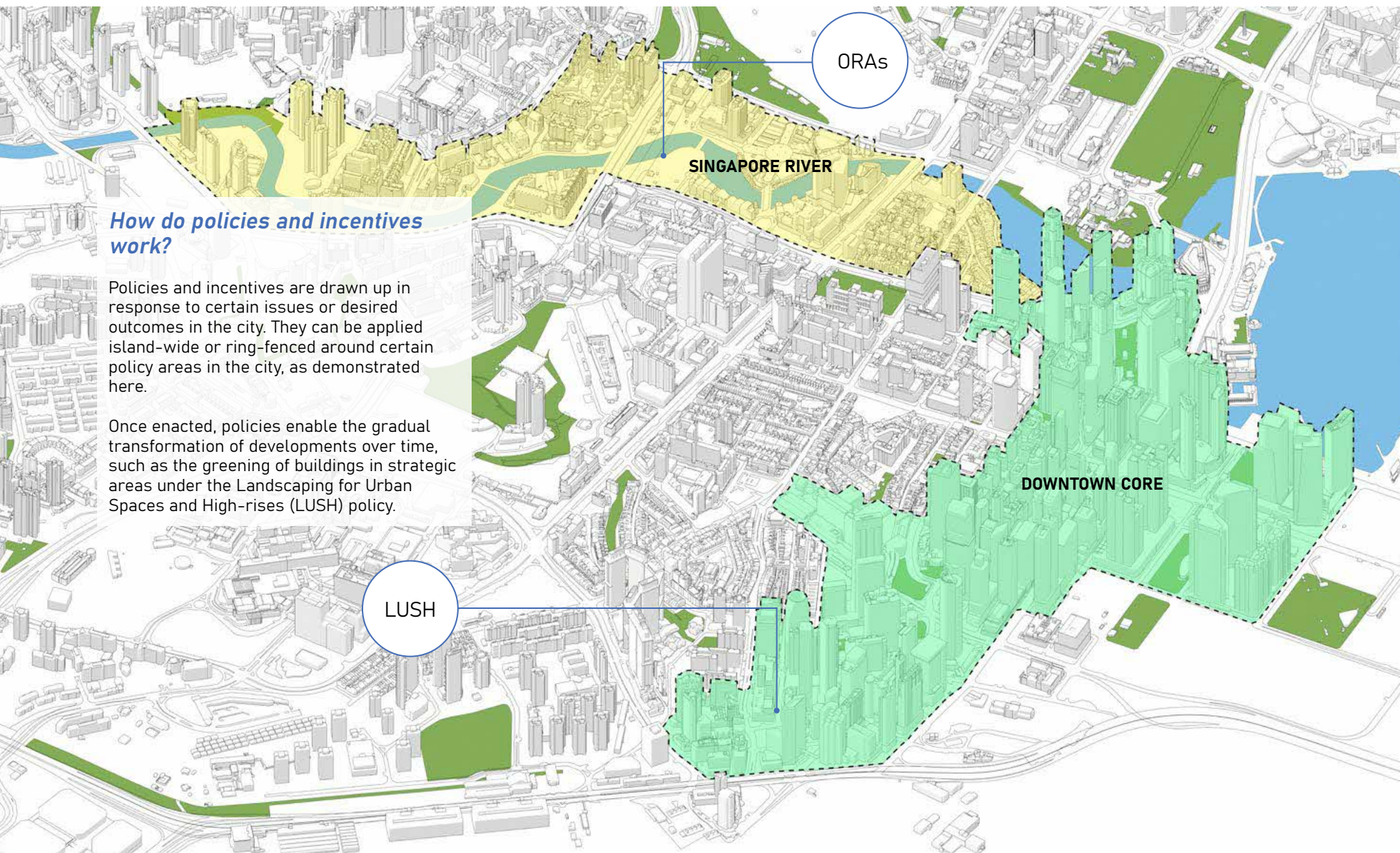


Urban design guidelines help to ensure that developments integrate well with their surrounding environment. Browse the urban design guidelines that URA has developed for various areas at this [link](#).

Where are urban design areas found?

This plan shows the urban design and Street Block Control Areas across Singapore, comprising the distinctive districts of the Central Area, such as the Downtown Core, Orchard Road and Singapore River, key growth areas like the Regional Centres, and also Urban Design Corridors like the Rail Corridor and Kallang River.

Guidelines in the Urban Design Areas tend to provide a full range of considerations to guide the physical expression of buildings and the public realm, covering the nine urban design elements introduced at the start of this book.



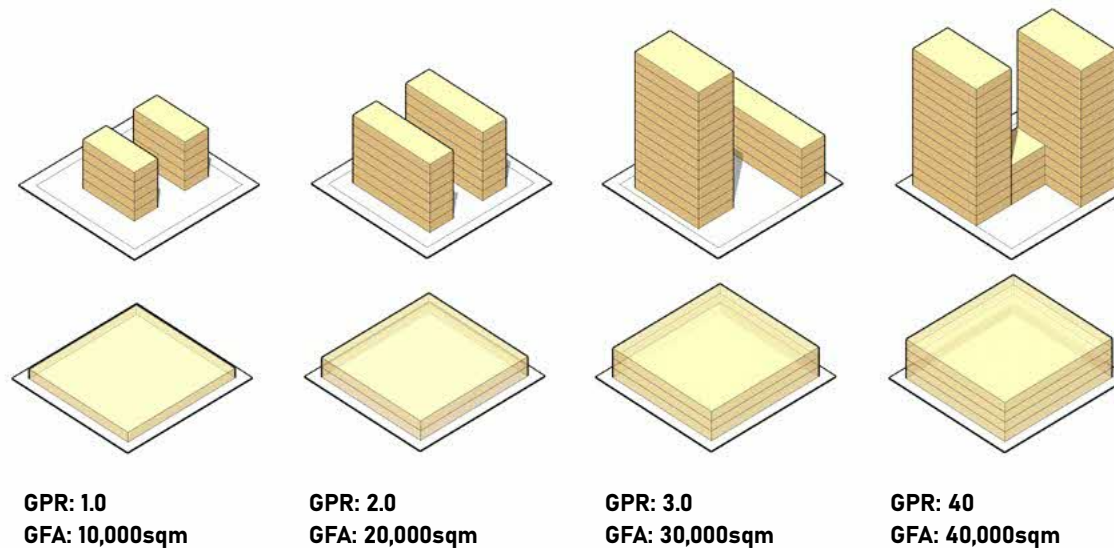
How urban design supports the planning and development cycle

1.2: UD implementation instrument: Policies and incentives

Compared to area-based guidelines, policies are usually developed in response to specific issues, for example to encourage the provision of certain features in developments like greenery, connections, outdoor refreshment areas, etc.

Policies provide transparency and ensure a level playing field by subjecting all developments to the same requirements.

Some policies are mandatory, such as LUSH – which requires landscape replacement areas as part of redevelopment. Others use gross floor area (GFA) as an incentive by offering GFA in the form of exemptions or bonuses as part of compliance with the policy.



GFA as an incentive tool

GFA is a planning tool used by URA to measure and control building bulk and intensity and is a valuable asset to developers as it translates into leasable areas in the development. Singapore is not the first or only country in the world using GFA, cities like New York, Tokyo and Hong Kong have similar systems although the methods of floor area definition differ.

Every development is subject to a GFA cap based on the gross plot ratio indicated in the Master Plan, to ensure that services, infrastructure and the environment can cope with the development intensity. Hence, bonuses work by allowing developers to exceed the GFA cap and obtain more leasable area, while exemptions work by not counting areas required as part of the policy under the GFA cap. Each approach has its benefits.



GFA exemptions

URA uses GFA exemptions to encourage the provision of desirable features in developments.

One such example is areas covered by roof eaves, which are important in Singapore's tropical climate as they provide shade. Without the exemption, developers would not be incentivised to provide them as they are not typically leasable or valuable spaces.

Another example is that of sheltered public spaces - without the exemption, developers may either not provide them or prefer to leave them open to sky, which would make them less comfortable and conducive to activities during the day.

While exemptions are effective at encouraging the provision and better design of certain features in buildings, they can have some distortionary effect on the overall massing and bulk of the development, as a building designed with many voids or other "exempted areas" can increase in size. Hence the list of areas that can be exempted is carefully considered, and urban designers may stipulate additional guidance on the overall mass and height of developments to ensure compatibility with the surroundings.

Bonus GFA

URA introduced the concept of bonus GFA as a more targeted approach to incentivise the provision of desirable features in developments.

Under such schemes, developments can exceed the Master Plan plot ratio control up to a cap if the desired building features or uses are incorporated under the policy.

One key example of a bonus GFA scheme is the guidelines for outdoor kiosks and Outdoor Refreshment Areas (ORAs) along Orchard Road, to encourage their provision to generate buzz and vibrancy along the commercial corridor.

Other bonus GFA schemes include policies for balcony spaces (to promote skyscraper greenery), as well as community and sports facilities in developments (under the Community / Sports Facilities Scheme).

To prevent over-use of the bonus GFA which could inflate development bulk and intensity, URA introduced a GFA cap of 10% for all bonus GFA schemes used in developments in 2009.

All GFA bonuses schemes have a validity period, after which URA would decide if the scheme needs to be retained, modified or retired.

GFA exemption areas

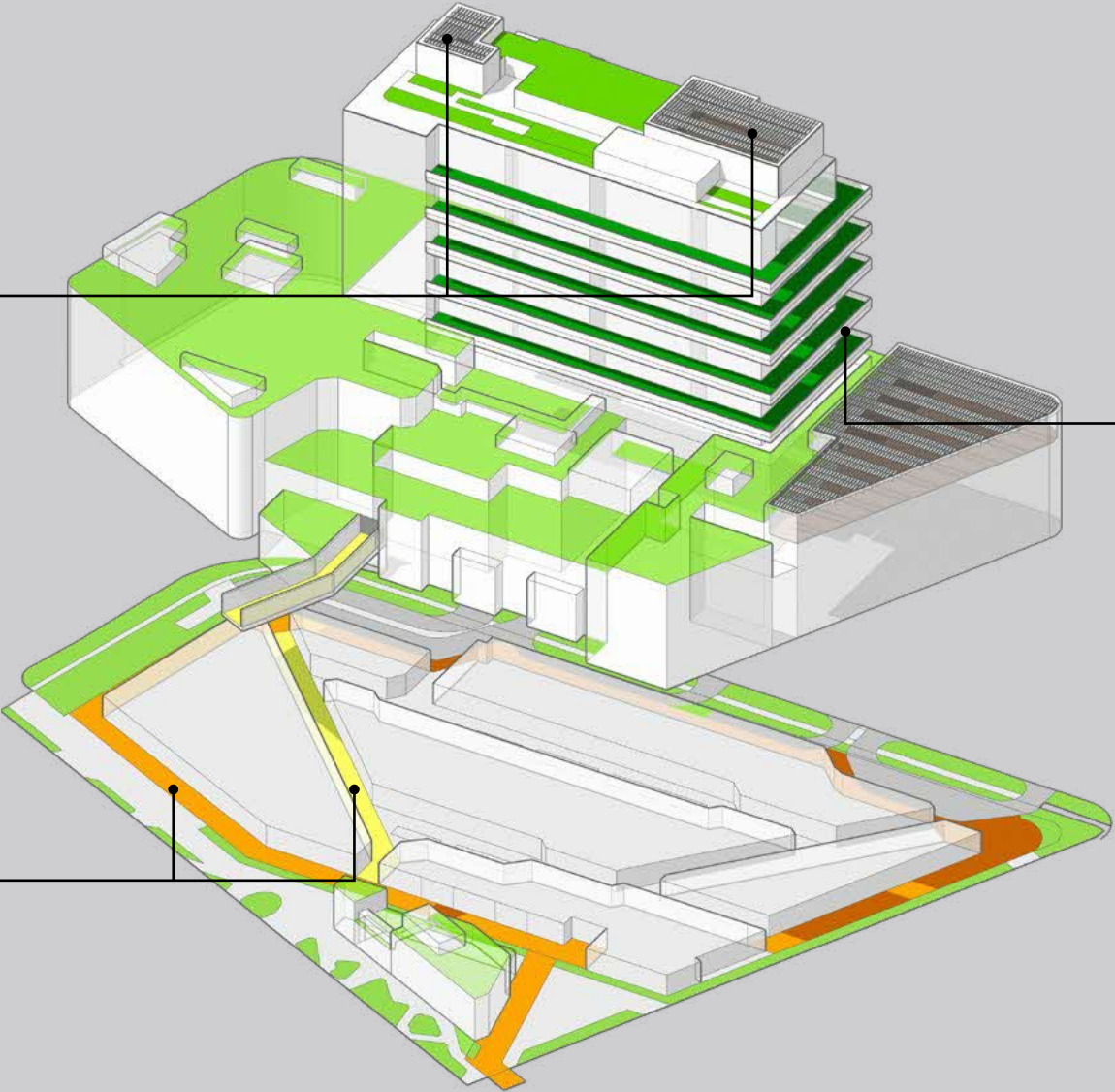
Generally, all covered areas of a development are considered as GFA as they are usable spaces, however some areas can be exempted to encourage their provision for the public good:

Rooftop M&E spaces
These can be exempted if generally open-to-sky (e.g. only covered by trellises) or if transferred to the top three floors below the roof to allow the rooftop to be used for roof gardens.

Public spaces
Generally, uncovered public spaces in a development are not computed as GFA, e.g. open plazas and gardens. Covered public spaces like sheltered plazas can also be exempted if they qualify under the POPs guidelines

Shadow areas
Unenclosed areas under building projections like ledges, balconies, bay windows, etc are generally exempted from GFA computation.

Connectivity network
Areas for public circulation such as covered walkways, linkways, through-block links, underground and elevated pedestrian links, etc. These must meet certain conditions such as minimum width requirements and stipulated opening hours.



Bonus GFA areas

Bonus GFA schemes are a more targeted approach to incentivise the provision of certain building features, and are subject to a cumulative cap of 10% of the development GFA.

Balconies
Covered semi-outdoor spaces that are important elements of tropical architecture. As they are computed as bonus GFA, they can be provided over and above the GFA cap for the development.

Outdoor Refreshment Areas
Unenclosed outdoor areas meant for eating only, as extensions of indoor f&b establishments. These are offered as bonus GFA schemes in strategic locations like Orchard Road.

Community and sports facilities
Community and sports facilities in commercial developments that can be provided over and above the GFA cap, subject to compliance with certain requirements.

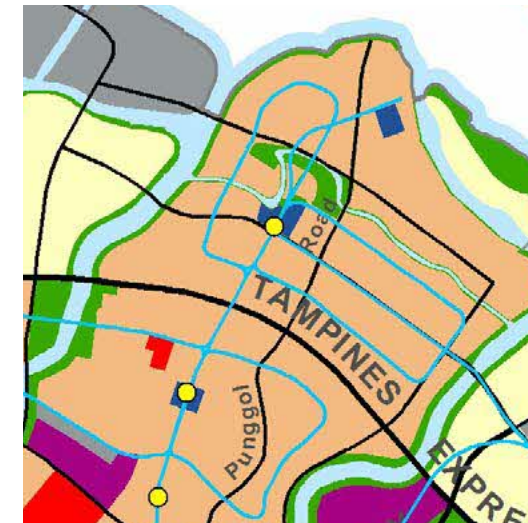


2.0

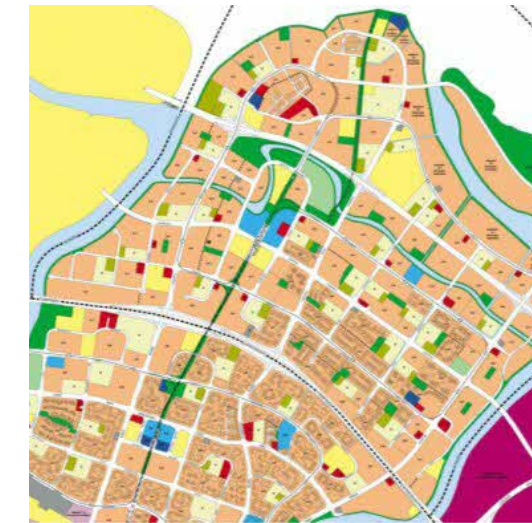
The development cycle

This section expands on the development section of the planning cycle covered in the previous chapters, focusing on the urban design implementation instruments that support the work of land sales and development control to facilitate good design outcomes.

Source: Andy Mitchell,
Wikimedia Commons



Long-Term Plan



Master Plan



Ponggol Town

Source: Stacked Homes

2.0.1: Closing the loop between planning intentions and development outcomes

URA's core functions in the areas of land sales and development control allow it to effectively steward the development process across both public and private sectors in Singapore, from the development of sale site conditions or planning approval conditions, to reviewing the design proposals when they are submitted for approval. This closes the loop between the planning intention and the final built outcome for every site.

Works deemed as development of land as defined in the Planning Act would require planning permission from URA. URA evaluates and grants planning approvals for developments to ensure orderly development, guided by the Master Plan as well as development control, urban design and conservation guidelines.

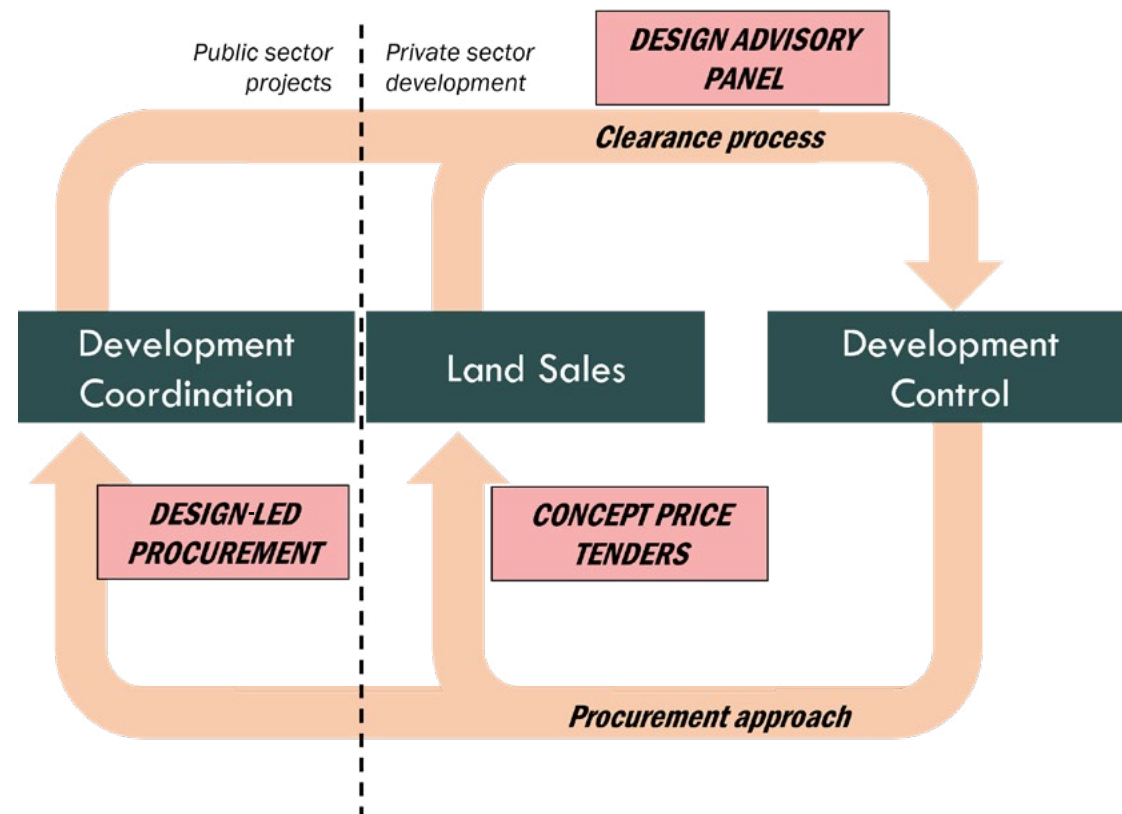


2.0.2: Ensuring design quality in the development process

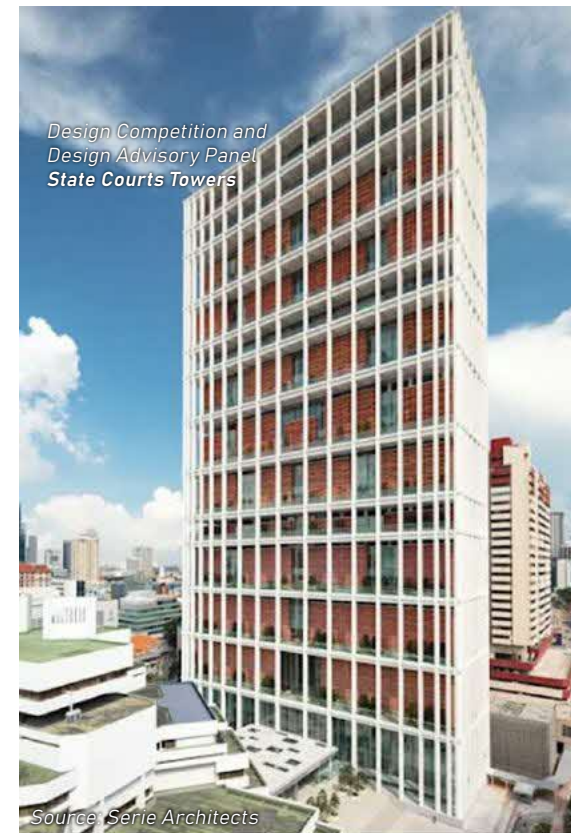
The importance of good urban design outcomes for Singapore's built environment should not be underestimated, helping to ensure outcomes like good connectivity, mitigation of density, provision of greenery and even improvement to microclimate, to name a few.

To ensure that Singapore achieves a well-designed built environment, several tools have been developed to augment the key processes of the development cycle, to ensure that every stage engenders better design quality. This chapter will look at the following:

- Design Advisory panels
- Concept & Price tenders
- Design-led procurement approaches



Processes taken for strategic sites to ensure good design outcomes





2.1: UD implementation instrument: Design Advisory Panels

This is a tool that augments the Development Control process. For strategic projects in the city, URA may convene a design advisory panel, consisting of experts from the public and/or private sectors, to guide design development as part of the development application stage.

Design Advisory Panel (DAP) reviews augment URA's regulatory function, as URA typically regulates more on the functional aspects of planning and urban design, like building form, massing and connectivity. The DAP also reviews the architectural design of the proposal.

The DAP review is a two-stage process. The DAP will evaluate and suggest improvements at:

- Stage 1 – urban design: site layout, building form, massing, connectivity, vehicular circulation, landscaping, etc;
- Stage 2 – architectural design: building layout, appropriateness and consistency of architectural language, use of materials, finishes, detailing and lighting, environmental response.

Source: someformofhuman, wikimedia

ION Orchard which was a DAP project
RSP Architects Planners & Engineers Pte Ltd with Benoy

The history of Design Panels in Singapore

The first DAP was formed for the Marina Barrage project in 2003, helping to transform it from a utilitarian water pumping structure to a signature public space for the city.

Prior to that, a variety of design panels had existed over the years to support design development efforts for different types of projects. These included the Architectural Design Panel (ADP) to guide the design of strategic GLS sites, and the Supervisory Design Panel (SDP) to guide projects with heritage significance.

DAPs are not unique to Singapore, and can be found in countries like the UK, USA and Australia. They are intended to value-add and advocate for good design outcomes and reserved for only strategic sites in the city.

URA releases sites for development under the **Government Land Sales (GLS)** programme. A list of sites on the Confirmed and Reserve lists are updated regularly at this [link](#).

How urban design supports the development cycle

2.2: UD implementation instrument: Concept and Price Tenders

This is a tool that augments the land sales process, by making design quality part of the evaluation criteria in government land sales (GLS) tenders.

Most GLS sites are sold through price-only tenders, where price is the sole criterion and the tender is awarded to the highest bidder.

For strategic sites, URA may adopt a concept and price tender (CPT) approach instead, where the design quality is one of the tender evaluation criteria.

The CPT is a two-envelope system, where the first envelope comprising the concept is evaluated first. Schemes that are shortlisted



Artist impression of the Collyer Quay concept price tender in 2006 that became Fullerton Heritage.

are advanced to the second stage, where they then compete on price as revealed in the second envelope. The tender is awarded to the highest bid amongst the shortlisted concept proposals.

The first sale site that used a CPT system was for an urban entertainment centre in the Bras Basah.Bugis district in 2005 (the development known today as Bugis+). URA was looking for a proposal that would feature entertainment uses, such as cinemas and performance venues, to support the positioning of the district as a vibrant area for arts and entertainment.

Given that it was the first time URA was selling a site for entertainment uses, this approach ensured that the land would only be awarded to a compelling scheme that fulfilled the planning and urban design vision for the site.

Other sites that used the CPT system include the developments known today as Fullerton Heritage, South Beach and Capitol Theatre, which are all sites which require high quality and sensitive design response to the unique characteristic attributes of the site.

A variant of the CPT system is the fixed-price tender system, where the land price is fixed and tenderers can compete on the strength of the development concept, quality of architectural design, committed level of investment and extent of economic spin-off as well as their track records in delivering quality projects.

This is reserved for the most strategic projects where economic as well as concept and design response are critical, such as the Integrated Resorts at Marina Bay and Sentosa.



2.3: UD implementation instrument: Design-led Procurement Approaches

These refer to tools used to augment the basic form of procurement adopted for government development projects, known as the Quality Fee Method (QFM). The QFM is a transparent tender process that evaluates both price and quality to ensure that the winning bid results in the best value for money for the government. It establishes a clear structure for tender evaluations and rules on eligibility to ensure that awarded firms have the capability to see projects through to completion.

The QFM framework is adopted for most public sector construction-related tenders. However it is not always the most suitable instrument for strategic projects where design quality is critical, given that the architectural design merit typically only accounts for 20-30% of the quality component in the evaluation. Prior to March 2024, another limitation is that for projects costing less than \$16 mil in value, no design evaluation is required as winning firms would be selected through balloting from a pool of eligible consultants who meet the criteria for inclusion is the Public Sector Panels of Consultants.

The Building Construction Authority (BCA)'s revised framework now allows for greater flexibility in the adjustments of the evaluation criteria and associated weightages. Government procuring entities can now consider placing more emphasis on architectural design merit as part of the 'Quality' Component in their procurement tenders for design consultancy



NS Square – a project made possible under the QFM approach.

for smaller projects costing \$50 mil in value and below. The weightage for quality can range from 70% to 90% and for fee from 10% to 30% correspondingly.

One notable project is that of the NS Square, where higher emphasis was placed on architectural design by increasing the weightage for the quality criteria in the selection of the design and appointment of the multi-disciplinary team. This approach was taken given the prominence of the site at the bayfront and the vision for the project to be one of the gems as part of the necklace of attractions around Marina Bay.

Open Design Competitions

The Open Design Competition (ODC) is a powerful tool of design-led procurement, providing a platform for architects to compete for a project based solely on the merit of their design where the consultancy fee is fixed upfront. It casts a wide net for ideas from the industry, inviting local, overseas and even small and new firms to participate. Judging is anonymous, allowing the best ideas to win without the choice being influenced by the track record of the architects.



The winning scheme of the Duxton Plain Public Housing Design Competition.
Source: Arc Studio Architecture & Urbanism Pte Ltd

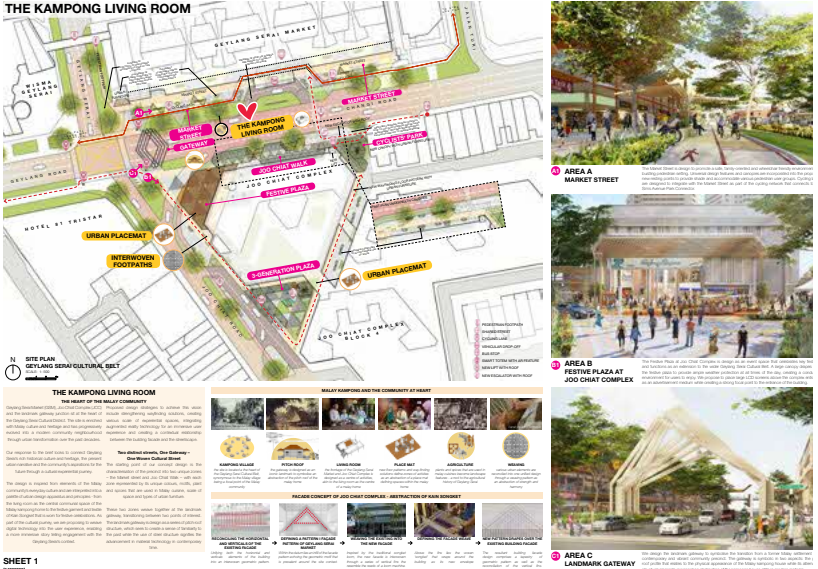
Design competitions have been responsible for realising some of the most notable landmarks around the world that have elevated city profiles, such as the Sydney Opera House and Bilbao Guggenheim Museum. Given their high visibility and resource-intensive nature, ODCs are therefore reserved only for the most strategic projects in the city. Some prominent projects in Singapore that have used this procurement method include Pinnacle@Duxton, National Gallery and Gardens by the Bay, which have proven to be transformative projects for Singapore.

Single-Stage Design Competition

To place greater emphasis on the design quality for smaller-scale public projects and to create more opportunities for local design firms and

young architects to work on public projects of varying types and scales, URA, in consultation with BCA and Ministry of Finance (MOF), developed a simpler format of the ODC, called the Single-Stage Design Competition (SSDC). This new approach can be adopted for smaller-scale public projects of lower value but of significance (cultural, social, identity, heritage, community and/or national).

Like the ODC, this platform allows for best design ideas to compete solely based on merit and gives smaller and aspiring local architects a chance to participate in the development of public projects. Unlike the typical two-stage ODC, the submission requirements for the SSDC is lesser and the timeframe is shorter.



The winning scheme of the Geylang Serai Cultural Belt Single Stage Design Competition.
Source: BDP Architects South East Asia Pte Ltd

To ensure that winning teams can carry the project through to implementation, teams have to be registered with the Board of Architects and Public Sector Panel of Consultants, which screens them for eligibility to take part in government projects.

The SSDC framework was successfully piloted in the Geylang Serai Cultural Belt public realm improvement project in 2021.

The **Quality Fee Method Framework** is the default form of procurement for government development projects. More information on the framework can be found at this [link](#).

**CASE STUDY**

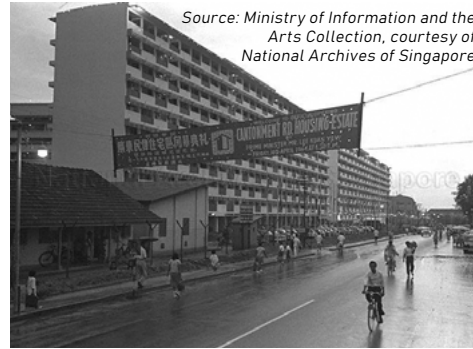
PINNACLE@DUXTON – generating the best design ideas for new public housing

Searching for the best design response for a historically significant site

The award-winning Pinnacle@Duxton was the result of a design competition organised by URA in 2002 to reimagine the typology of public housing on a historically significant site. The location was where the first HDB rental flats were built in the city, and well-positioned for much higher density public housing to bring more live-in population to the city centre.

The competition brief called for an innovative design approach to high-density, high-rise public housing with an environment that would facilitate the formation and bonding of close-knitted communities.

Stage 1 of the competition required submission of two A1 panels and a model to allow the jury to shortlist up to six teams to progress to stage 2. For Stage 2, the shortlisted teams were given an honorarium for them to develop more detailed design. They were required to submit details, submitting up to 12 A1 panels and a larger model for the final jury evaluation.



Original HDB rental flat on site.

Source: Ministry of Information and the Arts Collection, courtesy of National Archives of Singapore



Winning submission for the design competition.

Source: Arc Studio Architecture & Urbanism Pte Ltd

The competition attracted a total of 227 entries from 32 countries and was judged by a panel of distinguished architects and planners including Koh-Lim Wen Gin, former Chief Planner of URA, architects Moshe Safdie and Fumihiko Maki, amongst others.

After a rigorous and anonymous judging process, the winner turned out to be ARC Studio Architecture + Urbanism, a small local firm at the time. They later teamed up with RSP Architects Planners & Engineers Pte Ltd, based on the requirement to partner with a more established firm that would have the resources to deliver the project.

The winning design comprised seven 50-storey tower blocks linked with sky gardens at the 26th and 50th storeys, winding through the irregularly shaped 2.5ha site to maximise coverage and density. It drew inspiration from using “flows and eddies” as well as “strips and loops” to weave through the estate and form a network linking the towers to the ground, creating pockets of greenery and interactive

spaces for residents. In addition, residents could choose units with different exterior façade treatments such as planter boxes, bay windows and balconies, which created visual complexity on the façade.

Pinnacle@Duxton successfully redefined the stereotypical image of mass-produced public housing blocks in Singapore, and popularised the creation of communal spaces in high-rise levels of public housing. It went on to be named Asia and Australasia’s “Best Tall Building” by the Council on Tall Buildings & Urban Habitat in 2010, as well as “World’s Best housing Development” in the World Architecture Festival in Barcelona the same year. It was also awarded the President’s Design Award, Singapore’s highest accolade for good design.

The completed 50-storey residential development Pinnacle@Duxton



Source: Supanut Arunoprayote via Wikimedia Commons



Distinctive archway as part of the Geylang Serai Cultural Belt enhancement works.



The completed development

Source: BDP Architects South East Asia Pte Ltd

CASE STUDY

GEYLANG SERAI CULTURAL BELT – a design-led approach for smaller-scale public projects

The first Single Stage Design Competition

The Geylang Serai Cultural Belt (GSCB) is a recent project to enhance the public realm around Geylang Serai – known as the Malay emporium of Singapore. Given its location and cultural importance, a design competition was considered to attract the best design ideas. Due to its relatively small scale, URA introduced the Single Stage Design Competition (SSDC) framework for the project.

This entailed reducing the process to a single stage and simplifying the submission materials to be easier for small firms to participate.

A platform for young designers to establish themselves

The competition for GSCB allowed small architecture firms to participate with more established firms in other fields, to mitigate the risks and yet give them a foothold in public projects. Another specific requirement was that multi-disciplinary teams (MDTs) had to be led by a 'young architect', aged 45 and below.



Source: BDP Architects South East Asia Pte Ltd

The competition attracted 14 submissions and was awarded to the relatively new firm BDP Architects (Southeast Asia), who impressed the judges with their holistic approach to the site and culturally sensitive urban design strategy.

They drew on references from daily lifestyle in a Malay Kampung, using motifs like the pitched roof, place mat, agriculture and weaving them into the public realm design. They also used modular geometric elements inspired by festive garments and designed the outdoor seating structures to be scalable and adaptable to suit different users.

Modular typology for street furniture

Type 1 Canopy



Type 1 Planter



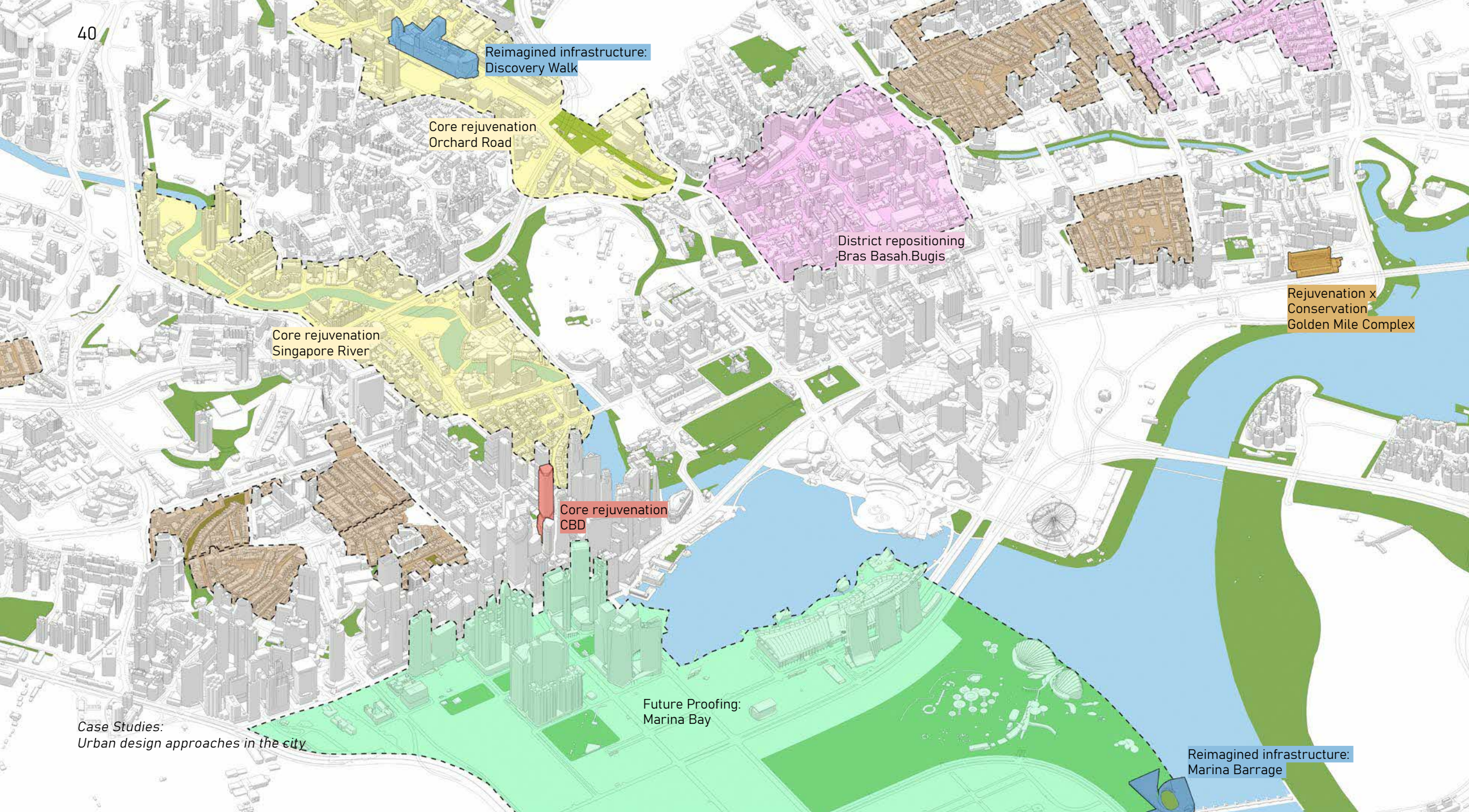
Type 1 Bench



Type 1 Table



Source: BDP Architects South East Asia Pte Ltd



INTRODUCTION TO THE CASE STUDIES

Case studies are particularly important for urban design professionals. While each study area is unique, there are still generic issues and common approaches that can be taken to address these issues. Across cities and jurisdictions, all urban designers understand the limits and possibilities of what they can realistically propose, depending on parameters such as land ownership (public vs private), lease period of land (leasehold vs freehold), legal definition of development rights (gross plot ratio, land use) and the implementation instruments that they can or cannot wield within the definition of the planning and land laws.

Case studies detailing the processes undertaken as part of upstream to downstream urban design work, such as stakeholder engagement and public consultation, design reviews, procurement of consultants, land sale methods, etc, offer in-depth lessons for urban designers. Many of the examples can be applied with modifications to suit local contexts and regimes.

This chapter details case studies of the work of URA over the span of last few decades, with a focus on showcasing the types of urban design work of various scales in terms of land area, and in the context of existing city core as well as green field areas. Where the solutions are specific to the context, the takeaway is that looking for specific contextual response is a requisite to achieving authentic solutions with better longevity. One interesting inclusion is a case study of urban design principles applied to a non-urban context which shows that the principles of urban design can be applied with good outcomes in such a context.

The case studies are categorised according to the context as well as the driving motivation and outcomes they seek to achieve. These categories are by no means exhaustive and definitive as urban design work continues to negotiate new challenges, emerging areas of knowledge and disciplines.

- Core rejuvenation
- Rejuvenation x conservation
- District repositioning
- Character Building
- Reimagined Infrastructure
- Non-urban areas
- Future Proofing



3.1

Core Rejuvenation: Updating historic cores

Urban rejuvenation of historic areas in the city centre comes with particular challenges.

This case study on Boat Quay illustrates the approaches URA took to empower stakeholders to take the lead in initial restoration works of the shophouses, followed by placemaking efforts for the historic district.



The Central Area Structure Plan, 1985

Boat Quay

Rejuvenating an area with fragmented landownership

One of the challenges of rejuvenating built-up areas of the city, especially historic areas with numerous diverse landowners, is finding effective implementation instruments to bring the stakeholders together to drive urban rejuvenation.

URA's experience with Singapore River, particularly at Boat Quay, shows that involving stakeholders in the process and enabling them to take the lead makes for longer lasting outcomes.

Repositioning the river to create value for its precincts

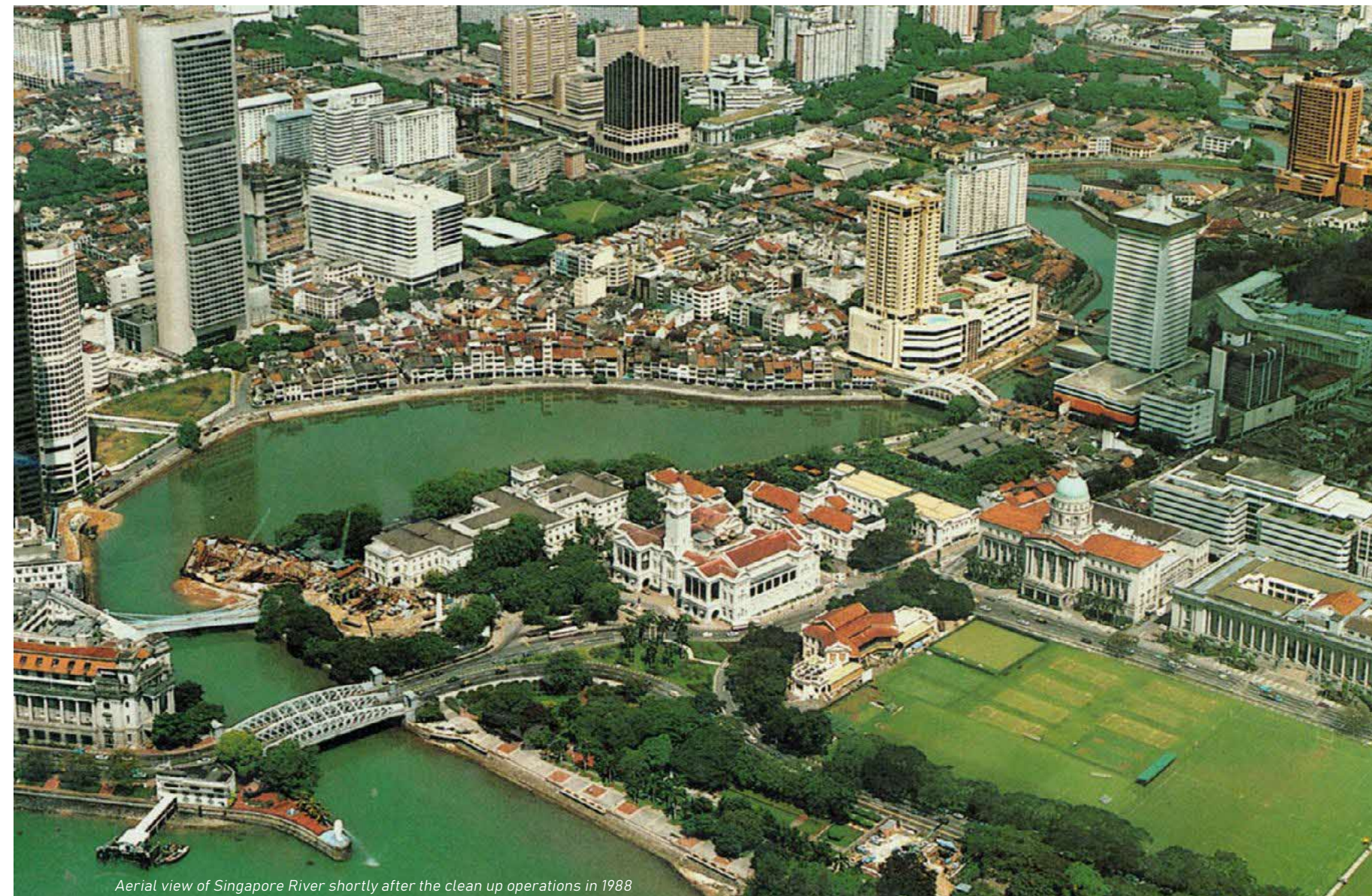
Rejuvenating the urban core

The 1960s was a period of great change as the government embarked on major urban renewal efforts to tackle poor living conditions in Singapore. Rejuvenation of the urban core, which suffered from severe overcrowding, lack of basic infrastructure and modern buildings to house new business needs, was high on the agenda.

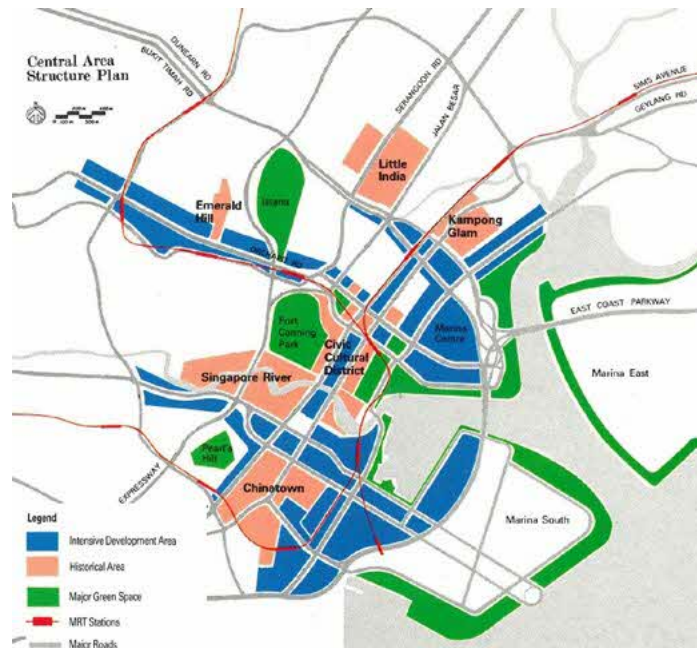
Improving the cleanliness of the environment was made a key priority not just to improve public health, but also improve city image to attract economic investment. Several campaigns were launched in quick succession – the Tree Planting campaign in 1963, Garden City campaign in 1967 and Keep Singapore Clean campaign in 1968.

Particular attention was paid to cleaning up the contaminated waterways in the core of the city. In 1977, then Prime Minister Lee Kuan Yew gave the government agencies a timeline of 10 years to clean up Singapore River. The river had long been a lifeline bringing economic vitality to the city but had also become highly polluted due to heavy industrial and trading use.¹

As part of urban renewal, there was also a need to reposition the river with new uses and activities with many of its pollutive trade and industrial activities phased out under the clean-up efforts.



Aerial view of Singapore River shortly after the clean up operations in 1988



Central Area Structure Plan, 1985.

Coordinating urban renewal and conservation efforts with the Central Area Structure Plan

The Urban Redevelopment Authority (URA) was set up in 1974 as an independent agency to oversee comprehensive urban renewal efforts in the Central Area and rest of Singapore.

The Ministry of National Development (MND) and URA set up the Central Area Planning Team (CAPT) in 1979, comprising multiple agencies, to deliver a comprehensive framework for urban development, conservation and environmental improvement.

This resulted in the Central Area Structure Plan in 1985 which sought to intensify development

along the new Mass Rapid Transit (MRT) corridors while introducing green spaces and low-rise historic districts that would act as the “lungs of the city”.

Seven conservation areas were also introduced in the plan for the first time, including at Boat Quay, which were formally conserved when URA was appointed the conservation authority in 1989.

Under the Structure Plan, the area around the river was identified as the “Singapore River” district, earmarked for conservation and lower intensity development while flanked by higher density corridors along Havelock road and the Central Business District.



Singapore River Concept Plan depicting Boat Quay, 1985.



Illustration by URA depicting refurbished shophouses at Boat Quay



Physical model of the three quays as part of the Singapore River Concept Plan, 1985.

Developing a new vision under the Singapore River Concept Plan

Guided by the Central Area Structure Plan, URA unveiled the Singapore River Concept Plan in 1985 to chart out a new vision for the river. This plan outlined the positioning and development approach for the three quays, taking into account the complexities of land ownership for each.

It also outlined strategies for continuous connectivity so that people would be able “to stroll or take a morning jog” along the river, through a network of pedestrian malls and promenades which would be partly realised through direct government intervention.

Robertson Quay

As the parcels here were fairly large being occupied by old warehouses, URA envisioned their redevelopment into new hotels and residential uses, with partial retention of historic warehouses to preserve area character.

Clarke Quay

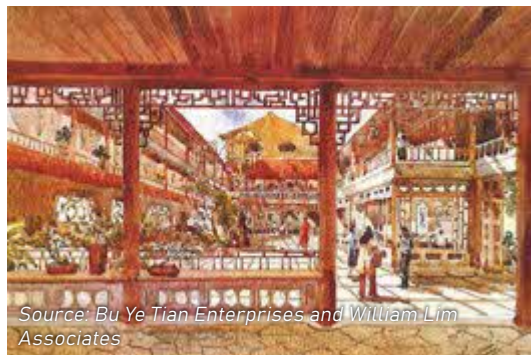
Resembling a small village, URA proposed pedestrianising the streets around the retained warehouses and shophouses which would be repurposed for shops, restaurants and studios. The buildings had already been acquired by the government and would be rejuvenated through the Government Land Sales (GLS) programme with private sector participation.

Boat Quay

The north bank would be preserved as a Government and Civic Centre while the shophouses on the south bank would be restored by the numerous landowners for commercial and entertainment uses.



Initial concept to amalgamate Boat Quay shophouses into three clusters to accommodate internal courtyards



Source: Bu Ye Tian Enterprises and William Lim Associates

Artist impression of internal courtyard for the Boat Quay shophouses, part of a “BuYeTian” proposal by businessmen and professionals in 1983. Source: Bu Ye Tian Enterprises and William Lim Associates.

Involving the private sector to undertake holistic rejuvenation

Taking a collaborative approach for Boat Quay

A fine balance was needed between public intervention and market friendly policies to achieve holistic urban rejuvenation of Singapore River. The government typically focused on a few demonstrative projects and creating the right investment conditions for private landowners to drive rejuvenation efforts themselves.

After Boat Quay was designated as a conservation area under the Conservation Masterplan of 1989, URA debated whether to acquire the properties directly or work with the existing landowners to rejuvenate the area.

The latter approach was taken reflecting a willingness of the government to take a collaborative approach to make conservation a success. This represented the changing role of URA from being direct implementer of renewal projects to more of a planner and facilitator².

Another important strategy for Boat Quay was that conservation gazetting was done first before the lifting of rent control. Otherwise the business case for restoring the shophouses would have been eroded.

Navigating fragmented ownership to drive urban renewal

URA initially proposed the amalgamation of all the shophouses into three clusters so that each would be large enough to accommodate internal landscaped courtyards. However, the take up for this plan was slow due to fragmented ownership and difficulty of forging

consensus between the building owners, some of whom were embroiled in family disputes.

URA then reworked the plans in July 1988 to allow owners to undertake restoration works individually. Coupled with the lifting of rent control for conserved properties in October 1988, building owners were able to re-possess their properties to restore them based on the URA’s guidelines.

URA was able to incentivise the owners to undertake the restoration works by upzoning the properties from industrial to commercial use. In addition, URA facilitated a waiver of Development Charges* and carparking requirements, providing substantial cost savings for the landowners. Assistance was also provided for the relocation of elderly single-person tenants through the Tenants’ Compensation Board.

Former Chief Planner Koh-Lim Wen Gin recalled repeatedly visiting all 117 building owners over a five-year period to persuade them to follow through on the restoration works. The Government also made a hard stand that it might be compelled to consider acquisition if the buildings were not rehabilitated by 1991. Through painstaking negotiations, the restoration works for Boat Quay were finally completed by the deadline.³

**Development Charges were a tax on enhancements to land use arising from URA rezoning, to realise returns to community in the form of infrastructure development and public programmes undertaken by the government. Starting 1 Aug 2022, Development Charges have been revised as “Land Betterment Charges” or LBC, administered by SLA.*

Making public realm investments to support stakeholder efforts

To support the restoration efforts of the private landowners, URA also undertook infrastructural works for the area, such as creating servicing lanes, electrical substations and pedestrianising the river promenade.

Restoring servicing access for the shophouses

Owing to problems with oversight, overcrowding and upkeep over time, the various shophouses had built out unauthorized extensions and “joined up” with each other, resulting in health and safety hazards.

The shophouse owners were given a deadline to demolish their unauthorized works so that URA could restore the back lanes and bring in supporting infrastructure such as sewer pipes and electricity lines.

In addition to supporting the introduction of new uses and businesses into the shophouses, the works also helped to restore many buildings to their original design.

Implementing the riverfront promenade

Owing to its legacy as a working river and centre of trade in Singapore, the river had continuous service roads lining its edges which facilitated the movement of goods from the lighters to the warehouses and other parts of Singapore.

With the repositioning of the river, these access roads were earmarked to be transformed into a vehicle-free and landscaped pedestrian promenade, which would help beautify the shophouse frontages and support vibrancy.

URA took care to plan the works in two phases starting in May 1986 to work around ongoing restoration works to the shophouses at the same time:

Phase 1

A limited 6-7m wide promenade was first created along the river edge, leaving space for vehicular access to the shophouses behind so that they could continue restoration works.

Phase 2

The vehicular lane was phased out for the promenade to be fully realised after the shophouse restoration works were completed, taking place from 1992 to 1993. While substantial portions of the promenade were completed by 1993, several sections were still unfinished as there were either no adjacent developments or redevelopment had not taken place for the street block. In 1997, URA and the then-Public Works Department (PWD) undertook additional works to stitch up the gaps for continuous access to be created along the entire river.

In 1999, URA released the Promenade Design Guidelines to guide future enhancement works for consistency, while allowing flexibility to customise parts of the promenade to relate to the adjacent developments. More details on the guidelines are covered in the second book in this series (A Green and Liveable City).

The **Singapore River Promenade Guidelines** provide information on landscaping, paving materials and riverbank treatment, among other elements. The guidelines may be found at this [link](#).



Original condition of the riverfront with service lane



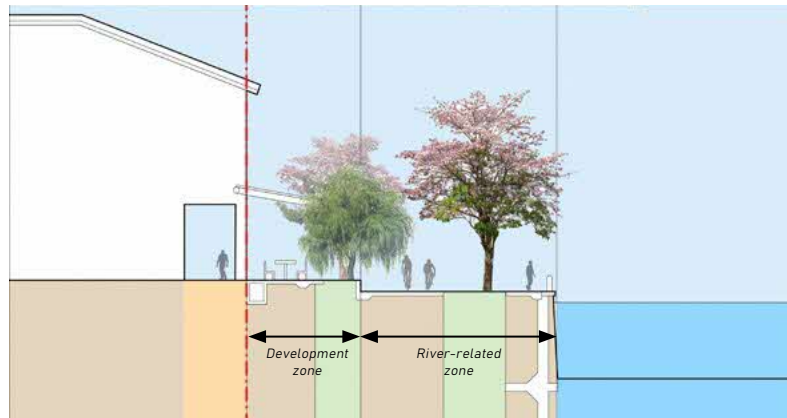
Phase 1 completed in 1986 – partial pedestrianisation



Phase 2 completed in 1993 – full pedestrianisation



Outdoor dining at Boat Quay, 1999



Singapore River Promenade Design Guidelines –allowing ORAs along the river within the development zone

Shifting from the “hardware” to “software” of rejuvenating Singapore River

Facilitating alfresco dining along the river – a key ingredient of success

As soon as the promenade enhancement works were completed, URA introduced the concept for alfresco dining to provide patrons a unique experience of dining under the stars. This introduced activities and vibrancy along the river, reflecting the shift towards enhancing the “software” now that the “hardware” of restoring the buildings and waterfront was complete.

URA identified spaces along the promenade which could be leased to the adjacent shophouses as Outdoor Refreshment Areas (ORAs), to serve as unenclosed outdoor extensions of indoor F&B establishments. As they were located on State Land, Singapore Land Authority (SLA) had to issue Temporary Occupation Licenses (TOLs) for the ORAs, which were subject to periodic renewals.

Small-scale umbrella and tent structures were subsequently allowed as part of the Promenade Design Guidelines in 1999 to provide some shade and shelter for the ORAs.

By the late 1990s and early 2000s, Boat Quay was the choice destination for waterfront dining and entertainment for locals and tourists alike, set against a backdrop of charming shophouses juxtaposed with the modern skyscrapers of the CBD.



Initial condition of promenade with small umbrellas and tents allowed.



Unauthorised modifications over time which resulted in an unsightly promenade.

Navigating initial placemaking efforts and business rivalries

The Singapore River Business Association and Boat Quay Business Association were formed in the mid-1990s by local stakeholders to help drive the appeal of the area for business and tourism. They organised events like the Singapore River Regatta and Singapore River Festival which were highly successful.

While these efforts were supported by the Singapore Tourism Board (STB), funding was only available on a project-basis, limiting opportunities for longer-term planning. There was also a ‘free-loader’ issue from non-contributing stakeholders which led to active members becoming disillusioned over time.

Boat Quay had become a victim of its own success, with the immense popularity of the ORAs leading to multiple ad-hoc modifications for larger awnings, fans and TVs within the structures, resulting in bulkier, unsightly structures which blocked the view of the water.

Without the benefit of overall curation, the offerings along the river were also becoming duplicative with too many seafood restaurants, leading to intense competition and touting for business along the promenade.

The stakeholders initially lobbied URA and the agencies to take action against touting activity, however this was difficult to enforce and did not address the underlying issues facing Boat Quay. It was clear that an alternative to a top-down approach was needed.

Empowering stakeholders to take the lead in place management

Conversations to chart out the future of Singapore River

A voluntary, informal Singapore River Task Group, co-chaired by URA and Grand Corphone Waterfront Hotel, was formed in 2011 to serve as a sounding board for ideas to chart out the future direction of Singapore River.

One of the first initiatives borne out of these discussions was the “A Better Singapore River” campaign which started in December 2011, encouraging the Boat Quay businesses to sign pledges to stop touting and overcharging customers.



Source: Cesma International Pte Ltd
Revised design for ORA structures to open views of the river

The early success of this initiative led to a bolder plan being put on the table. URA offered to help rebuild the ORA structures to meet business needs while cleaning up the public realm, provided the stakeholders rallied themselves and supported the works.

URA saw this as the only way the project could move forward as a top-down approach would be mired in opposition from individual operators, given the likely extent of business disruption. A strong enough stakeholder representative group had to be formed to steward the collaboration process.

Leveraging the ORA works to strengthen stakeholder cooperation

A key issue with the Business Associations formed earlier by the stakeholders was that membership was voluntary and not fully representative of all the stakeholders in the area. With only voluntary contributions of membership fees, there was also no reliable revenue stream to sustain placemaking work.

Capitalising on the fact that the business owners were heavily dependent on their ORAs, URA developed a framework to encourage the formation of a new association that could act as master tenant to manage all the ORAs along Boat Quay.



Completion of ORA improvement works

Singapore River One (SRO) was established in 2012 as a non-profit company dedicated to the place management of the entire river, taking the master TOL for the promenade so that they could sub-lease the ORAs to the businesses and rely on this as a revenue source. This allowed SRO to undertake programming efforts to elevate the competitiveness of Singapore River.

SRO became URA's strong ally to rally the stakeholders around the ORA refurbishment works, generating a sense of ownership amongst the stakeholders for the final outcome.

Refreshing the ORAs through a collaborative approach

URA focused on a few design strategies to uplift the look and feel of all 60 ORA structures along the 335m long promenade. The design was carried out with close attention to details based on feedback from the operators, to ensure practical and efficient facilities.

Lightweight design

In contrast to the mish mash of structures, tentages, and partitions assembled over the years to demarcate the individual ORAs, URA introduced uniform lightweight structures with in-built retractable canopies and metal beams for the mounting of lights and fans. Height variations were introduced to mirror the non-uniform nature of the shophouses.



Source: Cesma International Pte Ltd
Varying of heights to relate to eclectic architecture of Boat Quay

Views and Open Spaces

The ORA structures were designed to be tall and open-sided to provide clear views of the river from the promenade. In addition, two open spaces with public seating were introduced along the riverfront to provide vantage points to rest and appreciate the civic monuments on the opposite bank.

Discreet design for services

To eliminate the need for unsightly cables overhanging the pedestrian walkway between the shophouses and ORAs, the redesign included underground electrical cabling and individual electrical meters. Ramps were also introduced to make the ORAs barrier-free accessible.

The ORAs were also designed with a standardised "kit-of-parts" including menu display lecterns, spaces for business signs and planters for greenery, to reduce overall visual clutter along the promenade.

SRO helped to lead a three-month long consultation effort that resulted in over 80% of the Boat Quay stakeholders giving their support for the revitalisation project. The project would be carried out in five phases to minimise the impact to business operations.



Sustaining vibrancy with Singapore's first pilot BID

Recognising the need for more sustainable placemaking arrangements that put stakeholders in the lead, URA introduced the pilot Business Improvement District (BID) programme in 2017 to support BID formation through legislation and co-funding.

BIDs are empowered to take collective action on placemaking efforts for districts as they are formed through majority support from stakeholders in an area.

Singapore River One became the first pilot BID formed in 2017, following through on successful initiatives such as major festivals such as St Patrick's Day Street Festival and the Singapore River Festival, which drew significant visitorship through coordinated marketing and promotion.

The pilot BID represents the latest chapter in the long arc of working with stakeholders to drive contextual and long-lasting solutions for the success of Singapore River.

Over the years, the range of implementation instruments utilised in Boat Quay – from conservation, lifting of rent control, TOLs and now BIDs, consistently sought to bring stakeholders together to help drive rejuvenation efforts in the historic core themselves, to ensure more sustainable and authentic outcomes.



Source: SRO

St Patrick's Day festivities at Circular Road, Boat Quay



Source: SRO

Mid-Autumn Festival celebrations organized by SRO

The **pilot business improvement district programme** provided support for funding and development of business plans for various participating precincts. Find out more about the programme at this [link](#).



Source: SRO

Outdoor exercise activities at Circular Road



Boat Quay following the ORA enhancement works in 2017



3.2

Core rejuvenation: changing the face of the Central Business District

Similar to many cities around the world, Singapore's CBD is evolving to meet the needs of the future.

This case study demonstrates how through planning incentives, a sub-optimal carpark station was redeveloped into a biophilic skyscraper that delivers transformative impact to the CBD through provision of generous public goods.



CapitaSpring development
Source: Bjarke Ingels Group, photo by Finbarr Fallon

CapitaSpring

A striking addition to the Singapore skyline

Emblematic of Singapore's shift in priorities over the years, the redevelopment of the Golden Shoe Carpark into CapitaSpring in 2017 is notable in its transformation from a utilitarian multi-storey carpark into a 280m tall biophilic skyscraper, forming a striking addition to the skyline.

CapitaSpring was the outcome of rezoning efforts to achieve better land optimisation in the CBD, resulting in a high-rise integrated development with Grade A office space, serviced apartments, a food centre and generous public spaces within a vertically connected environment.

CapitaSpring also contributed to URA's efforts in remaking the CBD into a dynamic mixed-use area with a live-in population and 24/7 vibrancy. Since its opening in 2022, its voluminous sky terrace dubbed the "Green Oasis" has become must-visit space for locals and visitors to Singapore.



Multi-storey car parks in the CBD in the 1980s

Shifting priorities for the CBD

The multi-storey carpark that once occupied the site was a utilitarian 10-storey building built by URA in 1984 to support the car parking needs of the growing CBD. It was named after the "Golden Shoe" district – the area it was found in – that URA had deregulated from rent control under the Controlled Premises (Special Provisions) Act in 1969.

Carpark stations were needed to support the rapid development of the 32ha district which had become filled with modern offices and skyscrapers. The first purpose-built facility was the Market Street carpark in 1964, then Singapore and South East Asia's largest multi-storey carpark⁴. Both Market Street and Golden Shoe car parks were built by URA using Deficiency Charges collected from twenty-one nearby developments which were unable to provide their own parking lots due to site constraints.



Former Golden Shoe Carpark

Golden Shoe Carpark opened in May 1984 at the cost of \$50 million with 1,074 lots, with its own petrol kiosk, shops and 3 floors of hawker stalls, providing affordable food to office workers.

By the 1990s, carpark stations had largely been phased out of the CBD with the completion of several MRT stations, allowing most office workers to switch to public transit for commute. The ownership of Golden Shoe and Market Street car parks transferred to Pidemco Land – created when URA hived off its property management arm, and then to Capitaland – which was formed when Pidemco merged with DBS Land.



Repositioning the CBD for relevance

Over the years, URA has been looking at ways to remake and enhance the CBD to maintain Singapore’s competitive edge as a global business and financial hub, as well as meet evolving needs and lifestyle aspirations. Many cities around the world had placed increasing emphasis on becoming multi-experiential places to be, with vibrant authentic character, offering a dynamic mix of uses and amenities and high-quality public spaces.

One of the strategies to rejuvenate the CBD is the introduction of more mixed-uses to the CBD with the aim of injecting live-in population.



White sites in Marina Bay

Facilitating a timely redevelopment proposal

In 2006, Capitaland submitted redevelopment proposals for both Golden Shoe and Market Street carparks to turn them into mixed-use office developments, at a gross plot ratio of approximately 15 to match the surrounding streetblock density. This came at an opportune time as there was an office crunch situation in Singapore – facilitating their redevelopment would add about 120,000sqm of Grade A office supply.

The Land Transport Authority (LTA) also supported the phasing out of the carparks to support car-lite outcomes for the CBD. A carpark study revealed that there was already a surplus of parking lots in the area – some of the twenty-one developments that had contributed funds to construct the multi-storey carparks had gone on to redevelop and provide their own parking. Public transit mode share was also continuing to grow, with the arrival of the Downtown Line in the CBD in the 2010s.

While it was an easy decision to support the redevelopment proposals from a land optimisation perspective, URA also ensured that significant public good would be secured through the redevelopment in exchange for the upside in GFA that would be given.

Golden Shoe Carpark became the 51-storey tall CapitaSpring development in 2022, designed by BIG and Carlo Ratti, in collaboration with RSP Architects, Planners and Engineers Pte Ltd.



Source: CapitaLand
Redevelopment of Market Street Carpark into CapitaGreen in 2014



Source: Bjarke Ingels Group, photo by Finbarr Fallon
Replacement Hawker Centre within CapitaSpring.

Negotiating public contributions as part of development

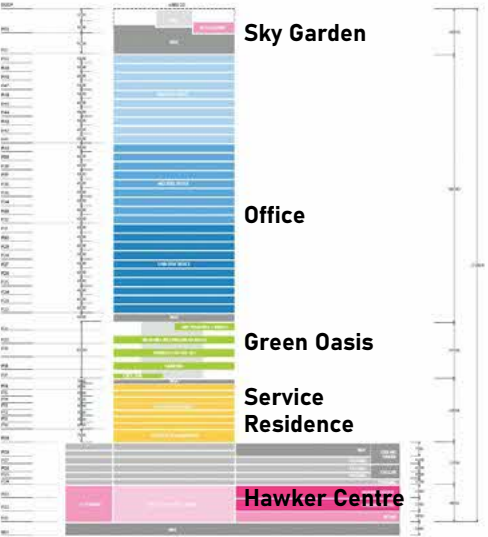
The ability to secure robust public good contributions from private sector redevelopment projects comes from URA’s integrated function as the planning agency and development control authority.

This is facilitated through the development approval process, which grants planning permission for development proposals. URA issues the planning and urban design requirements at the point when an Outline Application is made. These requirements must be met before planning approval is given.

The final approval known as Written Permission is needed before the other technical agencies give clearance for construction to begin.

Some of the key public good contributions mandated for the Golden Shoe carpark redevelopment are listed in the section here.

On top of these, the redevelopment was also required to achieve Green mark platinum rating for sustainability and 100% Landscape Replacement under the LUSH (Landscaping for Urban Spaces and High-rises) policy, to contribute to Singapore’s vision to become a City in Nature.



Source: Bjarke Ingels Group

Replacement of the Hawker Centre

Providing affordable food options is a planning strategy to provide convenient amenities for all in the Downtown area. The original food centre built by URA as part of the multi-storey carpark had 56 hawker stalls providing a wide range of food and drink options, becoming one of the most popular eating places in the CBD. To ensure that this vital amenity was not lost during the duration of redevelopment, the developer was required to provide an interim replacement hawker centre in the vicinity. The new development had to provide a replacement hawker centre of similar size.



Schematic first-storey plan of CapitaSpring development

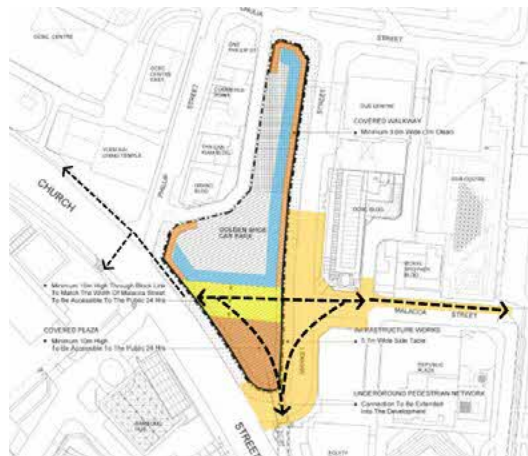
Pedestrianisation of Market Street

In line with the vision to shape a more car-lite and pedestrian-friendly CBD, which can in turn support greater use of public transit and active mobility, URA worked with LTA to plan for the reduction of road space and pedestrianisation of part of Market Street. This allowed more walking, cycling and landscaping space to be created along the street, linking the development to Raffles Place Park and the MRT station. The developer was then required to carry out the pedestrianisation and road dieting works.

A new city room and gathering space

URA identified the opportunity for a 'city room' on the southern end of the site to contribute to the network of public spaces in the CBD. The public space was to be around 1,000sqm in size and at least three storeys (15m) high, and designed to be an attractive space, offering a place for repose which was lacking in the area. Activity-generating uses like shops and eateries were required to front the 'city room' to contribute to vibrancy.

The design team interpreted the 'city room' requirement as an 18m high public space at street level, fronting onto two main streets in the CBD – Church Street and Market Street, for good visibility and accessibility.



URA's control plan for the site.

Through-block link and covered walkways

To improve overall connectivity and porosity in the urban fabric, a wide and lofty through-block link of minimum 18m width and 10m height (at least double volume) was also required through the site to create visual connectivity between Raffles Place Park to the plaza at Capital Square, along Malacca Street.

The ceiling was also rigged with plug-and-play lighting and sound systems to support the staging of events and positioning of the space as a community node for the surrounding area, allowing a range of events to be organised, from fitness sessions to temporary art installations, and family days for the tenants, making the development more than just a place for work.



City Room within CapitaSpring

Source: Bjarke Ingels Group, photo by Finbarr Fallon



Safeguarding a high-quality design to uplift the city through the DAP

Given the strategic location and nature of the development, a strong architectural and urban design response was critical, ensuring that the skyscraper would contribute positively to the precinct and skyline. URA convened a Design Advisory Panel (DAP) with private sector experts to engage with the developer and consultants on how to elevate the development's design quality.

The DAP provides a complementary role to the government by being able to weigh in on matters of design, often involving prominent architects in the local development scene. This is a two-stage process looking at both the urban design and architecture scale (for more information on the DAP, refer to chapter 2.1 in this publication).

Refining the unifying façade of fluid lines

One of the key features of the building is its sweeping aluminium façade, with sleek 'pinstriped' vertical fins. The architects used this design gesture to unify the various programmatic and social spaces of the development. At strategic locations, the fins are pulled apart to create openings to provide both views into the development and glimpses of the lush, tropical high-rise greenery inside, as well as views outwards – framing unexpected views of the city, both near and far.

The result is a tower that feels like one cohesive space, where various programming and community spaces are integrated into a seamless whole.

The design of these openings were refined over the course of the DAP process to ensure sufficient soil depth for trees, and to also provide creepers and drooping plants to enhance the sense of lushness at these openings (to give the effect of greenery 'spilling out' of the façade openings).

For the sections of the façade fronting the carpark, several rounds of full-scale mock-up testing of the screening elements, and site visits at night, were done with the DAP to ensure sufficient screening of the car parking interior as well as the effect of glowing from inside at night. Adjustments were done to the porosity of perforated façade screens to achieve the desired effect.



Source: CapitaLand

Façade openings around carpark

Creating a green oasis in the sky – interpreting the LUSH guidelines

Offering dramatic views of the surrounding city, the publicly accessible roof garden and sky terraces, which form an extension of the lushly landscaped 'city room' at street level, have become must-see spaces in Singapore since the building's opening in 2022.

These public spaces were the result of URA's LUSH policy, which is a set of guidelines, incentives and mandatory requirements to promote urban skyrise greenery, introduced in 2009.

The LUSH policy works as an instrument to safeguard the creation of urban greenery in two ways. First, it mandates a minimum quantity and quality of landscape replacement areas (LRAs) to be provided in the development, depending on the location, land use type and allowable building height. Secondly, it incentivises LRAs by exempting these areas from GFA computation.

The **Landscaping for urban spaces and highrises (LUSH) guidelines** consolidates various skyrise greenery guidelines into one and introduces minimum landscape replacement requirements for different areas around Singapore. Find out more at [this link](#).



Source: Bjarke Ingels Group
photo by Finbarr Fallon

Sky Terrace within CapitaSpring

New developments in the CBD are required to provide 100% landscape replacement areas, comprising hardscape and softscape areas like roof gardens, covered community ground gardens and green walls.

Tall developments often have more scope to explore sky terraces within the high-rise portion of the building. As one of Singapore's tallest developments, the architects were able to leverage this to achieve a remarkable series of sky terraces spread across multiple floors in the building.



A generous green oasis in the sky

Spanning the core of the building across four inter-connected levels (17th to 20th floors), a voluminous, 35-metre-high open-air garden called the Green Oasis beckons, with a spiraling staircase linking the various levels. It offers opportunities for office workers and residents in the serviced apartments to enjoy outdoor dining at the bistro, exercise at an outdoor gym, meet at work pods, or simply enjoy the outdoor breeze and lush greenery.

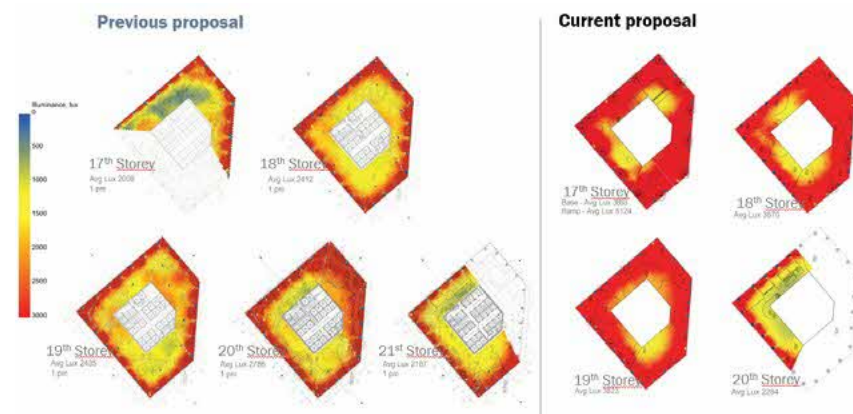
Initially conceived as a continuous spiral ramp set in lush planting across the several floors, the DAP suggested to go for more generous spatial quality instead and allow more sunlight to penetrate the landscaped areas. This resulted in the introduction of more voids in the floor plates to create loftier open spaces with better light penetration.

Capping the development at the 51st storey is Singapore's tallest public observatory deck which includes a rooftop restaurant that offers breathtaking city views and an urban farm with over 150 species of fruits, vegetables, and flowers, which end up being served to diners at the rooftop restaurants.

Overall, the development houses over 38,000 plants within a series of landscaped spaces totaling more than 8,400 sqm is equivalent to 140% of its site area, exceeding the minimum requirements under URA's LUSH guidelines.



Evolution of Green Oasis spatial quality after discussions with the DAP



Source: Bjarke Ingels Group



Source: Capitaland

Multi-storey sky terrace known as the Green Oasis from the 17th to 20th storeys



Roof Garden at CapitaSpring

Source: Capitaland

A multi-faceted approach to rejuvenating the CBD

The transformation of the Golden Shoe carpark into a biophilic, mixed-use skyscraper with generous public spaces has contributed to the rejuvenation of Singapore's core financial district, introducing more live, work and play options and creating unique experiences.

The various tools and instruments used to negotiate for public contribution and better design outcomes for the building form only part of a larger suite of initiatives URA has put in place to steer the continued evolution of the CBD. Policies like LUSH have also pushed the envelope on what it means to build skyscrapers in the tropics, leading to the emergence of a uniquely Singaporean typology of high-rise development.

Reflecting on the impact of the Green Oasis, project architect Brian Yang of BIG shares that it "redefined the ambition for what a sky terrace can be and how to effectively integrate it into a skyscraper. The Green Oasis and the rooftop farm are more than just greenery on the facade and in the sky, but meaningful extensions of social and communal spaces."⁵

It is a good reminder that people should always be at the heart of urban design and planning policies.



Source: Bjarke Ingels Group,
photo by Finbarr Fallon



BEHIND THE SCENES

How cities and CBDs are evolving to stay relevant in a post-pandemic world

The reinvention of CapitaSpring from a multi-storey carpark into a biophilic mixed-use skyscraper with generous, experiential public spaces represents a new chapter of evolution for Singapore's CBD. We speak to Brian Yang, the partner-in-charge and project lead for CapitaSpring from Bjarke Ingels Group (BIG), on how cities around the world are also changing and keeping up with the times.

CapitaSpring is an eye-catching addition to the Singapore skyline, but what is even more impressive are the grand and lush public spaces found throughout the skyscraper. Tell us more about how they came about and what motivated their design.

Brian: When we first started the project, there was a well-defined brief that was very clear in terms of technical deliverables. More importantly, what emerged from conversations with the client was their ambition for CapitaSpring to go well beyond being a typical development. It was to be a catalyst for activating the CBD outside the hours of 9 to 5.

In that way we understood our metric for success was not just the quantitative requirements for square meters and efficiency in the brief, and certainly not design for designs sake – but to create something that is in the end fundamentally and qualitatively about contribution to community and the public realm.

In order to facilitate this, we decided to really push the boundaries of what a sky terrace could be – not just a green space serving the tenants and residents of the building but in this instance a multi-storey three-dimensional public park serving the community of the CBD. The park as a typology was an intentional choice that allowed us to blur the boundaries between public and private, and to create a social mixer for the tower integrating elements of live, work, and play.

Was there anything that surprised you or you particularly enjoyed in the design and realisation of the CapitaSpring project? Or aspects of it that you received particular feedback on?

Brian: I was told that the rooftop urban farm on the 51st floor, although relatively limited in area, generates between 70–80 kg of produce a month for the restaurants in the building. It has been so successful that the restaurant operator has asked to take over the entire rooftop area.

It's a small thing in the scale of the tower but significant as a testament to how we can make effective use of limited land area and resources to live more locally and sustainably – and to provide more collective value to what might otherwise be seen as a residual space.

BIG has projects in major cities all around the world, what are the challenges facing modern CBDs today, especially taking into consideration the far-reaching impact of the COVID-19 pandemic?

Brian: COVID-19 has had a definitive impact on work culture, which is now much more attentive to work-life balance, often facilitated by technologies around remote working. The consequence in some markets has been significant reductions in office space requirements, if not at minimum a reevaluation of how the office as a typology is planned and utilized.

This has had an especially large impact on CBDs that have relied on the provision of office space as their main economic generator, and high vacancies and reduced rental rates can lead to downward spirals in adjacent businesses dependent on the office crowd. This combined with generally higher prices due to inflation means that economic activity is being pushed more and more out of the center and to the periphery.

It's important to bear in mind that this is also a significant opportunity to reinvent urban centres to be more flexible and resilient over the longer term.

What are the commonalities in the way major urban centres or CBDs are evolving around the world and how do BIG's projects respond to this trend?

Brian: When we are asked to reimagine the city and buildings and parks within it there are often some common major themes being explored that could be framed as a series of questions seeking to reconcile the seeming contradictions of modern life:

How can the city be more globally relevant than ever and yet more human and more local to the needs of its communities?

How can we bring nature into the city so that it is not just aesthetic but also performative? How can spaces and uses be complementary rather than exclusionary, so that the city is a living place that is equitable and inclusive for everyone?

How can buildings be designed to be fit for purpose today and yet flexible for use over the longer term? Do we need to tear something down to build something up?

Sustainability in particular has become urgent as something that requires collective action across a broad range of stakeholders, and there is increasing interest in designing over a longer time span with adaptive reuse as a tool to reinvent and reinvigorate.

One example of how BIG has approached this is with Copenhill, a waste-to-energy plant with a ski slope on top that we have designed here in Copenhagen. Through it, we have been exploring the concept of Hedonistic Sustainability – which is the idea that a more sustainable city can also be a more enjoyable and profitable city. In this case by exploiting from the very start the possibility for the dual use of industrial and energy infrastructure as part of the social infrastructure of the city.

While each of our projects responds to the above questions in a specific way depending on the context, at the end of the day what we try to do is to be bold in giving form to a future that is fundamentally about holistically serving the needs of the community in question.

The longer version of the interview can be found at this [link](#).



Orchard Road in 2004 just prior to enhancement of the pedestrian mall, with façade articulation works completed at Wisma Atria

3.3

Core rejuvenation: Transforming a shopping district

In rejuvenating built-up contemporary areas of the city, the right approach and implementation instruments are needed to bring about effective change.

For Orchard Road, URA worked closely with stakeholders, developers and architects to develop policies and incentives that would allow them to evolve and stay relevant over the years.



Orchard Road in the 1970s – as private sector-led development of malls, hotels, entertainment complexes and other mixed-use developments transformed the street into Singapore's premier retail belt.

Orchard Road

Staying in style – supporting the evolution of Orchard Road

Orchard Road was not originally conceived as a coherent shopping and entertainment district but grew organically and “piecemeal” over time to become Singapore’s premier retail belt, largely through private sector entrepreneurial and development efforts. This has necessitated a different approach to rejuvenation over the years to maintain its appeal.

While the sale of prime sites and enhancement of the Orchard Road pedestrian mall in the 2000s were major moves by the government to help refresh Orchard Road, what is less known are the various policies and levers developed over the years that enabled local stakeholders to drive urban rejuvenation efforts themselves, unleashing a wave of creative and innovative proposals that continue to help Orchard Road to evolve and ‘keep up with the times’.



Opening of C.K.Tang Department Store in 1958.

From plantations to prime retail belt

Orchard Road started as an area of nutmeg and gambier plantations before building up into a residential suburb and retail street by the 1950s, with the establishment of C.K. Tang Department Store (1958) and Lido Cinema (1959) ushering in new modes of retail consumption and entertainment to the street. Singapore's first Master Plan in 1958 already identified Orchard Road as an established commercial district.

As part of urban renewal efforts for the city centre in the 1960s and 1970s, the government, via the Government Land Sales (GLS) programme, facilitated a wave of private sector development along Orchard Road which



Orchard Road reflected as a commercial district (blue) in the 1958 Master Plan.

solidified its evolution into a prime retail belt, seeing the completion of notable shopping malls such as Plaza Singapura in 1974 and Far East Plaza in 1981. Increased tourism also saw the development of a hotel cluster with developments such as Mandarin Hotel in 1971 which had 700 rooms and a revolving restaurant at its crown – the peak of modernity in its time.

To support the growing popularity of the street in the 1970s, the government decked over Stamford Canal to create a pedestrian mall along Orchard Road and planted fast-growing Angsana Trees for shade. The burgeoning street life was accelerated by the opening of Orchard and Somerset MRT stations in 1987 and introduction of public events like the annual Christmas light-up in 1984 and Great Singapore Sale in 1994.

By the early 2000s however, many of the malls and hotels along Orchard Road were beginning to look dated, having largely been designed and built in an earlier era as inward-looking developments that contributed little to the public realm. Some had grand vehicular drop offs and driveways fronting Orchard Road that were not conducive to street life along the development frontage.

At the same time, rising competition from other cities in the region made the need for rejuvenation more pressing, with visitorship to Orchard Road declining. This led to the formation of a multi-agency Orchard Road Rejuvenation Taskforce to identify strategies to enhance Orchard Road.

Big moves to rejuvenate Orchard Road

In 2001, URA and STB introduced a series of ideas for public feedback at the “Making Orchard Road More Happening!” exhibition, held at Paragon Shopping Centre. This was accompanied by discussions with the Orchard Road Business Association and local stakeholders to review and refine the proposed proposals for the street.

The proposals centred around three key prongs – making the street more attractive and memorable with distinctive junctions, new paving, street furniture and landscaping; more connected by diverting vehicular access points away from the pedestrian mall and introducing more above-ground and underground linkways; as well as more vibrant with outdoor refreshment areas, urban verandahs and new concepts as such the Discovery Walk and a Fashion Incubator.

The proposals for open spaces, urban verandahs and pedestrian connectivity received stronger support (more than 70% of all respondents) than other ideas like multi-media towers and street junction painting. URA evaluated the feedback to prioritise proposals with stronger public support and developed a set of comprehensive urban design guidelines in 2002 to guide developments towards the desired planning outcomes.



URA concept model of the Orchard Turn Sale Site above Orchard MRT Station.

Sales of strategic sites

Prime sites atop the Orchard and Somerset MRT stations had been kept in reserve until the right time when they were needed to spur rejuvenation efforts for Orchard Road.

The land parcel above Orchard MRT Station, at the prominent Orchard – Paterson Road junction, was launched in 2005 under the Government Land Sales Programme resulting in the landmark ION Orchard development. As part of the sales conditions, URA required public goods in the form of underground pedestrian links under Orchard and Paterson Roads to further expand connectivity around the MRT station, a 3,000sqm public plaza at the prominent road junction, as well as a viewing gallery at the top of the development to offer panoramic views

of Singapore. As a landmark site under the Landmark and Gateway plan, the development was also put through the Design Advisory Panel to guide its design development.

The other two strategic sale sites above Somerset MRT station were launched in 2005 and 2006, to bring mixed-use developments to anchor the other end of Orchard Road. Similar to the sale site above Orchard MRT station, the resultant 313@Somerset and Orchard Gateway developments were required to contribute to the underground pedestrian network, as well as deck over Stamford Canal to create the Discovery Walk. More on these sale sites and innovative infrastructure will be covered in the upcoming case study.



Source: Cox Architecture
Pedestrian Mall enhancement works (realised).

Pedestrian mall enhancement

Another key decision was to undertake enhancement of the pedestrian mall to improve the overall public realm, setting the stage for developments along the street to similarly refresh themselves.

A project steering committee consisting of URA, STB, LTA and NParks was set up to oversee the works. The agencies took the decision to reclaim one traffic lane on the south side of the street to widen the pedestrian mall, creating more spaces for events and outdoor performance areas. In addition to repaving the pedestrian mall, the works also included new smart lighting posts that enabled attractive uplighting of the Angsana trees along Orchard Road for a distinctive nightscape as well as provided plug-and-play power equipment to support events along the pedestrian mall.



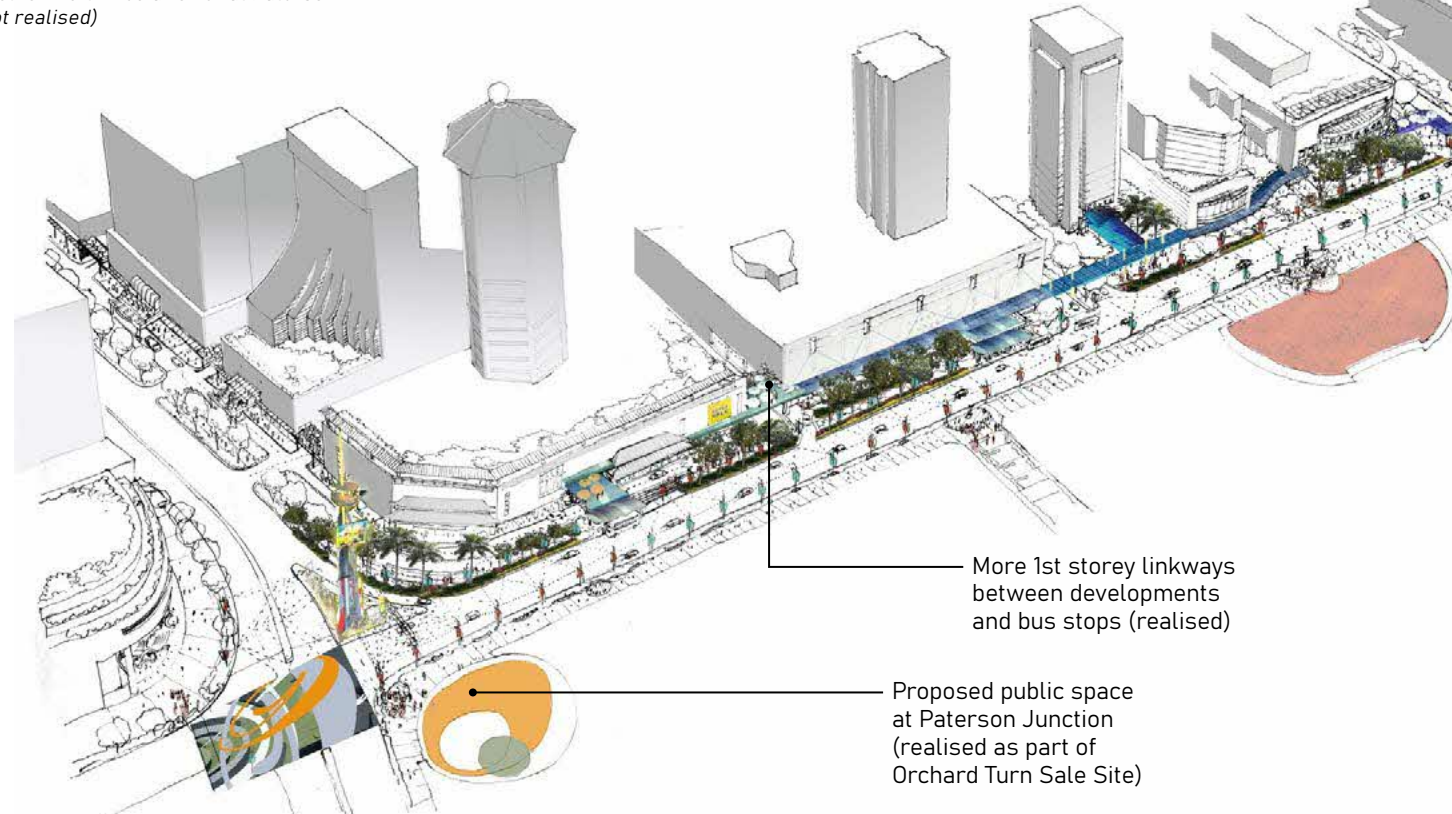
Early concept for Multi-Media Tower at Paterson Junction (not realised)



Improvement of nightlighting along Orchard Road with new Smart Lighting Poles (realised)



Early concept for Media Ring at Bideford Junction (not realised)



Early concept for Fashion Incubator behind Orchard Building (realised on different site)

Concepts drawn up for the “Making Orchard Road More happening!” exhibition in 2001

Urban Verandahs with 2nd-storey ORAs lining the street (realised)

More 1st storey linkways between developments and bus stops (realised)

Proposed public space at Paterson Junction (realised as part of Orchard Turn Sale Site)



The **Façade Articulation** guidelines can be found at this [link](#).

The guidelines for **outdoor refreshment areas** in the city can be found at this [link](#).



ORAs at Wheelock Place



ORAs at Shaw Centre

Responding to stakeholder needs with market-responsive policies

Given that the majority of developments along Orchard Road were in private ownership, URA consulted stakeholders extensively and developed enabling policies in response to their upgrading proposals. This was essential to unlock and spur innovative rejuvenation efforts across the rest of the district, ensuring that rejuvenation would go beyond the three strategic sale sites.

This collaborative policy making approach was exemplified in the development of the guidelines for outdoor kiosks and outdoor refreshment areas (ORAs) in 1996, Urban Verandah and Façade Articulation Guidelines in 2002 and 2005 respectively, as well as the Orchard Road Development Commission (ORDEC) in 2005, all of which continue to play a role in helping Orchard Road innovate and evolve with the times.

Guidelines for outdoor kiosks and outdoor refreshment areas

Outdoor kiosks and ORAs serve as outdoor dining spaces that add to vibrancy along the street. The guidelines to facilitate them were first introduced in 1996 in response to growing requests for ORAs along Orchard Road from then developments such as Lane Crawford Place, Traders Hotel and Ming Court Hotel.

One key consideration of the guidelines was ensuring that the Outdoor Kiosks and ORAs would not visually impact the streetscape, by limiting their overall size as a percentage of the development's façade. Another consideration was making sure that a minimum six-metre width was safeguarded for pedestrian circulation along the pedestrian mall at all times.

There was strong interest from stakeholders to utilise the guidelines when it was first released but several applications had to be turned down as those developments had already maximised their permissible Gross Floor Area under the Master Plan. URA revised the guidelines in 1998 to allow the GFA for outdoor kiosks and ORAs to be computed over and above the total permissible GFA for the development, allowing more developments to take advantage of the scheme.

Further revisions were undertaken in 2002 and 2004 in response to stakeholder feedback to provide more flexibility for layout and design, while maintaining transparency to the developments along the street. Today, popular ORAs such as at The Heeren, Wheelock Place and along the Discovery Walk offer opportunities for alfresco dining and to people-watch along the busy pedestrian thoroughfares.



Façade Articulations at Wisma Atria (2004)

Urban Verandah and Façade Articulation Guidelines

Another example of market-responsive policy is the Urban Verandah (UV) and Façade Articulation (FA) Guidelines which were released in 2002 and 2005 respectively to encourage more interesting and varied building frontages along Orchard Road.

Many developments along Orchard Road had already been built up to the mandatory 7.6m – 11.6m building setback line and had maximised their permissible GFA, making the business case for renewal difficult without undertaking major additions and alterations (A&A) or redevelopment works to the existing buildings.

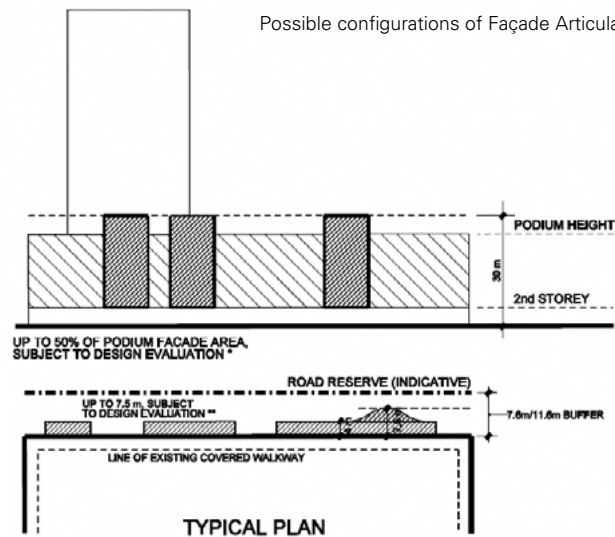
The UV guidelines were introduced shortly after the 2001 exhibition to enable developments to create interesting facade articulations within the

building setback area as well as support ORAs on upper levels along the street.

In 2003, owners of Wisma Atria proposed a variation to this policy, requesting to fully extend part of the upper floors of the development into the building setback area so that the main part of their building and the businesses would not be affected. Taking their proposal into consideration, URA developed the Façade Articulation guidelines to allow fully enclosed projections of the façade into the building setback area, to create more usable internal spaces.

The extent of projection was carefully calibrated based on total façade area and depth to prevent erosion of the generous boulevard effect along Orchard Road, which was the outcome of a consistent building setback line established over the years.

Possible configurations of Façade Articulations



The Wisma Atria façade improvement works transformed the building's relationship to the street with a new three-dimensional grid frame supporting new retail spaces, signages and an escalator connected directly to the fourth storey food court, hailed by the press as a “stairway to food heaven”.⁶

In 2009, URA further allowed the GFA for Façade Articulations to be computed over and above the maximum permissible GFA for the development, to enable more developments to take advantage of the scheme.

To date, the scheme has left a visible mark along the street having been successfully deployed in other prominent developments such as Paragon Shopping Centre (2003), The Heeren (2009 and 2012), Mandarin Gallery (2009) and once again at Wisma Atria (2012).



Completion of the pedestrian mall enhancement works in 2008 which created more space for walking, events and activities along Orchard Road



Source: shutterstock

Supporting ongoing and future rounds of rejuvenation efforts

As outlined in the earlier section, urban rejuvenation is not premised entirely on wholesale development or redevelopment works. A range of tools and instruments are at play in Orchard Road to facilitate shorter term and other experimental initiatives that are more responsive to market conditions and evolving trends.

In addition to smaller scale interventions such as Façade Articulations or ORAs outlined earlier, another mechanism deployed at Orchard Road is short-term activation projects on State Land.

Short-term interim developments

A variety of State Land parcels within Orchard Road comprising future development sites as well as surface carparks are being put to short-term interim development to facilitate innovative concepts on State Land, offering a low-risk avenue for both public and private sector to test bed new ideas and diversify the offerings of Orchard Road. These are tendered out for limited periods of 10 to 30 years to inject new development concepts while retaining flexibility for the land to be redeployed to other uses in future.



Source: TRIFECTA Singapore

Trifecta at Somerset Road, completed 2023.

Design Orchard at the prominent Orchard-Bideford Road junction today is a fashion and design incubator space that nurtures and profiles home-grown brands and local talents along Singapore's premier retail street. The concept was first introduced in the 2001 "Making Orchard Road more Happening" exhibition.

Another product under the same model is Trifecta, Asia's first snow, surf & skate attraction on Somerset Road in late 2023. The site was launched under open tender, allowing agencies to select from a variety of exciting ideas pitched by the private sector. The shorter lease duration made sense for an attraction that typically had a shorter commercial life-span, making them less viable in traditional shopping and entertainment complexes.



Source: WOHA Architects

DesignOrchard, completed 2019.

Having seen various waves of transformation and reinvention over the years that led it from plantations to prime retail belt in the city, Orchard Road continues to evolve and innovate through a variety of private sector investments and market responsive government policies and levers.

URA continues to ensure that the range of implementation instruments deployed at Orchard Road are appropriate to the needs of building and business owners and developers to pursue rejuvenation efforts in different scales and forms, while encouraging innovation, good design outcomes and provision of public contributions.



3.4

Rejuvenation x conservation: Concocting a new cocktail for urban rejuvenation

The conservation and rejuvenation of a large-scale, strata-titled modern landmark that was put up for en bloc sale presented an unprecedented challenge for URA.

This case study explores the range of approaches and incentives deployed to secure the conservation and rejuvenation of Golden Mile Complex, through understanding the diverse aspirations and needs of various stakeholders involved.

Golden Mile Complex (2022)



Golden Mile Complex

The journey towards conserving a modern landmark

In the globalised world, conservation helps to retain a city's distinctive character and foster a sense of history and identity. Since Singapore's conservation programme began in the 1980s, more than 7,200 buildings from different periods, in different contexts and settings, have been designated for conservation.

In recent years, there has been growing recognition that significant buildings from the recent past should be celebrated for their heritage values. Among such buildings, Golden Mile Complex stands out as a trailblazing project in Singapore's post-independence years and its familiarity to Singaporeans as the "typewriter" building (so nicknamed because its slanting profile along Nicoll Highway resembles a typewriter).

When the media reported in 2018 that an en bloc sale attempt was underway for the privately owned Golden Mile Complex, the possibility of losing the building to redevelopment evoked an outpouring of concern from heritage groups, the architecture fraternity and members of the public. An online petition calling to conserve Golden Mile Complex and other modern icons garnered close to 1,700 signatures including from notable academics, business leaders and other prominent figures.

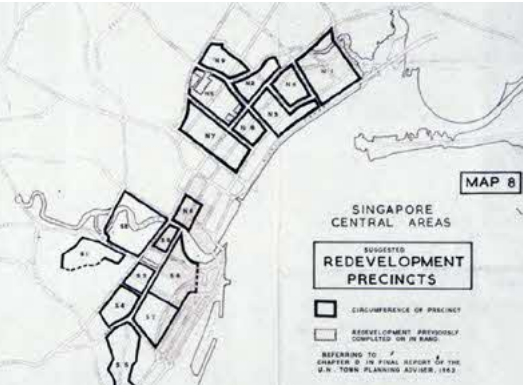


Source: DP Architects

Waterfront view of Golden Mile Complex (circa 1970s)
Image courtesy of DP Architects

Behind the scenes, URA had already sprung into action to rally support to conserve Golden Mile Complex. URA came up with a strategy to balance the interests of multiple stakeholders and encourage the rejuvenation of the site. Recognising that this effort would require deep understanding of the aims, constraints and considerations driving many parties, URA engaged widely and collaborated with other agencies and ministries to conduct studies. Consequently, it managed to devise an unprecedented package of incentives to support conservation.

URA's extensive engagements and studies culminated in October 2021 when Golden Mile Complex became the first modern, large-scale, strata-titled development to be designated for conservation in Singapore.



The Lorange Plan outlined a two-pronged rejuvenation approach beginning with the northern and southern ends (N1 and S1 precincts) of the Central Area and moving towards the center of the city until redevelopment was complete.

The birth of a transformative masterpiece

Initiating urban renewal efforts in the city centre
Golden Mile Complex was conceived in 1967, just two years after Singapore's independence. It was a tumultuous time in Singapore's history when urban renewal and investment to create jobs were pivotal to uplift the nation. With the foresight that public projects alone would not be sufficient, the Government made the bold move to engage the private sector to remake the city.

The plan was to develop strategic sites starting from the North and South of the city centre towards the core around Singapore River where the population was the densest. To harness the resources and business acumen of the private sector, 14 land parcels were launched for sale by open tender in the first Government Sale of Sites in 1967, Golden Mile Complex was amongst them.

The site for Golden Mile Complex was located at the northern edge of Beach Road, coined the "Golden Mile", to reflect the aspiration to transform the old slums and squatter settlements into gleaming modern high-rise high-density developments along the waterfront. The Government's commitment to a good outcome was evident in the tender evaluation being based not just on price, but also on quality. Despite the pall of uncertainty in those early days, developers proved to be optimistic about the future and the Sale of Sites programme drew substantial public interest in bidding for State Land.

An accomplishment of local design

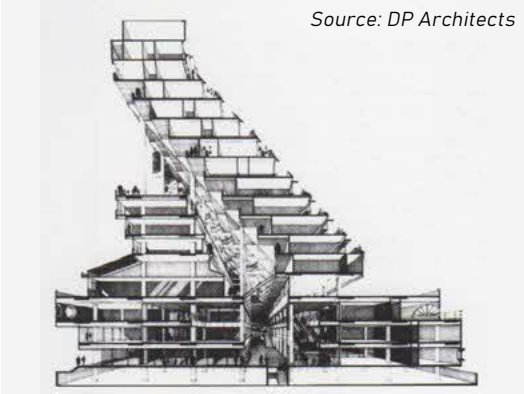
The eventual tender-winning scheme for Golden Mile Complex has since received many accolades for showcasing the architectural and engineering ingenuity of Singapore's pioneer generation of building professionals, and for redefining modern city-living during our nation-building years.

The design was the brainchild of homegrown firm Design Partnership. The project team comprised Gan Eng Oon, William Lim Siew Wai and Tay Kheng Soon as principal architects, with Koh Seow Chuan and Chan Sui Him also at its core. Together, the young architects demonstrated their high abilities with this scheme and would later go on to become luminaries of the local architecture scene. Other crucial contributors were the engineer Joseph Huang Wei Liang from Ove Arup & Partners who designed the innovative structure, and the contractor Woh Hup (Private) Limited which took the design from blueprints to reality.

The striking physical form of Golden Mile Complex owed much to its structurally

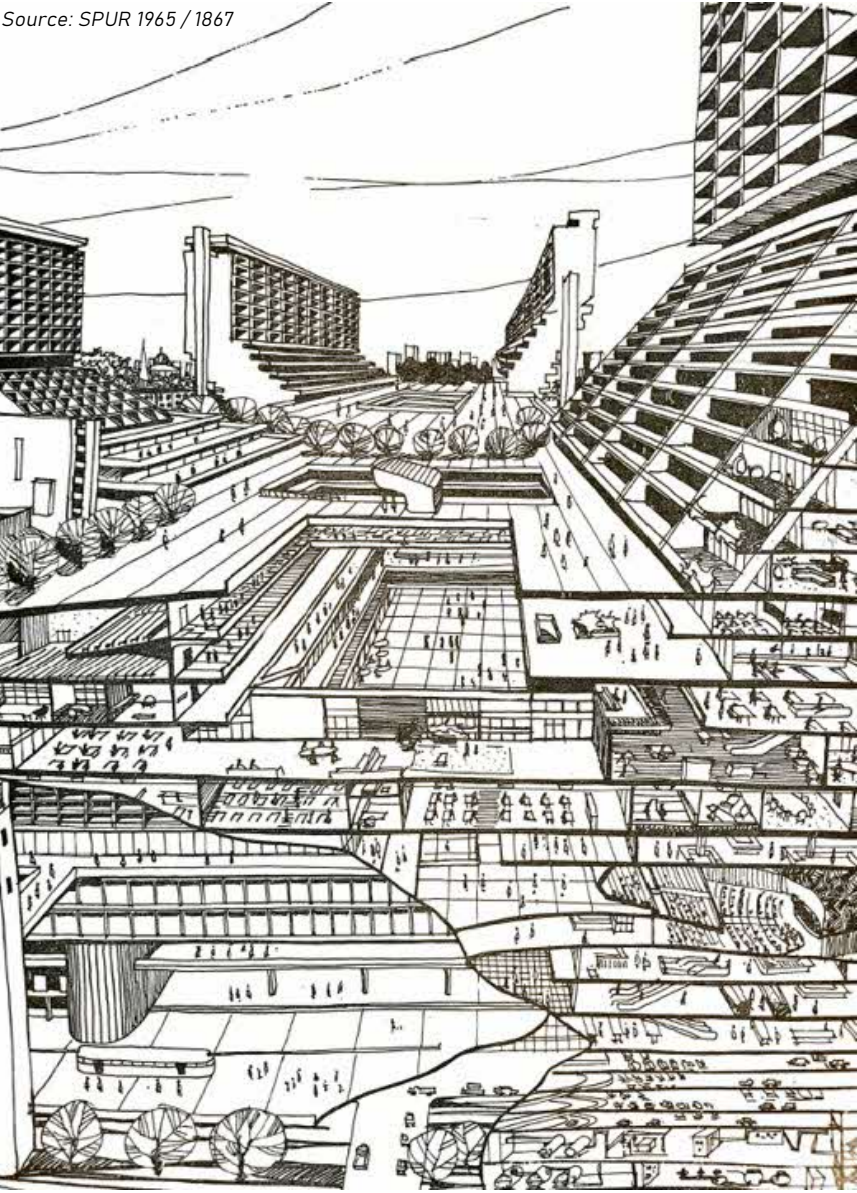
ambitious assemblage of terraced floor slabs, slanted beams, towering columns and "floating" staggered staircases.

The design deftly grounded the international modern movement to Singapore's context through nuanced responses to the site conditions. For example, the building's terraced profile facing the waterfront allowed residents to enjoy open views of Kallang Basin. On the other side facing Beach Road, the stepped effect brought natural light and ventilation into the lofty atrium at the heart of the building. This attention to detail marked Golden Mile Complex as an excellent piece of tropical architecture. Further reinforcing the richness of the design, spaces for social bonding were provided through communal decks.



Cross-section of Golden Mile Complex
Image courtesy of DP Architects

Upon completion in 1973, Golden Mile Complex was one of the largest mixed-use developments in Singapore. In this regard, it is held as an early prototype for integrating commercial, recreational and residential uses in a single compact urban form.



SPUR's sketch illustrating their vision for future cities

The design ethos underpinning Golden Mile Complex can be traced to the writings of the Singapore Planning and Urban Research Group (SPUR), which counted the Design Partnership founders among its members. SPUR championed the Asian city of the future as a high-density linear model featuring "megastructures" which housed residences on the upper floors and other components of a live-work-play environment at the lower floors. Such developments would be plugged into a comprehensive public transport network to ease traffic congestion and cut commuting times.

The designers of Golden Mile Complex were also inspired by the Japanese Metabolist movement which espoused the concept of a dynamic city and flexible architecture that could be re-modelled to meet the needs of an ever-changing environment. Notably, the architecture of Golden Mile Complex was imbued with Brutalist influences, expressed through the bold geometric forms and exposed concrete surfaces.

Resonance with the public

After it was completed, Golden Mile Complex attracted a live-in population and visitors for shopping and recreation, sparking a new burst of vibrancy along the Beach Road area. Over the decades, it has served as a touchstone of social memories for many Singaporeans. While the shops and eateries evolved with the times seeking to appeal to changing trends and tastes, the building continued to be a distinctive landmark and symbol of the progressiveness and can-do spirit of our pioneer generation.



Source: DP Architects
Elevation along Beach Road (1973)

Understanding the challenges of conservation for a large strata-titled building

The Government has taken the lead to protect important State-owned modern buildings like Jurong Town Hall and the former Subordinate Courts (now Family and Juvenile Courts). For private owners, especially strata-title owners, the retention of large modern buildings poses some challenges.

Changing the paradigm for large ageing strata-titled buildings

Inevitably, ageing buildings require major upgrading works to keep essential services like sewer pipes, electrical wiring and lifts up to date. This may entail high costs which the strata-title owners are unable collectively to undertake. The older generations may also find that the building no longer meets their needs unless retrofitted to be senior-friendly. Or they may prefer to sell their units and use the returns to consolidate their retirement funds.

As a result, many strata-title owners desire to liquidate their property, often through an en bloc sale to reap a price premium. Such was the case for Golden Mile Complex, whose strata-title owners triggered an en bloc sale attempt after years of delayed upkeep and perceptions of sleaze had dimmed the public image of the building. The problems were exacerbated by the ad hoc nature of latter-day extensions and a mishmash mix of tenants which led to low footfall and shuttered shopfronts. By this time, the hundreds of strata-title owners were anxious to divest ownership. Conservation was perceived by many as an obstacle to their hopes of a financial windfall.

Changing the business case against redevelopment

The owners' fears were not unfounded. Developers often find it more expedient to tear down an existing building and construct a brand-new development. There are several reasons.

Retaining and rehabilitating a building could involve extensive works to keep up with current regulatory codes on structural strength, fire safety and universal access. Extensive modifications may also be required to meet market expectations for large column-free floor plan and high ceilings for offices, or to cater to demand for smaller unit sizes for residential apartments. Moreover, a conservation project could run into unforeseen circumstances and delays compared with the predictability of a conventional total redevelopment.

All these mean significant investments of financial resources and time to explore feasible solutions to retain and rehabilitate a building, posing high risks. On the other hand,

the monetary rewards of conservation may be difficult to forecast as the market demand for a refurbished unit in a decades-old large modern building is relatively untested in Singapore.

Against these odds, the typical conservation incentives that the Government is prepared to offer, such as granting additional floor area and facilitating adaptive reuse etc, may not be enough to tip the balance for a developer to choose to rehabilitate a conserved building.

Coming up with a strategy for Golden Mile Complex

Nevertheless, URA recognised that a successful en bloc sale signalled the best chance for a new lease of life for the building, failing which the building could fall into disrepair. Therefore, it set out to establish favourable conditions for the en bloc sale to take place with the condition that Golden Mile Complex would be conserved.

Engaging stakeholders and members of the public

URA sought to gain a well-rounded perspective on the views surrounding the conservation of modern heritage buildings and Golden Mile Complex. To be clear, the outlook was not altogether bleak. Around the world, there were instances pointing to the tremendous potential of rehabilitating modern buildings and adapting them to other uses. Such projects offered excellent opportunities to create something special to satisfy the needs of the local community and global travellers' hunger for an experience that was unique and authentic. Like Park Hill in Sheffield, United Kingdom and The Murray, Hong Kong, seemingly tired buildings could be revitalised and turned into vibrant, attractive, even trendy destinations that nonetheless remained true to their roots.

Closer to home, the impetus to protect modern buildings, particularly significant buildings reflective of our nation-building era had been gaining traction alongside the pressure for redevelopment. This manifested in many ways.

Besides the online petition, some members of the public penned their support to conserve Golden Mile Complex through letters to URA and to the forum page of newspapers. The architecture and heritage fraternity raised awareness and appreciation through talks, exhibitions and publications. The Singapore Heritage Society released a position paper entitled "Too Young to Die: Giving New Lease of Life to Singapore's Modernist Icons" which highlighted Golden Mile Complex together with People's Park Complex and Pearl Bank. ICOMOS Singapore and the DoCoMoMo Singapore Working Group also came out to voice their support to conserve these buildings.



"Too Young to Die: Giving New Lease of Life to Singapore's Modernist Icons," Singapore Heritage Society. Credit: Singapore Heritage Society



Creative posters that were shared via social media

There was a series of creative posters that circulated via social media to boost public sentiments for these buildings.

URA's Conservation Advisory Panel (CAP)* and Heritage and Identity Partnership (HIP), which brought together heritage experts, developers and other practitioners to advise URA on the management of built heritage and identity in Singapore, unanimously supported the conservation of Golden Mile Complex. CAP members were of the view that the building reflected groundbreaking experimentation in local architecture and gave the city character. On that same note, HIP members commended the building as a defining work of architecture that represented Singapore's early modernisation history and embodied the economic, architectural, and socio-cultural ideals of the time.

* The Conservation Advisory Panel was retired in 2018. In its place, the Heritage and Identity Partnership was constituted.



Considering environmental sustainability

From the sustainability viewpoint, there was also good cause to deviate from the norm of demolish-and-rebuild. Studies showed that new buildings could take decades to pay back the emissions generated by the construction process even if more energy-efficient systems were adopted. Conversely, building rehabilitation projects could produce good outcomes through cost savings from reduced operational energy loads, higher rental yields, and stronger appeal to tenants whose corporate social responsibility policies prioritised low-carbon practices.

Tapping on industry feedback

URA also tapped on its networks and industry connections to learn from the knowledge and experience of experts on wide-ranging topics. These included the opportunities and potential of conservation projects, the financial calculus of building rehabilitation versus total redevelopment, and the technical viability of retrofit design and implementation.

Putting together an incentive package

With a better sense of the technical, economic and policy issues involved, URA formulated an incentive package to support conservation. This was a concerted effort involving close collaboration with other agencies and ministries to implement new planning and tax incentives.

The package of incentives included:

- Bonus Gross Floor Area resulting in roughly one-third increase in development intensity, which would allow the erection of an high-rise tower beside the conserved building;
- Partial waiver of land betterment charge on the additional Gross Floor Area;
- Waiver of land betterment charge for any enhancement in value of the conserved Gross Floor Area arising from change of use;
- Adjustment of the site boundary to be more regular, via either a land swap or amalgamation of the site with part of the adjoining State Land;
- Lease renewal to a fresh 99 years lease; and
- Flexibility to adapt the building to a mix of commercial, hotel and residential uses.

Many simulations and studies were carried out to justify the unprecedented package of incentives. For example, waiver of land betterment change had so far only been applicable to conserved Gross Floor Area only. After careful study, URA concluded that there was a strong case for additional tax incentives through partial waiver of land betterment

charge on the new Gross Floor Area, and secured the concession.

URA also identified that a multi-storey carpark located at a sharply angled corner of the site could be demolished without eroding the heritage values of Golden Mile Complex. In its place, the new tower could be built.

In another first, the developer could even opt for land swap or amalgamation with part of the adjacent State Land, to achieve a more regular-shaped layout for the floor plate and basement.

Calibrating conservation guidelines and putting together the en bloc sale tender package

Dialogues with diverse groups including industry stakeholders and the Design Advisory Panel (Conservation) surfaced that to overcome the functional and regulatory challenges (for example, the original design did not provide lift access to all units), clear and flexible guidelines customised to the building were critical if it was to be rehabilitated under conservation. Hence, the conservation guidelines for Golden Mile Complex were carefully calibrated to anticipate and accept building adaptations if they were sensitively handled and safeguarded the key character-defining features of the building in keeping with conservation principles.

The Golden Mile Complex collective sale committee put together a tender package incorporating the conservation incentives and guidelines so that potential buyer-developers could use the information to work out a bid.

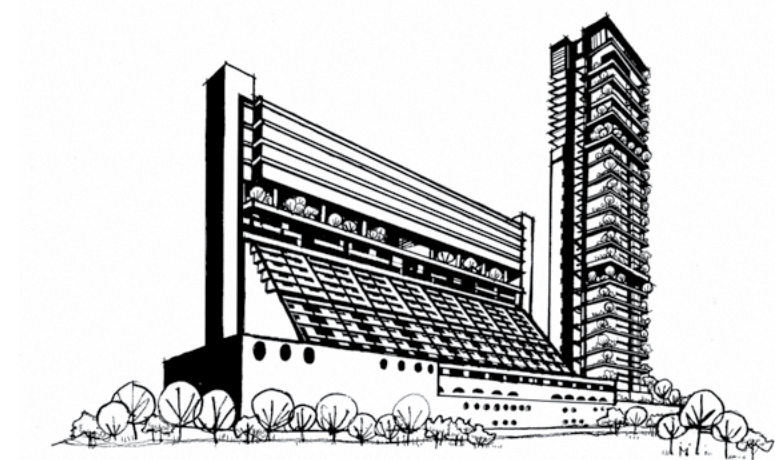


The start of a new chapter

In designating the Golden Mile Complex for conservation, Minister for National Development, Mr Desmond Lee, shared in a message posted online on 22 October 2021:

“This decision to conserve Golden Mile Complex was not taken lightly, and comes after extensive and careful study and engagement with building owners and heritage stakeholders.... URA has made the effort to ensure that conservation does not undermine the owners’ collective sale efforts, and has put together a significant incentive package to make development options more attractive to potential buyers. We hope that this will support the owners to move forward with their collective sale efforts and motivate developers to consider the potential of the site, alongside our vision to rejuvenate a national icon.”

The conservation announcement, welcomed by many, marked a new chapter in Singapore’s conservation programme and protected a legacy for future generations.



Source: Perennial Holdings and Far East Organisation

Looking to the future

In May 2022, it was announced that a consortium comprising Perennial Holdings Private Limited (PRE) and Far East Organisation (FEO), had bought Golden Mile Complex for \$700 million. Driving this new era for Golden Mile Complex is DP Architects (which succeeded Design Partnership), working in collaboration with the consortium to lead the adaptive reuse and rejuvenation project.

The scheme that was developed sought to refresh Golden Mile Complex and continue its legacy as a dynamic lifestyle hub, offering a mix of retail and food and beverage outlets, offices, medical suites, as well as residential units in the new tower that would take shape beside the conserved building. A second-storey link bridge connects the two buildings.

Polishing an architectural gem

To restore Golden Mile Complex as an architectural landmark, DP Architects partnered with conservation consultant Studio Lapis. Efforts have been dedicated to accentuate the distinctive stepped building profile that faces the waterfront, and to keep intact the characteristic atria. Original features such as oculus-shaped elements, localised mosaics and linear facade bands will also be meticulously reinstated. Within the podium, the metal roof over the atrium will be uncovered, allowing natural ventilation to flow through the expansive space from the ground floor to the 9th storey. As a result, the spatially distinctive outcome that was envisioned in early iterations of the original design of Golden Mile Complex is now materialised with the use of new technologies, mitigating prior compliance concerns.

The provision of quality social spaces for the community is also a key focus – the 9th storey will be converted into a sky terrace for recreational purposes.

Creating a centre for learning

An architecture centre will be housed within the conserved building. Initiated as part of URA's Community and Sports Facilities Scheme that facilitates the co-location of compatible community uses with highly accessible commercial developments, the architecture centre aims to inspire greater appreciation of Singapore's architectural journey through firsthand experience of a conserved icon.

The guidelines for the **Community/Sports Facilities Scheme** provide bonus GFA for community and/or sports users for highly accessible commercial developments. Find out more at this [link](#).



Source: Perennial Holdings and Far East Organisation
Illustrated concept for the rejuvenation of Golden Mile Complex



Source: Perennial Holdings and Far East Organisation
Artist's impression of 9th storey sky terrace

Striking a balance with new development

Much thought and deliberation went into ensuring the conserved building will be ready for its new users and compliant with current regulatory codes, while respecting its unique qualities. For example, the team drew inspiration from the sketch by SPUR shown in the preceding sections and studied overseas projects with new additions surmounting historic buildings. From these references, the team derived plans for a new extension which would be carefully integrated on top of the conserved building and provide users with the option for large open-plan office spaces.

The proposed design was reviewed by a Design Advisory Panel to ensure that the key essence of the conserved building will be kept and new interventions are sensitive to the conserved building. While supportive of the rooftop extension which would be read as a legible and complementary addition in terms of materiality and façade treatment, the Panel suggested further improvements. As a result, the rooftop extension will be clearly and distinctly “lifted up” to provide a visible separation from the existing building. In doing so, a publicly accessible sky terrace with panoramic views of the Kallang Basin will also be created as a public contribution.



Source: Perennial Holdings and Far East Organisation
Artist's impression of the ground floor atrium

Realising a trailblazer once again

The conservation of Golden Mile Complex signifies not just a new chapter in the life of this iconic building. It also promises to serve as a model of resilience and sustainable rejuvenation, bringing along a wave of dynamism and excitement that could generate a wave of revitalisation for the neighbourhood and the city.



Bras Basah.Bugis, a lively and vibrant district in the city centre, 2023



3.5

District repositioning: Re-establishing relevance

In re-establishing the positioning and vibrancy of existing districts in the city like Bras Basah.Bugis, URA took a layered and incremental approach to ensure that it found new relevance while staying true to its identity. Along the way, the urban fabric was enhanced for more human-centric outcomes.



Bras Basah.Bugis in 1984 as urban renewal efforts were being undertaken in the Central Area.

Bras Basah.Bugis

Repositioning BBB for a modern era

In the years following Singapore's independence, the resettlement of city dwellers into New Towns around the island for better living conditions meant that formerly vibrant areas in the city centre were starting to hollow out.

While repositioning these districts for new economic value and vibrancy, URA took steps and efforts to ensure that historic buildings and important streetscapes were retained, avoiding the kind of wholesale redevelopment approach associated with urban renewal in other cities.

For the Bras Basah and Bugis areas, this incremental and layered approach of rejuvenating the historic urban district helped to retain, enhance and build on their rich identity while modernising the urban fabric to meet current needs.

Several decades on, the area now called Bras Basah.Bugis, or BBB for short, in the heart of the city is a thriving district once again, host to diverse communities and activities, as well as a rich blend of old and new.



Source: No 9 Army Film & Photographic Unit (UK) via Wikimedia Commons

Many schools and religious institutions were established in the vicinity of Bras Basah Road by the 1950s.

Building on the diverse charm of BBB

The colourful history of Bras Basah and Bugis Street

The Bras Basah and Bugis areas are some of the oldest districts in the centre of Singapore with a rich and colourful history.

“Bras Basah” (from the origin word beras basah which meant “wet rice”) was once a gateway for the rice trade in Singapore. Due to its central location, many notable schools and churches were established in the area, as well as a mixed community of Jews, Europeans, Eurasians, Malays, Indians, Armenians and Chinese residents, laying the foundations of a rich cultural legacy.⁷

Just to the east of this ethnically diverse neighbourhood was the Bugis Street area, originally named after seafaring settlers

from South Sulawesi. In later years, it gained notoriety as a district of Japanese brothels and “Karayuki-san”, as well as a flamboyant transvestite community after the war.

In the post-war years, living conditions were generally dismal in the city centre, with problems of overcrowding, congestion and deterioration of the physical environment. Things began to change when the government began resettling the population to New Towns outside the city centre, that were planned with low-cost housing, schools and community facilities. This exodus of schools and residents from the city centre was significant – between the 1960s to 1980s, the percentage of the total population living in the Central Area had declined from 30% to just 6.5%.⁸



Bugis Street had a vibrant night life scene, photo circa 1980s.

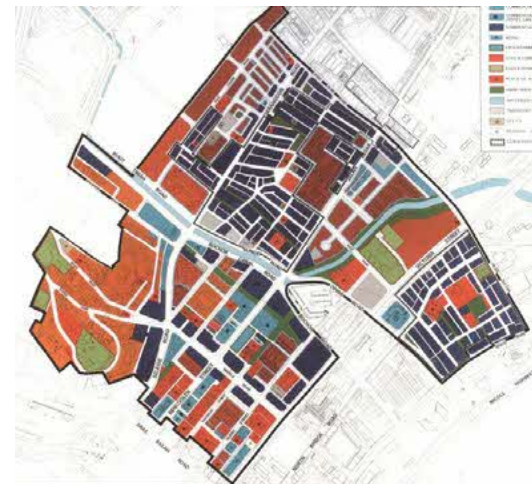
Around the time of the 1991 Concept Plan, which sought to create more character and soul for Singapore to become a world class city, URA saw synergies in positioning the Bras Basah area as an extension of the Civic District to serve as an arts and culture hub for the city.

The Culture Master Plan of 1991 and Rochor Development Guide Plan of 1993 built on this concept to kickstart the rejuvenation of the two areas, rebranding them as Bras Basah.Bugis or BBB for short, and shaping them into an arts, culture, learning and entertainment district.

Repurposing existing gems and injecting complementary uses

URA took the approach to retain, restore and repurpose existing significant buildings as much as possible, seeing them as gems that anchored the identity of BBB. New uses were inserted amongst them to rejuvenate the district through careful acupuncture, keeping the overall character intact.

Appointed the national conservation authority in 1989, URA was empowered to do so by designating conservation areas and creating enforceable conservation guidelines, resulting in 5,200 conserved buildings by 1993. Amongst these were notable structures in BBB such as the former St Anthony’s Convent at 111 Middle Road (now the National Design Centre) and



Development Guide Plan (DGP) for Rochor, 1993.

the former Japanese Elementary School at 155 Waterloo Street (now the Stamford Arts Centre).

New uses were inserted amongst the retained “jewels” to rejuvenate the district through careful acupuncture, keeping the overall character intact.

Cultural Institutions

In 1989, a concerted push for museum development had been made by the Advisory Council on Culture and the Arts (ACCA). This influenced plans to anchor several museums within the former school premises of BBB, such as the Singapore Art Museum in St Joseph’s Institution and Catholic High School, as well as the Peranakan Museum in Tao Nan School.

This achieved multiple objectives – it provided these museums with an impressive setting for artworks, as well as a new lease of life for the vacated buildings; it also allowed the social memories associated with the schools to stay in place, preserving the emotional ties of many student cohorts to the area.

The National Museum, a prominent landmark on Stamford Road for over a century, started out as the Raffles Library and Museum in 1887. Expansion was needed in 2000 to double the capacity of the existing Museum and re-define its programme showcasing the national identity and history of Singapore.



Civic and Cultural District Master Plan by URA, 1989.



St Joseph’s Institution before (1960s).



After: Singapore Art Museum (2000s).



New extension of the National Museum of Singapore

A design competition was called for the new museum, and the design by architect Mok Wei Wei, together with CPG Consultants was chosen as the winning scheme. While the old building with the historical facade was beautifully restored, an understated new extension with a transparent building façade provided a new public space for visitors to enjoy. The back of the building, once forgotten, was given a new frontage, and this responded well to the site's context as an urban corridor connecting the two major historic green spaces of then Bras Basah Park and Fort Canning Hill Park.

Arts Housing

To cater to the needs of Singapore's growing arts industry, several State-owned properties along Waterloo Street – bungalows, terrace houses, a school and a chapel – were also retained and transformed into arts housing facilities. With the creation of the Waterloo Street Arts Belt, the local arts community was able to gain access to affordable and unique premises in the city, giving them space to develop a vibrant arts scene.



Arts Housing along Waterloo Street

Educational uses

Building on BBB's legacy as a schooling district, URA brought in new educational institutions to anchor a student population and youthful energy in the district. URA persuaded LASALLE College of the Arts and SOTA (School of the Arts) to relocate to new and expanded premises at BBB, designed as city campuses that fit into the urban fabric of the district.

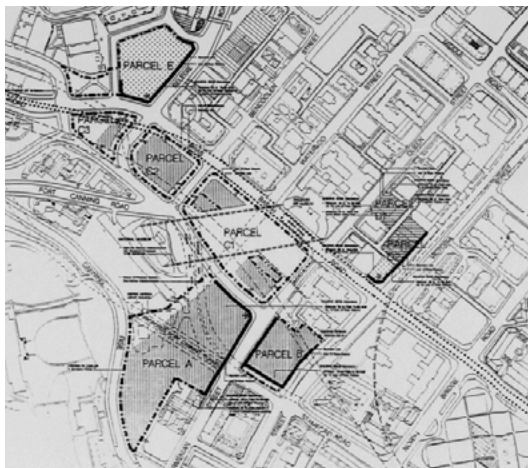
For SOTA, a design competition was called to generate the best ideas for the urban campus, that would incorporate both a school and arts venue. WOHA's winning proposal was based on two visually connected horizontal levels demarcating the public and private spheres of the development. It was also designed with sustainability in mind, allowing cross ventilation to every classroom, and lined with walls of green capers to keep the interiors comfortable.

URA also championed the establishment of Singapore's third university in BBB, over sites like Marina Bay and Tampines, in the form of a city campus for Singapore Management University (SMU). Detailed guidelines were drawn up to ensure that the campus buildings



Singapore Management University

would blend in with scale of the district and remain porous and inviting. URA also drew up a view corridor to protect the visual link between two monuments in the heart of the campus – The National Museum of Singapore and the Singapore Art Museum.



View corridor in the SMU urban design guidelines

Enhancing vibrant walking streets and the public realm

In the early 1990s, URA released Development Guide Plans (DGPs) for 55 planning areas around Singapore to articulate the planning vision and urban design strategies for each of them. The 1993 DGP for Rochor sought to build on the existing street life and vibrancy of BBB by focusing on connectivity and public realm improvements.



Pedestrianisation of Waterloo Street (before)

Retail and entertainment

URA also saw retail and entertainment as a key driver of vibrancy in the district. BBB plays host to several retail and entertainment "scenes" within a compact and walkable area of 92ha. These include the traditional wholesale activities found in markets and department stores along Albert Mall, selling a plethora of goods such as dried foods and medicinal products; electronics, gadgets and digital services at Sim Lim Square; ktv bars and board game cafes at Prinsep Street; and night life establishments along Selegie Road.

There was also a concentration of theatre companies, arts groups and performance venues located in close proximity within the BBB area.

Building on these organic clusters of retail and entertainment activity, URA developed strategies to strengthen BBB as an entertainment hub for Singapore with "bright lights", although this did not quite take off in a big way.





Transit priority and cycling lanes, Bencoolen Street

Bencoolen Car-lite Street (2017)

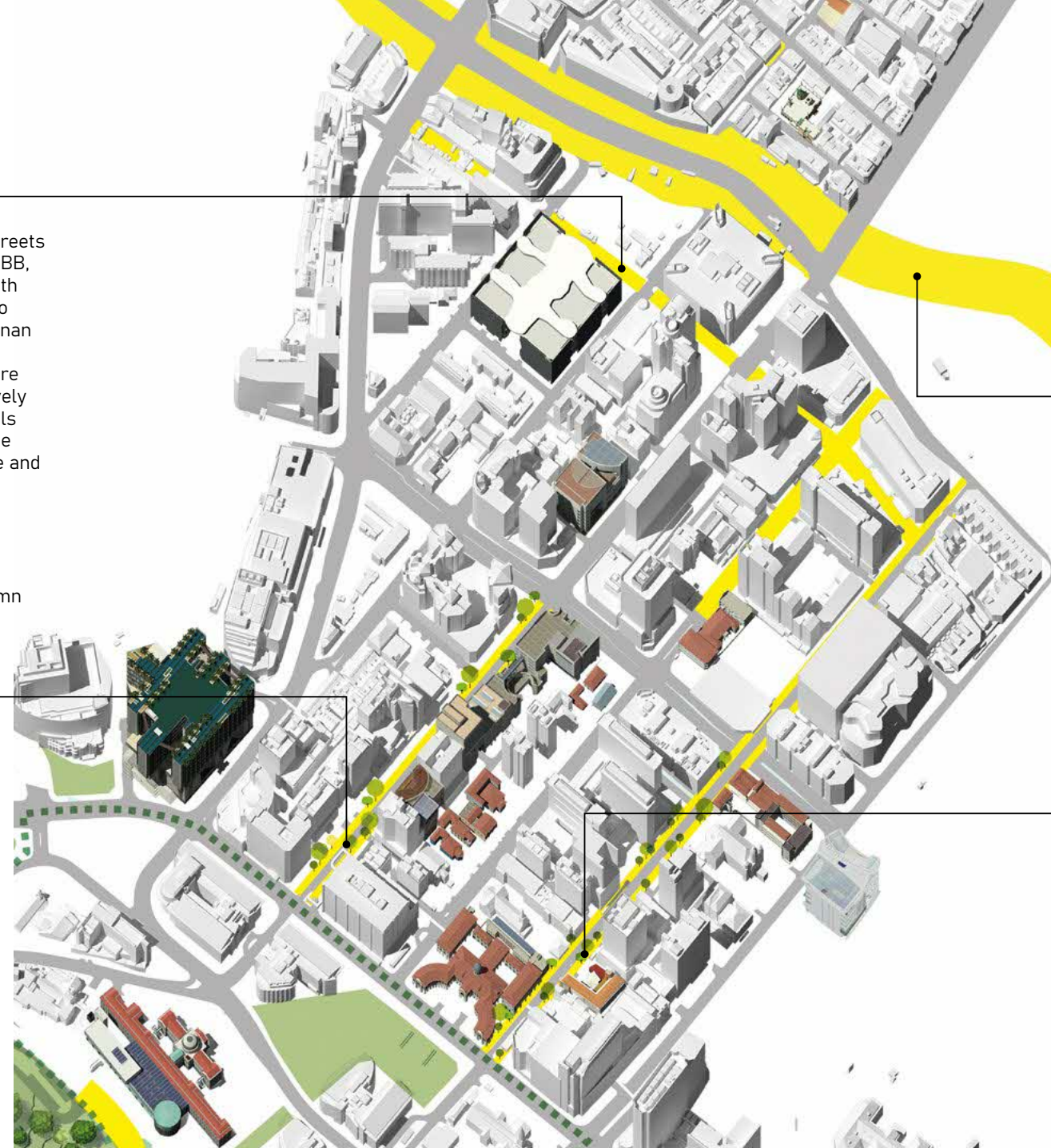
In 2017, while part of Bencoolen Street was closed to facilitate construction of the Downtown Line MRT system, LTA took the opportunity to redesign the once busy roadway into a car-lite street. Dedicated bus lanes were created while two of the original four lanes were reclaimed for more walking and cycling space.

URA's urban design guidelines supported the integration of the adjacent developments with public transit along the street, guiding them to connect seamlessly to MRT station entrances and bus stops (find out more about the integration strategies at Bencoolen Street in the third book of this series called "A Connected and Inclusive City").

Albert Mall (1994)

The first major investment was the pedestrianisation of Albert and Waterloo streets in the early 1990s. Located in the heart of BBB, these crossroads were a hive of activity, with large crowds of religious devotees drawn to the Kwan Im Thong Hood Cho and Sri Krishnan Temples during festive periods. Extensive stakeholder engagement was done to ensure the pedestrian mall was designed conductively for the activities on the ground. (More details on the design of the mall can be found in the first book in this series called "A Distinctive and Delightful City").

URA also worked with stakeholders to spearhead the organisation of activities on the pedestrian mall. Today, street bazaars are regularly staged here during Mid-Autumn Festival and Chinese New Year.



North South Corridor

As part of the upcoming North South Corridor project, where vehicular lanes along Bukit Timah and Rochor Canal Road will be diverted underground, significant road space will be reclaimed for public use with up to 40m wide sidetables along the northern frontage of BBB.

LTA is carrying out extensive public consultations and a masterplanning consultancy in 2024 to shape the corridor into a vibrant public space, stitching BBB to the nearby historic districts of Little India and Kampong Gelam.



Lane reclamation and environmental improvement works at Queen Street



Source: Henning Larsen Architects

Pedestrianisation opportunities under the North-South Corridor project

Queen Street enhancements (2013)

URA also pursued enhancements of other streets in BBB. In 2013, environmental improvement works were carried out for Queen Street to reduce the number of traffic lanes and kerbside parking to allocate more space to the sidewalks.

This allowed the provision of more benches, tree planting and activity spaces which could be programmed by stakeholders. URA worked with students from Nanyang Academy of Fine Arts (NAFA) to paint some of the benches to enliven the streetscape.



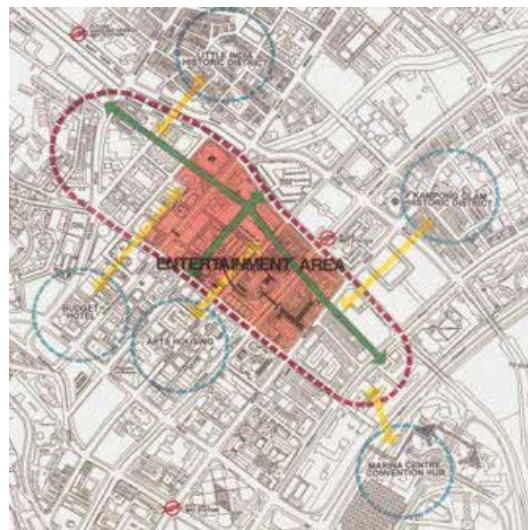
Artist impressions of the planned Entertainment Area in BBB

Experiments with guidelines relaxation

Not all of URA's urban design and placemaking initiatives for BBB worked out. One such initiative was the plan to liberalise the signage guidelines to allow it to become a "bright lights" entertainment district, building on several studies that took place in the 1990s.

1994 Entertainment District Study and 1996 Lighting Master Plan for the City Centre

In 1994, recognising that retail and entertainment was important for city vibrancy, URA, STB, EDB and NAC embarked on a study to transform BBB into an entertainment area for Singapore, building on its critical mass of hotels, entertainment and arts offerings including theatres.



The Entertainment Area was centred around pedestrianised Albert Mall

According to Michael Koh, former Director for Conservation and Urban Design at URA at the time, the plan was to build up more unique entertainment concepts and "for the first time, [allow] bright neon signs to illuminate the entertainment area".⁹

Later on in 2006, URA appointed Lighting Planners Associates (LPA) from Japan to develop a Lighting Master Plan for the city centre to enhance its character, support vibrancy and a "night economy" after dark.

LPA proposed dynamic lighting, luminous walls and large-scale signages in BBB to reflect its vibrant nature, as opposed to the more formal and restrained treatments elsewhere in the city centre.

Relaxation of signage guidelines for BBB

To facilitate the "bright lights" and entertainment area concepts, URA worked with the Building Control Department (BCD) to relax the signage guidelines for BBB. This was also done in response to years of lobbying from advertisers to allow animated signages and three-dimensional "artvertisements" in the city.

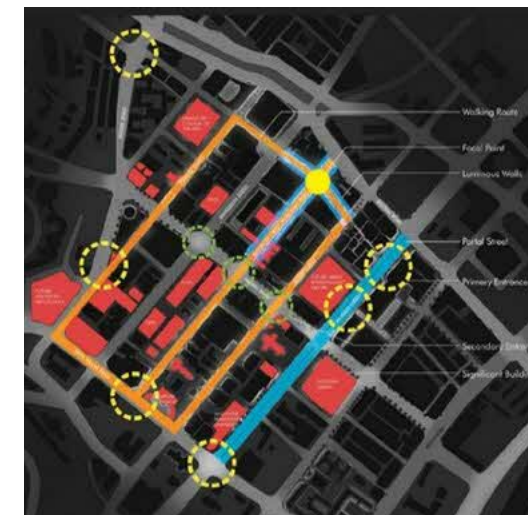
As explained in the first book in this series ("A Distinctive and Delightful City") under the "Streetscape" chapter, URA was concerned that liberalising the guidelines wholesale would bring back the visual clutter that had marred Singapore's streetscapes and buildings in earlier decades.

The relaxation to signage controls was therefore only permitted within BBB, to ringfence any potential degradation of the city's streetscapes. Along key intersections, URA now permitted animated signages and large signages up to 30m high, and encouraged artvertisements on prominent gateways like the Selegie Road overhead bridge. URA also looked at proposals to build infrastructure for advertising revenue, like billboards and signage posts, to support local placemaking efforts.

Unfortunately, the "bright lights" idea never quite fully took off for BBB as advertisers continued to gravitate to prime areas like the CBD and Orchard Road.



Plan showing routes for illuminated signages



Nightlighting concept for BBB by LPA



Concept for "Art"vertisements on the Selegie Road pedestrian overhead bridge





Urban Entertainment Centre Sale Site which was the result of a Concept and Price Tender process

Experimental sale site:

Urban Entertainment Centre

Another experiment was the conceptualisation of the Urban Entertainment Centre (UEC) sale site in 2005. This was a unique concept-price tender site where URA included requirements for unique entertainment concepts like theatres to boost BBB as an Entertainment Area.

The concept and price tender is a variation of the Government Land Sales tender process which allows land bidding to be evaluated both on concept as well as price, and it typically adopted for strategic sites with complex planning or urban design requirements.

While this resulted in a striking development with a moving illuminated façade that energised street life (lluma), some proposed business concepts like thematic restaurants and media studios did not materialise. The development also suffered from weak visitorship until it was bought over by CapitaMall and rebranded with a more regular tenant mix, as Bugis+.

One learning point URA had from the UEC sale site was that business concepts evolve constantly over time, and it was important to acknowledge the changing market trends which could result in the intended outcome not being implemented.

The **urban design guidelines for Bras Basah.Bugis** provide holistic guidance for developments to ensure that its overall character is preserved and enhanced. Find out more at this [link](#).

A living, evolving local neighbourhood in the city

BBB has come a long way since its residents and schools shifted out in the 1980s. Today, it is once again a vibrant neighbourhood in the city centre offering an authentic view of local Singapore, with thriving streets and public spaces.

It is a complex and diverse neighbourhood but also a familiar and local one, the product of a layered, incremental planning approach taken over the years.

URA always sought to involve the stakeholders and businesses as part of plan and policy making, whether it was for the development of Albert Mall, enhancement of Queen Street or the relaxation of signage controls, seeing their involvement as essential to the success of the plans. In certain cases where the envisioned outcomes did not materialise, such as with the Urban Entertainment Centre sale site, URA allowed the concept to evolve based on market needs.

The underlying principle behind each intervention was to pursue them in collaborative and contextual manners, so that the end outcome would feel authentic and true to the identity of BBB.

Street scene in Bras Basah.Bugis today



Source: STB



The charming streetscape at Lorong Mambong, Holland Village

Source: Terence Ong via, Wikimedia Commons

3.6

Character Building: reinforcing identity

Recognising that character and identity are key ingredients of shaping districts and places that people feel connected to, URA has identified various Identity Nodes and Corridors around the island for holistic planning and urban design attention.

Holland Village

The distinctive and widespread appeal of Holland Village

Many places with unique charm and character around Singapore have been designated as identity nodes, so that holistic strategies can be developed to enhance their charm and appeal. One particularly well-known node is Holland Village located in the Bukit Timah – Tanglin area, which was designated an identity node in 2014 in recognition of its unique urban form and emotional appeal to many Singaporeans.

It first developed in the 1930s as a village serving nearby military bases at Pasir Panjang and Alexandra, with shops and businesses catering to a predominantly western clientele. This association with the expatriate community continued over time with the creation of British military housing at Chip Bee Gardens in the 1960s, and continued popularity of homes in the area with foreign professionals.¹⁰

Over time, Holland Village became known as a haven for good food and unique shops, with a mix of traditional kopitiams, family-run establishments and trendy cafes in a village setting.

It remains popular with both locals and expatriates, including students from nearby schools who frequent its cafes. It even became the subject of a 125-episode blockbuster television series in 2003 revolving around a family selling *nasi lemak**.



Source: National Archives of Singapore.
Crown copyright.

Aerial photographs of Holland Village by the British Royal Air Force, 1940s to 1970s

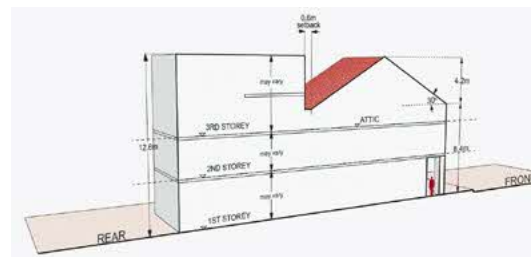
Preserving the urban form of Holland Village through a street block plan

The 1993 Street Block Plan

Street Block Plans are developed by URA to guide the setback, storey and building height of developments for street blocks across Singapore. Applied contextually to specific areas, they help retain existing unique urban form that would otherwise be eroded with redevelopment.

The Street Block Plan for Holland Village was first released in 1993 to maintain the existing two-storey low-rise character and street blocks formed by the shophouses. The controls have been reviewed over time to remain responsive to market conditions and the evolving ambience of the area.

*a dish originating in Malay cuisine with fragrant rice cooked in coconut milk and pandan leaf



In addition to the 1993 Street Block Plan, URA has developed urban design guidelines to enhance the streetscape and pedestrian connectivity for Holland Village.

Roof form and envelope control

The first row of shophouses along Holland Avenue is known to be the most imageable stretch of the village for its clay tile double-pitched roofs that step up in pairs to mimic the slope, and with their roof ridge and springing line aligning neatly with each other. On the internal streets of Holland Village along Lorong Liput and Lorong Mambong, an eclectic mixture of double-pitched roofs and clerestory roofs can be found.

Guidelines are in place to ensure that redevelopments retain the distinctive frontage and unique building form and roof profiles to form legible and recognisable streetscapes.

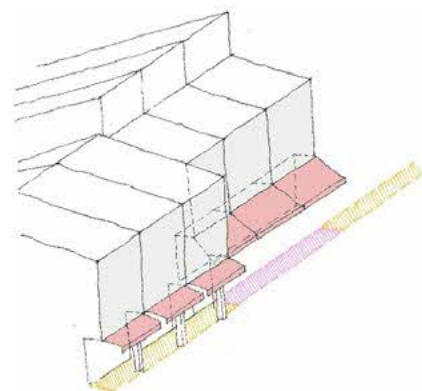
Shophouses along Holland Avenue



Façade treatment and business signs

Windows are a key element of the shophouse typology. While the shophouses of Holland Village do not have particularly ornate windows, their second-storey openings are guided to maintain consistency and imageability of the streetscape.

The sizing and coverage of signages on the building façades is also balanced and curated to maintain the integrity of shophouse façade elements and overall architecture.



Covered walkways

The alignment of the building setback line also ensures that covered walkways and five-foot ways are continuous between adjacent buildings and accessible to the public. Guidelines have been put in place to make good any impediments such as level difference and walls or partitions that block pedestrian movement along the covered walkways.

Developing more holistic strategies through identity node designation

The significance of identity node designation

Holistic strategies are developed to allow them to retain their unique defining character. This means that beyond building form controls, URA will look at larger strategies covering land use, urban design, accessibility and the public realm, to guide the evolution of each node.

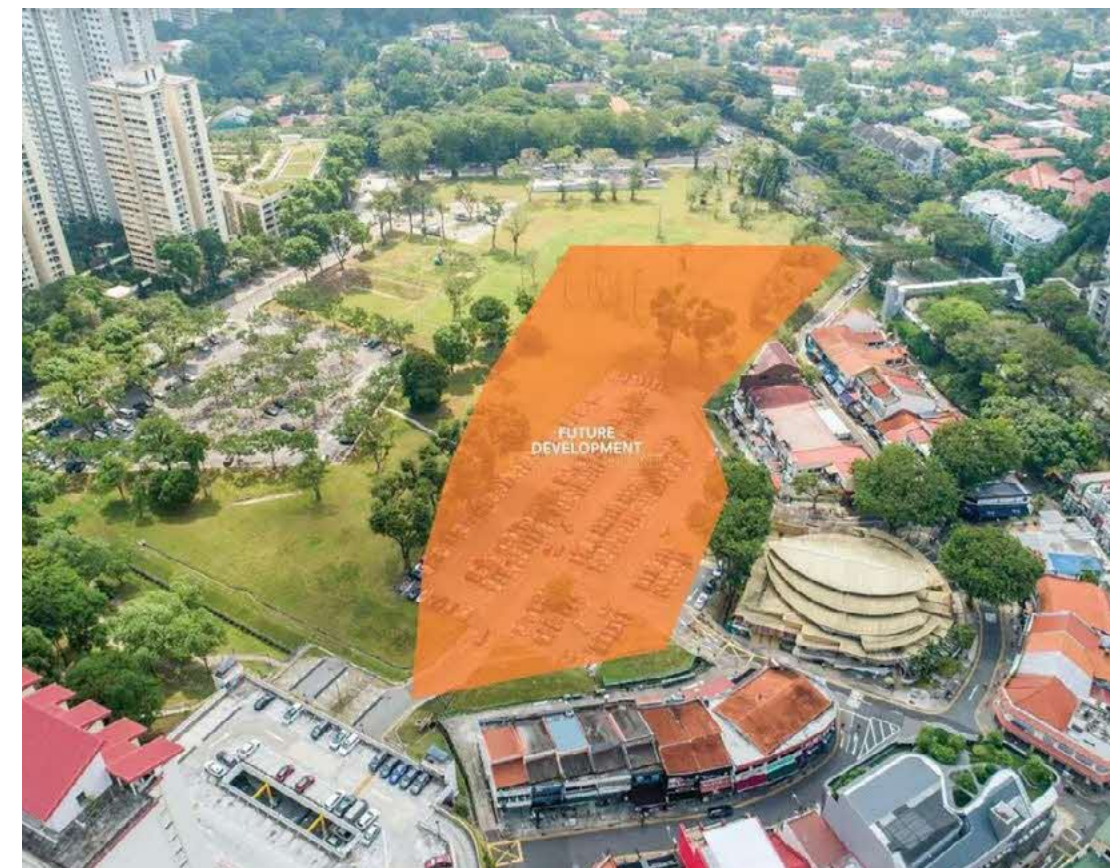
The 2003 Identity Plan identified 15 nodes, grouped into four clusters of urban villages, hillside villages along the southern ridges, old world charm nodes and nodes along the rustic coast. Three more nodes were added in the 2013 Draft Master Plan, namely Serangoon Gardens, Jalan Kayu and Holland Village.

Reviewing the plans for Holland Village

At the time of its designation, the unique low-rise and fine-grained character of Holland Village was already largely preserved thanks to the 1993 Street Block Plan. The village comprises three rows of shophouses laid out in a concentric, scallop-shaped fan around the central market.

Meanwhile, a 2.3ha site next to the identity node had earlier become available due the Holland Drive SERS (Selective En Bloc Redevelopment Scheme) in 1996.

While ensuring that the land is optimised, URA developed detailed urban design strategies to ensure that the new development would sit well with the scale and context of the low-rise urban village.



Aerial view of showing the former SERS site behind Holland Village

Around 2010, URA's planners started reviewing the plans for Holland Village even though it was vibrant and doing well. Something they felt could be improved was the lack of public spaces to serve the community.

One inspiration URA's planners had was to expand the human-scale and intimate streets of Holland Village into the new development and

create public spaces which could become the focus of community life.

The vision for the new development was threefold: to seamlessly integrate with the village, to build on the vibrancy of the walking streets and create attractive human-scale public spaces.



Illustration of the mixed-use sale site by URA

Guiding a major new development for compatibility with the existing node

To ensure that the high-rise, high-density development would integrate sensitively with the identity node and not overwhelm it, URA developed the following urban design strategies for the sale site.

Sensitive form and massing to integrate with the village

URA introduced a series of building height zones to ensure the new high-rise development step down towards the low-rise urban village. The southern-most portion of the site, adjacent to the existing village, was kept low-rise, of up to three storeys to complement the existing two-storey shophouses. Moving northwards with a tiering effect, the building height stepped up to a midrise zone of eight-storeys before culminating into a high-rise zone of thirty four-storeys.

To further strengthen and create a well-defined low-rise urban edge, a two-storey building edge was also required to enable a continuity of the streetscape along Holland Village Way.

Stepping of heights to ensure the new development relates to the scale of the identity node.





Aerial perspective showing the extension of walking streets into the new One Holland Village development

Source: MKPL Architects Pte Ltd

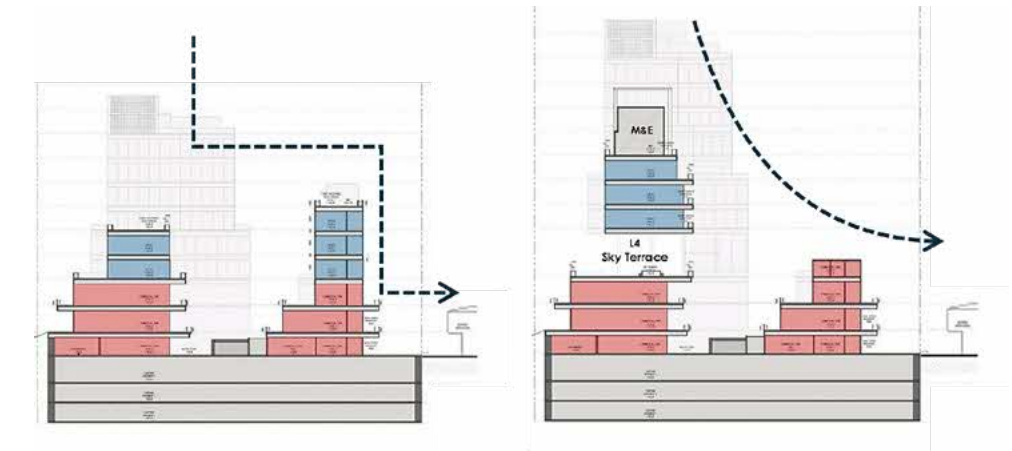
Putting an emphasis on design in the development process

Achieving quality through a Concept-Price Tender approach

As opposed to the typical government land sales tender process where land is awarded to the highest-priced bid, URA adopted a Concept and Price Revenue tender approach for the strategic sale site to allow design and concept to form part of the evaluation criteria.

This was done through a two-envelope format with the first envelope containing the concept proposals to be evaluated first. Only concepts that meet the envisioned quality are shortlisted into stage two, where the price envelopes are opened and the highest bidder wins.

For the Holland Village sale site, a total of 15 Concept Proposals from 10 tenderers were received for the site. The Concept Evaluation Committee (CEC) shortlisted 5 concept proposals deemed to have substantially satisfied the evaluation criteria, i.e. demonstrating strong overall development concepts and architectural designs that responded appropriately to the site context.



Earlier study to adjust height profile to relate better to low-rise node of Holland Village

The land tender was awarded to the team from Stirling Land Holdings Pte Ltd and MKPL Architects Pte Ltd who submitted the highest bid among all the shortlisted schemes.

Guiding design development with the Design Advisory Panel (DAP)

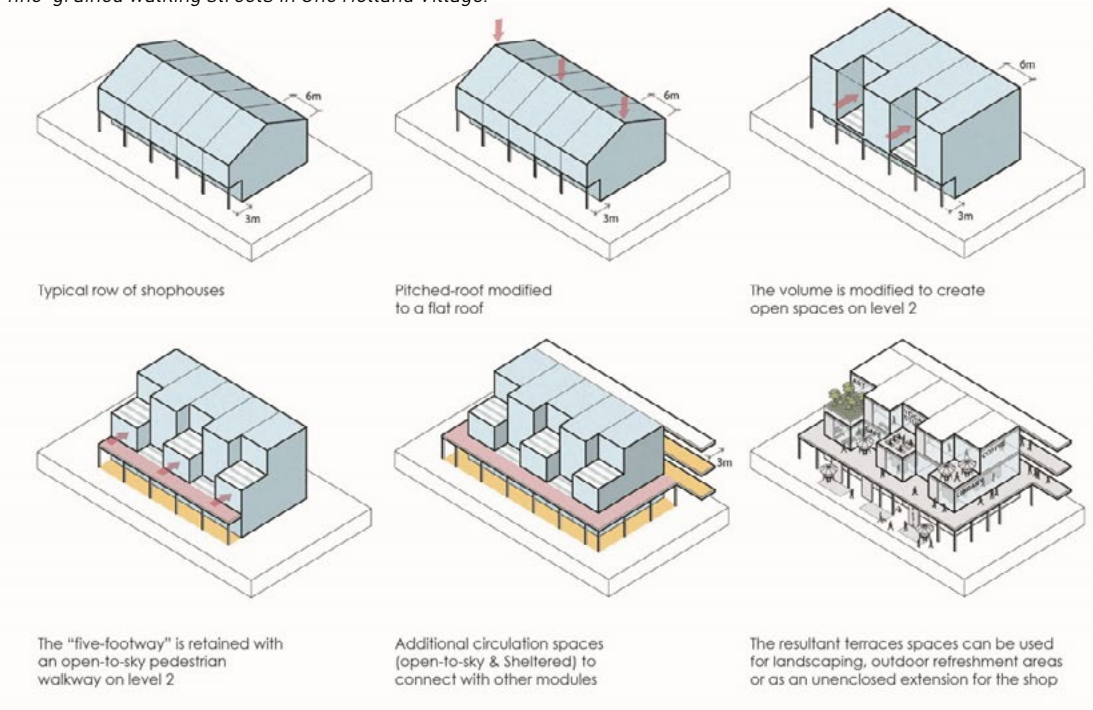
A DAP comprising experts from the public and private sectors was convened to guide the design development of the site.

Sensitive form and massing

The original concept of the new development saw a building height profile with two levels stepping down to the shophouses. The DAP encouraged the stepping down of the six-storey block to three-storeys nearer the shophouses to avoid the creation of a wall-like effect closest to the existing Holland Village. This also allowed the consolidation of the offices into a single block to improve operational and functional efficiency.



Building typology studies to support the creation of fine-grained walking streets in One Holland Village.



Source: MKPL Architects

Organic evolution over time

The original concept was to adopt a consistent façade design treatment across the entire development, including the individual shops lining the pedestrian malls. The DAP suggested instead to adopt a 'blank canvas' approach, to allow various wall murals and artworks to be added over time, allowing the tenants to contribute to an eclectic identity over time. In addition, four shops strategically sited near key public spaces were given freedom to propose differentiated shopfront facades. This would

allow the development to evolve in a more organic way to complement the rather eclectic nature of the existing Holland Village.

Diversification of shopfronts

The DAP also called for shopfront design guidelines which would allow for variety while ensuring quality and compatibility, building upon the eclectic character of Holland Village. This will provide sufficient space for more creative interventions to tenants to showcase their brand identity.

Guiding the evolution of identity nodes over time

Identity nodes are living, evolving community nodes. The strategies adopted for Holland Village act more as a framework to guide its evolution over time, balancing economic, environmental and social imperatives sensitively, instead of attempting to freeze its identity in time.

While URA's policies and levers can aim to slow down the pace of redevelopment, encourage adaptive reuse and even retain old buildings in certain areas, the survival of certain activities largely depends on market forces and the support of local communities.

"It's only natural that the new development acts as an extension of Holland Village; that's why its called One Holland Village."

Siew Man Kok, co-founder of MKPL Architects



Source: STB



BEHIND THE SCENES

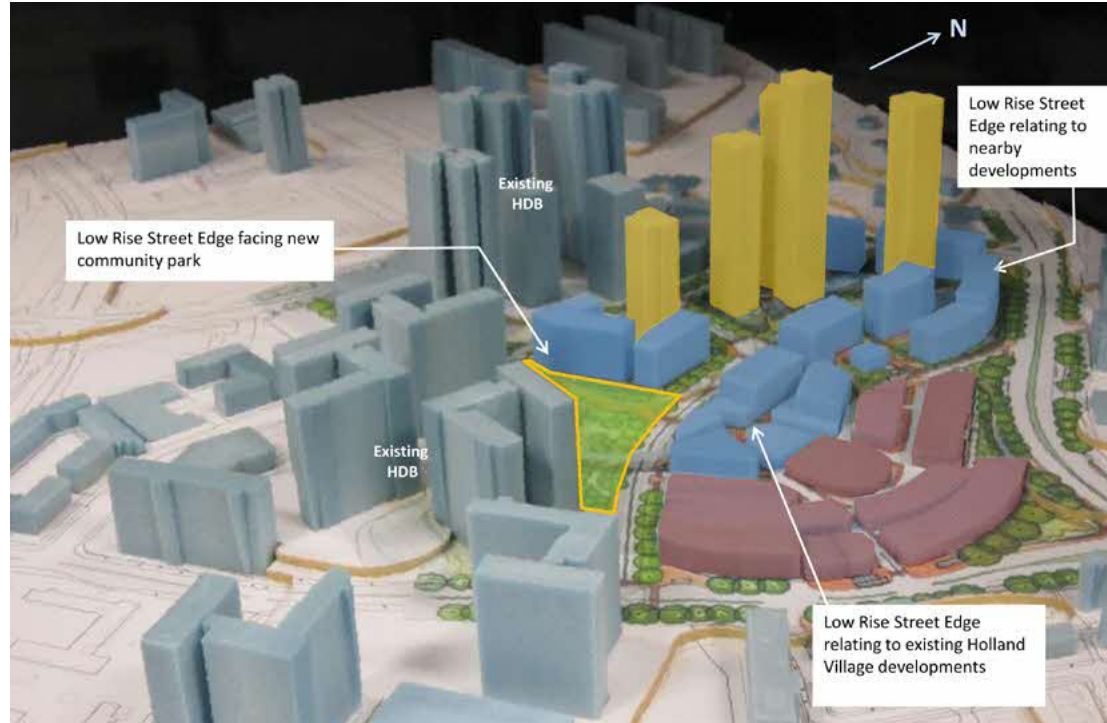
Shaping the city to strengthen the human connection

Over the years, the identity of Holland Village has evolved and yet remained familiar to Singaporeans of different generations. Planners and urban designers worked together to understand its sense of place and build on its charms, allowing it to keep up with the times while preserving its essence.

Tan See Nin, Senior Director with the Physical Planning Group, URA, shares his thoughts on the motivations that influenced the planning and urban design requirements when faced with the challenge and opportunity to expand Holland Village through the sale of the adjoining piece of land under the Government land sales programme.

Can you tell us more about the planning and urban design of Holland Village and the sale site that led to the recent One Holland Village development?

See Nin: The planning and design of buildings and open spaces should facilitate an engagement between architecture and the public realm to create new civic moments and shared experiences. The relationship between these experiences and the places that we value require careful and sensitive design interventions. That was our intrinsic motivation behind the urban design considerations that guided the expansion of Holland Village (HV). As a result of organic and piece-meal growth over the years, HV lacked open spaces and a quality public realm for the wider community to gather and freely use.



Extending the fabric of Holland Village into the new sale site.

The planning and urban design for the HV extension were influenced by the charm and sociability seen in smaller traditional urban villages, comprising human scaled buildings and public spaces that collectively create a rich sense of place and community. For the HV extension, we wanted to promote a similar level of porosity and inclusivity with the future development (now known as One Holland Village). Creating a welcoming gesture was especially important for the neighbouring residents from the adjacent HDB public housing estate. Among the urban design parameters was one that required the developer to build a

pedestrian overhead bridge to seamlessly link the Holland Drive HDB neighbourhood with One Holland Village.

The other requirements included the gradual layering of building heights from low to medium to high-rise, the retention of visual corridors along the pedestrianised “streets”, and the insertion of a small park as a transition between existing Holland Village and the new development.



Shaping the city with endearing and loveable places.

In our highly urbanised environment, how can planners and urban designers continue to shape our city with a strong sense of identity and character?

See Nin: Planners and urban designers need first to be inspired if they want to shape our city into an endearing and loveable place. Inspiration and identity are virtues that inform each other. But there is another element which perhaps is more important than just technical know-how and skills. It lies at the heart of what we do. I call it simply the “heart-ware” of planning and urban design. Let me illustrate this with an experience I had some years back.

A few years ago, I had just arrived one morning in Paris and decided to take a walk along the Promenade Plantee which was a former railway line transformed into a linear park. The park was lovely, and it attracted people from all walks of life. I saw couples walking hand in hand while joggers navigated carefully around them. I passed by an older gentleman reading newspapers on a park bench and I recalled thinking that must be the man’s favourite bench where he would sit every morning to read his papers.

I then came across this big round lawn full of young people lying on the grass enjoying the sun. This open space called Jardin de Reuilly

was re-purposed from a former railway yard where trains used to turn around, which explains its rather unusual shape. Not far from this open space was a prominent drinking fountain where I was invited by a kindly gentleman to drink from it, saying it was special. He had many bottles with him and said he was filling them up for his grandchildren who were visiting him that weekend. When I took a drink from the fountain, I was completely blown over because it was no ordinary tap water. It was bubbly sparkling water. To me it tasted delicious like “Perrier”, and that elixir of life in the heat of the day was an experience of surprise and joy that I had never expected and I will never forget.

What is the main point of this story?

Inspiration goes beyond the cognitive to reach the heart and the emotions of people. We should be conscious of how our plans can profoundly impact the daily life and well-being of the community as planning and city making are ultimately about people and for the people. If we are inspired, we are likely to care and pay special attention to the details of our plans right through to implementation, enabling people to have a tangible and authentic experience of the city, and hopefully to experience it in surprising new ways too. If through planning and urban design we can forge an emotional connection between people and place and in the process enrich a community’s life experiences, I think we would have succeeded in becoming the inspiring planners and designers that we ought to be.

The longer version of the interview can be found at this [link](#).



3.7

Infrastructure reimaged: Making infrastructure do double-duty

In land scarce Singapore, there is a need to rethink the role of infrastructure to achieve multiple objectives and bring greater value to the city. The case study of Marina Barrage demonstrates how critical infrastructure like a waterpumping station can be shaped into recreational space to serve the needs of Singaporeans.

Marina Barrage

The utility building that became a favourite kite-flying spot

Generous open spaces are hard to come by in land scarce Singapore, especially one with a dramatic view of the city skyline as well as abundant breezes coming from the sea. It is for these reasons that the Marina Barrage is so popular with Singaporeans, playing host to family picnics and kite-flying on weekends, as well as providing a front-row seat to fireworks shows in Marina Bay.

It is hard to imagine that the popular Marina Barrage of today could have ended up as a simple standalone pumping station at the mouth of Marina Channel instead. Its reconceptualisation into a multi-functional facility for utility and recreation was the result of intervention from URA urban designers who saw the potential for it to become more than just a utility building that was out-of-bounds to the public.

From polluted waterbody to freshwater lake

The 10-year long journey to clean up Marina Bay and Kallang Basin

In 1977, then Prime Minister Lee Kuan Yew issued a challenge to the Ministry of Environment to clean up the heavily polluted Singapore River and Kallang Basin within 10 years¹¹, believing that a good living and natural environment was critical for supporting the economic growth and development of the country.

This effort extended far beyond the riverbanks, requiring the removal of diverse polluting sources upstream and downstream. Over 46,000 squatters, 5,000 hawkers, 12,000 nightsoil latrines and 2,800 backyard industries were closed down or relocated. Some 3900 premises had to be sewerred, and riverbed cleaning had to be carried out. The end result was a riverine system where wildlife and community could flourish again.¹²

In 1987 when the clean-up was declared complete, Lee Kuan Yew issued another challenge to the government, this time to turn the waterbodies in the heart of the city into a freshwater reservoir.



The creation of Marina Reservoir with the completion of Marina Barrage



“In 1987 I said it was possible, in another 20 years’ time break throughs in anti-pollution and filtration technologies can allow us to dam up the mouth of the Marina Channel, and create a freshwater lake in the Marina Bay.”

Lee Kuan Yew, speaking at the Marina Barrage Commencement Ceremony on 22 Mar 2005.

Kallang River water system



Source: PUB

Manifesting a bold vision to create a reservoir in the city centre

A multi-objective optimisation approach to infrastructure

Lee Kuan Yew’s vision for a reservoir in the heart of the city was a bold one as the technology to transform water catchment from a highly urbanised area into drinkable water was not yet available in 1987, with no viable timeline apparent to PUB. However it was a logical culmination of an integrated planning approach, to strive to achieve multiple outcomes from the creation of major infrastructure in the city.¹³

The benefits of the barrage were clearly multifold.

First, the resultant reservoir would contribute significantly to improving water security for Singapore, thanks to its huge 10,000ha catchment area spanning the Central Region (the largest of all the catchment areas). In fact, it would increase the country’s total catchment from half to two-thirds of the island. PUB had initially considered the reservoir to be only a marginal source of drinkable water until advancements in reverse osmosis were ready. Marina Reservoir could now provide 10% of Singapore’s water needs, reducing the need to depend on imported water as part of the “four national taps”.¹⁴

The next benefit of the barrage was providing control over water levels in the system, reducing flooding risks in the city. With nine 30m wide and 5m high steel crest gates along the 350m wide Marina Channel, as well as seven drainage pumps capable of displacing 280 cubic metres of water per second (or about one Olympic pool every 8.9 seconds), the barrage could discharge water into the sea through one of two ways depending on external tide levels.

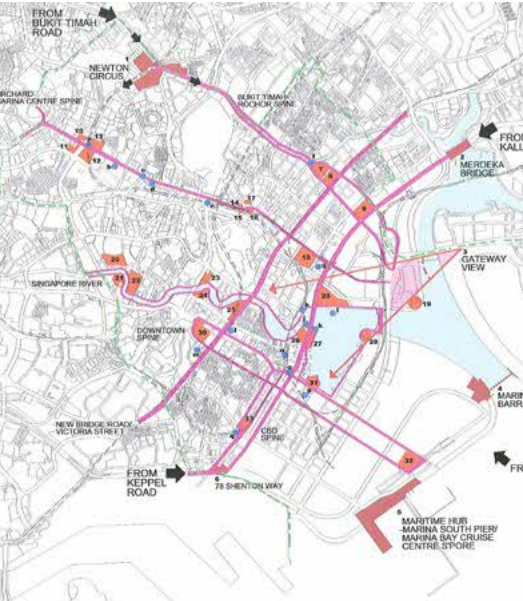
When water levels in the internal system are higher than the sea, the gates are opened to release the excess water. When the opposite happens, e.g. during high tide in the external system, the gates are closed and the pumps are activated instead. This way, the barrage alleviates flood risks in low-lying areas of the city, including the historic areas of Chinatown, Jalan Besar and Geylang found within the Marina catchment area.

The third function relates to urban aesthetics. As the Marina Barrage allowed water level in the reservoir to be controlled, this would eliminate tidal fluctuations which used to expose unpleasant sections of the riverbed and release smells. Keeping the water levels constant also made the reservoir suitable for water-based activities all year round, like sailing, canoeing and dragon boating, supporting the recreational needs of Singaporeans.

Finally, given the strategic location of Marina Barrage on along the waterfront, URA’s urban designers also identified the opportunity for it to serve as a major attraction and public space in Marina Bay. This was made possible by a number of concerted moves in the early-2000s to coordinate the planning of Marina Bay and support design excellence outcomes.



Location of Marina Barrage in relation to Marina Bay and Kallang Basin.



Landmark and Gateway Master Plan



Construction of Gardens by the Bay

Supporting architecture and urban design excellence for the city

Shaping the new Marina Bay area

Around the early-2000s when the plans for the Marina Barrage were being finalised, plans were also taking shape for various developments around Marina Bay. In 2005, URA prepared a paper putting forth a vision to turn Marina Bay into a “Waterfront City in a Garden”, as part of a set of strategies to position Singapore competitively as a distinctive global city. This vision capitalised on Singapore's strengths as a modern city in the tropics, as well as the significant green and blue assets of Marina Bay.

Several unique projects were conceptualised for Marina Bay around this time. During a parliament session in April 2005, then Prime Minister Lee Hsien Loong announced the decision to develop two integrated resorts (IRs) to boost the tourism industry, one of which would be sited prominently along the Marina Bay waterfront. A request-for-concept (RFC) procurement approach for the IR allowed the government to select the proposal that best fulfilled various objectives including a good urban design response to the site.

At the National Day Rally in 2005, PM Lee also announced plans for the 101ha Gardens by the Bay, which would anchor the 360ha development area of Marina Bay and provide generous greenery in the future downtown. Another

project around the bay – the Singapore Flyer, had also just broken ground in September 2005, conceived as the world's tallest Ferris Wheel.

As the plans for the Marina Barrage came slightly earlier than these other projects in Marina Bay, URA's urban designers played a key role to coordinate the plans for each project to ensure a seamless public realm outcome, leveraging various implementation instruments like sale site conditions and design reviews to align the various design efforts.¹⁵

Elevating architectural and urban design in Singapore

It was also around this time that URA introduced a slew of initiatives to promote architecture and urban design in the city, seeing them as essential to propel Singapore to the next level as a globally recognised city and endearing home to Singaporeans.

These included the introduction of a Landmark and Gateway plan to enhance the legibility and imageability of the city, as well as the use of design competitions to realise them. Shortly after, the Design Advisory Panel was set up to guide the design of two of the landmark sies. These initiatives accompanied the creation of an Architecture and Urban Design Excellence (AUDE) unit within URA to support these efforts.

Leveraging the power of design through the DAP

Convening the first Design Advisory Panel
The Design Advisory Panel (DAP) is a panel of public and private sector experts convened to guide the design development of strategic projects, suggesting improvements at the urban design scale and architectural level.

The formulation of the Landmark and Gateway Plan in 2001 was one of the events that led to the birth of the DAP. Prior to the DAP, an Advisory Design Panel (ADP) played a similar function from 1978 to 2000. One difference between the two was that the ADP comprised a standing panel of advisors whereas the members of the DAP varied according to the requirements of each project.

Optimising the design of the Marina Barrage
The initial concept for pumping station that formed part of the Marina Barrage project in end-2002 was a four-storey high stand-alone utility building along the waterfront, with a discharge channel between the reservoir and the sea that cut off public access to the waterfront. Given the importance of the site, URA decided to put the design of the project to a DAP for review.

URA saw it not just as a utility project but a potential attraction for Marina Bay, that would blend in with the landscape of the nearby Gardens by the Bay and incorporate a pedestrian and cycling bridge across Marina Channel.

URA's urban designers drew up a concept of how a sloping green roof could be built over the pumping station to bring park users from Bay South Gardens to the roof to enjoy waterfront views. This would also ensure that the promenade continued uninterrupted along the waterfront.

PUB's consultants translated URA's concept into a design that took the form of an elliptical mound that concealed the pumping station and wrapped around the discharge channel. It also integrated a visitor centre to showcase Singapore's water conservation efforts. Connectivity was improved by allowing the waterfront promenade to flow directly into the site, while part of the turfed roof would extend seamlessly from the gardens itself.

Over the course of the DAP sessions, the final design evolved from an elliptical earth mound into a sloping, curvilinear turfed roof, enclosing the utility components and creating an inner plaza with a water play area. The sloping roof provided a seamless extension of the adjacent Bay South Garden and provided access to an expansive green roof overlooking the Bay and Singapore Straits. Works on the barrage began in 2005 and completed three and a half years later.



Original concept for Marina Barrage



Evolution of design through the DAP process





Integrating the barrage into a necklace of attractions around Marina Bay

Realising a necklace of attractions around the Greater Marina Bay

The Marina Barrage proved to be an instant hit with the public upon its opening in October 2008. With its green roof commanding a panoramic views, it has become a popular spot for picnics, kite flying and watching firework displays.

To create points of interest along the waterfront URA planned for a “necklace of attractions” around Marina Bay. The Marina Barrage has become one of the gems in the necklace of attractions.

At the point of the Marina Barrage’s completion, some of the attractions that were already completed included the Esplanade Theatres by the Bay and One Fullerton, as well as the 165m tall Singapore Flyer.



Source: Bob Tan, Wikimedia

Completed Barrage with publicly-accessible green roof

Implementing a continuous waterfront promenade

While the attractions served to activate the various stretches of the waterfront, URA also laid plans for a continuous 3.5km long waterfront promenade which would encircle the waterbodies and provide easy accessibility to the different attractions. It was implemented in segments either directly by URA or as part of the adjacent developments around the bay, in a period stretching from 2002 to 2015.

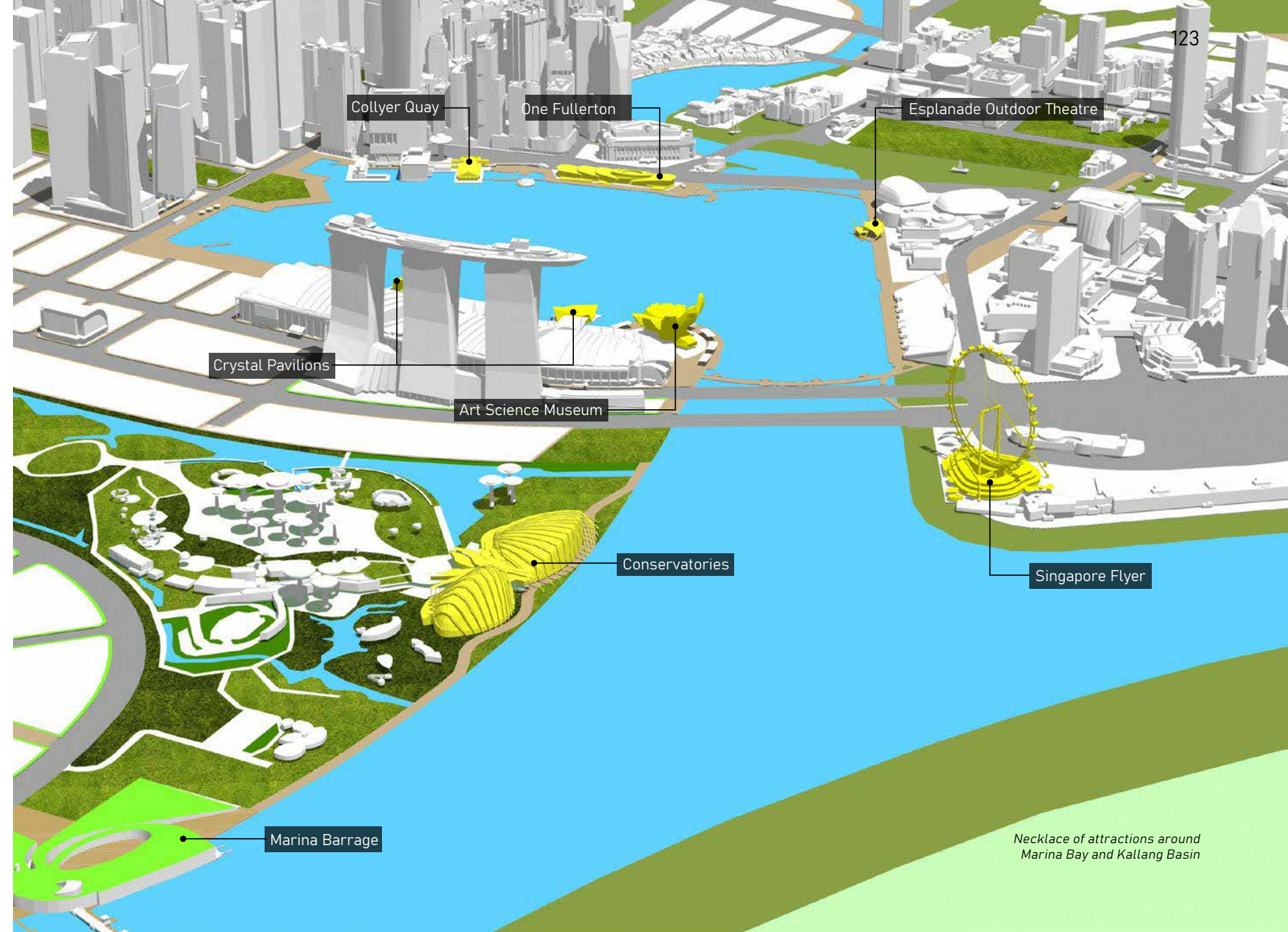
URA implemented a major segment of the promenade on the eastern edge of the Bay between 2008 to 2010 to extend from Fullerton Heritage to the Marina Bay Sands site. Two significant bridges were also implemented by URA to improve access across the bay – The Helix and Bayfront Bridge in 2010 and Jubilee Bridge in 2015. The completion of the latter also marked Singapore’s 50th year of independence, completing the 3.5km loop around Marina Bay.

Transforming our relationship with water

The reconceptualisation of the Marina Barrage from a utilitarian structure to a beloved recreational space for Singaporeans was driven by an optimisation approach in land planning, rethinking the function of infrastructure to bring additional value to society.

This approach also reflects the evolution of Singapore’s relationship with water over time, from being at the mercy of frequent floodings and shortages to taming it for resilience and beauty in the city

This was a journey that took several decades and the efforts of many involved across the public and private sectors, which started from a singular powerful vision of turning the polluted Marina Bay and Kallang Basin into a freshwater lake.



Necklace of attractions around Marina Bay and Kallang Basin



Stamford Canal - before



Decked over Discovery Walk - after

3.8

Infrastructure reimagined: Transforming a canal into a connector

The various drains and canals that criss-cross Singapore have been reimagined as useful connectors serving commuting and recreational needs.

This case study of Discovery Walk at Orchard Road demonstrates how URA worked with private landowners and developers to deck over an open canal and piece it back together as a unique retail street.



Source: Ministry of Information and the Arts Collection, courtesy of National Archives

Hawkers at Gluttons Square along Stamford Canal

The Discovery Walk at Orchard Road

Doing more with our urban infrastructure

Compact urban cities simply have to do more with limited space. Critical urban infrastructure, like drains and canals, is often reimagined as part of the public realm in Singapore, forming park connectors, cycling routes and green links through the island.

In the case of Orchard Road, an open canal along it has been transformed into a vibrant retail alley lined with outdoor kiosks, alfresco dining areas and art installations, conceived as a "Discovery Walk" to add variety to the experiences found along the shopping street.

Its inception was part of a set of strategies to rejuvenate Orchard Road in the early 2000s, through the use of different implementation instruments and careful coordination across multiple developments to realise a pedestrian mall over the Stamford Canal.

Turning an open canal into a Discovery Walk along Orchard Road

Floods and hygiene issues along an open canal

It was not too long ago that the Stamford Canal used to be an uncovered monsoon drain lining Orchard Road, bringing floods and other problems associated with open drainage systems to the area.

According to the former Chief Transportation Engineer of the Public Works Department (PWD) Professor Gopinath Mennon, "seeing that Singapore was getting quite popular" and that "Orchard Road was making a name for itself", the PWD and Ministry of Environment worked together to cover up Stamford Canal in the 1970s, improving the landscaping, signages and tree planting along the street.¹⁶

One section of the canal remained uncovered however – where it was deviated from the main road into the street block above the future Somerset MRT station. Over time, the canal became a 'back of house' for the developments there, with M&E equipment and carparks lining it.

The success of the night hawker bazaar "Gluttons Square" in one of the carparks brought further issues – the hawkers had to be relocated in 1978 due to hygiene concerns, as they would dump their leftovers into the canal.¹⁷



Developing plans for the canal as part of remaking Orchard Road

By the early 2000s, efforts were underway to remake Orchard Road, with plans to enhance the pedestrian mall and launch Government Land Sales (GLS) sites to rejuvenate the shopping street's offerings.

URA developed the idea to deck over the canal and turn it into a "Discovery Walk", to create a new type of street-based shopping experience for Orchard Road, that would also integrate the developments within the street block to create a critical mass of retail, hotel and office uses.

The idea was to create a lively activity corridor in a semi-outdoor setting, to be lined with activities, shops and outdoor refreshment areas. The concept was exhibited as part of the Remaking Orchard Road exhibition in 2001, receiving positive reactions from the public.



Concept for Discovery Walk by URA



Illustrations of Discovery Walk by URA



Overcoming technical challenges to deck over the canal

Understanding loading and structural limitations of the existing canal

Encouraged by the public feedback, URA initiated discussions with the Public Utilities Board (PUB) to study the technical challenges of covering up the open canal.

There were concerns about building a new deck directly onto the canal walls as it had been built more than 20 years prior. It was eventually determined that lightweight precast and pre-stressed hollow core slabs could be safely loaded onto them, subject to investigations to ensure that they were in good structural condition.

The other method was to build transfer structures on both sides of the canal to carry a new deck over it. These structures had to be setback at least 1m from the canal walls, which meant encroachment into private land outside of the drainage reserve, requiring negotiations with adjacent landowners.

New access arrangements were also needed to allow PUB to continue inspecting and maintaining the canal. PUB required access panels at 50m intervals along the deck to allow personnel to enter the canal space. A sizeable inspection chamber was also needed for equipment access.

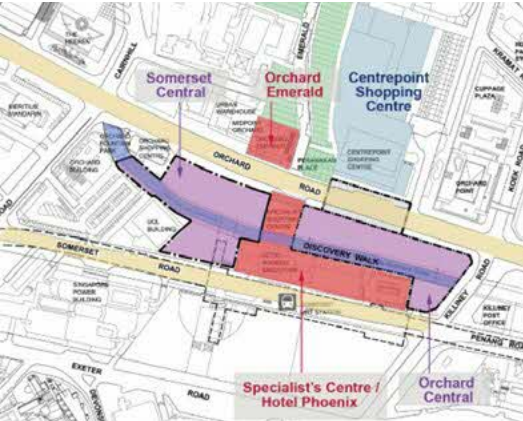
Galvanising different landowners to realise the works in tandem

One of the biggest challenges was coordinating the completion of Discovery Walk across three different parcels, each with its own development timeline.

To kick things off, two parcels of State Land which were used as surface carparks were packaged into the two GLS sites and launched for tender in 2005 and 2006 respectively, allowing the majority of Discovery Walk to be realised immediately.

For the other stretch in private ownership, URA encouraged the building owners to undertake redevelopment of its aging shopping centre and hotel under the Orchard Road Development Commission (ORDEC). This scheme incentivises building owners to undertake redevelopment or major refurbishment works of their properties by awarding them with additional Gross Floor Area if the works bring about transformative benefits to the precinct.

Three buildings, namely Specialist Centre, Phoenix Hotel and Orchard Emerald, which belonged to the same owners, were redeveloped in this way, allowing the final section of Discovery Walk to be completed.



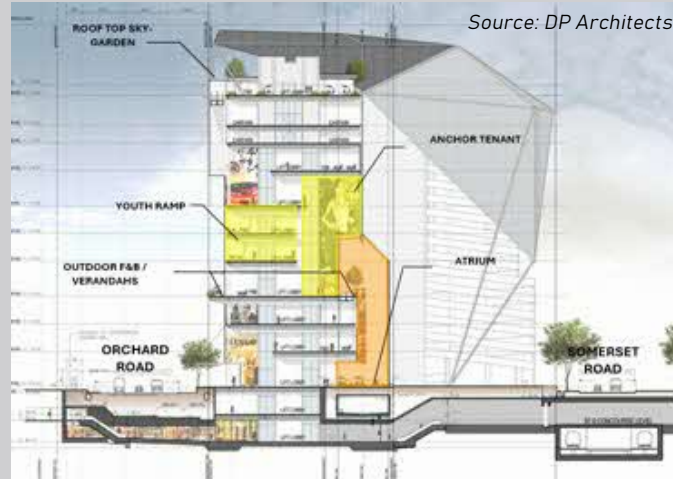
Various developments and parcels lining Stamford Canal in Somerset



Former Specialist Centre and Phoenix Hotel



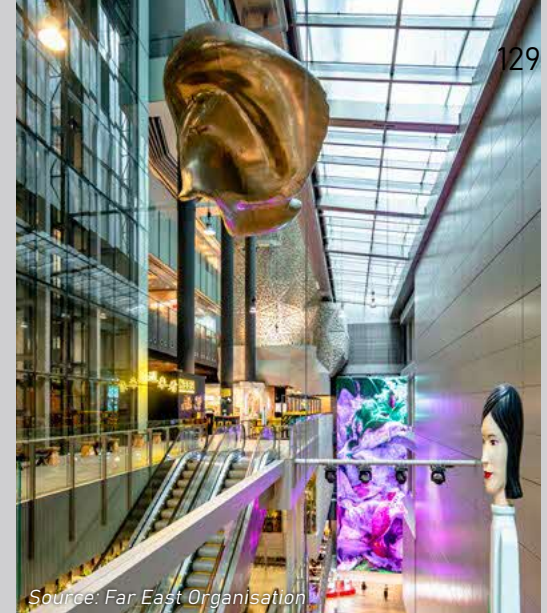
Sheltered outdoor pedestrian mall section at 313@Somerset



Lofty corridor within Orchard Central



Staggering of ORAs along the pedestrian mall.



Public art found within Orchard Central

Shaping the Discovery Walk into a unique experiential space

Creating a generous “volumetric” space

Urban design parameters were formulated to ensure that the Discovery Walk would be a unique and memorable space. It also had to be spacious to function as a continuation of the Orchard Road pedestrian mall.

To cater for the consistent stream of human traffic plying between Somerset MRT stations and Bideford junction, URA required a clear pedestrian walkway width of 6m to be set aside, the same width as the rest of the Orchard Road pedestrian mall.

URA required a minimum two-storey clear height throughout the corridor to ensure that the Discovery Walk would be airy and attractive.

The Design Advisory Panel, which was set up to guide the design development of the two sale sites as well as the joint redevelopment of Specialist Centre, Phoenix Hotel and Orchard Emerald, also encouraged the design of Discovery Walk as a continuous and integrated “volumetric experience”.

URA planned parts of Discovery Walk to be open-to-sky where it was flanked by different developments on both sides, so that it resembled a public street. Where the land parcel straddled over the canal, URA allowed the buildings to span over the canal. This varying of indoor and outdoor settings and diverse edge and height treatments created different spatial experiences within the 370m long corridor.

Anchoring vibrancy and visual interest along the walk

To ensure its vibrancy, URA stipulated uses such as shops and eateries, as well as Outdoor Refreshment Areas (ORAs), to line the Discovery Walk. The ORAs were granted as additional GFA system as an incentive to developers.

URA also required the provision of landscaping to evoke an outdoor quality for Discovery Walk. Some developers went beyond this to introduce a variety of water features, creating visual and sensory delight.

As development works for most of the adjoining properties were taking place at the same time, the various architects actively collaborated to match the look and feel of the Discovery Walk. This was also coordinated through DAP sessions chaired by URA for the various developments.

One coordinated design approach was staggering the placement of the ORAs and landscaping lining the Discovery Walk, to shape it into a ‘meandering’ path for interest.

The Art Incentive Scheme was also active during this period, which gave GFA incentive equivalent in value to the art work incorporated into the development. This resulted in the developers introducing major pieces of art along the corridor, including a five-storey “Tall Girl” sculpture that reached the full height of the atrium.

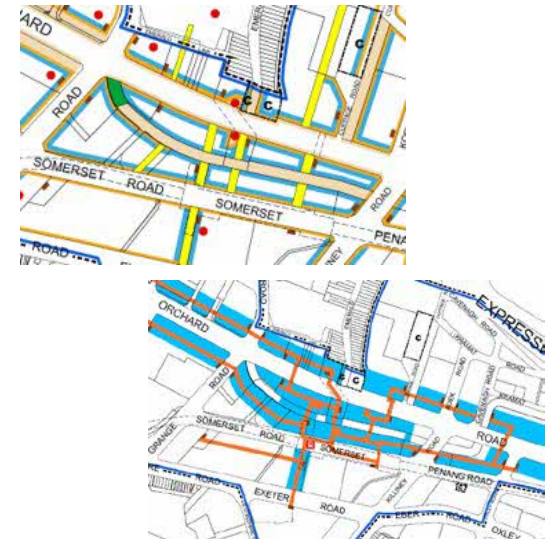
The **urban design guidelines for Orchard Road** provide holistic guidance for developments to integrate well with the environment, support vibrancy and strengthen its appeal. Find out more at this [link](#).

Improving porosity and connectivity

To enhance porosity across the Somerset street block and improve accessibility to the MRT station, URA introduced numerous through-block links to improve circulation across the developments. Each through-block link had to be at least 7-10m in width to cater to the heavy foot traffic generated by the MRT station.

An underground and elevated pedestrian network was also drawn up to maximise linkages from the developments to the MRT, as well as to each other.

The extensive linkages at multiple levels also resulted in the tight assimilation of the various properties together, making it feel like one integrated development. This created a critical mass of retail, hotel, office and other uses to anchor this end of Orchard Road.



First storey and Underground Pedestrian Network requirements by URA



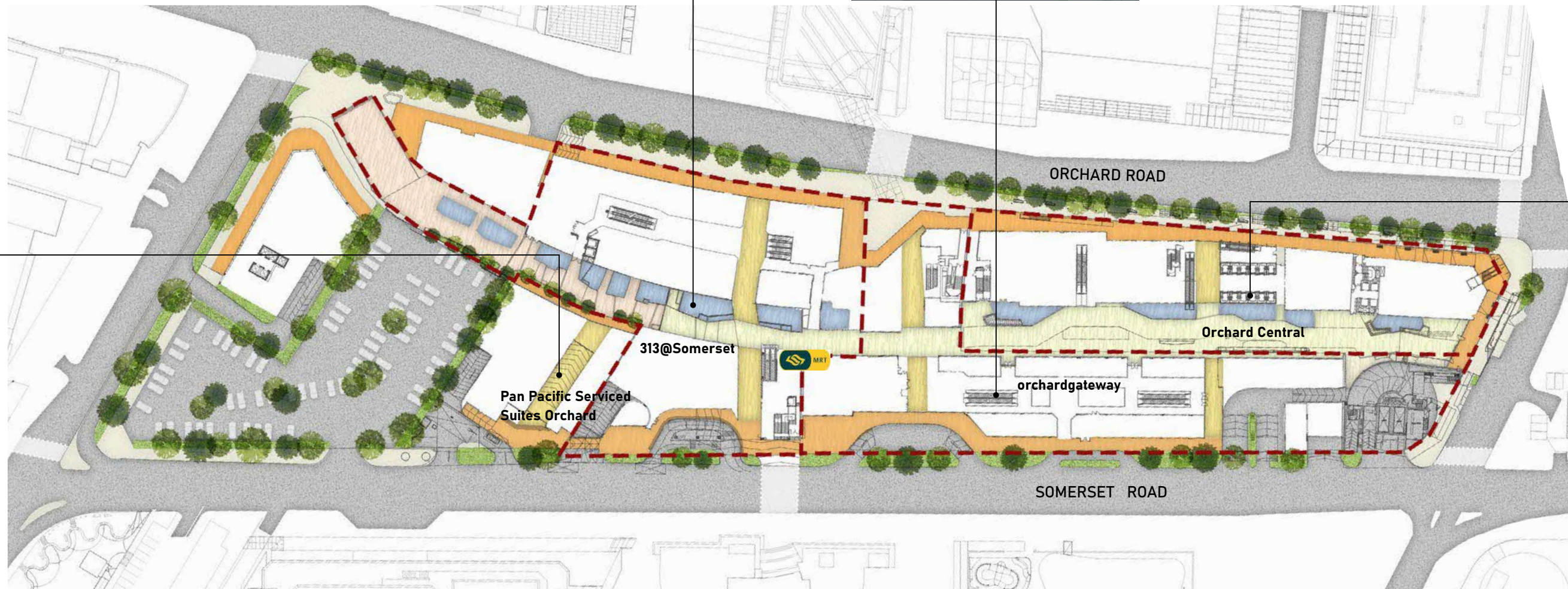
Source: Lendlease

313@Somerset

This was a GLS site launched by URA in 2006 on the eastern end of the street block, forming a key gateway to the MRT station at the busy Bideford Road junction. The Discovery Walk begins as an open-air pedestrian mall nearer the junction before transitioning into the indoor spaces of the development, seamlessly integrated with the entrance structure of Somerset MRT station.

Pan Pacific Serviced Suites Orchard

In 2003, the owners of UOL building initiated discussions with URA to redevelop the existing office building into a new mix of uses including Serviced Apartments. As part of the redevelopment works, UOL proposed a through-block link that would enhance porosity through the street block, and provided covered walkways and activity-generating uses along Discovery Walk as required by URA.



Source: AWP Pte Ltd

orchardgateway

The joint redevelopment of Hotel Phoenix, Specialist Centre and Orchard Emerald under the ORDEC scheme allowed the final section of the Discovery Walk to be completed in the middle of the street block.

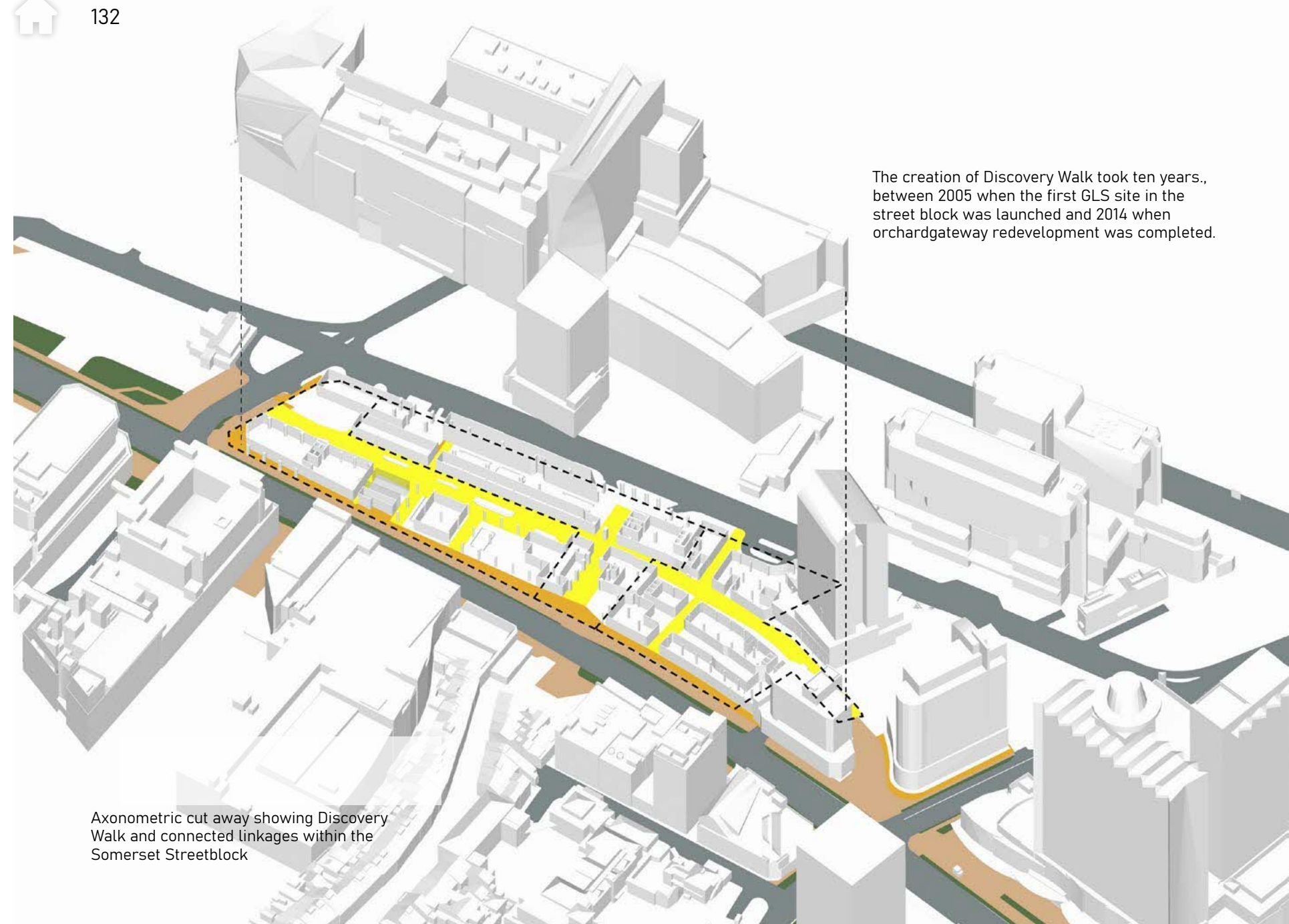
As part of the redevelopment, a key underground pedestrian link was realised underneath Orchard Road allowing the developments north of the street to plug into the underground pedestrian network around Somerset MRT station.



Source: Far East Organisation

Orchard Central

This was the first GLS site launched in the street block which facilitated the creation of the Discovery Walk. The developer decked over the Stamford Canal and created a generous multi-storey atrium space above it, with interesting articulations and projections over the Discovery Walk. The developer also introduced artwork which enlivened the experience of the corridor.



The creation of Discovery Walk took ten years., between 2005 when the first GLS site in the street block was launched and 2014 when orchardgateway redevelopment was completed.

Axonometric cut away showing Discovery Walk and connected linkages within the Somerset Streetblock

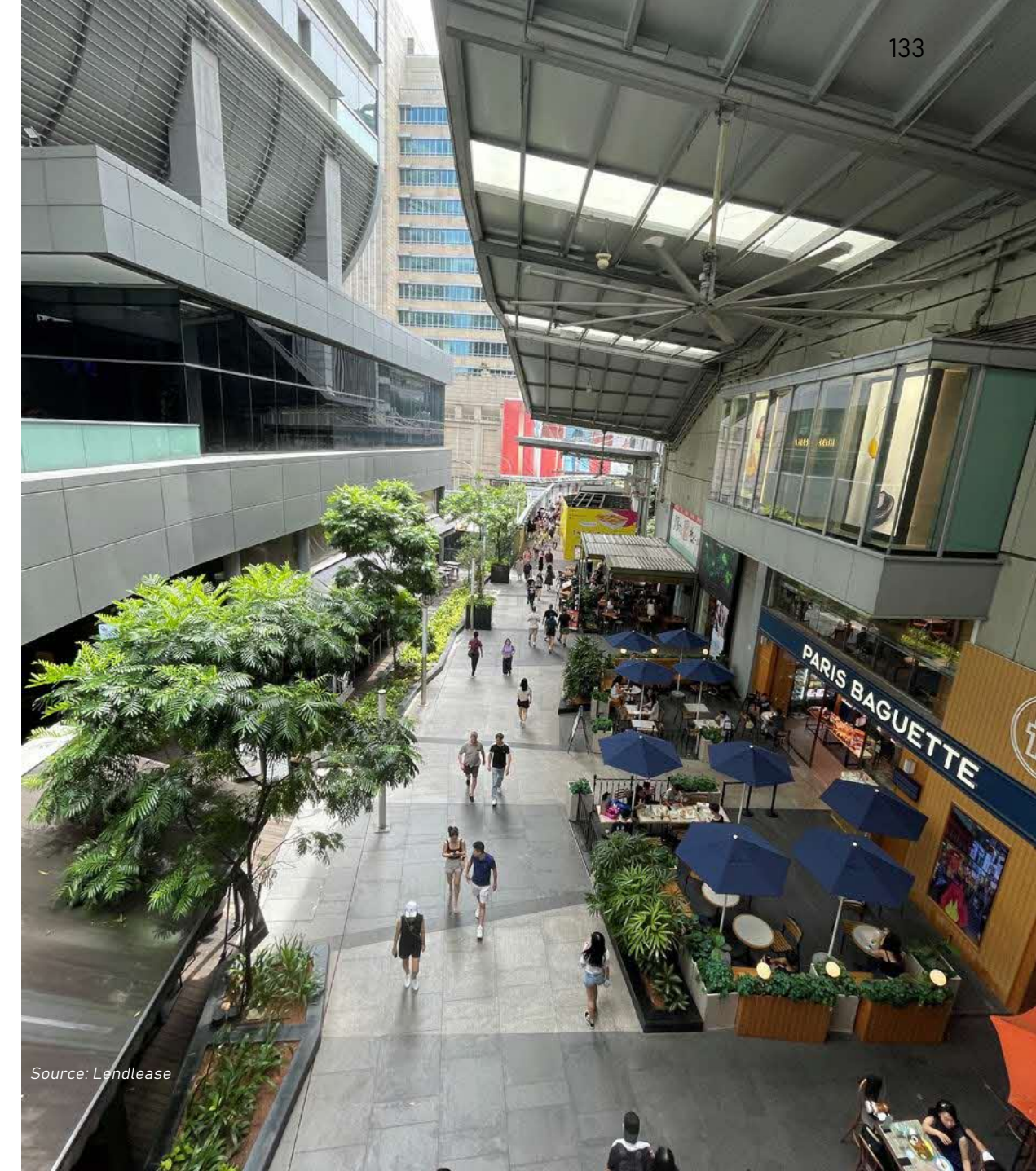
Facilitating other transformative projects by the private sector

Turning drains and canals into pedestrian spaces is not new in Singapore where land optimisation is a fundamental planning approach. However the Discovery Walk presented a unique case where the government worked closely with the private landowners and developers to realise the transformation works themselves.

A collaborative and market-responsive approach was needed, to create the vision and business case to galvanise various landowners to take action to create economic, environmental and social value through enhancing infrastructure.

The Orchard Road Development Commission (ORDEC) scheme in particular proved a gamechanger in enabling ageing developments to undertake joint redevelopment works together to enhance the larger street block and complete the Discovery Walk. The scheme, which was specific to only the Orchard Road area from 2005 until 2019, has since been updated and expanded to the rest of the city as the Strategic Development Incentive, or SDI.

The **Strategic Development Incentive (SDI) Scheme** is intended to encourage the redevelopment of older buildings in strategic areas into new, bold and innovative developments that will positively transform the surrounding urban environment.. Find out more at this [link](#).



Source: Lendlease

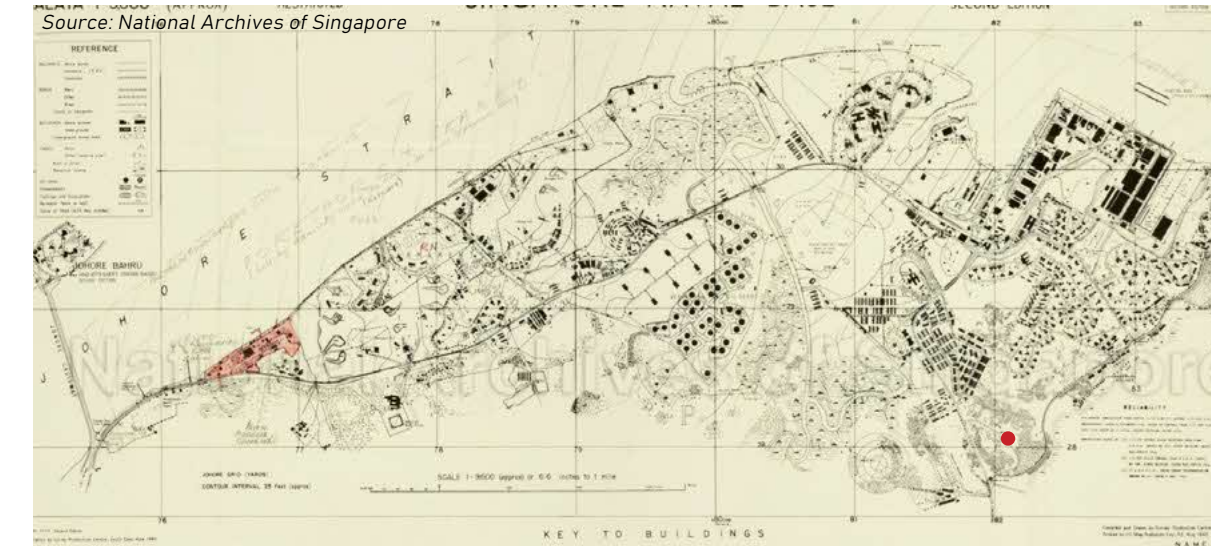


Source: DP Architects

3.9

Urban design transposition: Using UD lenses in a non-urban context

Good urban design principles ensure that development can be contextually appropriate even in non-urban settings. The case study of Bukit Canberra demonstrates how this is achieved through respecting local topography, landscaping, sense of place and history.



Map of the former Singapore Naval Base with Bukit Canberra marked in the red dot.

Bukit Canberra

Urban design efforts are not limited to urban, built-up areas of the city. URA applied urban design lenses to guide the sensitive insertion of a sports and community hub into a verdant, hill park setting in the northern region of Singapore.

The Bukit Canberra integrated hub is a public sector project where different facilities are co-located on the same site to achieve better land optimisation. The hub comprises sports and recreation facilities, a hawker centre, polyclinic, senior and childcare centre and public park.

In recognition of its scenic qualities, historic significance and community value, URA developed highly detailed urban design guidelines for the project.

Creating a community hub in a scenic and historically significant site

Bukit Canberra is a hill in the northern region of Sembawang, situated in a historically rural area with plantations, farms and kampongs, such as Chong Pang and Sembawang villages nearby.

The site is a hill characterised by lush greenery reached by the winding Nelson Road.

It is crowned by a mansion that overlooks the Sembawang Shipyards, part of the sprawling Singapore Naval Base that was built by the British in the 1930s to protect its interests in this side of the world, also referred to by Winston Churchill as the 'Gibraltar of the East'.¹⁸



Source: National Archives, courtesy of National Heritage Board
Former Admiralty House on top of Bukit Canberra, which enjoyed views of the larger Naval Base

The monument on top of a hill

The mansion was built in 1939 as the residence of highest-ranking naval officer in Singapore and enjoyed a good vantage point of the larger military base.

Designed in the Arts and Crafts architectural style, the building is two-storeys tall and has a distinctive stucco treatment and exposed brickwork. It has been known under various names over the years, such as Navy House, Nelson House and ANZUK House after the tripartite military force based in Singapore (Australia, New Zealand and United Kingdom). It eventually became known as the Former Admiralty House when it was gazetted in 2002 as a national monument.¹⁹

Impetus for an integrated hub

URA began planning for a sports and community hub to serve the Sembawang region in a period when the integrated hub model was starting to emerge in Singapore. The first example of this typology was Our Tampines Hub which was completed in 2017.

This approach of integrating and co-locating various amenities together in the same site was intended to optimise land and maximise convenience to residents, who could now find everything from food to healthcare to sports and community activities under one roof.

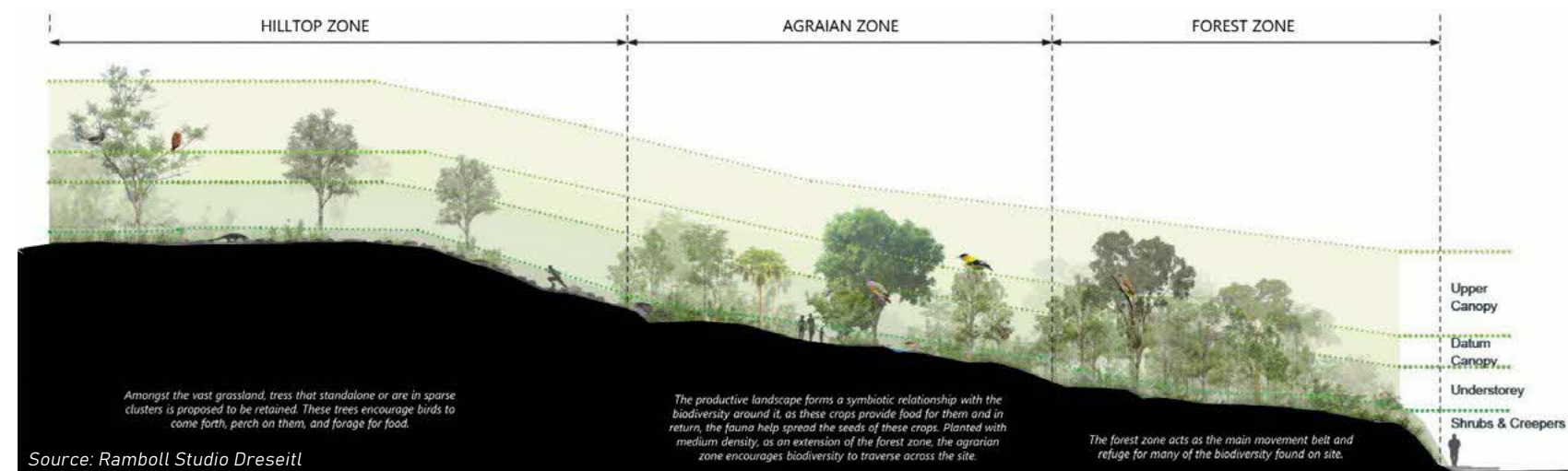
Bukit Canberra was an inter-agency effort involving SportSG, National Environment Agency, Ministry of Health, People's Association, URA and NParks. The involvement of NParks was especially important given the lush natural condition the site.

The site had earlier been zoned for Sports and Recreational use in the Master Plan, and the temporary use of the Former Admiralty House as an international school ended in 2019. Visiting the site just before COVID-19 disrupted the planning and construction works, agencies were nonetheless struck by the immersive lush nature and the topography of the site, as well as the intriguing sense of journey in reaching the summit of the hill.



Artist impression of Bukit Canberra Integrated Hub

Source: DP Architects



Landscaping zones by Ramboll Studio Dreseidl.

Creating development in nature under a new paradigm

Reestablishing a hillside agrarian landscape

NParks worked closely with URA and subsequently with DP Architects to realise the landscape vision for the site, which was to replicate the type of hillside agrarian landscapes already found in the area. The idea was to blend landscaping and human activities together to realise a high level of biodiversity and subsistence.

Taking the existing vegetation into consideration, NParks introduced three vertical zones for the landscaping:

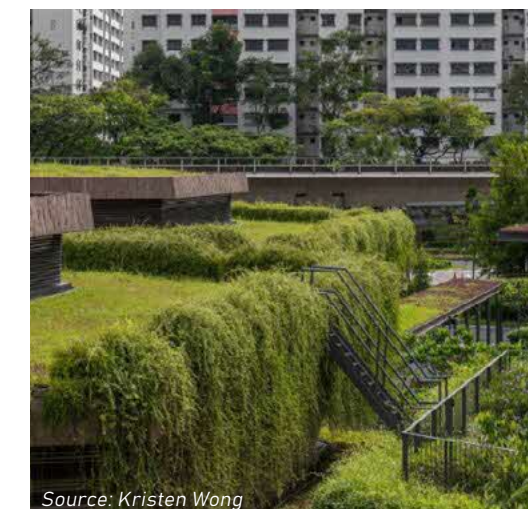
- A “Forest Zone” was established at the base of the hill where vegetation was already lush. A high green plot ratio of 6.0 – 8.0 was stipulated to ensure high density and quality of planting. (See Book 2 on a “Green and Liveable City” in this series to learn more about green plot ratio).
- An “Agrarian Zone” was introduced in the mid-level of the hill to create groves of edible plants and fruit trees, to stimulate the human senses and create wonder at the boundaries of the programme areas.
- The “Hilltop Zone” at the highest level of Bukit Canberra was planned as a garden filled with fruit trees and generous shade, with nostalgic shrubs such as hibiscus and oleanders and views of the surroundings. Tree planting here had to be sensitive to not obstruct views of the monument.

A responsive urbanism to greenery and biodiversity on site

DP Architects, working with the landscape consultant Henning Larsen, made a strong push for a biophilic and restorative landscaping strategy. They saw this as a paradigm shift, from integrating nature into the development to a more responsive kind of urbanism – to integrate the development into the existing ecosystem instead.

The buildings and spaces were laid out in a way that allowed the thriving green and blue networks to continue to flourish. Aside from retaining 466 trees, they also planted another 1,621 trees resulting in a total of 2,087 trees on site today.

When construction was shut down during the COVID-19 pandemic, more plants blossomed on their own and many were retained in the final landscape, supporting a wealth of biodiversity such as insects and other animals.



Source: Kristen Wong





- Community Gathering Notes
- Pedestrian Access Notes
- Vehicle Access Notes
- Active Pedestrian Mall
- Through Block Link
- Walk-Cycle Path



Site organisation and connectivity by DP Architects
Source: DP Architects Pte Ltd

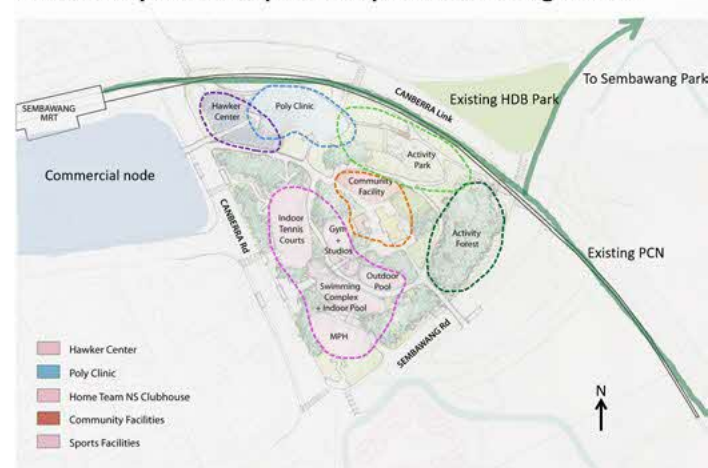


Hawker Centre
Source: DP Architects Pte Ltd

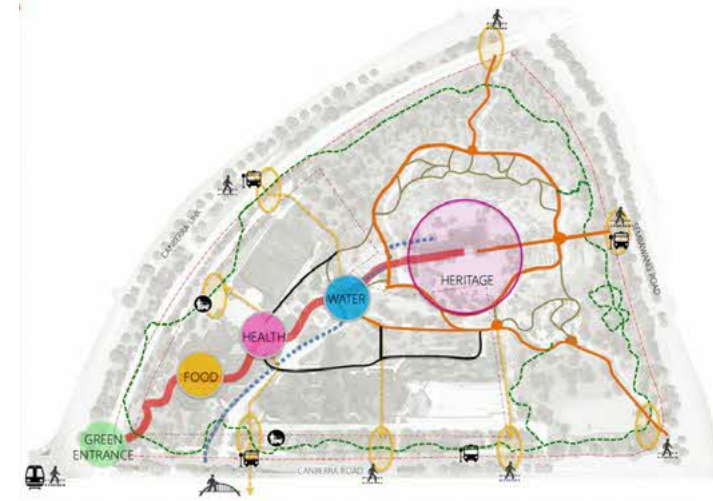


Swimming pool
Source: DP Architects Pte Ltd

Preliminary structure plan : Proposed clustering of uses



URA's sketch for site organisation and connectivity.



Final layout depicting programmatic synergies between different functions.
Source: DP Architects Pte Ltd

Shaping layout and circulation for programmatic synergies

Creating connectivity across the site

In planning the circulation for the integrated hub, URA envisioned an extensive network of pedestrian links across the site, to create convenient access between the various amenities, public transit, hilltop and surrounding community.

A 15m wide pedestrian mall was introduced to link the hilltop to the Sembawang MRT station. Smaller links in the form of covered walkways, linkways and footpaths extended from the hilltop to each corner of the site. A mid-level loop helped to tie all the links together around the hilltop mansion.

This resulted in what the architects called a system of "nodes and networks" in their final layout. In addition to the central loop identified by URA, the architects expanded each radiating path into further loops, maximising connectivity around the site and around the programmatic clusters,

Shaping synergies in the programmatic layout
Building on URA's suggestion to look into suitable adjacencies to generate programmatic synergies, the architects took the approach to develop the layout based on how people would use the space, instead of keeping areas run by different agencies separate.

One example of this programmatic synthesis was the decision to site the pool near the senior care centre and design it with universal features so that the senior care team could utilise it for the elderly programmes. They also sited the hawker centre nearby in consideration of the families that would bring their children for swimming classes, so that families could eat together after the lesson. In distributing sports facilities throughout the site, the architects also encouraged different user groups to partake in the various sporting activities, even as just onlookers of other groups in action.



Source: DP Architects, credit: Jerome Teo
Experiences of nature throughout the site.



Source: DP Architects, credit: Jerome Teo
Social spaces introduced between various programmatic areas.

Fostering community spirit through sensitive design

One way of understanding urban design is to see it as a bridge between planning and development. In the case of Bukit Canberra, urban design expanded on the planning strategy of co-locating different amenities together to bring about even deeper synthesis of the various programmatic parts together as well as with nature found in the site.

It was also mentioned at the start of this book that urban design plays a key role in coordinating many diverse disciplines to shape the final outcome. In translating the programmatic parameters of the site into 3D guidelines, URA worked closely with experts in planning, development, landscaping, ecology and heritage to lay the basic principles of urban form, landscaping and circulation for the development. This enabled the work of architects to follow through on the final design.

The act of integrating different functions and finding synergies is inherent in the work of urban design for the densely built-up city, and hence also worked in the context of natural settings. This act of integrating and finding synergies is what allows the whole to be larger than the sum of its parts, which was what has been achieved in Bukit Canberra thanks to the architects' ingenuity and sensitivity.

"If you go back to the first principle of the project, the big objective is that this must be a place of many places. If we call Bukit Canberra a park then we are saying there's actually many parks within this big park. It is a site that is designed to be inclusive, accessible for residents of all ages with various interests, because ultimately with that, the aspiration is about fostering a stronger sense of community and belonging."

Seah Chee Huang, CEO of DP Architects and project lead.



Source: DP Architects Pte Ltd, Credit: Finbarr Fallon



BEHIND THE SCENES

Redefining co-location: from adjacency to interdependence

Bukit Canberra, the new 12-hectare integrated development in Sembawang is introducing a new urban form set in a green haven, with its diverse uses from fitness to food, wellness, and park spaces. Architects **Seah Chee Huang** and **Chin Li Nah** share how the project pushes the co-location idea further and their dreams for new kinds of recreational spaces and opportunities for the future.

A key aspect of Bukit Canberra as an integrated co-location development is how its diverse uses are purposefully organised to open new possibilities and experiences for residents. Tell us more.

Chee Huang: Bukit Canberra enables us to experiment and push the co-location concept further. We have set up a framework in determining how we organise the uses and spaces according to how people would want to use the spaces as opposed to grouping uses based on facilities managed by different government agencies.

In designing the place, it was about finding the right synergy and synthesis between different components. Moving from adjacency of uses to more interdependent uses, you can create something far more impactful.



Source: DP Architects Pte Ltd, Credit: Finbarr Fallon

Li Nah: In organising the spaces, what is most important is to approach it from the residents' point of view, in understanding how they will use the spaces and how the experience and use of the spaces will benefit them.

In my many visits to the site, I have observed how people access and use different amenities seamlessly. Fathers who bring their sons for swimming lessons at the pool would naturally move on to have lunch at the nearby hawker centre in the premise. Or people would bring their grandparents to the senior care centre may go on to visit the pharmacy nearby.

In creating a green haven, you have gone beyond providing green buildings and green roofs to creating more ecologically connected habitats and differentiated vegetation and experiences. Tell us more about your approach.

Chee Huang: Instead of just going in to build the facilities on site, as what you may typically do in building a mixed-use co-located facility, we worked closely with Henning Larsen, our landscape consultant, to layout and curate the buildings and spaces in a way that retains and allows the existing thriving natural network of green and blue spaces to continue to flourish.

Our approach is also shaped closely by URA's urban design guidelines in respecting the natural and built heritage of the site, where the guidelines help determine which areas can be built, the kinds of spaces and programming to provide and the height of the buildings etc.

Li Nah: The site itself is quite challenging. It is not just a triangular site but was also on a hilly terrain. The challenge is how we can insert interventions into the different levels and work with the different varying levels. We did not just develop all over the site but worked with the site terrain in keeping most of the natural ecology intact, including preserving the top of the hill.

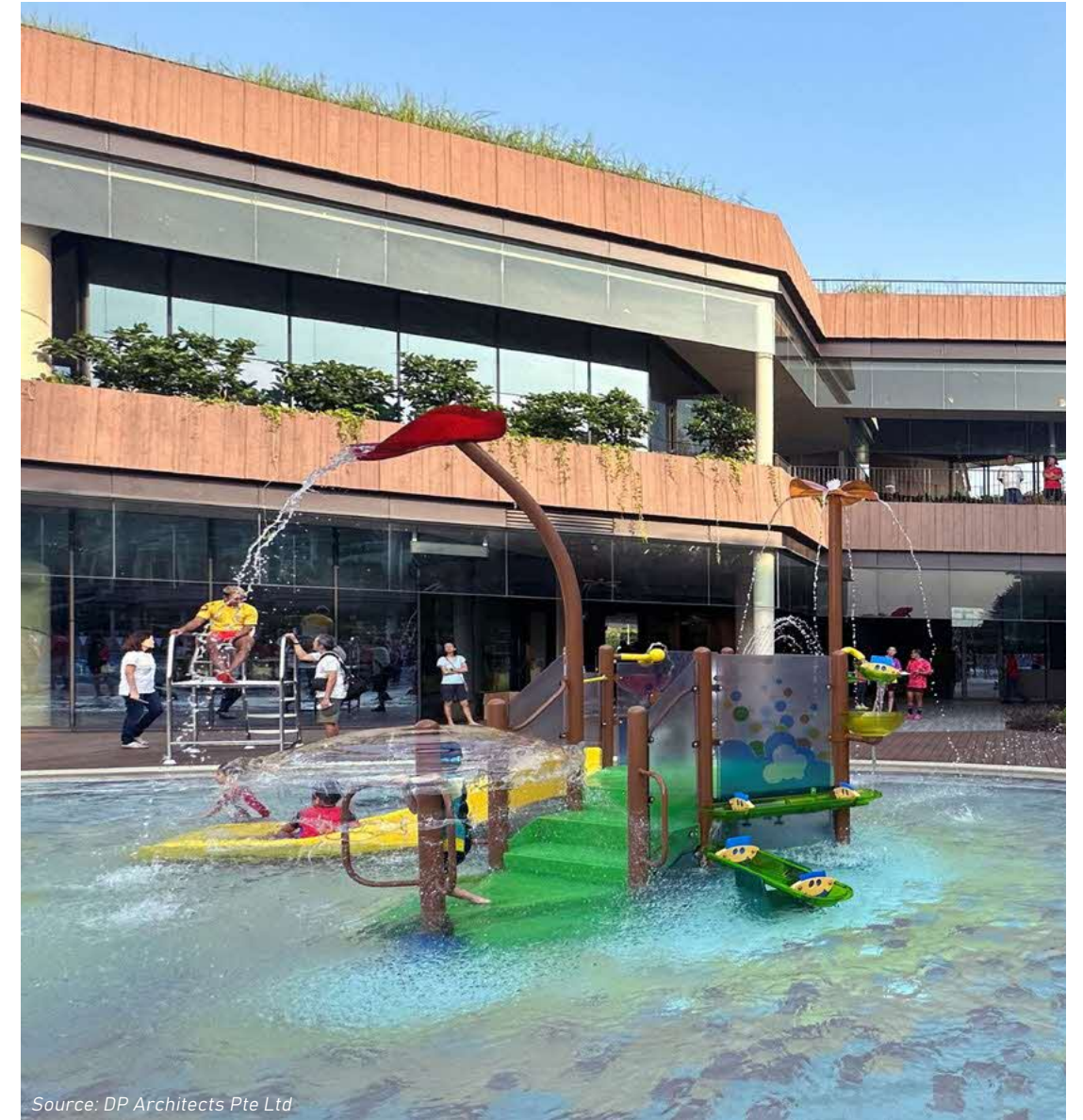
There is a deliberate design of a variety of public plazas and community spaces throughout Bukit Canberra. Why is this important?

Chee Huang: The larger goal of this place is that we want it to be a place of many places. This place was designed to offer a diverse range of spaces and uses to cater to different segments of the community from different walks of life.

Whether it is the pedestrian mall or the smaller range of public spaces, we see these as not just being used for wayfinding and to guide the seamless movements and flow, but such spaces also offer opportunities for people to forge more memorable experiences.

We hope that anyone who visits and spends time here will find a space that they can identify with and feel a sense of ownership and want to help care for and maintain the place well.

The longer version of the interview can be found at this [link](#).



Source: DP Architects Pte Ltd



3.10

Future-proofing for sustainable communities

In planning and designing future development areas, URA adopts a forward thinking approach and the latest simulation technology to ensure that the infrastructure laid down is robust and future-proof to support long term needs and aspirations.

For Marina Bay, studies on the eventual urban structure, grain and form started decades before the first developments were realised.



Artist impression of Marina South district currently under development.

Marina Bay

Planning for the future from the beginning

It is not an easy task planning for future generations, as the way people live, work and play evolves constantly, and yet plans must often be laid long before the first shovels touch the ground.

For URA, planning for the future starts many years before development, with every iteration of the plan incorporating the latest thinking on what the future holds. In the case of Marina Bay, URA's urban designers began thinking about its

future forty to fifty years ahead, even while the land was still being reclaimed from the sea in the 1970s.

With advancements in technology has come the ability to more accurately simulate diverse planning and urban design scenarios and understand the tradeoffs between them. URA has developed and used various tools and applications in the planning and design of Marina Bay, to enable more informed decision-making.



Reclamation of Marina Bay in the 1980s



Kenzo Tange Master Plan, 1983

Iterations of what the future could look like

The story of Marina Bay spans several generations of planners and urban designers in URA, almost as long as the organisation has been in existence (reclamation works started around the same time URA was formed in the early 1970s). Over the years, many versions of Marina Bay have been studied, exhibited and revisited, as part of forward planning for the strategic area.



I M Pei Master Plan, 1983

1983 Tange and Pei Concept Masterplans – laying the foundations for greenery and recreation

The first major masterplans for Marina Bay were hatched in 1983 when Kenzo Tange and I M Pei were invited to propose concepts for the area initially known as “Marina South” situated south of the CBD. Both plans were prescient in positioning the new city as one characterised by parks, public spaces and greenery, boldly setting aside generous areas for such uses.

Over the years this emphasis on greenery and recreation was incorporated into various iterations of the plans, such as the creation of the 26ha Marina City Park in in the 1985 Interim Land Use Plan – to position the area as a “major playground for Singapore”.²⁰

The strongest iteration of this vision came in the mid-2000s, when URA made the bold move to carve out 101ha from the total reclaimed area of

360ha for a series of three waterfront gardens that would anchor Marina Bay as a “waterfront city in a garden”. This also ensured that the waterfront would remain publicly-accessible for all to enjoy.

Ever pragmatic, the government had to be convinced that there would be cost-recovery and strong value creation from this sizeable investment, which URA and the agencies did through quantifying the potential enhancements to surrounding land value, potential tourism receipts and business viability of the gardens.

While its benefits were hard to quantify in pure economic terms, integrating greenery and recreation into the plans for Marina Bay was continuously pursued to serve a larger social good and achieve a vision of what liveability could be like in future.²¹



21st Century Downtown plan, 1992

1992 “21st Century Downtown” and 1996 “City of Tomorrow” plans – refinements for integration, connectivity

One of the main reasons why I M Pei’s masterplan was adopted was due to the fact that development of Marina Bay would take many decades to complete – his gridiron plan which framed the bay (compared to Tange’s sweeping curve) allowed the developing city to look complete enough at any point in time to form a good impression (learn more about the differences between Tange and Pei’s plans in the first book of this series called “A Distinctive and Delightful City”).

This consideration was further emphasised in 1992 when URA developed the first detailed land use plan for Marina Bay to become a “21st Century Downtown”, with a diverse mix of commercial, cultural, leisure uses as well



City of Tomorrow Plan, 1996

as “gracious waterside living”. Building on the benefit of Pei’s plan, a major consideration of the 1992 study was for Marina Bay to retain an “intact image” with the existing CBD while it was being built up, resulting in development extending outwards seamlessly from the existing areas.

Not long after, URA developed the “City of Tomorrow” plan in 1996, focusing on shaping an integrated environment for live, work and play. The vision was to ensure that the diverse mix of uses in the future downtown would be well-connected to each other, from waterfront homes to offices to parks as well as the existing city. A comprehensive pedestrian network was drawn up with concepts that were futuristic at the time – featuring second-storey travellers, hub carparks and a Common Services Tunnel (CST) for districtwide utilities.

Today, the world’s largest CST and district cooling system is the legacy of this plan, enabling the realisation of significant energy savings for Marina Bay through the sharing of cooling loads between different uses which are active at different times of the day.



Planned districts within Marina Bay in the mid-2000s.

Mid-2000s – Development of a Waterfront City in a Garden begin

Development of Marina Bay began in earnest in the mid-2000s in the push to make Singapore a distinctive global city. Then Prime Minister Lee Hsien Loong shared the plans for strategic projects like the Barrage, Integrated Resort and Gardens by the Bay during his National Day Rally speech in 2005, outlining what Marina Bay could look like by 2015 when those developments were completed in time for Singapore's 50th birthday.

These unique projects were part of the vision drawn up by URA for Marina Bay to become a “Waterfront City in a Garden”, capitalising on Singapore's strengths as a modern metropolis in the tropics. It was a vision that had been building up in the various studies and plans of the preceding years.

While the plans for Marina Bay were unapologetic about integrating high levels of greenery, URA also started looking into achieving real sustainability outcomes as the first developments were coming up.

2011 – Sustainability studies for Marina Bay and the Greater Southern Waterfront (GSW)

URA appointed AECOM in 2011 to carry out a sustainability audit of the ongoing plans for Marina Bay and the Greater Southern Waterfront (GSW) area, covering areas like energy, transportation, micro-climate and biodiversity.

The audit noted that compared to a business-as-usual (BAU) scenario, existing sustainability initiatives by URA such as implementing District Cooling, mandating LUSH and Green Mark Platinum in developments, etc, would already achieve substantial reductions in carbon emissions and energy use.



Source: AECOM Singapore Pte Ltd
Sustainability study for Marina Bay in 2011.

	BaU Business- as-usual	Baseline (with existing measures)	Performance increase	Aspirational Targets
Total Carbon Emissions	2,307,188 MTCO2eq	1,840,328 MTCO2eq	-19.8%	-30%
Total Energy Consumption	3,521,833 MWh/year	2,623,759 MWh/year	-25.5%	-35%
Total Water Use	36,229,900 M3/year	32,962,785 M3/year	-9.0%	-30%
Total Passenger Car Equivalent KM travelled	1,218,065,555 Km/year	1,212,706,067 Km/year	-0.4%	-6%
Total Waste Recycled	431,774 Ton/year	450,302 Ton/year	4.3%	15%

The consultants then looked at making MB-GSW an “Enhanced Garden City”, with better resource efficiency and ecological enhancements. Some of their strategies included promoting greener buildings, enhancing use of public transport and active mobility, introducing wind channels to facilitate district cooling, creating habitats for flora and fauna, etc. Many of these strategies were further studied for implementation by URA and the technical agencies.

Planning commences for the Marina South district

In tandem with the plans to complete the Thomson-East Coast MRT Line within Marina Bay by the 2020s (then still known as the Thomson Line), a 35ha district between the gardens and the coast called “Marina South” had been identified in the early 2010s for the next phase of development within Marina Bay.

According to the then-Chief Planner Koh-Lim Wen Gin, URA had already completed more than 20 versions of the plan for Marina Bay since I M Pei's masterplan was adopted in 1985. The plans thus far had sought to incorporate generous greenery, recreation and leisure into the future downtown to ensure a high quality of life for its inhabitants. The plans were also starting to look at sustainability seriously.

It was against this context that the detailed planning for Marina South began, in consultation with various advisory panels like the International Panel of Experts and the Design Advisory Committee.



Concept plan for Marina South, 2011



2010 IPE workshop – anchoring residential communities for the future downtown

The International Panel of Experts (IPE) is a panel of internationally prominent and distinguished academics and industry professionals set up by URA in 2000 to provide feedback on planning and urban design issues for Singapore. In 2010, the 5th session of the IPE invited luminaries like Moshe Safdie, Marilyn Taylor and Alfonso Vegara to comment on plans on the future Marina Bay and Greater Southern Waterfront area, including the Marina South district.

One comment they made then was that the vision for the 2000ha MB-GSW area was very ambitious as few other cities in the world were thinking along the same horizons. The IPE saw Marina South as a very unique opportunity with excellent green and blue adjacencies, and highlighted that it should remain as an accessible residential district that would inject live-in population for the future downtown.



International Panel of Experts discussing Marina Bay, 2010

2011 and 2013 DAC sessions – setting high standards for sustainability and inclusivity

The Design Advisory Committee (DAC) was also established in 2000 to invite a range of experts in the local development scene to advise URA on planning and urban design issues, meeting more regularly than the IPE.

URA reviewed many aspects of the Marina South plans with the DAC in 2011 and 2013. Their comments focused on making sure that the district would serve as a model for sustainability and liveability, incorporating the latest thinking on issues such as car-lite planning and development approaches to achieve integrated outcomes.

One key area the DAC weighed in was on the urban typology for the future mixed-use residential district. URA had originally envisioned a new type of high-rise housing



Massing model from 2010

that was raised on pilotis and stilts to improve porosity of the ground plane and create visual connectivity between the gardens and the sea. The DAC advocated smaller, denser street blocks that would provide a more urban condition along the ground plane, as well as courtyard typologies that would result in the creation of public and semi-public spaces in the urban fabric. These considerations were carefully considered by URA to shape a more welcoming and inclusive environment for the future community at Marina South.

2019 – Finalising the broad strokes for Marina South

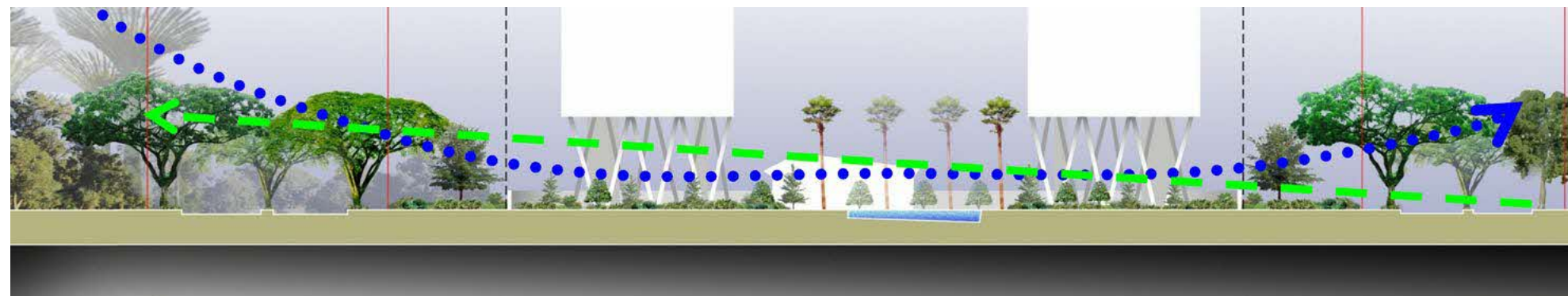
URA used the Draft Master Plan exercise of 2019 to showcase the plans for Marina South, highlighting the potential for a car-lite, pedestrian-friendly and urban neighbourhood with over 9000 new homes.

As the completion timeline for the two TEL MRT stations approached, URA prepared for the first GLS sale site to be launched in 2022 and published an illustrative urban design guide for Marina South in 2019. The guide outlined the desired development parameters for buildings in Marina South to make sure that they aligned with the overall vision, culminating the decades-long process of studying and refining the plans for the area.

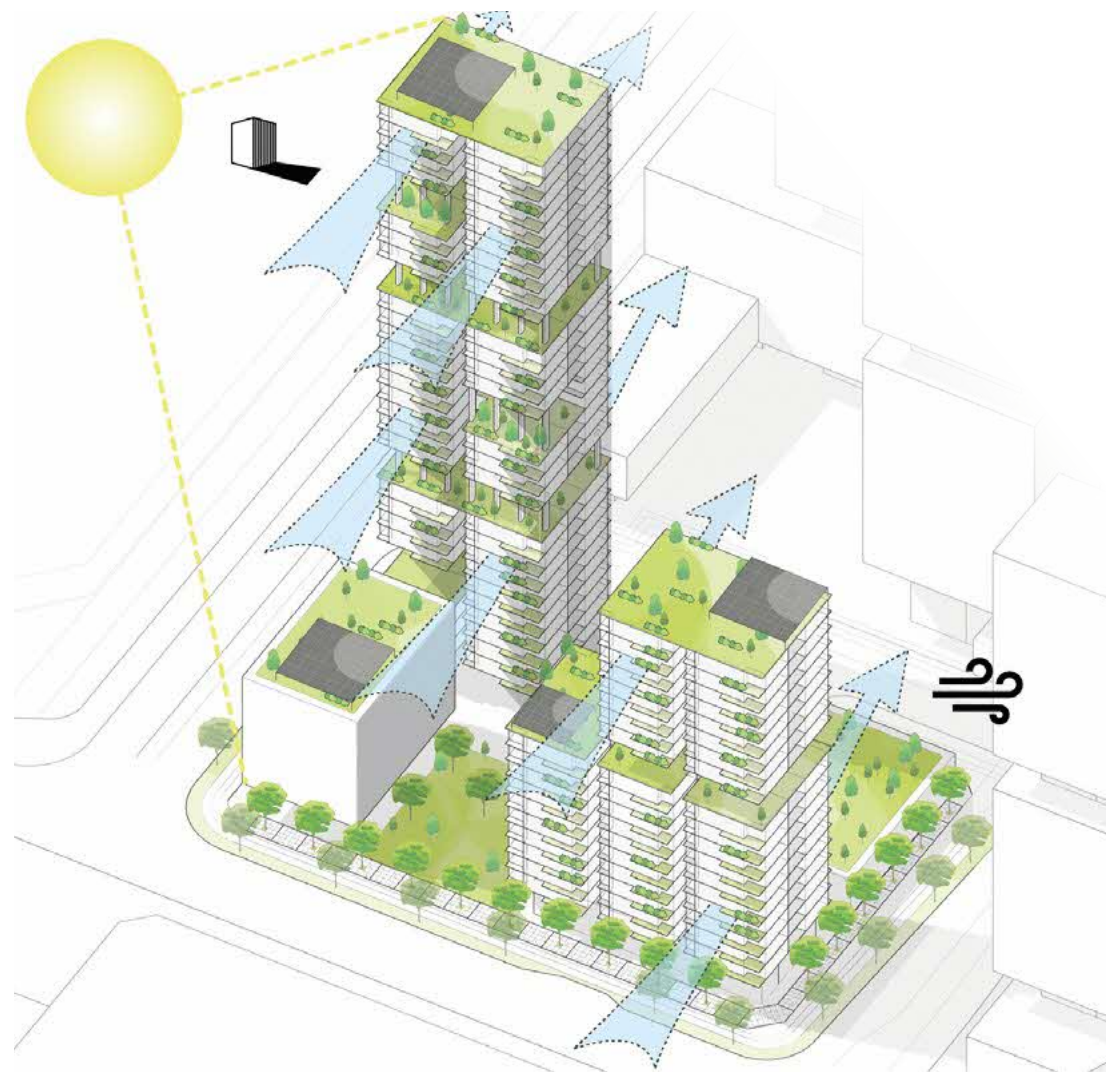
Building on the studies and considerations from the 2011 Sustainability Study, IPE and DAC, URA introduced three key themes in the urban design guide to ensure high levels of liveability, sustainability and inclusivity for Marina South. These themes will be covered in the next few sections of this chapter.



Concept plan for Marina South, 2013



Concept for building forms raised on pilotis for Marina South district, 2011



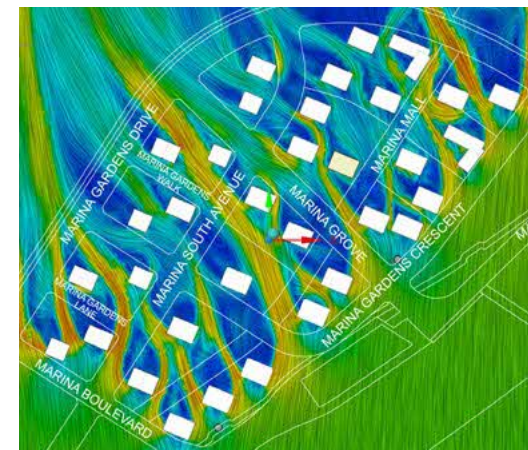
Passive cooling concepts for developments in Marina Bay



Lush development frontages along Gardens by the bay

Creating a green, blue and cool urban oasis

The first theme of achieving a green, blue and cool urban oasis was based on the idea of shaping an urban form that effectively leverages wind and shade to promote passive cooling throughout the district, as well as maximizes integration of the district with the adjacent seafront and Bay South Gardens.



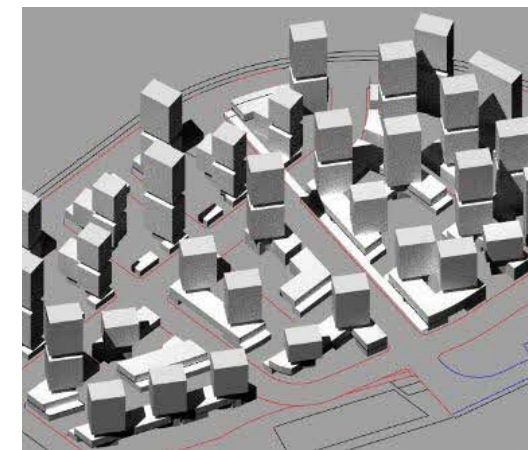
Site porosity study for wind flow.

Improving thermal comfort through passive design

Taking reference from the Sustainability Study to introduce wind corridors for ambient cooling, the road network in Marina South has been aligned with the predominant north-easterly winds to maximise wind flow through the district.

Extensive computational fluid dynamics (CFD) modelling studies have been done to guide the placement of tall towers within the development parcels to maximise wind dispersal. For example, there is a cap on buildings taller than ten-storeys for up to 50% of the development frontages along the gardens, preventing wall-like outcomes that would otherwise block wind penetration into the district.

Shadow analysis studies have also been carried out to ensure shading of public spaces identified within the district, either through provision of tree planting or from the shadows of buildings around them.

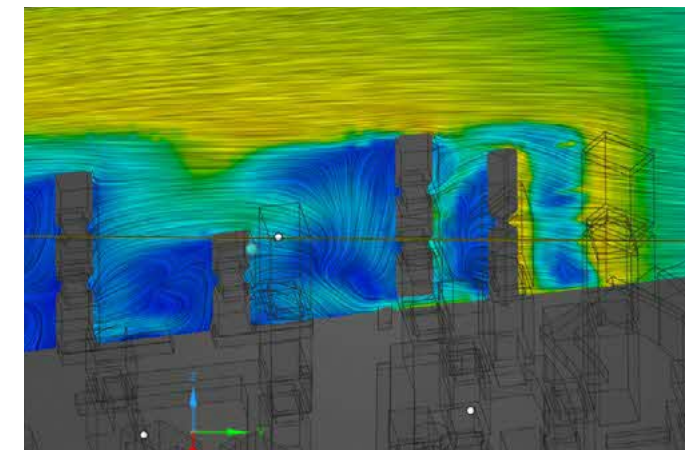


Shadow study for building orientation.

Encouraging greener biophilic buildings

In line with the positioning of Marina South as a green and sustainable district, all developments are required to achieve 100% landscape replacement in the form of roof gardens, sky terraces, communal ground gardens and green walls, under the LUSH guidelines.

One idea earlier debated by the DAC was whether pure residential developments should also be required to contribute publicly-accessible gardens and public spaces along the interface with the Bay South Gardens. Noting that these might not be well-designed or maintained by the residential Management Corporation Strata Title boards (MCSTs), the idea was revised into just externalising the green buffers to contribute to streetscape greenery. Mixed-use developments however were required to adopt a fenceless courtyard typology to ensure that the ground plane will be kept publicly accessible along the main activity corridor of the district.



Sectional analysis of wind flow.

Ensuring energy-efficient developments

Being a greenfield site, the decision was taken to plan Marina South as a highly sustainable neighbourhood from the start by mandating full compliance with BCA's Green Mark Platinum ratings, as well as Super Low Energy accreditation for all developments (to achieve at least 60% energy savings above 2005 building codes). Developers are also strongly encouraged to adopt centralised cooling systems, solar panel provision and energy monitoring systems to boost energy efficiency.

The guidelines also encourage designers to return to the basics of vernacular tropical architecture, by orienting the buildings and incorporating sunscreens and balconies to minimise solar exposure to living spaces, as well as shaping building form to maximise air ventilation and wind flow.



Shaping hyper-local 10-minute neighbourhoods

The second theme on shaping a hyper-local neighbourhood is based on achieving high levels of connectivity and self-sufficiency for Marina South. Broadly, it refers to the ability to access basic services and amenities within a 10-minute walk from every household. URA also sought to create walkable five-minute precinct clusters by fitting contiguous development parcels within maximum 200m radii.

Ensuring all amenities are within a 10-minute walk

A 10-minute framework was adopted in planning the distribution of amenities in Marina South, to ensure that all households would not have to travel beyond 400m to access the basic necessities and eliminating unnecessary travel.

A comprehensive amenities plan for food, groceries, healthcare and recreation and other facilities was drawn up with the help of analytics using ATOS*, to ensure good coverage for all households.

Amenities like convenience stores and fitness corners are sited within 200m from every household, while supermarkets, hawker centres, clinics and childcares are to sited no more than 400m away. The primary school is also located within a 20-minute walk from the furthest household.

Enhancing walkability in the urban form

Detailed guidelines have been put in place to ensure a highly-connected, car-lite environment, to facilitate ease of movement and reduce reliance on private car use. One additional review undertaken by URA was to turn one of the key roads into a pedestrianised spine such that it would become a key focal point for the communities.

Extensive walking infrastructure has been safeguarded in the district, with a 790m long north-south pedestrian mall forming the backbone of active mobility through the district. It intersects with a 650m long east-west elevated landscaped bridge that provides direct connectivity from the gardens to MS coastal park. In addition, dedicated cycling paths have been provided on both sides of all streets in the district, to promote active mobility and facilitate last-mile connectivity to public transport.

The urban form has also been kept porous and inviting by requiring developments fronting the pedestrian mall to adopt a fenceless courtyard typology, allowing pedestrians to cut across them easily for shorter journeys.

Finally, LTA gazetted Marina South as a car-lite district in 2019, with reduced car-parking provisions, reduced road spaces and more generous public spaces.

**ATOS (accessibility to opportunities and services): This is an analytics indicator that measures residents' accessibility to different types of key amenities, such as food, groceries, healthcare and parks & recreation, using the planned walking and cycling network.*



Planned pedestrian mall within Marina South

The **Marina South urban design guide** communicates the desired outcome of planning and urban design objectives for the district, and can be found at this [link](#).

Realising a community-centric district for all

Under the third theme of fostering a strong sense of community, URA developed urban design guidelines to ensure that the urban form, streetscapes and public realm of Marina South maximises social interactions and opportunities for community bonding.

Creating a lively social street in the heart of the district

One of the key moves URA made in planning Marina South was introducing a pedestrian corridor through the heart of the district, running north to south between the two MRT stations and optimising the non-buildable area above the underground tracks. It was initially envisioned as a Main Street with some vehicular traffic before it was revised into a 30m wide open-air pedestrian mall, framed tightly with adjacent low-rise buildings providing shops, eateries and other amenities.

The building edge control along the street is kept between two-to four-storeys to create a comfortable human-scale and facilitate comfortable wind flow dynamics, directing wind capture from adjacent towers to the pedestrian mall level.

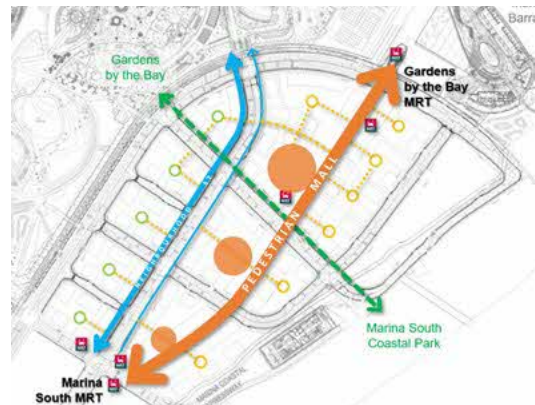


Clearly defined public space network to serve diverse needs

A hierarchy and diversity of public spaces has also been established for Marina South to cater to diverse lifestyle needs, ranging in scale, positioning and level of amenity provision.

The Main Square for example is envisioned as a more urban and active space with a gathering space to support big events. The Community Node is intended to serve more local needs and could be a greener space for sports and play. The Neighbourhood plaza acts as a more passive space that is well-shaded to encourage rest and respite along the busy pedestrian mall.

These main public space nodes are complemented by the various public and private courtyards found within the developments of Marina South, with convenient through-block links and passage ways linking them up into a network.



Hierarchy of public realm network



Artist impression of Marina South



Reclamation works for Marina Bay in the 1980s

The never-ending work of planning and urban design in Singapore

The planning and development of Greater Marina Bay and the Marina South district has spanned over 50 years and seen extensive iterations and refinements to make sure that they are future-ready and support a high quality of life for future generations.

That future arrived for Marina South when the first sale site was launched in 2022, ushering

the development of the rest of the district in the coming years. While this represents a form of conclusion to the "planning phase", the reality is that planning and urban design work does not truly stop for any area in Singapore. It simply moves on to the next phase of stewardship and governance, responding to the new challenges that come with it.



Artist impression of Jurong Lake District when fully built up

3.11

Future-proofing: Raising the bar in sustainability

As Singapore takes concerted steps to address climate change, sustainability considerations come to the fore in the planning and design of future development areas.

This case study of Jurong Lake District looks at the range of measures and initiatives being introduced to reduce the carbon footprint of development, as well as shape it into a liveable and resilient community of the future.



Former Prime Minister Lee Kuan Yew surveying Jurong in 1962.

Jurong Lake District

Planning for sustainability and resilience in a VUCA world

Thinking about development in the future presents an uncomfortable paradox – how can we continue to plan for future development needs while reducing our carbon impact? Are there ways to truly build and develop sustainably?

How can our plans also be future-ready, flexible and resilient in an increasingly VUCA (volatile, uncertain, complex and ambiguous)* world, in the face of potential disruptors to the way we live, work and play?

In the case of Jurong Lake District (JLD), its ambitious plans to be the most sustainable district in Singapore, represents a unique case study in planning for resiliency and flexibility to meet the unforeseen challenges of the future.

**VUCA (Volatile, Uncertain, Complex & Ambiguous): Originally used in the military context, the term has been widely adopted in various fields including business, economics, and urban planning, to characterize the nature of today's complex and rapidly changing world.*



Hills and swamps in pre-industrialisation Jurong

From hills and mangroves to industrial estate

Spanning many decades, the story of Jurong's journey started with industrialisation. Back then, this remote area of hills and swamps in the western corner of Singapore was known mainly for fishing and prawn farms, accessible only from a winding rural road. Its name belied its relative obscurity at the time – with one version explaining that the Malay word for “corner” or “penjuru” was the origin word for “Jurong”.

This humble corner of Singapore came to be selected as the first and largest industrial estate of the country, to support much needed job creation and modernisation of the economy.



Source: Terry Fitzpatrick via Wikimedia Commons
1945 map showing original condition of Jurong's landscape.

Yet even as Jurong was developed for major port and industrial activity, early planners were careful to weave in generous areas of green and blue such as Chinese and Japanese Gardens, Jurong Lake and Jurong Hills in the vast development area, preserving part of its natural beauty and laying the foundation for it to eventually become a “district of gardens and water”.



Source: Lim Kheng Chye Collection, courtesy of National Archives of Singapore
By 1969, Jurong Industrial Estate was home to 181 factories and 20,000 workers.

1960s – birth of Singapore's first industrial estate
In June 1961, at the request of the newly-formed government, Dr Albert Winsemius and a team from the United Nations developed an industrialisation programme for Singapore, which recommended the development of “a dynamic export industry”, transitioning the economy away from over-reliance on entrepot trade.

Jurong was chosen as the site for Singapore's first industrial estate as it was the least-populated area and its deep-water coastline was also suitable for port activity.²³

The landscape of Jurong changed quickly after that, much of its hills were levelled and swamps filled in to facilitate development. According to the plans, a modern port, shipyard, fishery, roads and railways were also completed.

1970s to 1980s – self-contained township
There were initial fears that Jurong's relative obscurity would lead to it becoming a ‘white elephant’. Some even named the decision to develop the area “Goh's folly”, in reference to then Finance Minister Goh Keng Swee's role in overseeing the project.

To ensure its success, the government saw that there was a need to bring residents and workers closer to the jobs being created in the area. Early planners moved quickly to shape Jurong into a self-contained township that would provide workers of nearby factories a liveable place to stay.²⁴

The Jurong Town Corporation (JTC) was given the task of realising this vision, beginning with the creation of housing at Taman Jurong, Boon Lay Gardens and Teban Gardens, with supporting amenities such as markets, food centres and sports facilities.



Source: Photo credit of JTC
Jurong Town Hall, completed 1974.

The development of major recreational attractions like Jurong Bird Park (1971), Jurong Ice Skating Centre (1974) and the Science Centre Singapore (1977) presaged the eventual growth of the township into a Regional Centre in the 1990s.

Jurong Lake – preserving the natural beauty of the site and creating a green lung
Recognising the need for a balanced approach, early planners took steps to plan and develop Jurong with ample provision park spaces and recreation areas to serve its workers and residents. This included the conversion of Bukit Peropok into Jurong Hill in 1969, with a showcase garden and a lookout tower overlooking the estate.

The damming of Jurong River in 1971 resulted in the creation of an 81ha reservoir and three man-made islands, which eventually housed the highly popular



Source: National Museum of Singapore
Chinese Gardens, completed 1975.

Chinese and Japanese Gardens, as well as the Jurong Country Club golf course. Collectively, this sizeable green and blue space functioned as a “green lung” for the area and served to buffer the newly created housing areas from the factories further west.

The eventual phasing out of Jurong Country Club in 2015 freed up land for comprehensive redevelopment and the expansion of the Regional Centre to create the 410ha “Jurong Lake District” today, bequeathing it with generous greenery and an extensive waterfront.



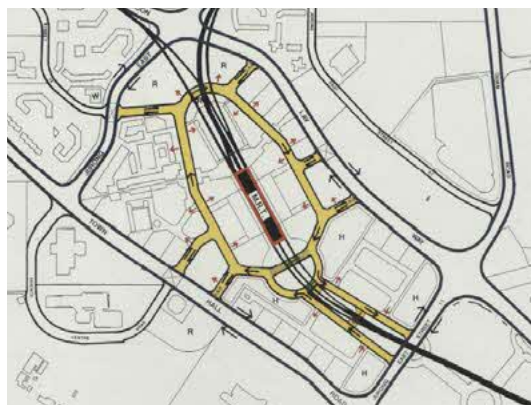
Source: User: Sengkang, Wikimedia
Jurong Hill Lookout Tower opened in 1970.



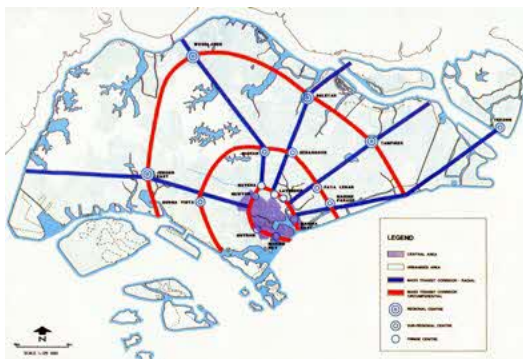
Aerial view of Jurong Lake in the 1990s.



Jurong Regional Centre model, 1991 Concept Plan



Pedestrian-friendly core around Jurong East MRT



Decentralisation concept for Singapore

Decentralisation, improved connectivity and paving the way for a car-lite future

Jurong saw sustained growth as a major centre of jobs and housing over the next two decades. It was designated a Regional Centre in the 1991 Concept Plan with the planning vision to have excellent connectivity links, leading to a concentration of offices and amenities to serve the wider region.

Several factors led to the designation of Jurong as a Regional Centre. The first was its central location serving the large catchment of homes and jobs in the Western Region. The second was the availability of land around the MRT station to support further development. The third reason was the eventual role of Jurong East MRT station as a major interchange between the East-West and North-South Lines, which was realised when the gap from Yishun to Choa Chu Kang MRT stations was closed through the NSL extension in 1996.

This connectivity to the rest of the island was integral to the attractiveness of the Regional Centre, ensuring that its jobs and amenities could be reached by its commanding catchment of workers and residents in the region.

Adopting a transit-oriented development approach, URA planned for a critical mass of commercial, institutional, recreational and residential uses around the Jurong East MRT station and Bus Interchange. A pedestrian-friendly precinct was also planned around the transport nodes with pedestrian spines and walking arcades lined with activity-generating uses.

1990s – Regional Centre as the gateway to the West

The 1991 Concept Plan elevated the thinking around Jurong again, positioning it as a key Regional Centre under URA's strategy for decentralisation. This strategy was borne out of the need to bring jobs closer to homes, so that unnecessary trips could be cut down to reduce strain on the transport network.

While Jurong was earlier developed as a town to bring workers closer to jobs in the industrial estate, the strategy was now to bring even more jobs and amenities to Jurong to serve the growing population of the west.

Expansion of Jurong Regional Centre towards Jurong Lake, 2008 Draft Master Plan

2000s to 2015 – Expanding the Regional Centre to create the “Jurong Lake District”

In the 2008 Master Plan, URA unveiled plans to take Jurong Regional Centre to the next level by expanding it to an area of approximately 360ha, or about the same size as Marina Bay, calling it Jurong Lake District (JLD) after the eponymous waterbody.

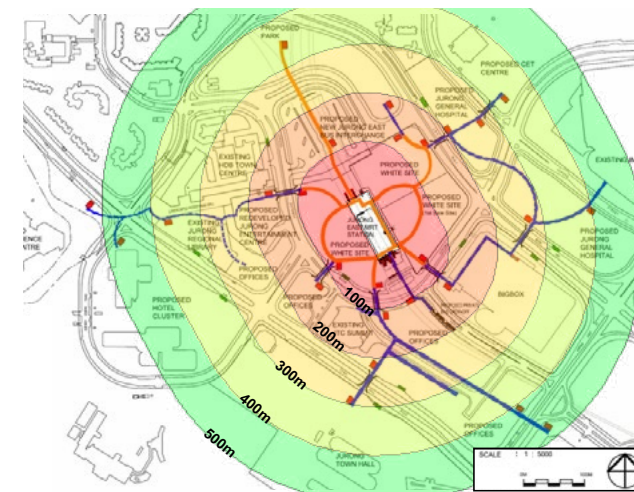
It was set to be the biggest commercial hub outside the city centre at nearly 2.5 times the size of Tampines Regional Centre.

Expanding it to the waterfront allowed it to be set apart from the other Regional Centres, with a unique leisure and lifestyle positioning. The district was given a further boost when then Prime Minister Lee Hsien Loong announced plans to create a 90ha large garden around the lake during the 2014 National Day Rally, to be the third national garden in Singapore after the Botanic Gardens and Gardens by the Bay.





Jurong Regional Centre, 2008 Draft Master Plan



Elevated pedestrian network around Jurong East MRT station.



Mixed-use developments in Jurong Gateway.

Creating strong connectivity within JLD to connect to the waterfront

As part of the reconceptualisation of Jurong Regional Centre into JLD, URA identified the existing Jurong Central as the “Gateway” district around the existing North-South and East-West line MRT station, while the expansion towards Jurong Lake was called “Lakeside”.

Connectivity was critical to bring the waterfront closer to the heart of the expanded Regional Centre, leading to the development of several pieces of walking and cycling infrastructure to provide direct connection to the waterfront, as well as integrate both districts together.

One key connector was the J-Walk, a network of elevated pedestrian links (EPLs) extending outwards from the elevated Jurong East MRT station to the surrounding developments as well as towards Lakeside eventually. An elevated network made sense here as the MRT concourse

was already on the 2nd storey. Developments would all be plugged into the network allowing commuters to easily access their destinations seamlessly from the MRT concourse. The paths would make their way through the second storeys of the developments which are kept open for public access.

The network was branded as the tongue-in-cheek “J-Walk”. Together with LTA, URA formulated a set of branding and wayfinding signage guidelines for developers to adopt. The owners of IMM Mall, which was already completed when J-Walk was first conceptualised, took up the suggestion by URA to build another leg of the EPL to connect to the MRT station by going through Devan Nair Institute for Employment and Employability.

A new at-grade 270m long pedestrian link through the existing Town Centre was built by URA in 2014, called the J-Link. This replaced a

once narrow and crowded path linking Jurong East MRT and the Science Centre, providing better connectivity towards the lake.

Shaping a vibrant mixed use district with walkable streets

JLD is planned to be a vibrant mixed-use district with active walking streets to promote car-lite outcomes. The parcels in Jurong Gateway were zoned “white” for mixed-use development, introducing new building types that would contribute to the making of lively streets.

Land parcels were also allocated to government agencies and major amenities such as Ng Teng Fong General Hospital and Jurong Community Hospital to result in a greater mix of uses that will provide a whole range of amenities to residents and workers in JLD.



Revised plans for Jurong Lake District in 2017 as the 2nd largest business district in Singapore

2015 to 2019 – Transforming JLD into the 2nd largest business district

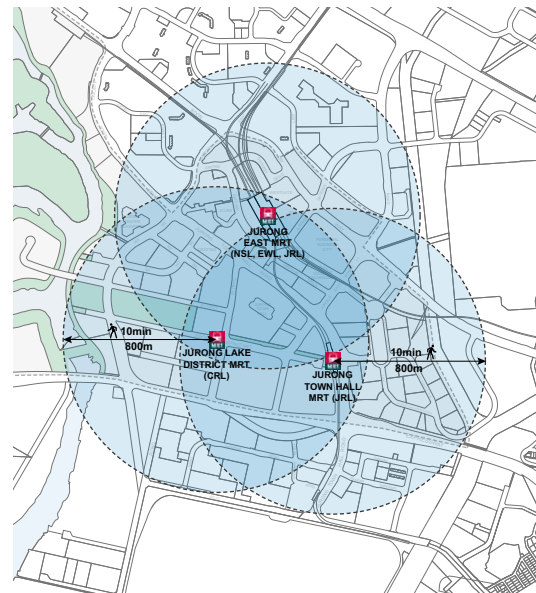
In 2015, URA updated the plans for JLD, looking at strategies to boost liveability, sustainability and car-lite outcomes for the district.

Plans were exhibited in 2017 outlining a new paradigm for mobility in JLD, with connections to four MRT lines in the district (including the future Cross-Island and Jurong Region Lines), with seamless traveller connectivity and integration with bus and active mobility infrastructure. There were also plans to make JLD car-lite, with transit priority corridors, cycling paths and “flexi-zone” streets, where the road carriageway could be sized dynamically in response to traffic patterns over time.

The overarching vision was for JLD to become a 10-minute district of lively streets enabling social interactions. This was solidified when LTA designated the district as one of the first

car-lite districts in Singapore in 2019, allowing further reduction of carparking provision and road widths to create a pedestrian-friendly public realm.

Green and Blue remained a key pillar of JLD’s plans, with a sizeable Central Park proposed at the heart of the district, visually connecting the Jurong Townhall landmark to the lakefront to create a strong sense of place. In addition, a 19km long waterfront promenade would be created around the lake. With these major investments, the total area of green and blue spaces in JLD grew to 40% of its total area, putting it in good stead to maximise ambient cooling in the district.



Public transit coverage in JLD



Car-lite streets with transit priority lanes and cycling paths



Generous provision of green open space in JLD

Navigating disruptions to be future-ready and flexible

Planning for the future involves uncertainty, but the use of advanced simulation and analytical tools helps with scenario optioneering and identifying pathways to cope with unforeseen challenges.

The decade of the 2020s however opened with a global event that exceeded the imagination of most policy makers worldwide, leaving a lasting impact on the way people lived, worked and played around the world.

URA had always kept planning flexible and responsive to change, however the experience of COVID-19 led to further reflection on additional measures needed to support greater resiliency in Singapore’s planning and development.

2019 – 2021: rethinking fundamentals during the pandemic

Few countries were ready for the shock of COVID-19 as communities around the world went into isolation at the start of 2020. Many Singaporeans were confined to their homes for extended periods of time until early-2022 when recurring “circuit breaker lockdowns” were imposed.

The pandemic forced the rethinking of many paradigms – with clear shifts in the way people now viewed live, work and play in the city. Some of these developments sharpened the need for URA to push ahead with certain evergreen, or no-regret, strategies, while others led to the rethinking of certain approaches.

- One key impact was how working arrangements had shifted dramatically. With more people working from home, there was a need to make amenities and services more accessible at the local level, doubling down on the need for decentralisation and building up the various polycentres. This has been sustained by the strong prioritisation of GLS sale sites for offices and mixed-use developments in Regional Centres like JLD in recent years.
- Another impact was in travel and commuting patterns, with less need to travel long distances to work everyday. Dr Cheong Koon Hean, former CEO of URA and HDB, framed this as a shift from a borderless world to creating “bubbles” in the city, highlighting the importance of mixed-use planning and creating self-contained zones around Singapore, to reduce reliance on the city centre.”²⁶

- Health and wellness concerns came to the forefront during the extended circuit breaker periods, when nearby parks and open spaces became a precious commodity. This validated the government’s push to make every household have walking access to a park within a 10-minute radius by 2030.
- One area of adjustment in URA’s planning was the safeguarding of more flexible buffer spaces in towns and developments, to cater for contingencies such as quarantine facilities and safe distancing. The activation of government buildings to host new co-working spaces was one example of redeploying available space to meet emergent needs. In JLD, the use of white zoning also allows developers flexibility to change their use mix in response to market conditions.



Towards a sustainable future – supporting Singapore’s net zero ambitions

As the COVID-19 pandemic brought the world to a standstill, the temporary clearing of polluted skies around the world also led to some reflection on the need to adjust human activities to tackle the climate crisis.

It is common knowledge that development activity is a major contributor of greenhouse gas (ghg) emissions, and thus the question posed at the start of this case study – on whether development can truly be sustainable, was one that has occupied planners at URA ever since the government set sustainability targets for Singapore in the 1990s.

The Singapore Green Plan (SGP), created in 1992, went through multiple revisions over the years to chart out viable pathways for sustainability across various sectors of the economy. The 2009 edition resulted in the Sustainable Singapore Blueprint which led to several consultancies and reviewing of the plans for areas like Marina Bay, Greater Southern Waterfront and Jurong Lake District.

The release of SGP2030 in 2021 marked the government’s strongest push yet to meet the Paris Agreement commitments, establishing a firm date to achieve net zero by 2050. The plans for JLD were extensively reviewed to try and meet this bold ambition, as well as exceed it.

SGP2030: Identifying pathways to net zero
The release of the SGP2030 in 2021 coincided with two critical developments. Firstly, the Greenmark certification scheme was updated to raise sustainability standards in six areas, resulting in new standards that could be used to guide development practices in Singapore. Secondly, URA worked with the National Climate Change Secretariat (NCCS) and other agencies like BCA and LTA to see if there were viable pathways to achieve net zero emissions for JLD even as it was developed to its full potential.

The JLD study looked at the effectiveness of solutions to reduce various scopes of anticipated emissions in the district.

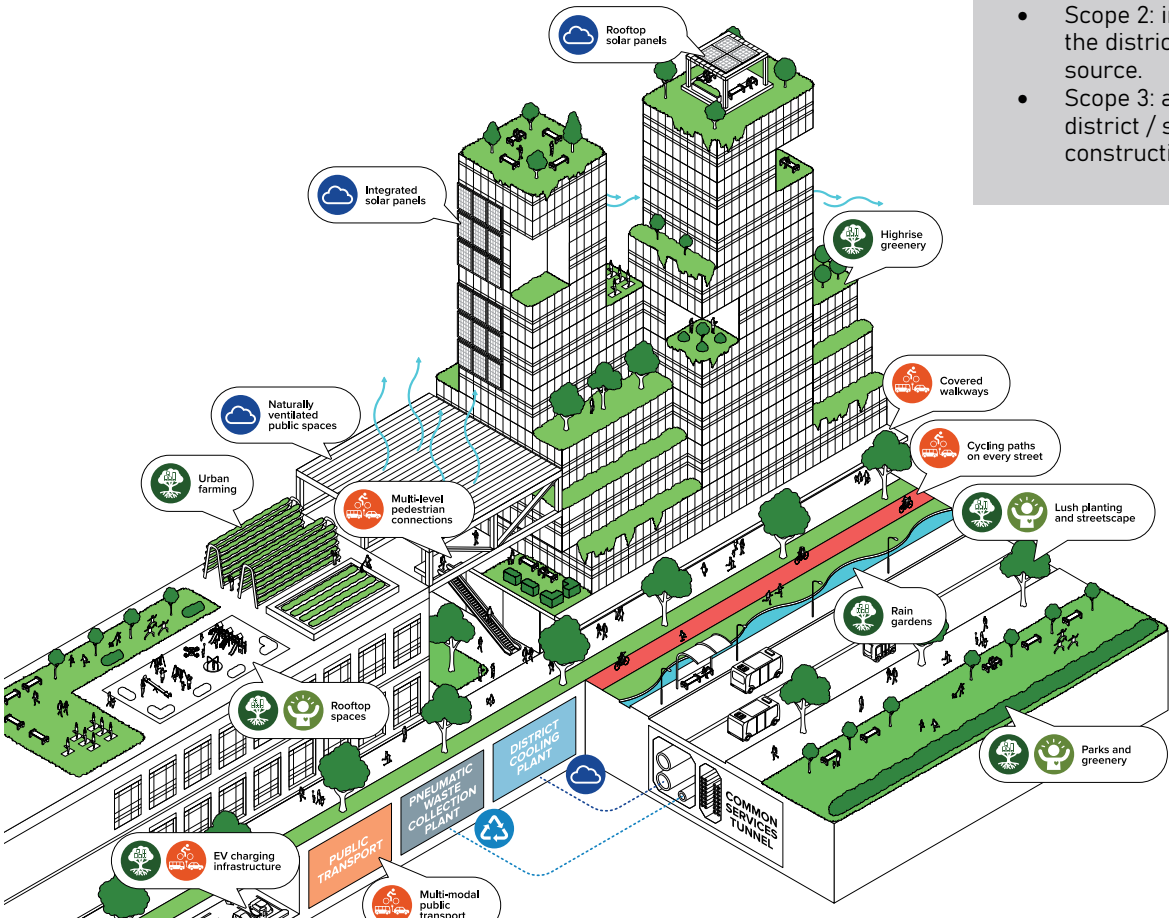
Under Scope 1, the study identified that a key strategy would be switching to electric or clean energy vehicles, as well as enhancing walk, cycle and ride mode share, to help reduce the scope of direct greenhouse gas emissions within the district.

Under Scope 2, the study found that decarbonisation of the electric grid as well as improving energy efficiency of buildings would go a long way to cut down emissions. To achieve this, all new developments would have to comply with Greenmark Platinum Super Low Energy standards, achieving more than 60% energy savings above the 2005 codes. Aggressive deployment of solar panels across available surfaces in JLD could also help to contribute to clean energy production under Scope 2.

Under Scope 3, the study recognised that it was hard to track emissions in the production process of goods and materials used and consumed within JLD. However, this could be improved by encouraging developments to achieve the whole-of-life carbon badge as part of Greenmark. The public sector could also play a role to develop model low-carbon buildings.

What are the 6 new sustainability areas under Greenmark 2021?

- Energy Efficiency – this plays a key criteria for certification, looking at ways to optimise energy use such as reducing wastage and conservation.
- Whole Life Carbon – this looks at the project’s carbon footprint with a focus on embodied carbon and use of sustainable construction
- Resilience – evaluates buildings on climate mitigation and adaptation strategies as well as use of nature-based solutions
- Intelligence – this looks at adoption of smart technologies and systems within building design, construction and operation
- Health and Well-being – guides the design, construction, operation and retrofit of buildings to facilitate mental, physical and social wellbeing
- Maintainability – sets criteria to ensure resource-efficient maintenance regimes in buildings



What are Scope 1, 2 and 3 carbon emissions?

One of the main ways greenhouse gas (ghg) emissions are tracked as part of net zero planning in systems and geographical areas is looking at them under three different “scopes”. This way, effective strategies with quantifiable effects can be adopted to cut down emissions systematically:

- Scope 1: direct emissions that result from activities within the district / system, such as vehicular traffic, use of gas burners, etc.
- Scope 2: indirect emissions from use of electricity within the district / system, that release greenhouse gases at source.
- Scope 3: all other emissions produced outside of the district / system as a result of products used within it, e.g. construction materials.

Co-creating urban solutions: JLD innovation challenge

To push the envelope on what was achievable in terms of meeting net zero emissions, and to encourage solutions from “outside the box”, URA partnered SNDGO, IMDA and ESG to organize a series of innovation challenges involving the private sector, start-up companies and academia, to develop novel urban solutions that would boost sustainability in JLD.

Some ideas included achieving circular economy and waste reduction by integrating resource loops in JLD, leveraging robots or automation to boost efficiency, and encouraging low carbon habits in residents and employees.



Creating a green carpet effect at JLD

The vision for the new precinct is to have a green carpet effect at key levels to create a three-dimensional landscape datum.

Prominent greenery shall be provided at the podium roof level between the second and sixth storey of the developments, and shall include trees and shrub planted close to the perimeter of the podium where there is sunlight for plant growth as well as shading effect created over the facades to prevent excessive solar heat gain.

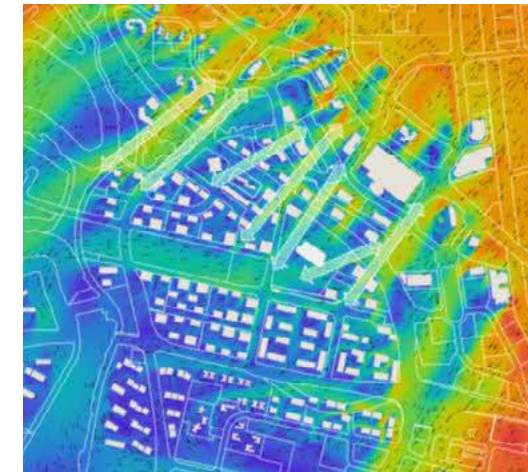
These podium roof gardens are to be connected across the various building blocks within the development, to create a seamless experience of an additional green communal space above the street.

Generous green spaces to create a "green carpet" effect at JLD

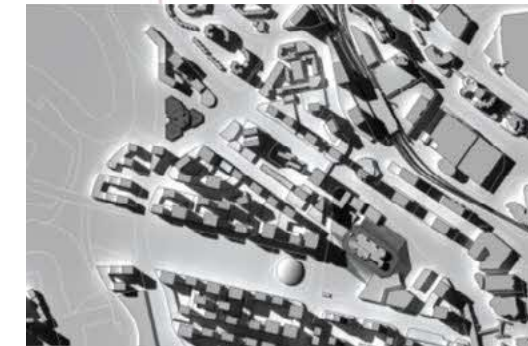
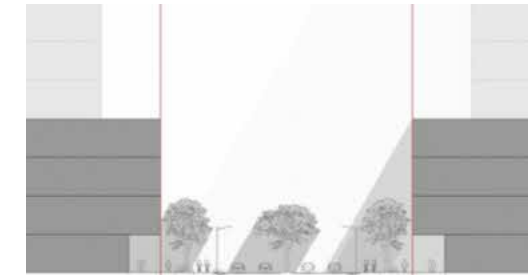
Setting pathways into motion: Urban Design guidelines

Recognising that there were now possible pathways to net zero, URA released the Planning and Urban Design guide for Jurong Lake District in 2023 to provide clear strategies on guiding development to achieve the intended liveability, resilience and sustainability targets.

One of the strategies proposed was maximizing wind flow and shade to improve thermal comfort in the district, reducing the need for mechanical cooling and energy consumption. Iterative studies were done using modelling software to develop the necessary urban and building form strategies, such as creating wind corridors through the street blocks.



Safeguarding of wind corridors for better ventilation outcomes in the urban form



Shadow analysis to optimise shading of streets and public spaces

Well shaded and comfortable streets

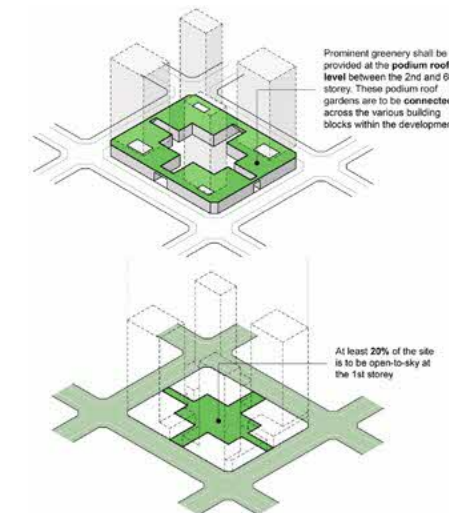
Most developments in the new precinct are planned to abut the lines of the Road Reserve. In addition, a minimum building edge of two storeys will be required to support covered walkways along all streets.

With no setbacks from the road, the streets are scaled to be narrower so that pedestrians can relate to the other side of the street for more intimacy and vibrancy. Narrower streets with a defined building edge also create a higher aspect ratio, which allows the buildings to shade the streets for human comfort.

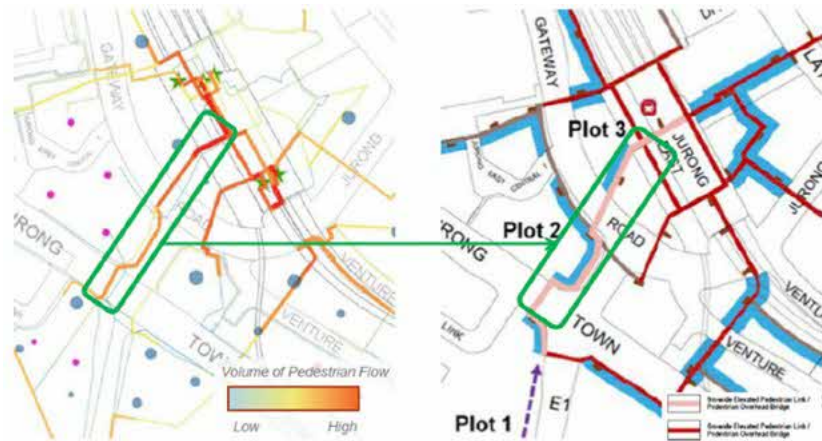
To address the potential Urban Heat Island effect experienced along wider major arterial roads, these streets are planned to have a wider planting verge to support multi-tiered planting. Trees with larger crowns will also be planted along the centre median to reduce solar exposure along these streets.

Heat mitigation strategies

The design of the building form and massing is to respond sensitively to the local equatorial climate. Developments will harness prevailing winds and utilise self-shading, to mitigate the Urban Heat Island effect and improve outdoor thermal comfort. High-density developments with multiple towers are to be designed to ensure that the public spaces and courtyards at the first storey are well shaded.



Urban form that maximises public space creation in JLD



Network Centrality analysis to determine required widths of elevated pedestrian links

District infrastructure systems

Another set of strategies included identifying types of district systems needed to deliver energy savings at scale, such as district cooling systems (DCS) and district pneumatic waste conveyance systems (DPWCS). These systems will help to achieve energy savings, reduce carbon emissions and manpower usage.

Pedestrian network analysis

Using various data sets such as the existing and proposed walking and cycling networks in JLD, GIS network centrality analysis is used to estimate the volume of pedestrian flows for various planned routes between transport nodes such as MRT stations and destinations. This allows planners to identify key corridors where wider and sheltered paths will be required in the development. This would be translated into the sale site conditions to be realised by developers. Running the ATOS analysis also allowed the URA to plan for amenities such as where to best locate a childcare centre, and hence require the provision in identified sale sites.

The **Jurong Lake District (JLD) Design Guide** presents the planning and urban design considerations for JLD to guide its future developments. Find out more at this [link](#).



View corridors towards Jurong Town Hall landmark

Shaping sense of place

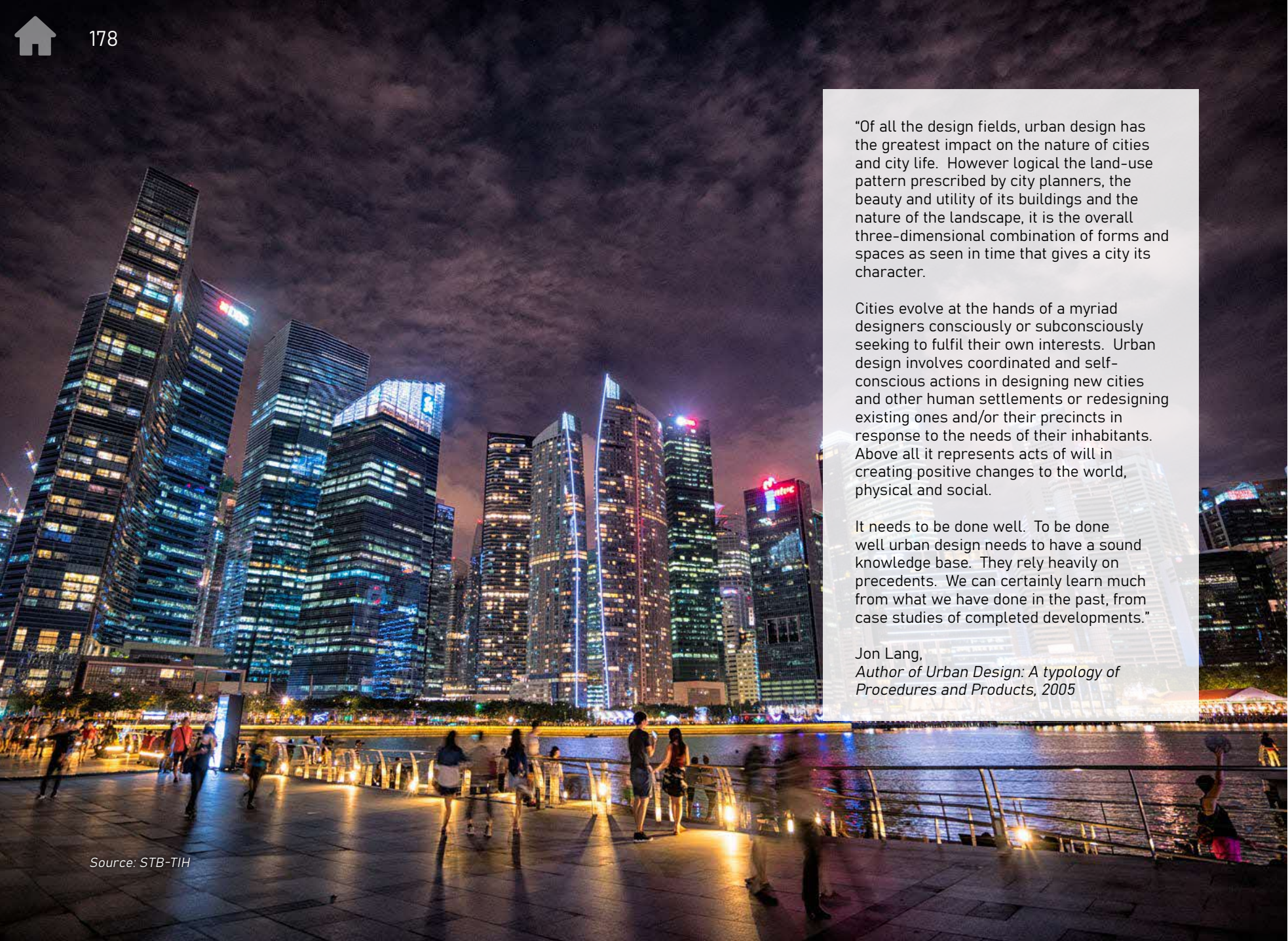
A conscious decision was taken to celebrate and incorporate familiar landmarks into the plans to strengthen place identity, given the greenfield nature of JLD. Even as URA planned for new developments, it retained some of the landmarks in the area and shaped the plans in response to them. The Jurong Town Hall National Monument and Science Centre are important landmarks and have become significant places of social memory, harking back to Jurong's industrial past and promoting scientific and technological education for many generations of school children. In the revised plan, they will anchor new streets and developments in JLD and continue to be landmarks through the safeguarding of view corridors and exploring adaptive reuse that ties in with JLD's positioning as a model sustainability district.

Flexibility and resilience in a complex and ever-changing world

The planning of the Jurong Lake District has taken a dramatic shift from industrialisation to urban sustainability over the years, paving the way for the rest of Singapore to follow in the march to reaching net zero ambitions.

Due to the fog of uncertainty inherent in long term planning, it is important to adopt evidence-based decision making and pragmatism to pursue the no-regrets moves that make sense and will pay off in the long run.

Flexibility, resilience and sustainability have become part of the planning ethos of URA, as it becomes increasingly clear that the more we know, the more we do not know, in the context of a complex, uncertain and ever changing world.



"Of all the design fields, urban design has the greatest impact on the nature of cities and city life. However logical the land-use pattern prescribed by city planners, the beauty and utility of its buildings and the nature of the landscape, it is the overall three-dimensional combination of forms and spaces as seen in time that gives a city its character.

Cities evolve at the hands of a myriad designers consciously or subconsciously seeking to fulfil their own interests. Urban design involves coordinated and self-conscious actions in designing new cities and other human settlements or redesigning existing ones and/or their precincts in response to the needs of their inhabitants. Above all it represents acts of will in creating positive changes to the world, physical and social.

It needs to be done well. To be done well urban design needs to have a sound knowledge base. They rely heavily on precedents. We can certainly learn much from what we have done in the past, from case studies of completed developments."

Jon Lang,
Author of Urban Design: A typology of Procedures and Products, 2005

CONCLUDING THOUGHTS

It would seem contradictory to quote Jon Lang's introduction in his book at the end of this book. In my preface for the first book, I gave reasons as to why it is not easy to define urban design. Jon Lang had summed it up so eloquently and concisely on what urban design means and what the work seeks to achieve lest we lose sight of the purpose of this series of guidebooks.

In concluding, it would be useful to also think of:

Urban Design is a contextual-driven discipline

A good urban design plan is one that makes recommendations based on the context of the study area such as its locational attributes, the topography, natural features, types of existing uses around and within it, demographic profile of the residents, visitors and workers and specific issues the area needs addressing. Hence, it would not be possible nor desirable for a set of urban design solutions for a specific area to be replicated wholesale in another context.

If urban design plans are well-conceived through an augmentative and iterative process with the stakeholders, then the solutions will feel authentic and more likely to enjoy strong support and longevity.

Urban Design as a contingent discipline

While the case studies featured in this book are chosen as good examples to demonstrate what urban design entails, it should be acknowledged the urban design outcomes are always contingent on various factors. These could include the multiple sets of stakeholders involved, the often not-so-perfect existing physical conditions of the site due to legacy issues, limits of fiscal availability, timing and lack of acceptance of new ideas and even well-tested initiatives, technology, etc. Urban design outcomes are also not static as the city will continue to evolve, influenced by socio-economic factors and changing demographics and aspirations. Hence, what had worked in the past may not work now and new solutions need to be found.

Therefore with this understanding, it is all the more critical that urban designers formulate innovative implementation strategies and instruments to ensure greater success of getting plans implemented with the desired outcomes.

Urban Design as a collaborative discipline

Urban design must continue to be a highly collaborative profession. As the body of knowledge grows about how cities function and the relationship between the environment

and human behaviour, the urban designer must continue to work with professionals from other fields including new areas of knowledge such as sustainability, biodiversity, climate resiliency, urban spatial analytics, among many other areas as well as using new digital tools to make sense of data and drive evidence-based design decisions. Urban designers can only be better at what they do if they keep an open mind, be curious about everything, be consultative, learn along the way and be prepared to lead to achieve the best possible outcomes for the city and the people.

The work of the urban designer is therefore multi-faceted; having to look at the macro picture to paying attention to micro details, negotiating with different stakeholders and driving implementation while facing fiscal realities, economic cycle and market conditions. What has kept our urban designers going is their passion for their city, to craft it in their own image and for the well-being of its people. This series of guidebooks is dedicated to past and present urban designers at URA and its partner agencies for their dedication and perseverance in always looking at ways to craft a better place for all and a brighter future for future generations.

Fun Siew Leng
Chief Urban Designer
Urban Redevelopment Authority



ACKNOWLEDGEMENTS

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- Building Construction Authority (BCA)
- Infocomm Media Development Authority (IMDA)
- Housing & Development Board (HDB)
- Jurong Town Corporation (JTC)
- Land Transport Authority (LTA)
- National Climate Change Secretariat (NCCS)
- Ministry of Finance (MOF)
- National Heritage Board (NHB)
- National Museum of Singapore
- National Parks Board (NParks)
- Public Utilities Board (PUB)
- Singapore Tourism Board (STB)

Private / Non-profit organisations and institutions

- Aedas
- Arc Studio Architecture & Urbanism
- AWP Architects
- BDP Architects South East Asia
- Benoy
- Bjarke Ingels Group
- Bu Ye Tian Enterprises
- Capitaland
- Cesma International
- COX Architecture
- DP Architects
- Far East Organisation

- Henning Larsen
- KCAP
- Kengo Kuma and Associates
- Lendlease
- MKPL Architects
- Multiply Architects
- RSP Architects Planners & Engineers
- San Wah Construction
- Serie Architects
- Singapore Heritage Society
- Singapore River One
- Perennial Holdings
- UOL Group Limited
- William Lim Associates
- WOHA Architects

Community organisations and individuals

- Kristen Wong
- Finbarr Fallon
- Jerome Teo
- Chin Li Nah

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- Chapter 2.0 Development Cycle
- Cantonment Road Flats**
- Source: Ministry of Information and the Arts Collection, courtesy of National Archives of Singapore

- Chapter 3.6 Holland Village
- Aerial photo of Holland Village**
- Source: British Royal Air Force between 1940 to 1970s, from a collection held by the National Archives of Singapore. Crown copyright.

- Chapter 3.8 Discovery Walk
- Gluttons Square. “Car Park” Hawker Centre at Orchard Road**
- Source: Ministry of Information and the Arts Collection, courtesy of National Archives of Singapore

- Chapter 3.9 Bukit Canberra
- Map of Singapore Naval Base**
- Source: National Archives (United Kingdom), NAUK, TNA

- Chapter 3.9 Bukit Canberra
- Former Admiralty House**
- Source: National Heritage Board

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- Aerial photo of Bras Basah in the 1950s**
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- Chapter 3.11 Jurong Lake District
- Jurong Hill Tower, taken by user: SengKang**
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Chapter 3.9 Bukit Canberra
Aerial view of Singapore Naval Base

Source: British Royal Air Force between 1940 to 1970s, from a collection held by the National Archives of Singapore. Crown copyright.

Chapter 3.11 Jurong Lake District
Lee Kuan Yew surveying Jurong in 1962
Source: Ministry of Information and the Arts Collection, courtesy of National Archives of Singapore

Chapter 3.11 Jurong Lake District
Aerial view of Ulu Pandan
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Chapter 3.11 Jurong Lake District
Aerial view of Jurong Industrial Estate in 1969
Source: Lim Kheng Chye Collection, courtesy of National Archives of Singapore

Chapter 3.11 Jurong Lake District
Jurong Town Hall
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Chapter 3.11 Jurong Lake District
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RELEVANT LINKS

Chapter 1

Urban design guidelines
<https://www.uragov.sg/Corporate/Guidelines/Urban-Design>

Chapter 2

Government land sales programme
<https://www.uragov.sg/Corporate/Land-Sales>

Quality-fee method framework
<https://www1.bca.gov.sg/procurement/tender-stage/quality-fee-method-qfm-framework>

Chapter 3

Singapore river urban design guidelines
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Pilot business improvement district programme
<https://www.uragov.sg/Corporate/Get-Involved/Shape-A-Distinctive-City/Placemaking-and-Partnership/Business-Improvement-District.aspx>

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Marina South urban design guide
<https://www.uragov.sg/-/media/Corporate/Guidelines/Urban-Design/Marina-South/Marina-South-Urban-Design-Guide.pdf>

Jurong Lake District urban design guide
<https://www.jld.gov.sg/events-and-resources/publications/jld-pud-guide/>

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