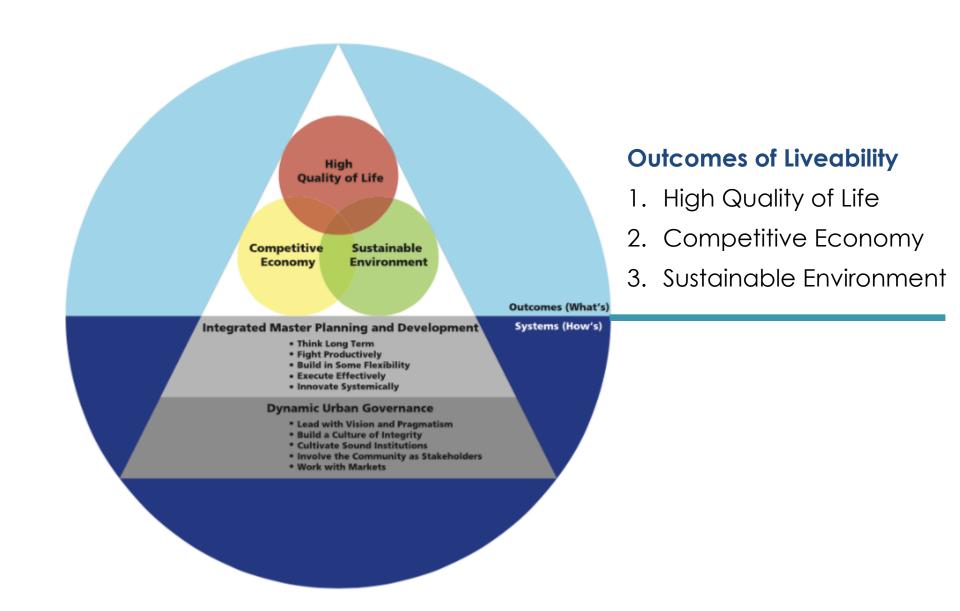


Integrated Master Planning and Development

Michael Koh Fellow, Centre For Liveable Cities

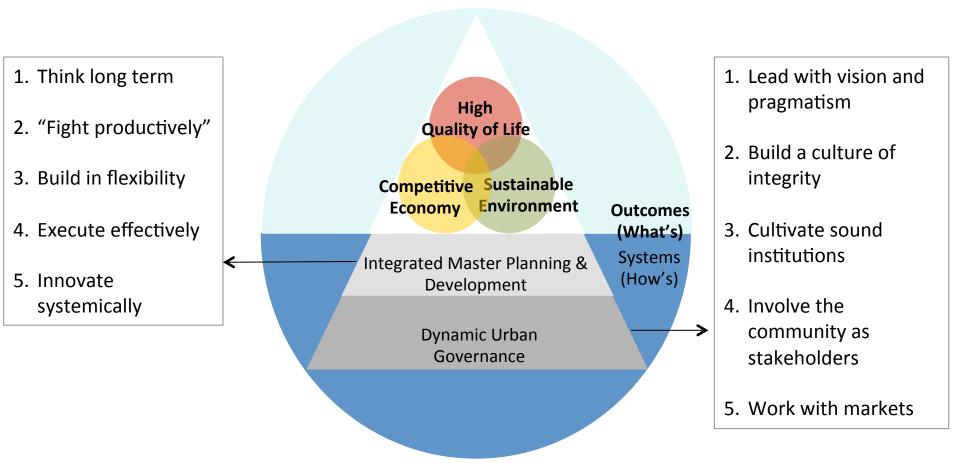
The views expressed in this presentation are the views of the author/s and do not necessarily reflect the views or policies of the Asian Development Bank, or its Board of Governors, or the governments they represent. ADB does not guarantee the accuracy of the data included in this presentation and accepts no responsibility for any consequence of their use. The countries listed in this presentation do not imply any view on ADB's part as to sovereignty or independent status or necessarily conform to ADB's terminology.

Singapore Liveability Framework



Singapore Liveability Framework

Framework for planning and developing a liveable city



Outline

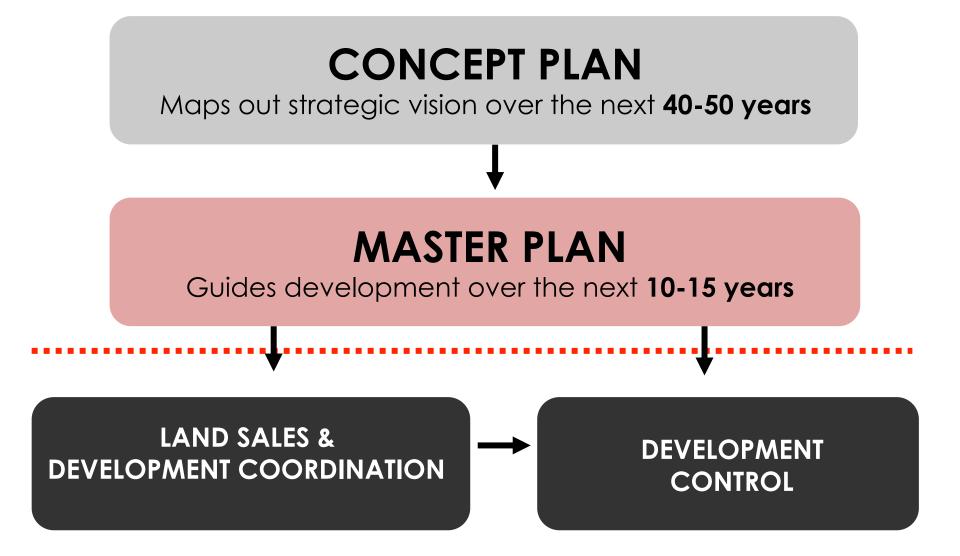
Principles of Integrated Master Planning and Development

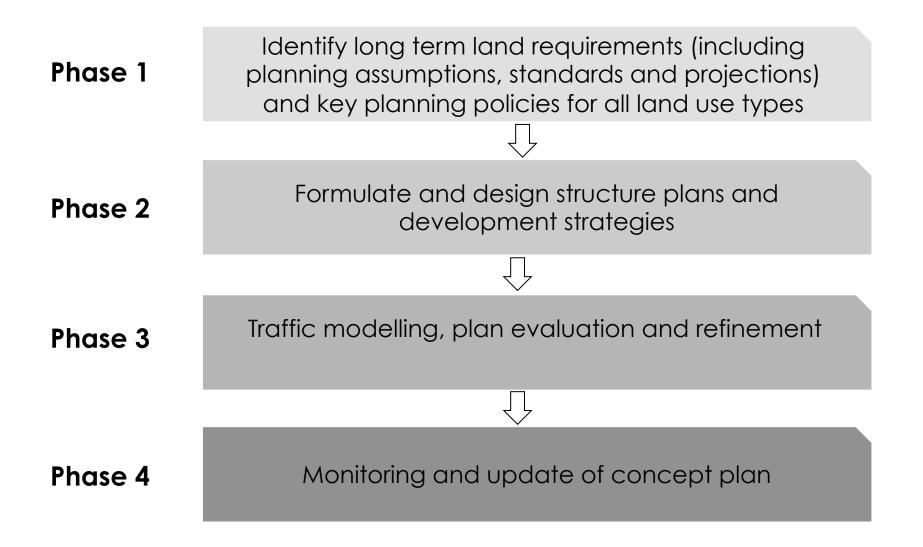
- 01 Concept Plan
- **02** Master Plan
- **03** Integrated Urban Water Management
- 04 Integrated Transport Planning
- **05** Urban Design Controls
- 06 Conservation

01 Concept Plan

- Master Plan
- Integrated Urban Water Management
- Integrated Transport Planning
- Urban Design Controls
- Conservation

Planning and Development Framework





Concept Planning Framework & Strategic Planning Components

POPULATION PROJECTIONS

8 CRITICAL AREAS Integrator: URA

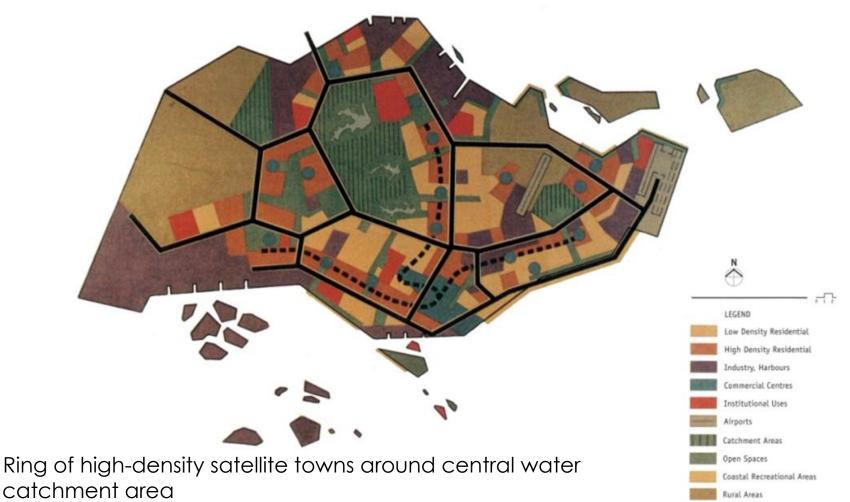
LAND SUPPLY

INDUSTRY COMMERCE INFRASTRUCTURE ENVIRONMENT RECREATION HOUSING INSTITUTIONAL USES TRANSPORT [MTI/JTC] [EDB] [PUB] [NEA] [NPARKS] [HDB] [MOE] [LTA]

DEVELOPMENT CONSTRAINTS

ECONOMIC FORECASTS

Concept Plan 1971: 'Ring' Plan structure



Expresswave

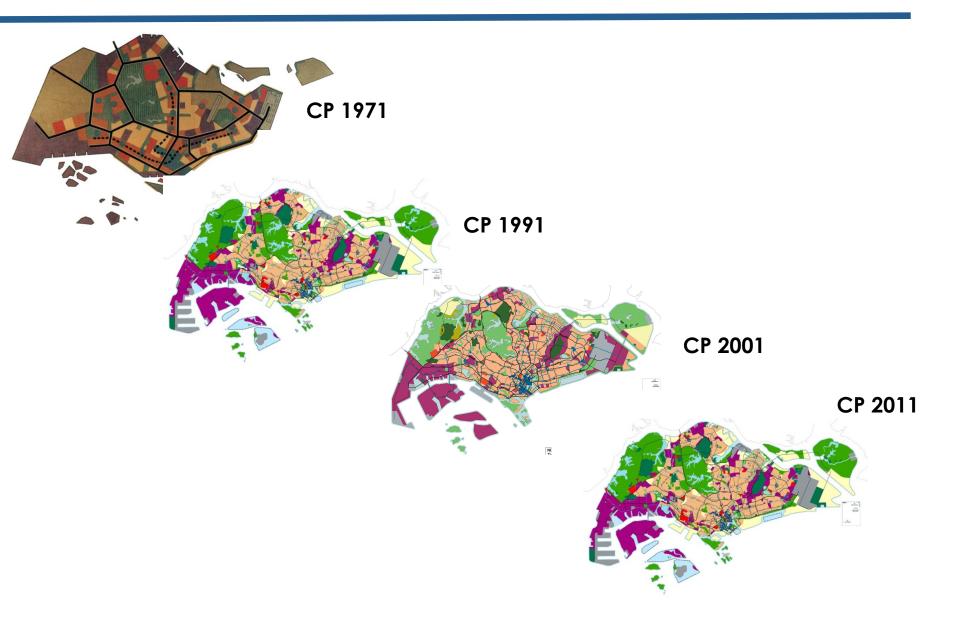
Mass Rapid Transit

- Each town separated by green spaces
- Provisions for industrial estate

•

• Changi airport development and system of MRT and expressways

Concept Plan: Regular 10-year review



01 Concept Plan

- Master Plan
- Integrated Urban Water Management
- Integrated Transport Planning
- Urban Design Controls
- Conservation

Local Planning: Development Guide Plans (DGP)

DGP is a product of detailed physical planning in the planning process.

<u>Relationship with Concept Plan</u>

Concept plan, a long term development strategy, forms the base for all physical development of Singapore whilst DGP translates the intentions of Concept Plan into detailed guidelines

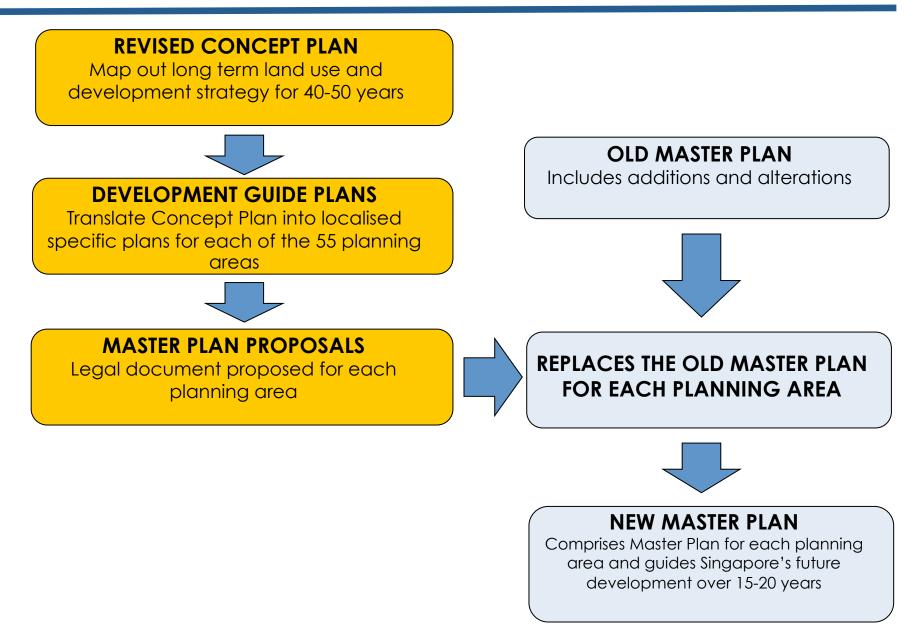
<u>Relationship with Master Plan</u>

Completed DGP will be gazetted to replace corresponding part of the existing MP under Section 6 of the Planning Act

<u>Relationship with Development Control</u>

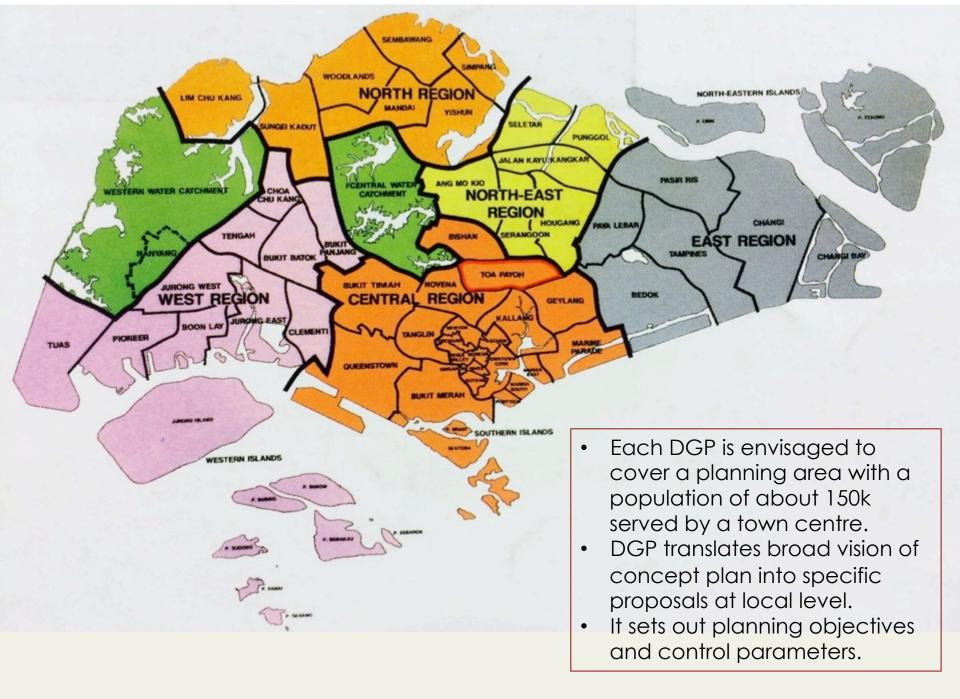
Gazetted DGP guide physical development through development control

The Planning Process



DGP

- Proactive effort to do more systematic and comprehensive planning
- Guide the use and development of land for Singapore
- Set in place a guiding plan, as well as a framework and process that allowed the public and government agencies to rely on the Master Plan as a guiding document for land use decisions
- One DGP for each of the 55 Planning Areas



DGP Process

Monitor & Review

Stage 1: Data collection

Data is collected to understand the planning area

Stage 2: Data analysis

The data collected is analysed to assess the area's strengths and weakness and to establish the planning objectives and strategies for the area

Stage 6: Statutory Master Plan

The Draft Master Plan is revised after all objections from the public have been evaluated. The finalised Master Plan or DGP is gazetted to replace the existing Master Plan for the area that it covers

months

 $\mathbf{\omega}$

Refinements

Stage 5: Statutory exhibition

A public exhibition of the Draft Master Plan is held to allow the public to lodge any objections. As a statutory requirement under the Planning Act, the Master Pan exhibition must be held for a minimum of two weeks

Stage 3: Outline plan

months

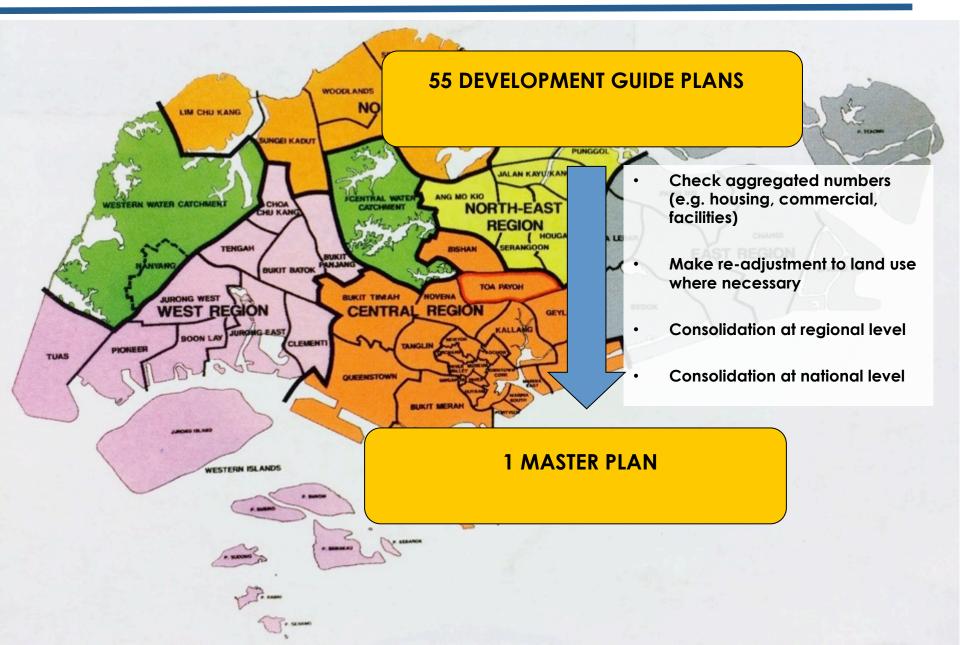
An Outline Plan is prepared, detailing the planning control guidelines such as land-use zoning. For selected DGPs, exhibitions and dialogue sessions are held on the Outline Plan to gather feedback from developers, industry organisations and members of the public

6 months

Stage 4: Draft Master Plan

The Outline Plan is refined into a Draft Master Plan. Any useful feedback that was gathered earlier is incorporated.

From DGP to Master Plan

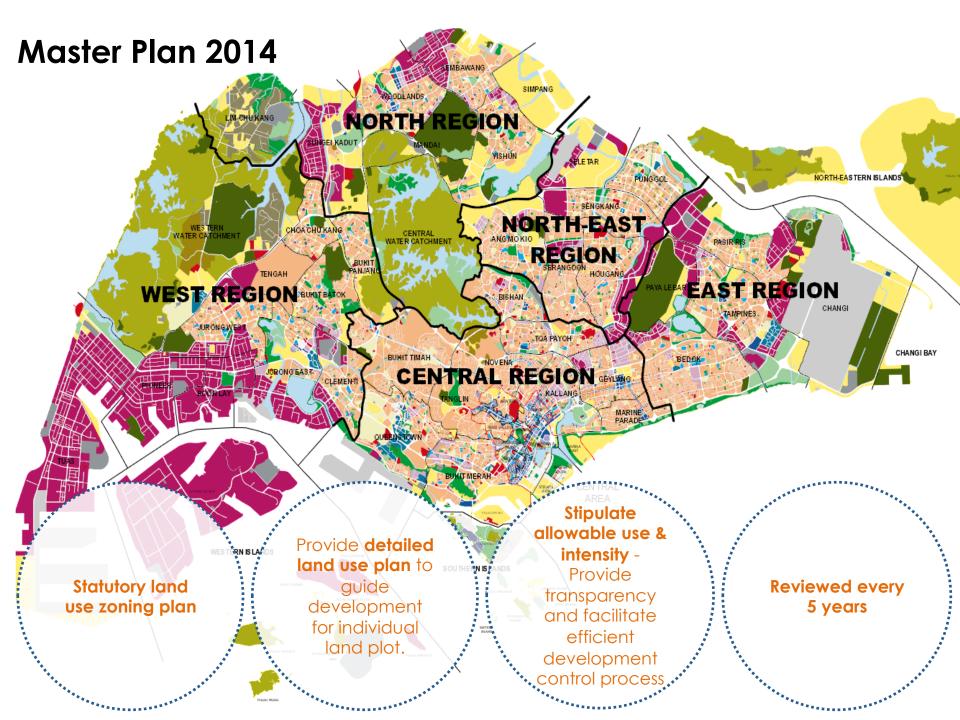


Partnership with Agencies

- Land use planning as multiagency effort
 - All agencies have common stake in development of Singapore
- Master Plan Committee (MPC)
 - Involves collaboration among agencies, with URA as coordinator
 - Ensures land is put to best possible use
 - Resolves conflicts and tradeoffs







Master Plan

- Statutory land use plan
- Guides development on each plot of land



3.0

3.0

3.0

Integrated Master Planning and Development

Case Study: Singapore River and Marina Bay



Inter-Agency Committee (IAC) for Planning and Development

Led by Urban Redevelopment Authority, comprising

- The then-Ministry of Environment
- Land Transport Authority
- Public Works Department
- National Parks Board
- Maritime Port Authority
- Singapore Tourism Board

Tackling the Challenges

Phase 1 – Basic Infrastructure 1960's – 1970's **Phase 2** – Providing Quality 1980's – 2000's Phase 3 – Sustainability and Liveability 2000's - Present

Development of Singapore River and Marina Bay

Phase 1: Basics

- 1. Sorting out the housing problem after self-governance (Establishment of HDB in 1960)
- 2. Land acquisition and resettlement
- 3. Urban Renewal (setting up URD, and URA)
- 4. Cleaning up the Singapore River

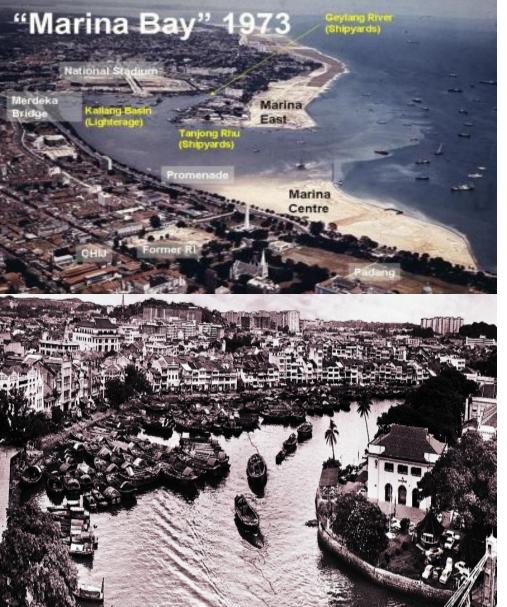
Phase 2: Quality

- 6. Plans by I.M. Pei and Kenzo Tange
- 7. Conservation and further urban renewal
- 8. Singapore River Plan

Phase 3: Sustainability

- 10. Construction of Marina Barrage
- 11. Construction of Gardens by the Bay
- 12. Car-lite City and car-free zones
- 13. Upgrading of Civic District
- 14. Development of Greater Southern Waterfront

Phase 1: Challenges at Singapore River and Marina

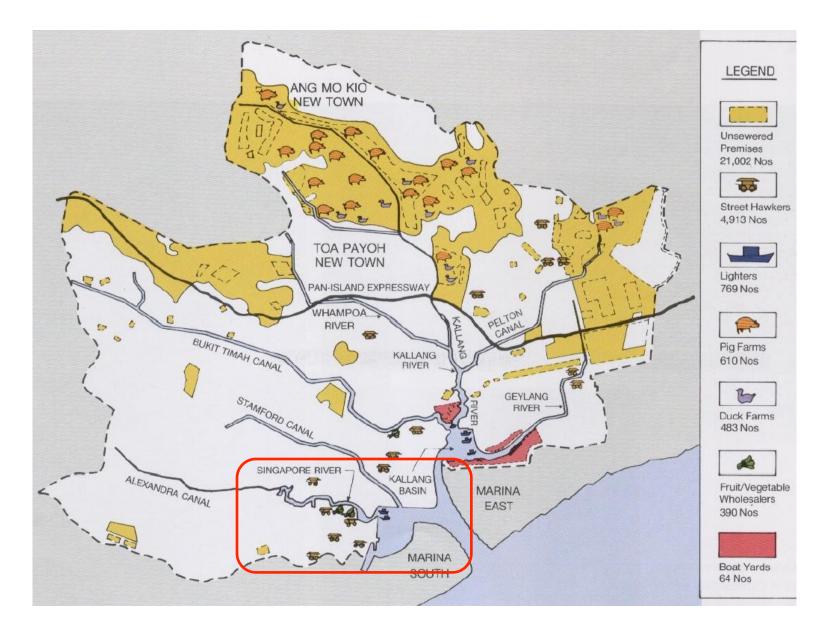


- Massive overcrowding and uncontrolled urban sprawling
- Pollution turned river into open sewer in the 1970s
- Lost relevance to trade
- How to renew area to spur new economic growth?

Phase 1: Singapore River Clean-Up Cleaning up pollution at source



Phase 1: Singapore River Clean-Up Cleaning up pollution at source



Integrated Approach to the Singapore River Clean-up

- Master Plan drawn up (1977)
- 26,000 families resettled
- 610 pig and duck farms phased out
- More than 2,800 industrial cases resettled
- 4,926 street hawkers resited into food centres
- Lighterage activities from some 800 lighters in Singapore River resited to Pasir Panjang
- Cost of nearly \$300 million, excluding resettlement compensation





Phase 2: Designing Marina Bay

- Marina Bay Downtown
 - Engaged Kenzo Tange and IM Pei to formulate Master Plans for Marina Bay
 - Pei's plan adopted as it gave more design flexibility for future growth
 - Revisions to Pei's plan in the 1992 land use plan for a '21st century downtown'



Master Plan by I.M. Pei (1983)



Master Plan by Kenzo Tange (1983)

Phase 2: Conservation and further urban renewal Land Acquisition and Land Sales

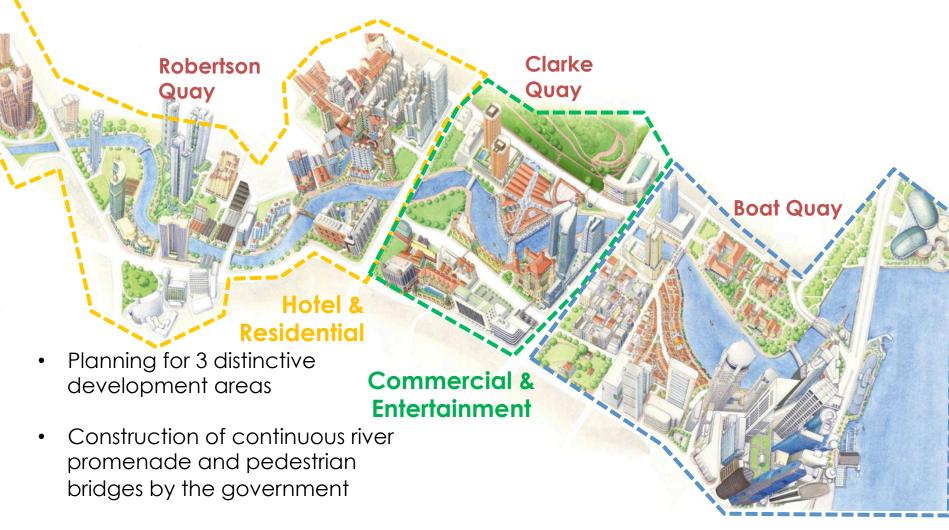


- Clusters of shophouses
 acquired
- Packaged for sale to private developers
- Restoration and adaptive re-use





Phase 2: Singapore River Concept Plan 1985

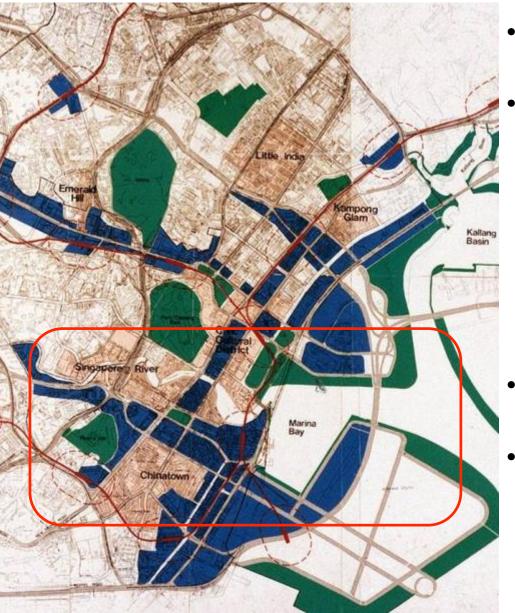


Civc & Commercial

 Urban design and conservation guidelines incorporated into land sales conditions for private sector developments

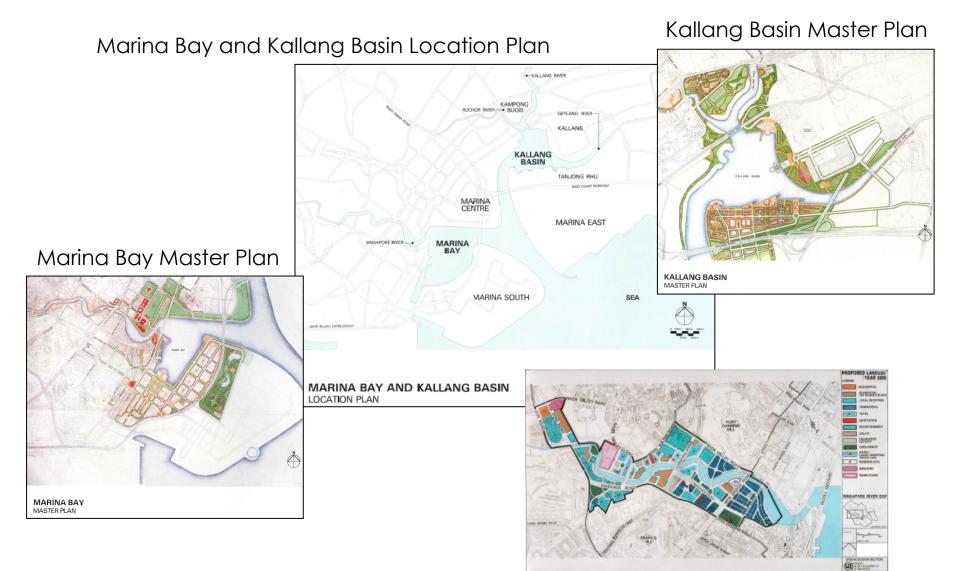
Phase 2: Central Area Structure Plan 1986

Comprehensive Planning for a distinctive city centre



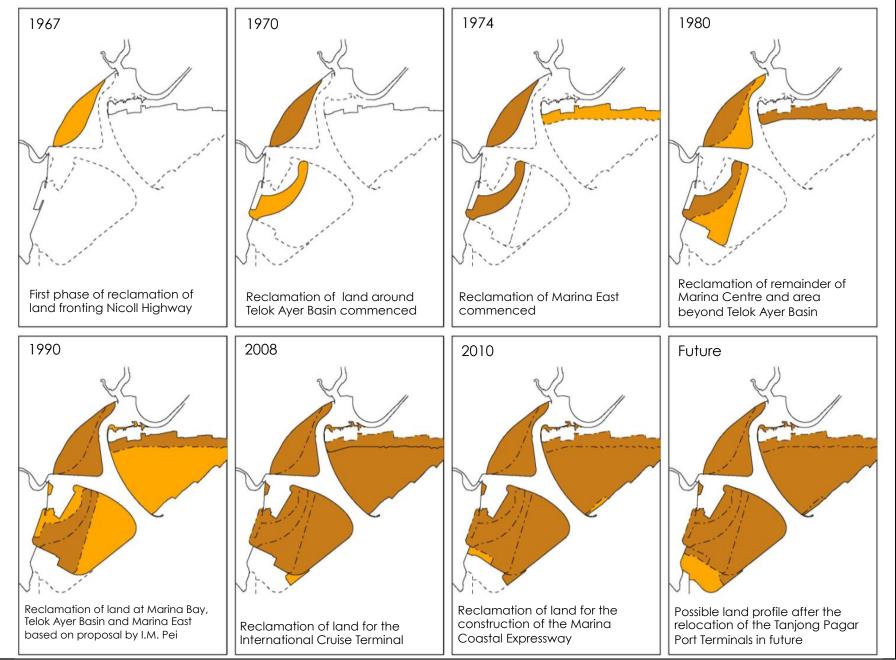
- Basic physical infrastructure completed by 1980s
- Decision to build urban rail network (MRT system) in 1982 -> opportunities to review urban structure of the city
 - Areas for intensive developments around MRT stations
 - Retaining green lungs for the city
 - Urban conservation districts to maintain our distinct identity
- Conservation districts identified as part of the Structure Plan
- Balanced by development potential in new development area, Marina Bay

Phase 2: Planning for Marina Bay



Development of the Singapore River Precinct

EVOLUTION OF RECLAMATION PROFILES



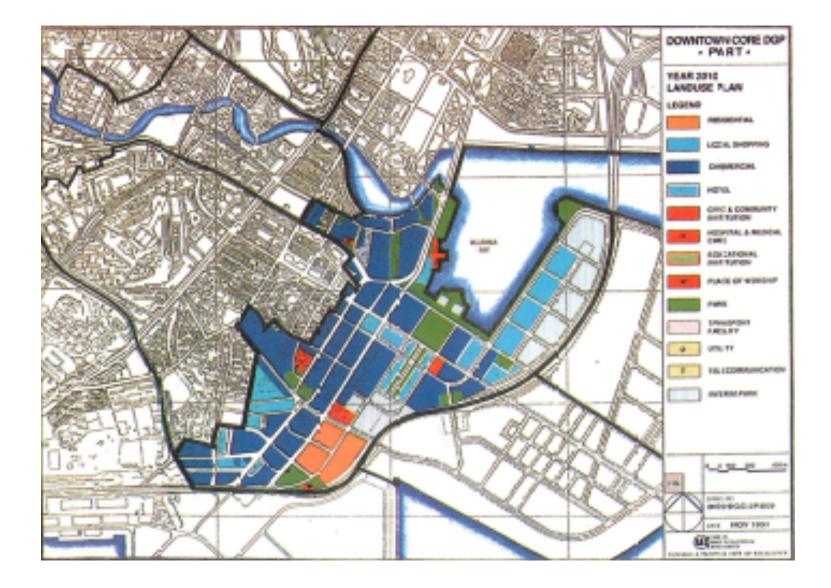




Reclaimed Marina Bay Area



The 1991 Outline Plan for the Downtown Core DGP – CBD Zone



Phase 3: Sustainability and Liveability

- Allowing seamless extension of CBD and flexibility in staging developments:
 - Grid urban patter which extends from existing road network within CBD
- Facilitating mix of commercial and residential developments:
 - Land sales sites in Marina Bay zones as white site





Development approach for Marina Bay

Balancing value creation through environment enhancement vs. development potential

- Retaining the bay to create a waterfront city centre instead of reclaiming the entire bay to gain additional land
- Devoting 100 ha of land for three public waterfront gardens (Gardens by the Bay) instead of maximising revenue and putting it to higher value uses e.g. offices





Phase 3: Marina Barrage

Turning Adversity into Opportunity

<u>Marina Barrage</u>

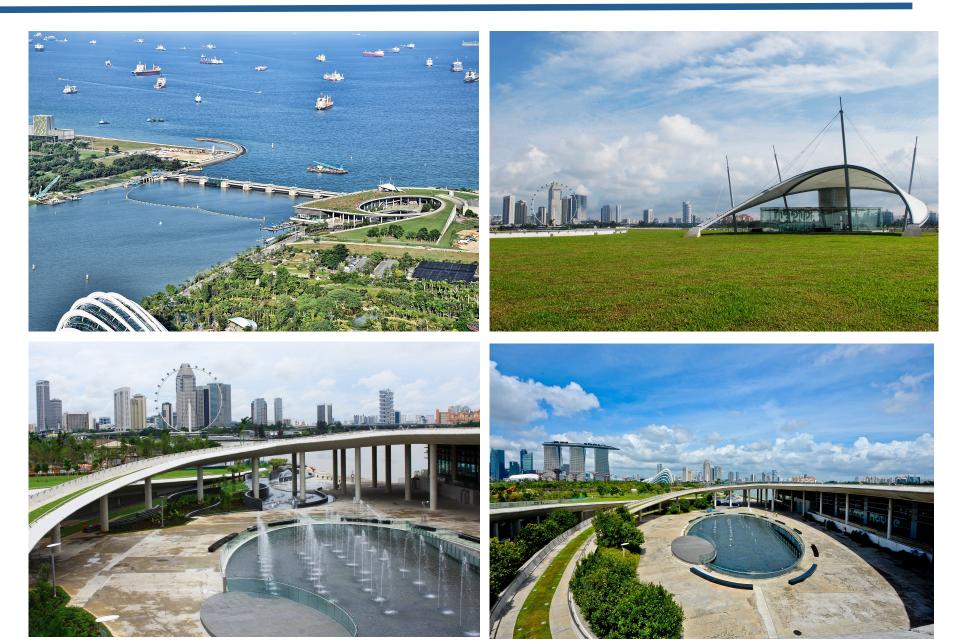
- Turning Singapore River into a water catchment
- Manage floods in low lying areas
- Community space and water sports







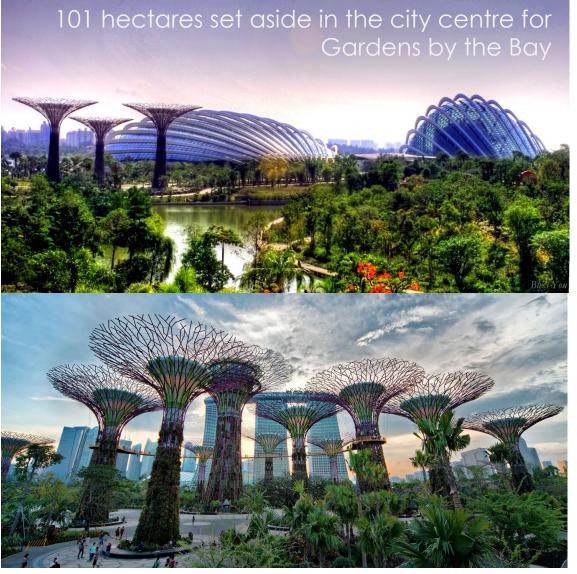
Marina Barrage



Phase 3: Gardens By the Bay City in a Garden

Gardens by the Bay

- 101 hectares of high value land set aside for recreation and greenery
- Enhance liveability of the city, providing vibrance and amenity



Vision for Marina Bay

A 24/7 live-work-play environment that encapsulates the essence of a global city

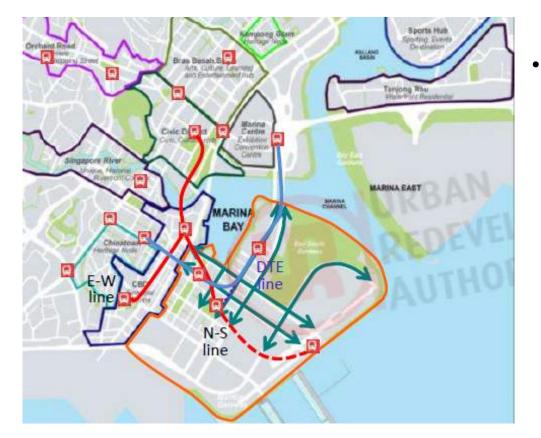
- More than a mere extension of the CBD that shut down after office hours
- A "life-style" precinct with a good mix of commercial, entertainment, hotel, residential and recreation developments







Phase 3: Car-lite City





- Improving accessibility and connectivity:
 - Extensive public transit network
 - Comprehensive network of covered walkways, underground pedestrian links & above-grade connections
 - Cycling paths along major arterials

Phase 3: Enhancing liveability

- Providing places where people will gather for events and their own recreation
 - Ample provision of parks and open public spaces





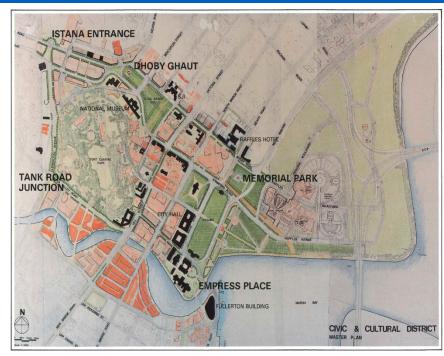




Phase 3: Upgrading the Civic District

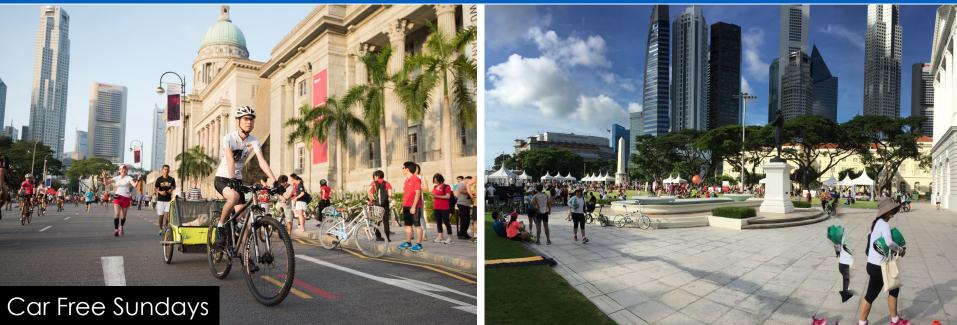
Further enhance conservation efforts and urban rejuvenation

- Stitch together spaces to create an integrated arts, culture and lifestyle precinct.
- Defines district into key identity zones according to their layout





Programming

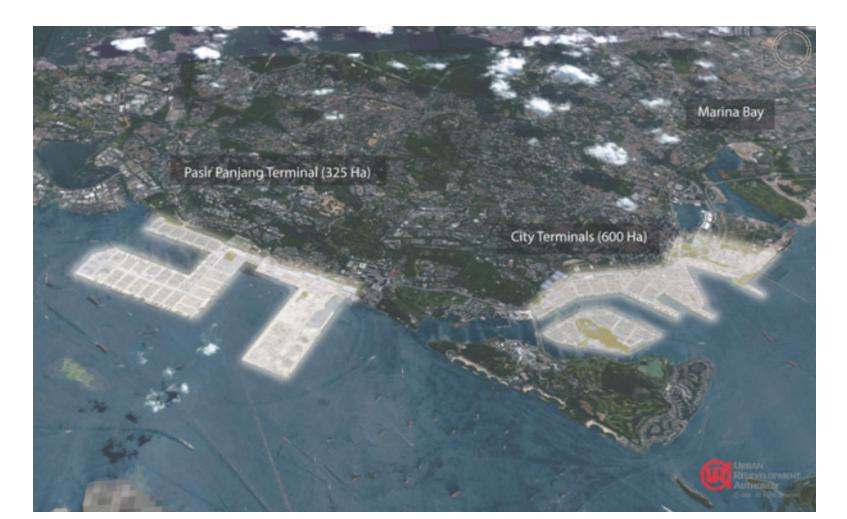






Phase 3: Greater Southern Waterfront

1,000 hectares of land for development after 2030 after relocation of port terminals

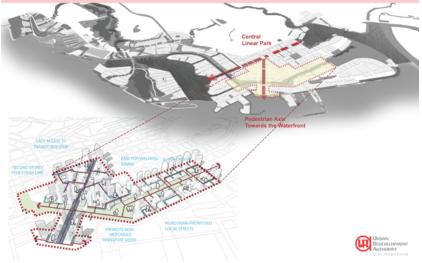


Greater Southern Waterfront

Idea 2: Extend the City to Greater Southern Waterfront



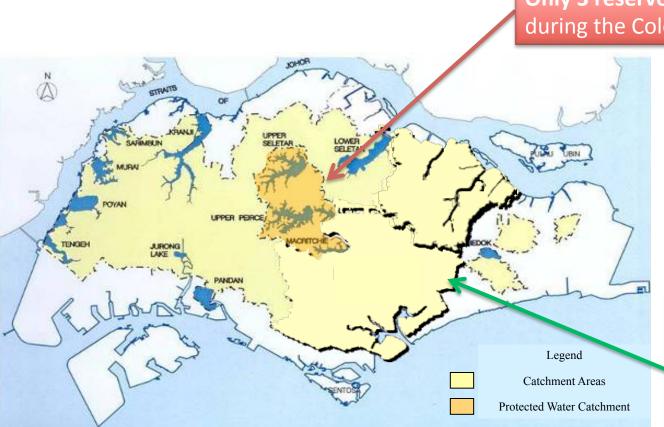
Idea 3: Expand the Network of Public Spaces



Integrated Urban Water Management

- 01 Concept Plan
- Master Plan
- Integrated Urban Water Management
- Integrated Transport Planning
- Urban Design Controls
- Conservation

Water Challenges since Independence



• Insufficient Water Catchment

Only 3 reservoirs were built during the Colonial period

• Expansion in capacities of existing reservoirs

• Creation of unprotected water catchments





Polluted Waterways



Rivers became open sewers







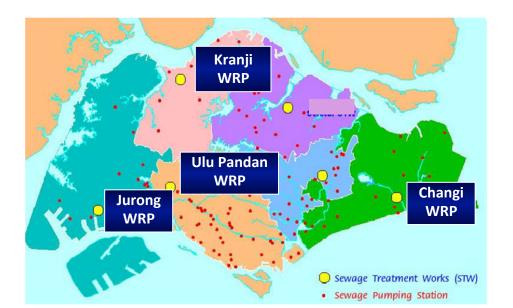
•Programme to clean up the Singapore River and other urban rivers 1997 - 1987

 People's way of life changed to eliminate sources of water pollution • Open sewers/poor sanitation





Half the population had proper sanitation; the other half depended on night soil collection



 Public Works Department divided the island into 6 used water catchment zones

• Currently **4 Water Reclamation Plants (WRPs)** serve the used water needs of Singapore

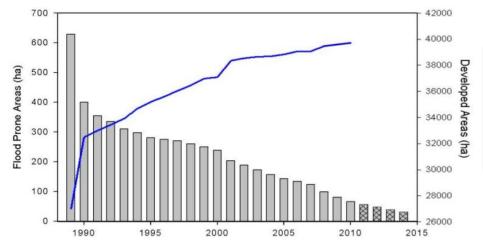
The island is now fully sewered.

Seasonal floods





Floods were more frequent and extensive in the past.



Flood prone areas from 3,178ha (1970) to 49ha (Nov 2011) despite more urbanisation

Singapore today...

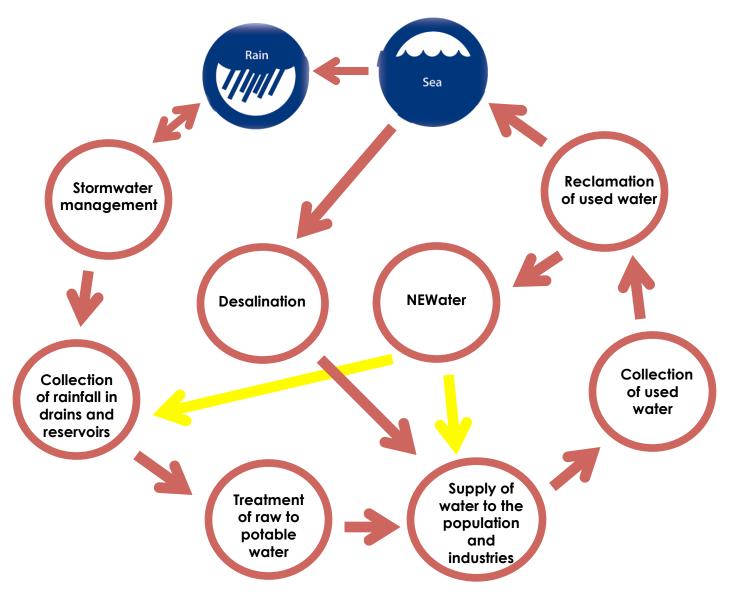




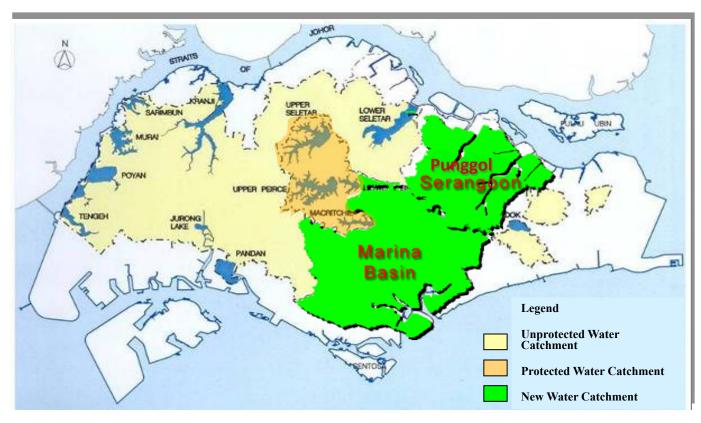




Managing the Complete Water Cycle



Harvesting Every Drop



- 0 Two-third of Singapore is now water catchment
- O Plan to increase to 90% in the future
- 3 new reservoirs were added recently viz Marina, Punggol and Serangoon
 Reservoirs. Singapore now has 17 reserviors.

MacRitchie Reservoir







Marina Barrage – 3 in 1 Benefits

Water Supply

Boosts Singapore's water supply by creating Singapore's 15th reservoir and its first reservoir in the city

Flood control

Acts as a tidal barrier to keep seawater out and alleviates flooding in the lowlying city areas such as Chinatown and Little India

Lifestyle attraction in downtown Singapore

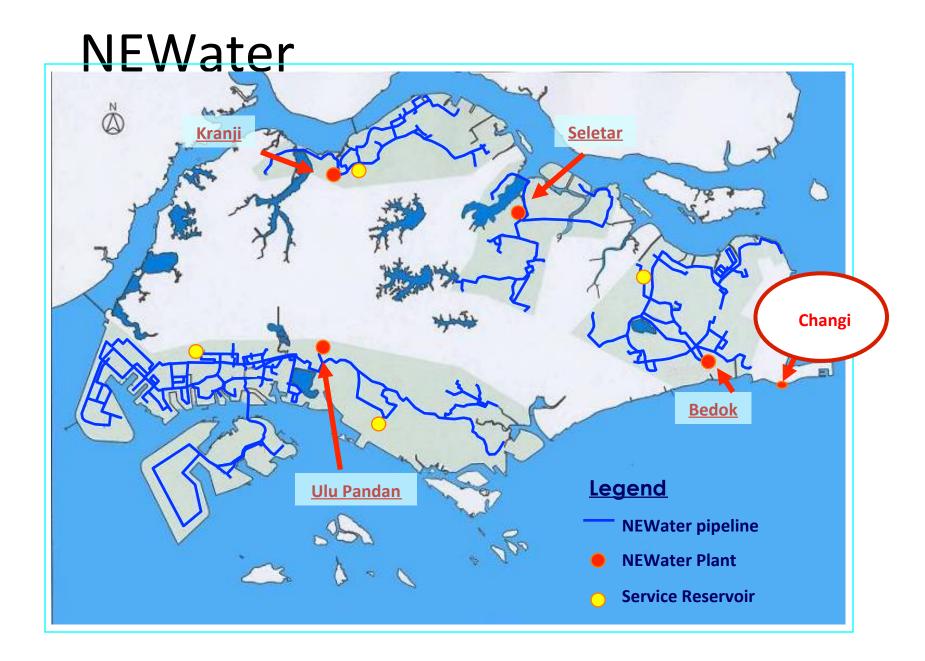
Hotspot for recreational activities and latest icon in Singapore





- Launched in 2003
- Currently five NEWater Plants in Singapore
- Caters to 30% of Singapore's water needs





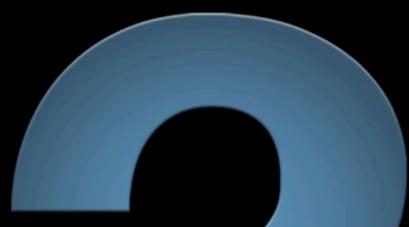
Desalinated Water

- First desalination plant started operation in 2005. The plant has a capacity of 30 mgd.
- The second desalination plant, commissioned in 2013, has a capacity of 70 mgd.
- Both plants use the Reverse Osmosis process to desalinate seawater.









How did Singapore transform its constraint into a virtue?



A. Collect every drop of rainwater

i. Political will & vision with clear political direction

- Strong political leadership that balanced populist pressure and administrative advice
- Water situation coordinated from Prime Minister's Office for 31 years:
 Broad direction that cut across different Departments and Ministries

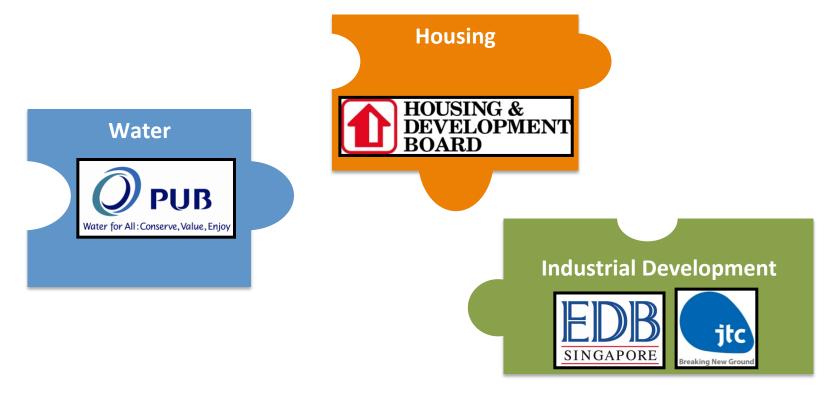
"Every other policy has to bend at the knees for our water survival"

– Former PM Mr Lee Kuan Yew

A. Collect every drop of rainwater

ii. <u>Resolution of conflicting land use</u>

Maximise Singapore's water catchment area - whole of government integrated effort to prioritise different land uses



A. Collect every drop of rainwater

iii. Innovation

- In the past, water catchments were located far from urbanised areas to prevent pollution and ensure water quality
- Innovations: Enabled meeting of multiple objectives of flood management, water supply and community recreational use of land

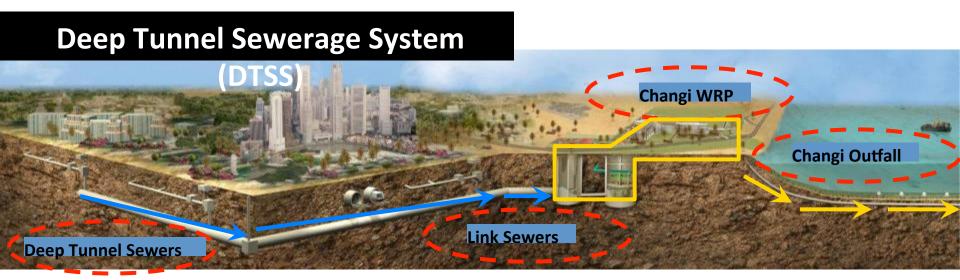
Lifestyle attraction



B. Collect every drop of used water

i. Long term investments

- Heavy investments in wastewater infrastructure as sanitation is deemed as a public good: Government funds development of sewerage systems e.g. DTSS
- Principle of cost recovery applies for basic services



C. Reuse every drop of water more than once

i. Going against conventional wisdom

- Political vision: To be self-sufficient in water, which included recycling of used water
- The lack of advanced technology, public acceptance and high cost made recycling of used water very difficult
- Relentless experimentation for 30 years enabled implementers to jump at the chance once the technology became viable in the late 1990s
- Leveraged on strong political leadership and extensive grassroots network to rally support for NEWater



Ensuring Water Sustainability

is not just about putting in place the hardware



+



Ensure diversified sources of water supply for Singapore with the Four National Taps

"Water for All"

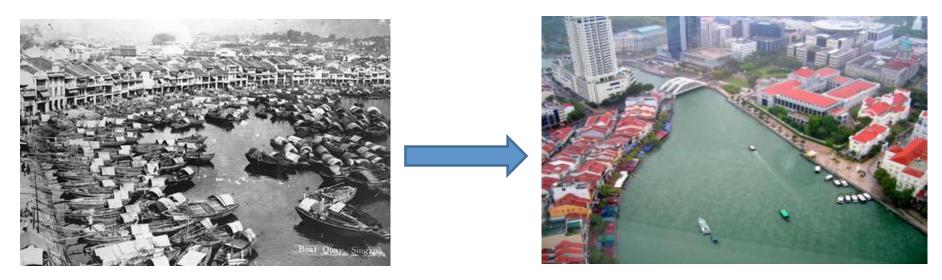
Adopt a 3P Approach to engage the 3P partners to use water wisely, keep the water catchments clean, and build a relationship with water

"Conserve, Value, Enjoy"

Engaging Stakeholders

Support from the People, Private and Public (3P) sectors is critical to developing and management of our water resources

- i. <u>Creating and maintaining the pristine quality of our</u> <u>catchment and waterways</u>
- Relocation away from major waterways for extensive clean-up: Politicians and the government worked closely with the people to secure buy-in and support



Engaging Stakeholders

i. <u>Creating and maintaining the pristine quality of our</u> <u>catchment and waterways</u>

Active, Beautiful, Clean (ABC) Waters













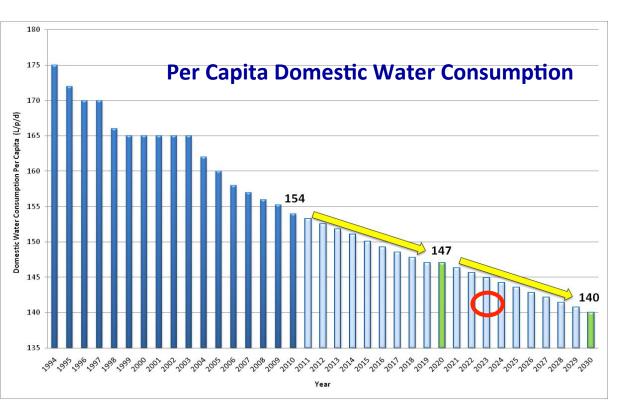






Engaging Stakeholders

ii. Year on year reduction in per capita water consumption







Singapore's unaccounted for water decreased from 9.5% in 1990 to 4.5% in 2010.



Engaging Stakeholders

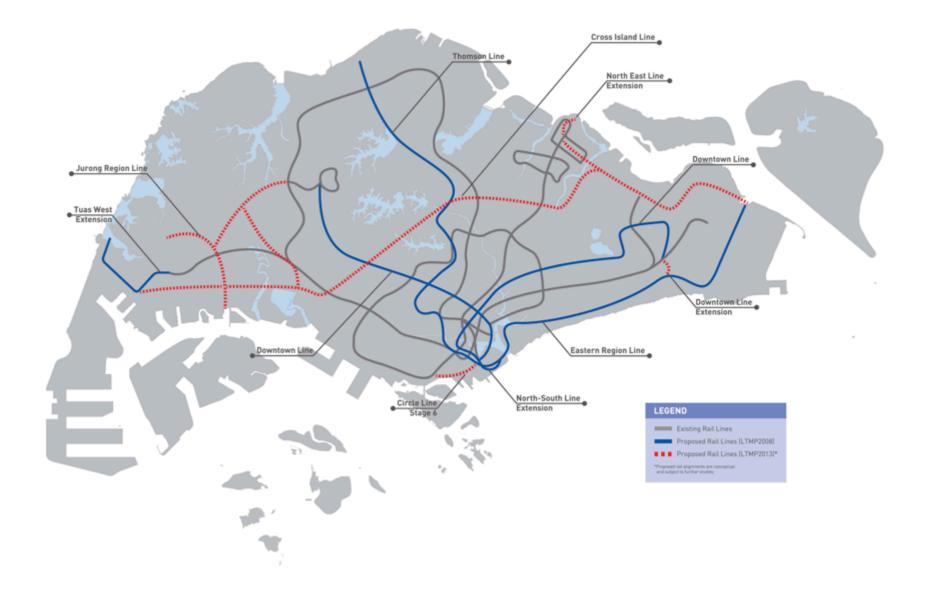
iii. Singapore as a Global Hydrohub

- Developing a vibrant water industry backed by a strong R&D ecosystem
 - Technology development, Cluster development, Internationalisation
- Singapore International Water Week (SIWW):
 - Platform for Singapore to profile itself as the Global Hydrohub
 - Global platform for sharing and co-creation of innovative water solns

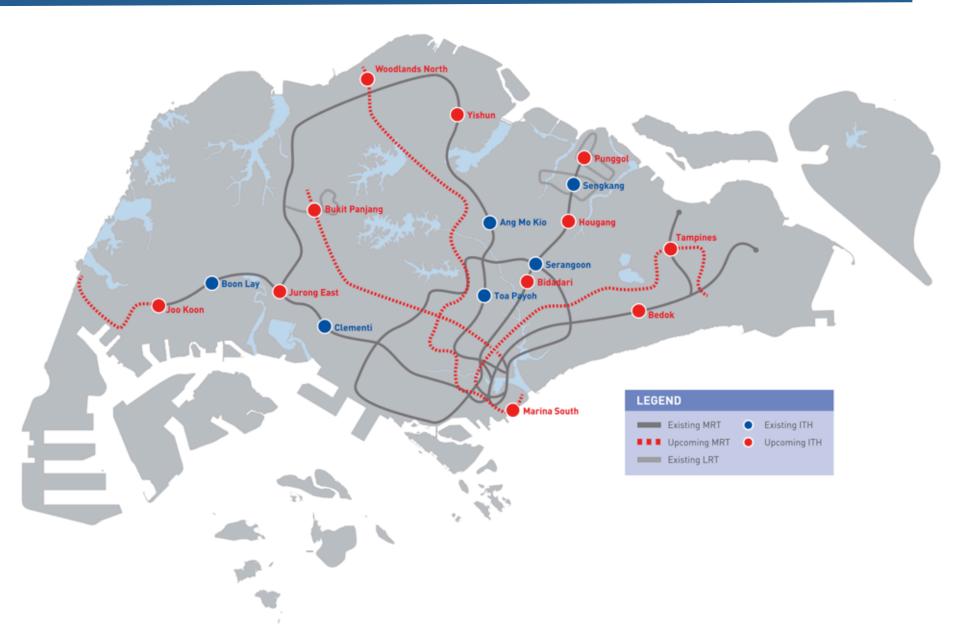


- 01 Concept Plan
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Land Transport Master Plan

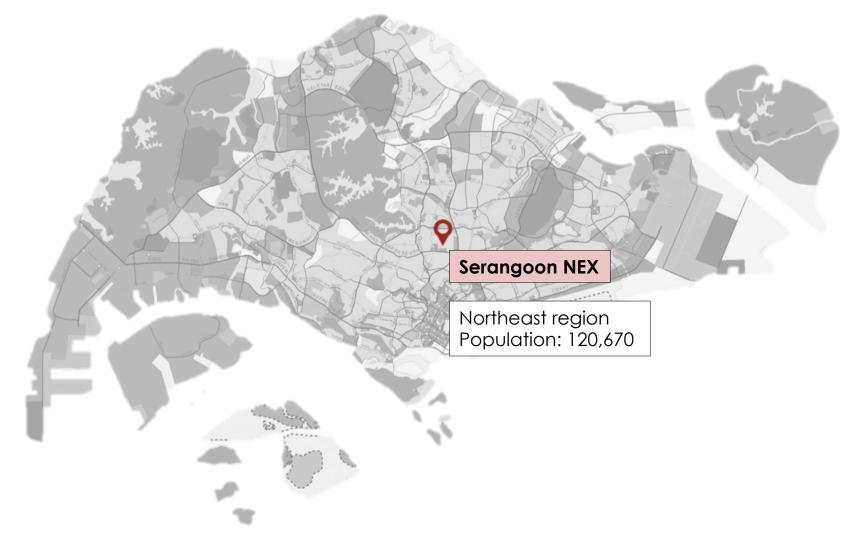


Integrated Transport Hubs



Integrated Developments

Multi-modal Hubs: Serangoon NEX



Serangoon New Town





MASTER PLAN 2014 (approved amendments incorporated)



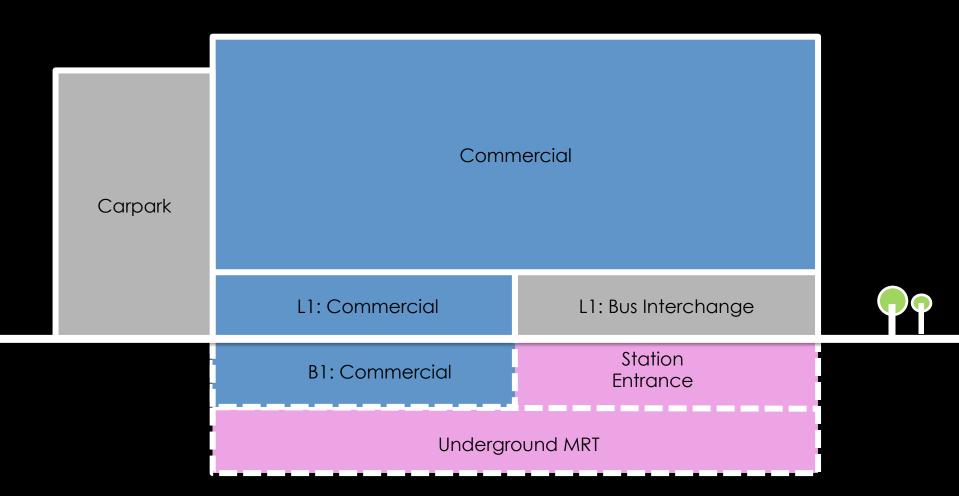


Serangoon NEX



Serangoon NEX





Serangoon NEX_Bus Interchange



Serangoon NEX_Bus Interchange



Serangoon NEX_Underground MRT



Interchange for Circle Line and Northeast Line

Integrated Developments

Multi-modal Hubs: Northpoint City at Nee Soon



Yishun New Town



MASTER PLAN 2014 (approved amendments incorporated)

(Please click on the zoning type for a description of the use)



Northpoint City at Nee Soon



Northpoint City at Nee Soon



Northpoint City at Nee Soon

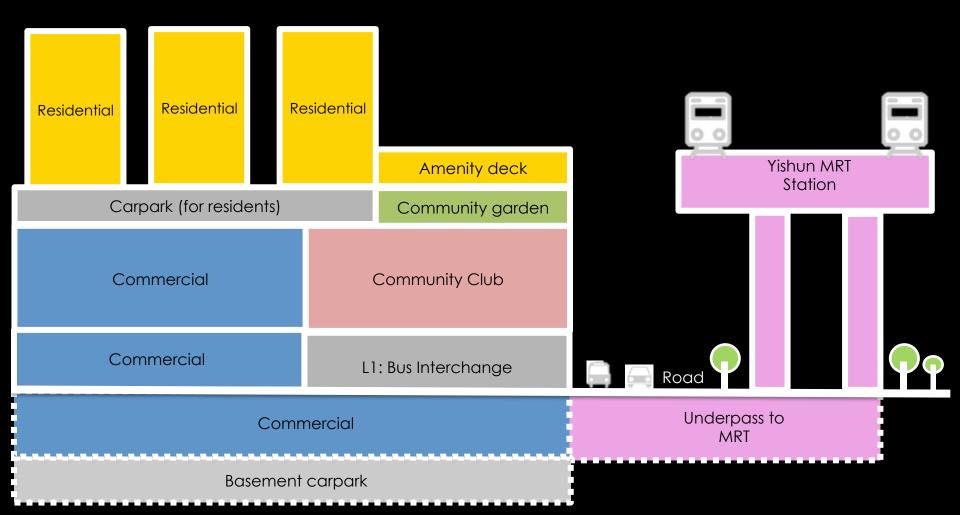


- I RETAIL UNDERPASS TO YISHUN MRT
- EXISTING UNDERPASS AT NORTHPOINT SHOPPING CENTRE
- BASEMENT 1 RETAIL
- CONCOURSE LANDSCAPED ATRIUM
- IEVEL 2 LINKAGE ABOVE CONCOURSE

LEVEL 1 RETAIL FLOOR
 LEVEL 2 RETAIL FLOOR

- COMMUNITY GARDEN
- BASEMENT 1 CARPARK
- (10) INTERGRATED BUS INTERCHANGE

11 NORTHPOINT SHOPPING CENTRE CARPARK
 12 REFURBISHED NORTHPOINT SHOPPING CENTRE
 13 NORTH PARK RESIDENTIAL TOWERS
 14 RESIDENTIAL AMENITIES DECK
 15 RESIDENTIAL CARPARK FLOOR



01 Concept Plan

- Master Plan
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Importance of Urban Design

- Buildings are usually built to the full site potential (i.e. maximum GPR) to optimize the land value.
- Urban Design
 - refines the overall land use plan.
 - guides developments to relates to surrounding.
 - safeguards spaces for cultural and leisure activities
 - enhances the quality, aesthetic and character of the built environment
 - shapes a dynamic, distinctive and delightful city

Key Urban Design Elements



Urban Pattern



Building Form



Streetscape



Skyline



Landmark



Open Spaces



Skyrise Greenery



Roofscape



Pedestrian Network



Vehicular Access

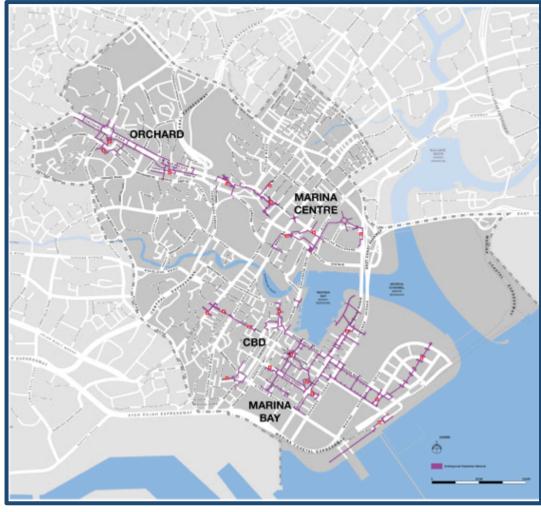


Night Lighting



Scenic

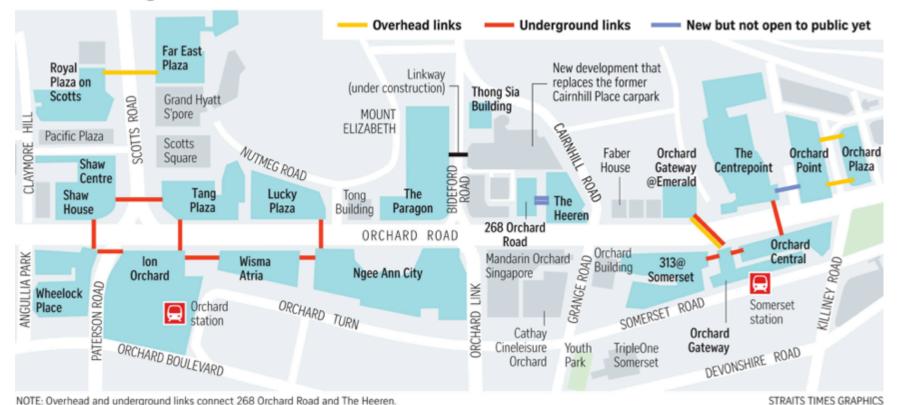
Central Area Underground Pedestrian Network



Source: URA

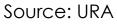


The underground web











Underground passageway beneath One Raffles Quay



Marina Bay Link Mall

Pedestrian Network

CityLink Mall

Case study: Raffles Place





Raffles Place MRT underpass



Marina Bay Link Mall



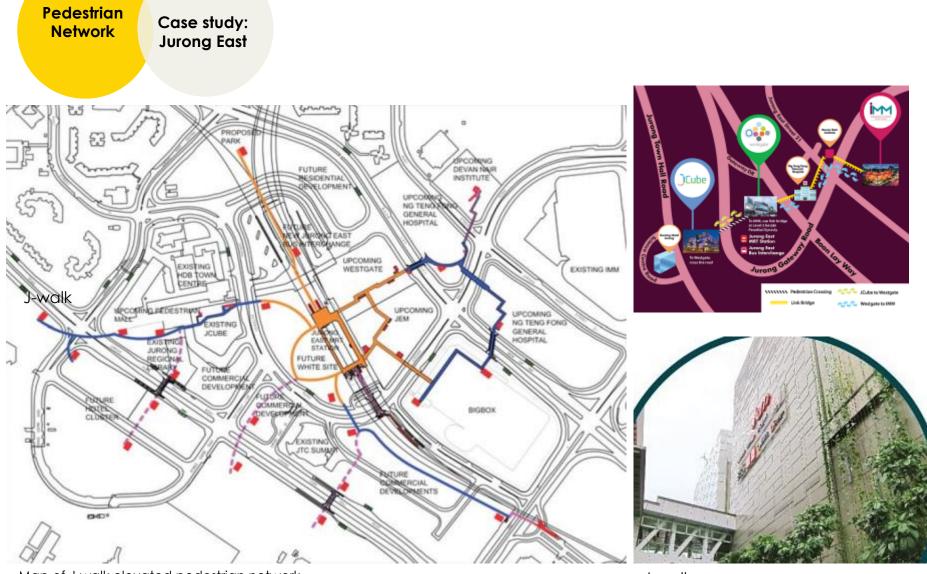
Map of CityLink Mall



Raffles Place MRT underpass plan



Map of Marina Bay Link Mall



Map of J-walk elevated pedestrian network

J-walk





01 Concept Plan

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A nation must have a memory to give it a sense of cohesion, continuity and identity. The longer the past, the greater the awareness of a nation's identity.....a sense of common history is what provides the links to hold together a people who came from the four corners of the earth.

> S Rajaratnam Former Senior Minister Prime Minister's Office 1986

What is Conservation to a Nation?

- Retain our Valuable Built Heritage
- Reinforces a sense of rootedness & identity
- Contributes to Distinctiveness of Our City
- Conservation Areas are also Attractions



ARCHITECTURAL MERITS

- 1. Representative of a particular period
- 2. Exhibits particular aesthetic, creative or technical qualities in design, construction technology or use of material



1819-1919 Immigrant Settlement **1920-1940** Cosmopolitan City **1941-1965** Post-War and Nation Bldg

1965 Onwards Post Independence











Tiong Bahru SIT













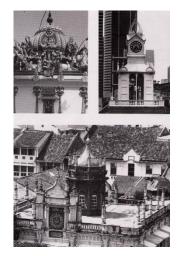








Criteria for conservation



HISTORICAL SIGNIFICANCE



RARITY



CONTRIBUTIONS TO THE ENVIRONMENT





IDENTITY



Difficulties faced

- Anger and resistance from owners who wished to demolish the old buildings on prime land to sell or to redevelop for profits
- Engineers did not want the hassle of refurbishing or preserving old structures and building elements
- Landlords/owners were not incentivized to do up dilapidated buildings due to Rent Control Act

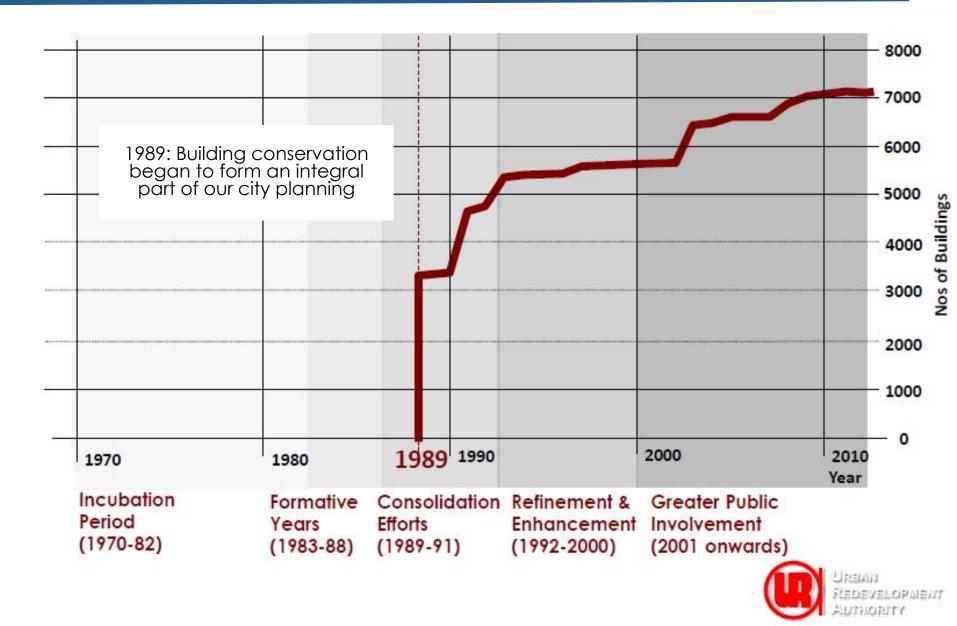


Enabling efforts of conservation

1989: Appointing URA as the Conservation Authority



Singapore's Conservation Efforts

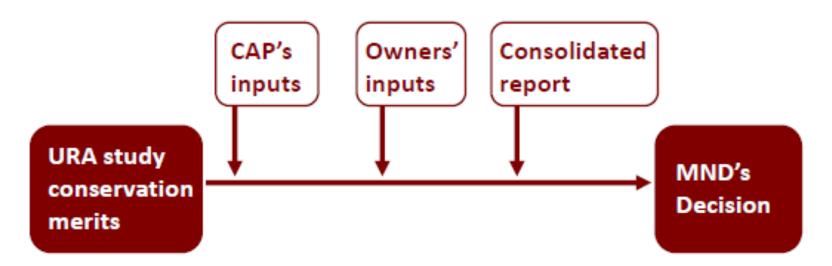


How are buildings selected?

Formation of Conservation Advisory Panel (CAP) i.e. Independent panel to advise on Singapore's building conservation efforts

- Give inputs on built heritage proposals
- Promote greater public understanding
- Propose buildings for study

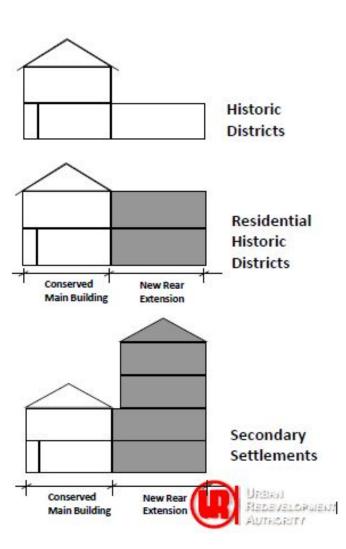
Conservation Study Process



Balance of Conservation & Economic Needs

- Highest priority to retain historical buildings while allowing changes and urbanisation to surroundings
- Allow adaptive re-use of old buildings: a balanced & market-orientated approach to approve proposed use
- Provide guidelines to allow creative solutions to optimise use of sites (refer to illustrations)
- Lifting of Rent Control Act to incentivise conservation





R E V I T A L I Z I N G A HISTORIC AREA

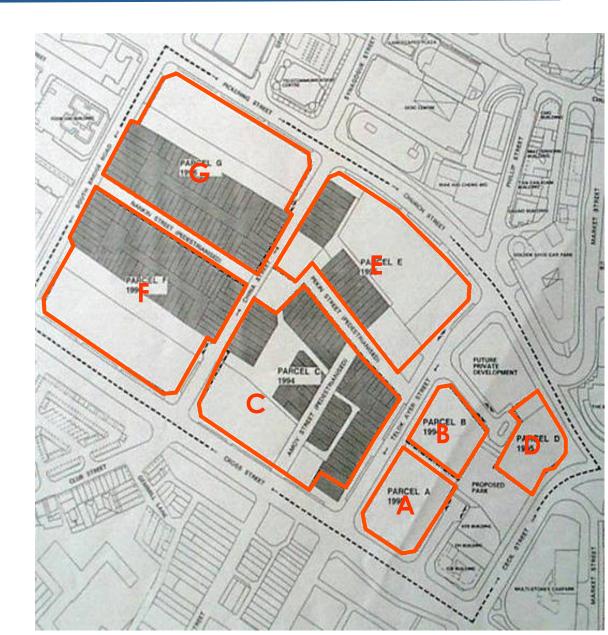


CHINA SQUARE A NEW CHAPTER

China Square – Before

Sale of Sites

- Identify the most valuable street blocks to be kept
- Divided into 7 parcels for sale in phases by open tender



A NEW CHAPTER

THE CHINA SQUARE CONCEPT PLAN



A UNIQUE MIX OF OLD AND NEW







THE CONCEPT

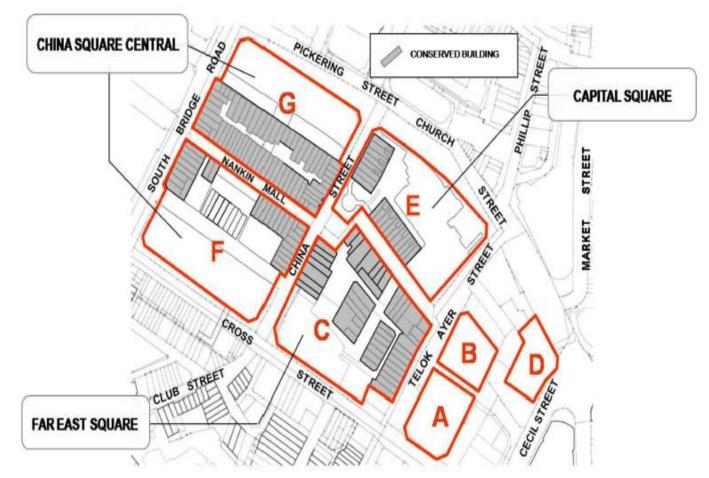
- An exciting and vibrant area, forming a transition between Chinatown, Singapore River and the CBD
- An important node along the future axis leading to the new Downtown
- A vital link in the pedestrian route from New Bridge Road to Cecil Street
- A source of new commercial and hotel space in an excellent location
- An interesting mixture of urban forms, creating a unique blend of old and new
- A centre of activity both day and night, offering a wide range of shopping and eating

Urban Design



- High rise 30-storey developments closer to CBD
- High rise 15-storey edge
- Low rise spine of conserved buildings
- Central pedestrian mall
- Underpasses

Sales Parcels



Four sites with conserved shophouses were bought by three developers. They are now Far East Square, Capital Square and China Square Central.



Achievements of URA's Conservation Programme

- Legal Protection & revitalisation of majority of pre-WW2 buildings
- Enthusiastic private sector participation
- Adoption of good restoration practice by many owners
- Widespread public buy-in through consultative approach
- Increasing public awareness



Source: Jeffrey Teo

