

HKHS INTERNATIONAL HOUSING CONFERENCE 2018

“Planning for Smart and Sustainable Towns : The Singapore Experience”

Keynote

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OUTLINE

- 01 **Singapore Context**
- 02 **Punggol Eco-Town Todate**
- 03 **Ageing In Place : Kampong Admiralty**
- 04 **Tengah Forest & Biophilic Town**
- 05 **Conclusion**

SINGAPORE CONTEXT

Public Housing in Singapore – Today's Context

Total Population:

5.6 million

Singapore Residents:

3.9 million

Main island:

Land Area: 719.9 km²

Public Housing Flats:

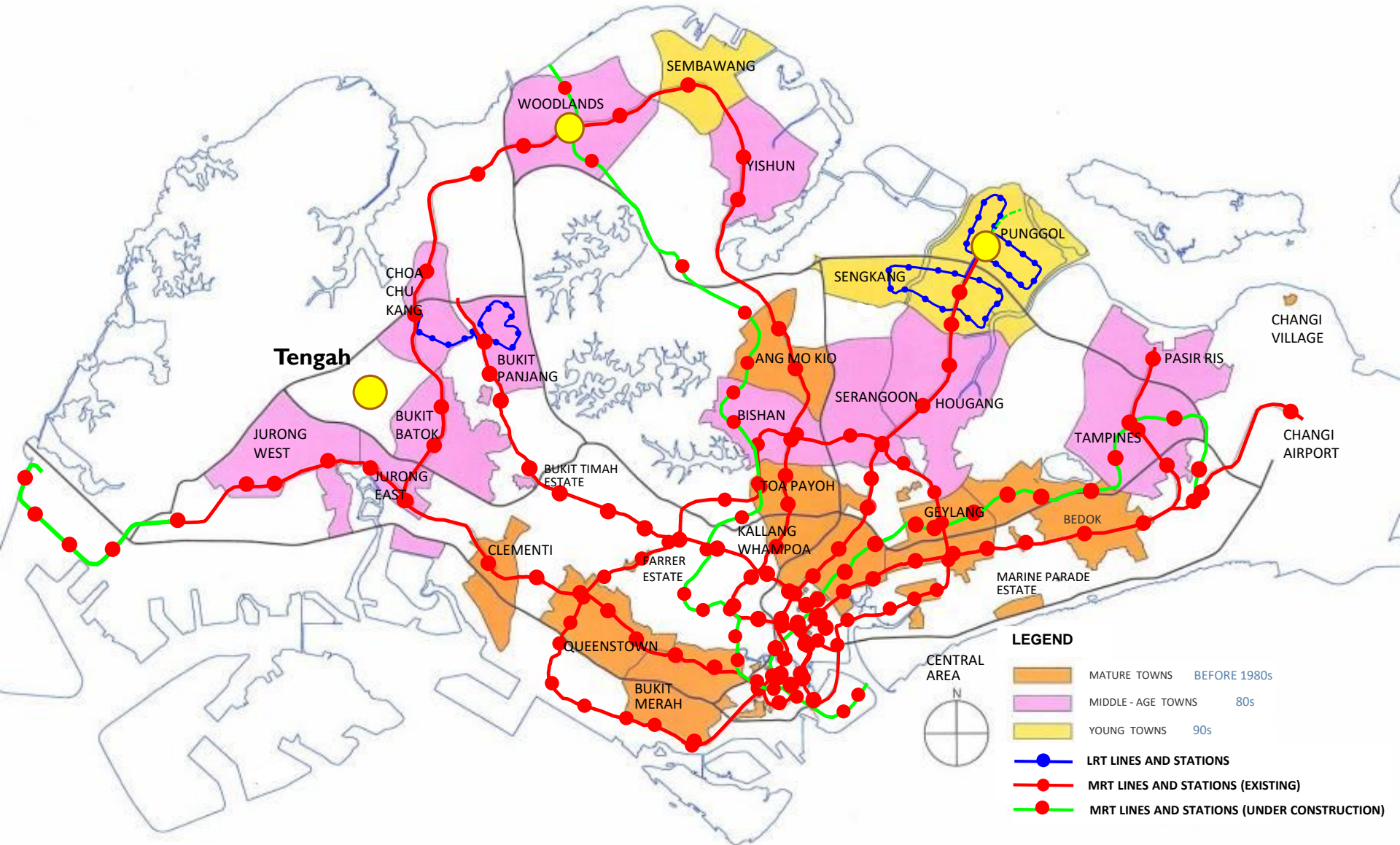
- More than 1 million HDB flats under management
- Houses **82%** of the resident population

Home Ownership: **About 90%**

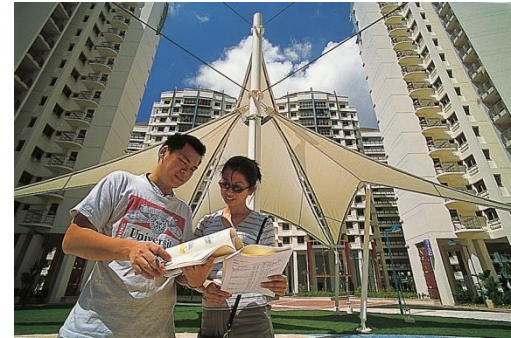


SINGAPORE CONTEXT

24 Towns Planned & Developed Through The Decades



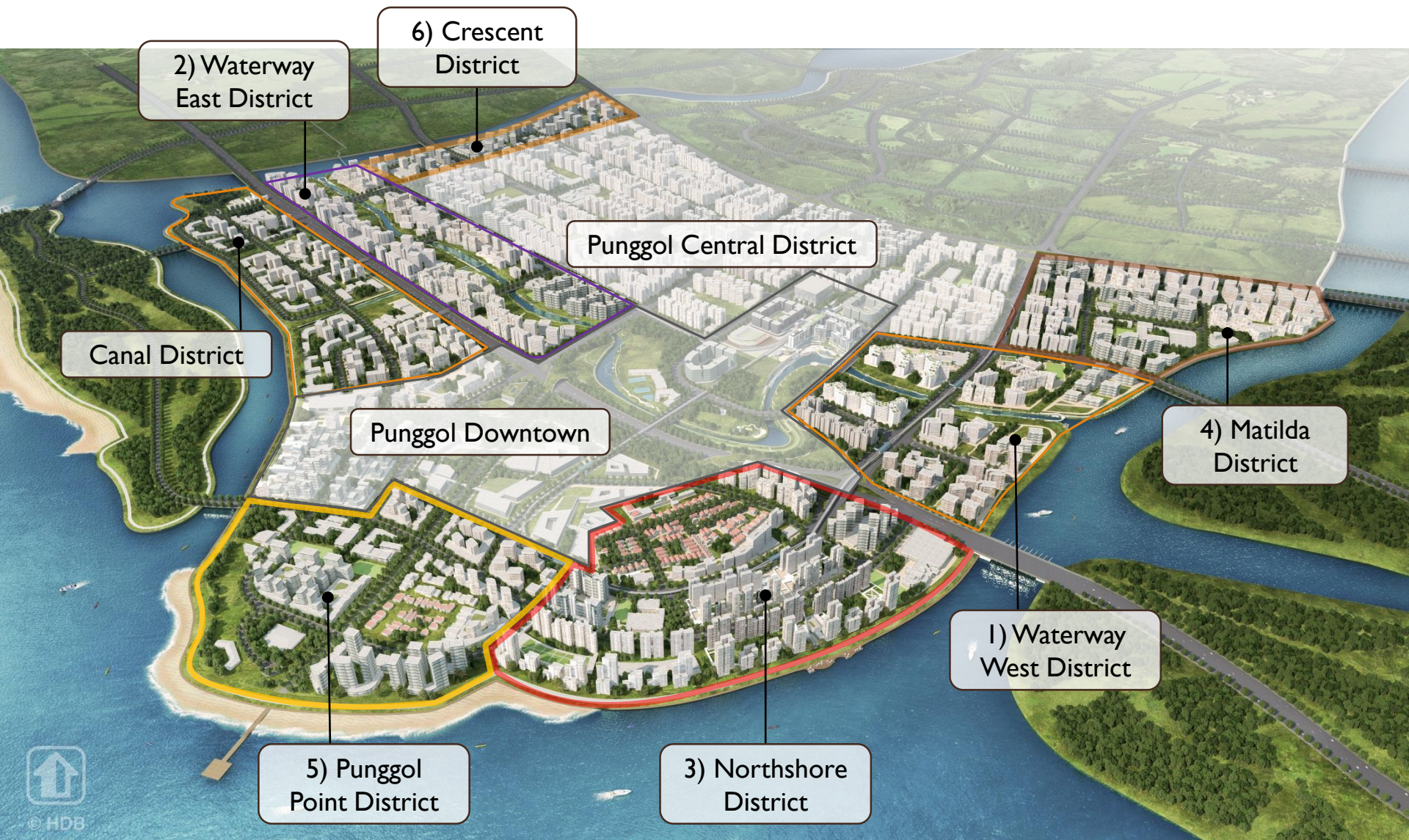
Punggol Eco-Town Today



KEY PLANNING PRINCIPLES

- **High Quality Housing**
- **Integrated Transport**
- **Comprehensive Facilities**
- **Green and Blue**

SIGNATURE WATERFRONT HOUSING DISTRICTS



PUNGGOL POINT – GREEN HERITAGE DISTRICT [VIDEO]



COMPLETED PROJECTS

Waterway Terraces



Waterway Terraces is inspired by the terraced rice fields of Asia, giving the precinct a distinctive identity.

COMPLETED PROJECTS

Waterway View



COMPLETED PROJECTS



Waterway Ridges

COMPLETED PROJECTS



Low-rise building facing the tributary which creates an intimate human-scaled environment along the tributary promenade

Waterway Ridges

PUNGGOL DOWNTOWN

Punggol Digital District

Sports & Recreation

**PUNGGOL
DOWNTOWN: A NEW
DESTINATION FOR THE
NORTH-EAST REGION**

Town Centre

Civic and
Community Uses

Market Village

Learning Corridor

➤ Punggol's vibrant Town Centre will be expanded to the North-East, turning this area to a key destination for the North-East region.



PUNGGOL DIGITAL DISTRICT – learning corridor & market village



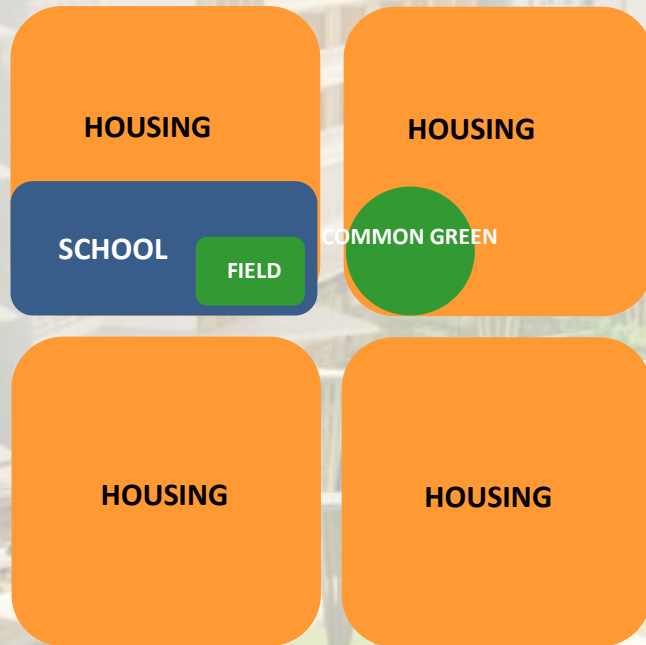
➤ More mixed uses with commercial, institutional and business uses could be introduced into Punggol Downtown

PUNGGOL DIGITAL DISTRICT – learning corridor & market village

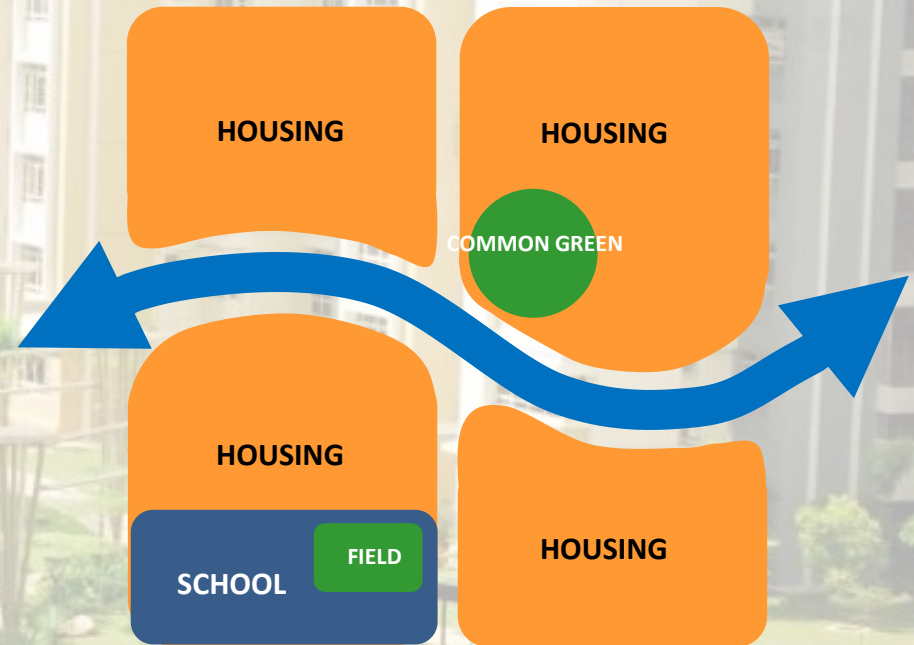


➤ Enjoy an interesting myriad of shops, restaurants and alfresco dining at this new marketplace, next to Punggol Promenade and the water's edge

HIGH QUALITY HOUSING



TYPICAL ESTATE

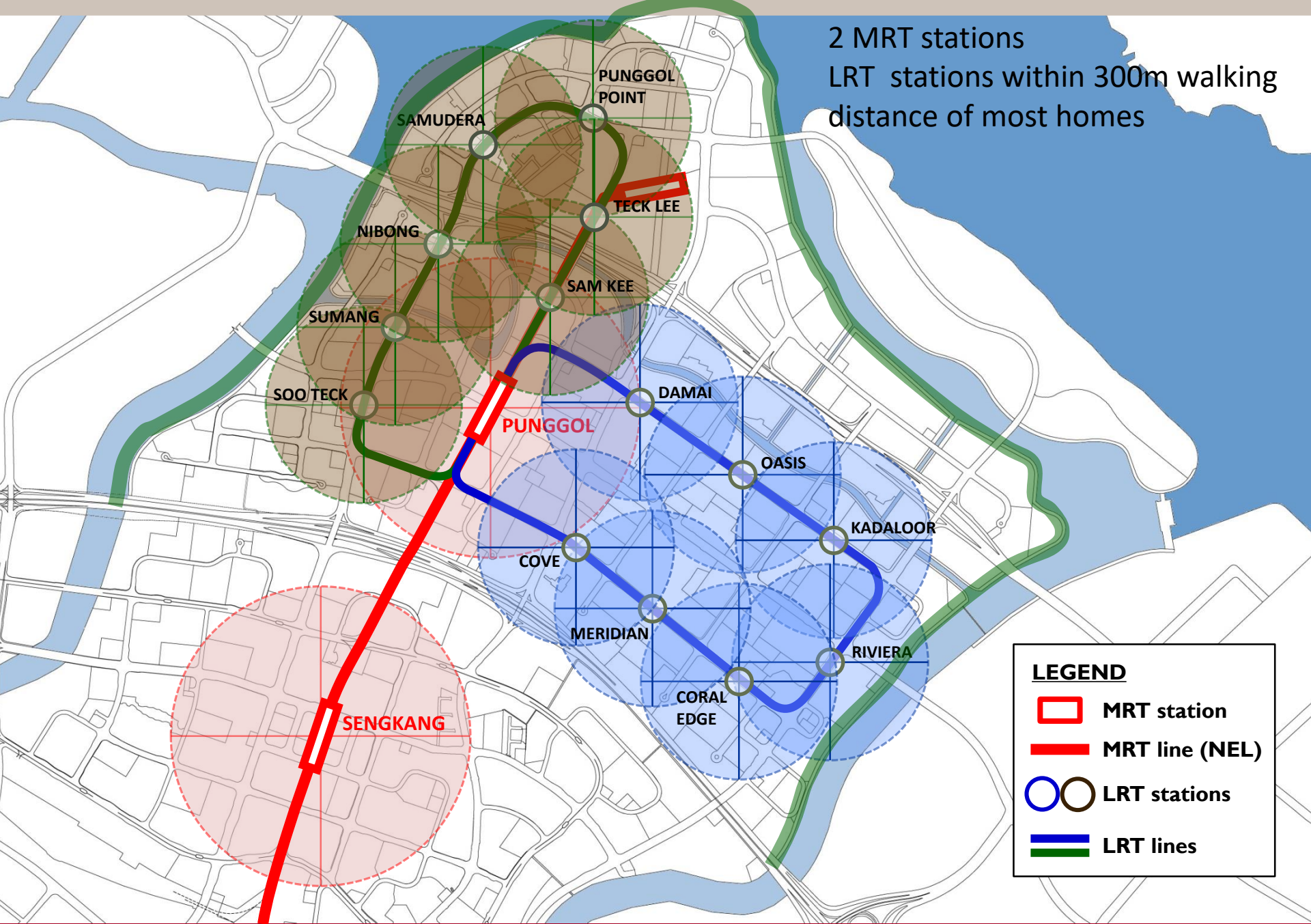


TYPICAL ESTATE

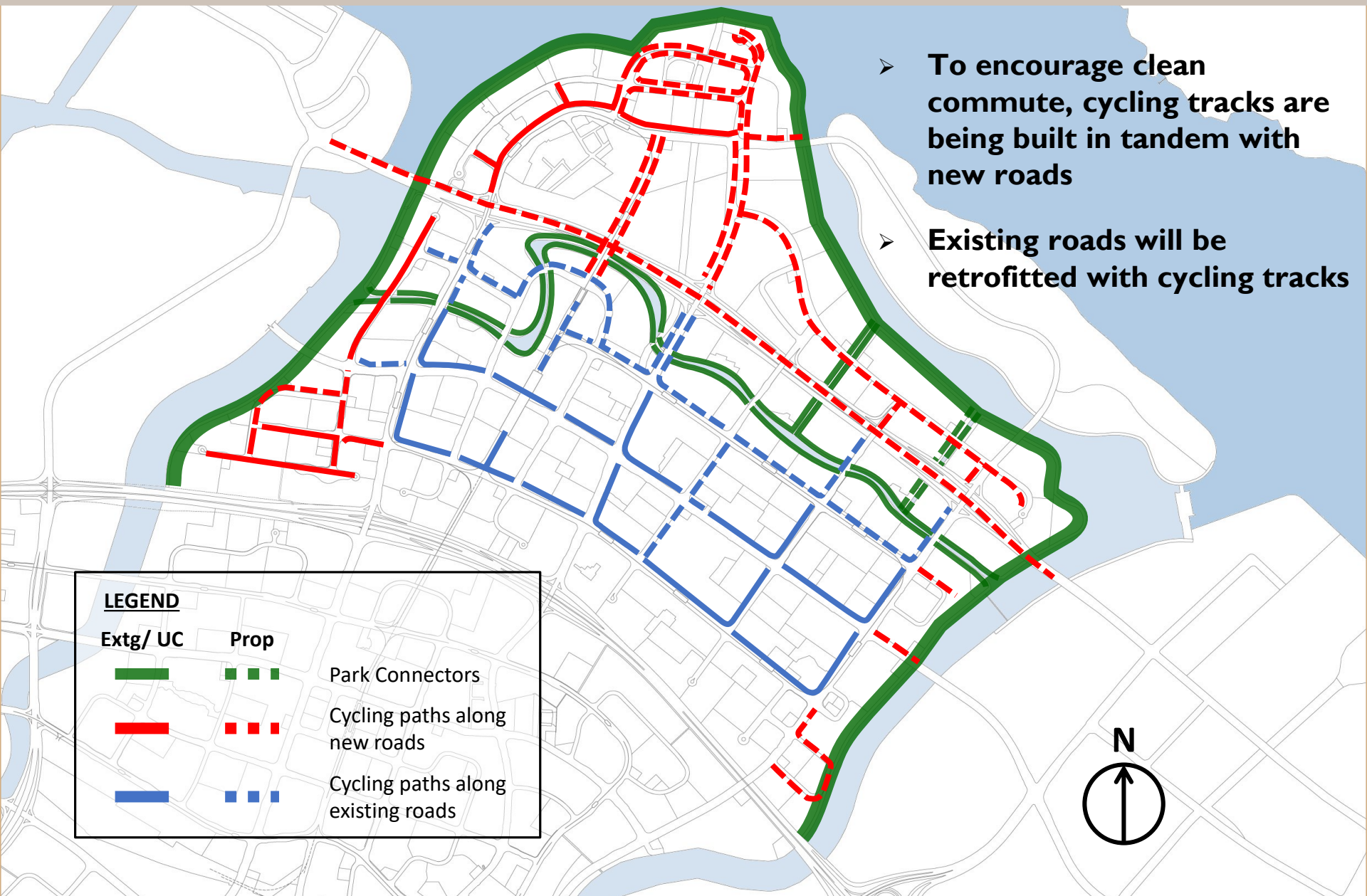
- **70 : 30 ratio of public to private housing**
- **Smaller estates for a more intimate scale**
- **(1,200 – 2,800 dwelling units) with common green**
- **Community spaces with a variety of 3-Generation facilities**

INTEGRATED TRANSPORT – RAIL

2 MRT stations
LRT stations within 300m walking
distance of most homes



INTEGRATED TRANSPORT – CYCLING NETWORK



COMPREHENSIVE FACILITIES



PUNGGOL TOWN SQUARE



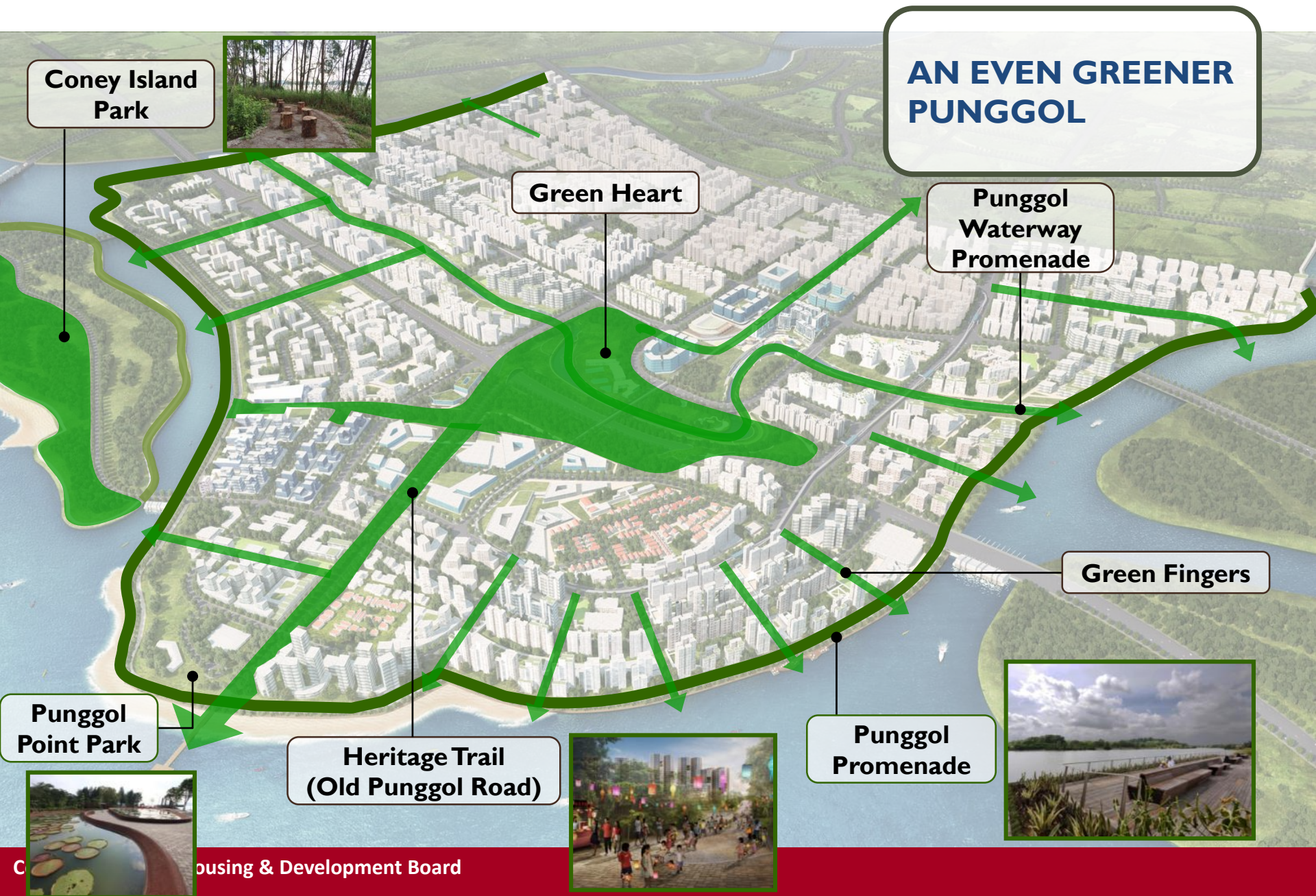
SAFRA CLUBHOUSE



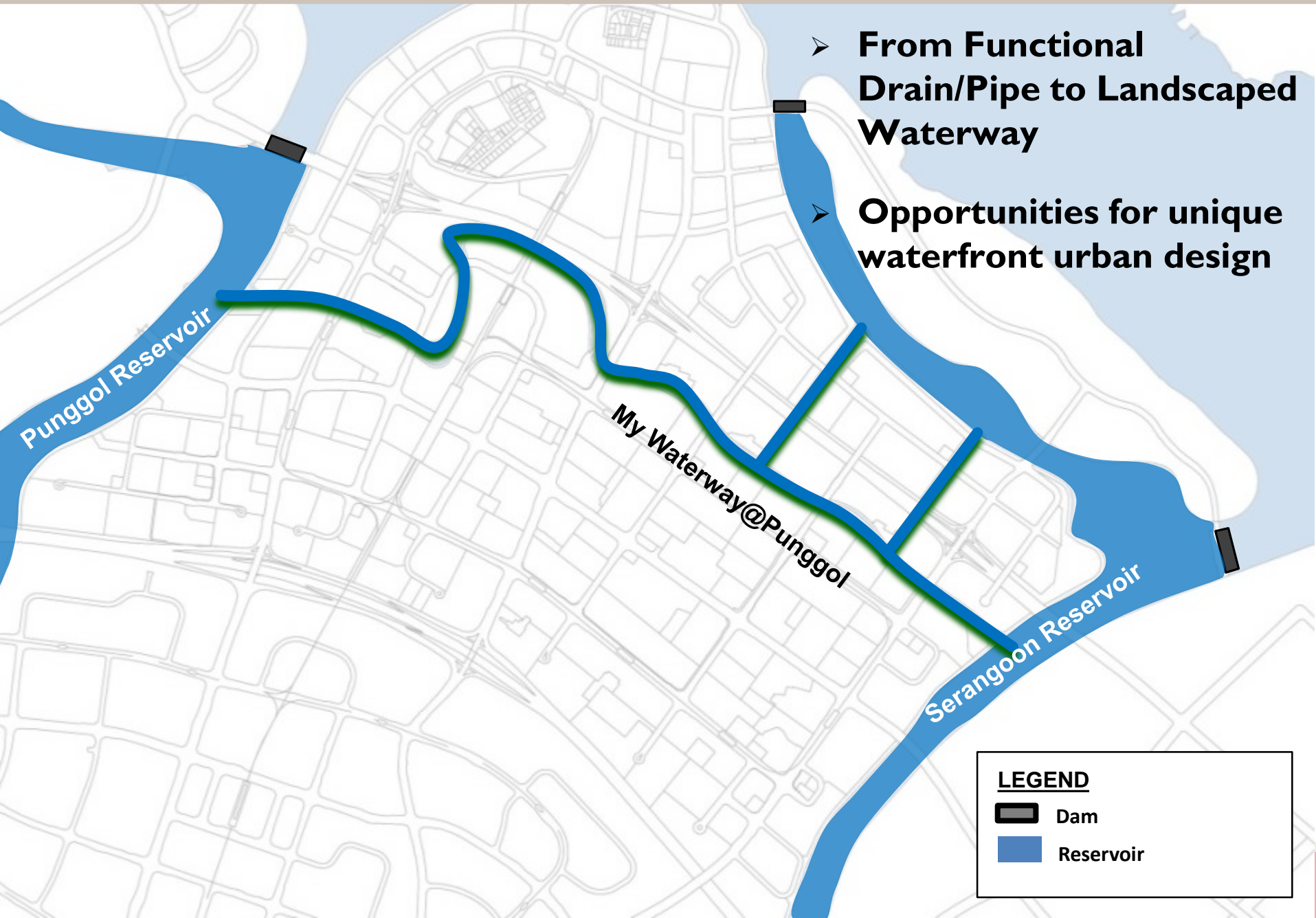
OASIS TERRACES



GREEN AND BLUE PLAN



GREEN AND BLUE PLAN



GREEN AND BLUE

- **Active, beautiful and clean**



GREEN AND BLUE





PUNGGOL ECO-TOWN

The Sustainable Waterfront Town in
the Tropics



ENERGY



URBAN
GREENERY



WASTE
& WATER



LIVING
ENVIRONMENT



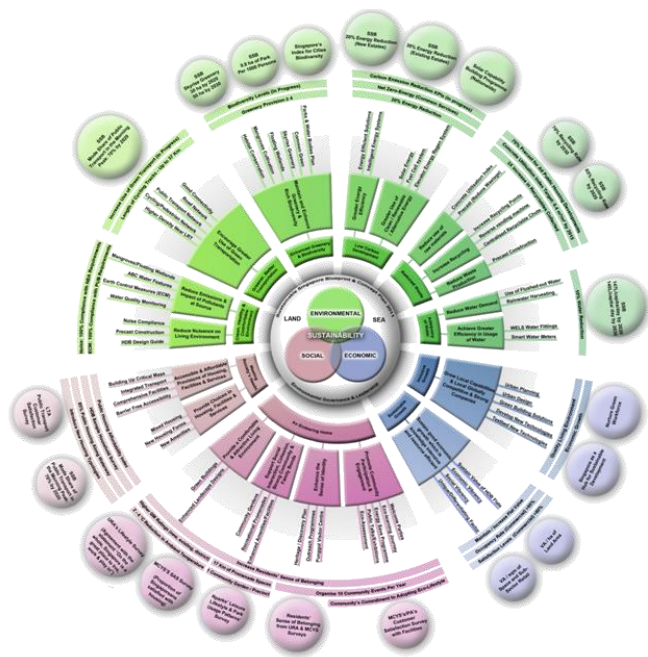
BUILDING
TECH

SUSTAINABLE INITIATIVES

- **Sustainability Development Framework**
- **Wind and Climatic Modelling**
- **Green Mark**
- **Green Plot Ratio**
- **Northshore District – A Smart and Sustainable District**

THE FUTURE IS GREEN

Sustainable Development Framework



Smart Town Framework

Liveable · Efficient · Sustainable · Safe

Applications and Services



Enabling Infrastructure



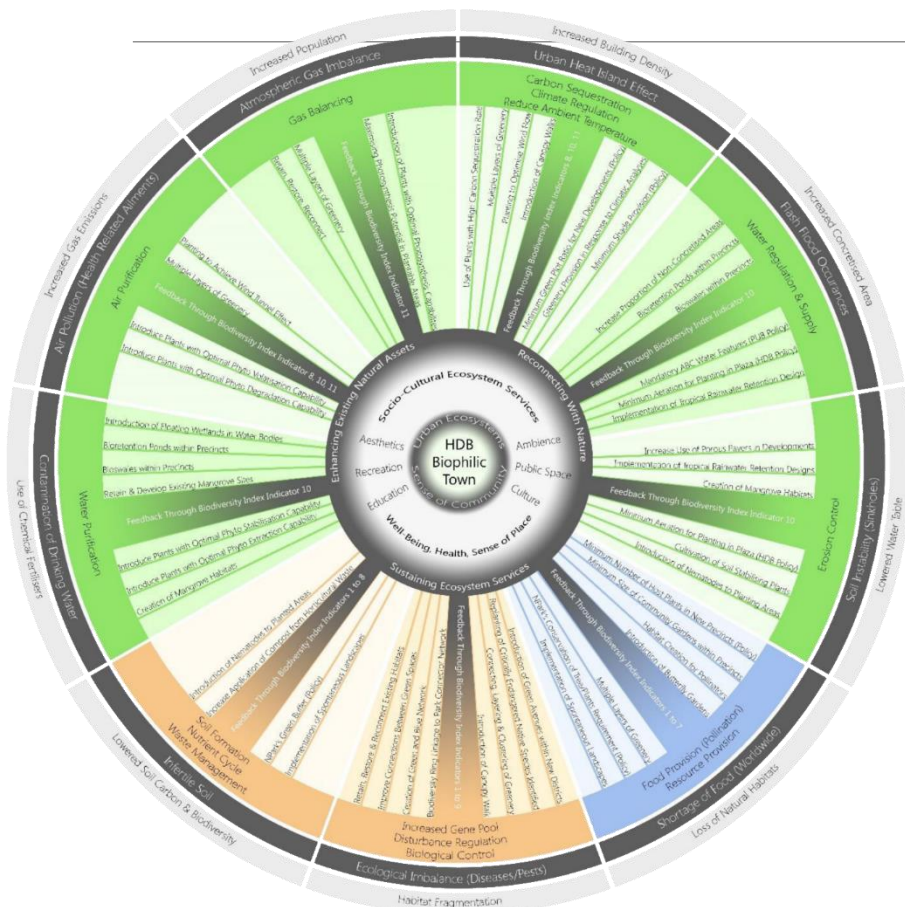
Develop a Town-wide Infrastructure

10 key desired outcomes

Environmental, Social & Economic Sustainability

THE FUTURE IS GREEN

CONFIDENTIAL



HDB Biophilic Town Framework

3 Components:

1. Respecting Nature
2. Greater Access to Nature
3. Making Nature Work Harder

KEY SUSTAINABLE INITIATIVES

PUNGGOL ECO-TOWN

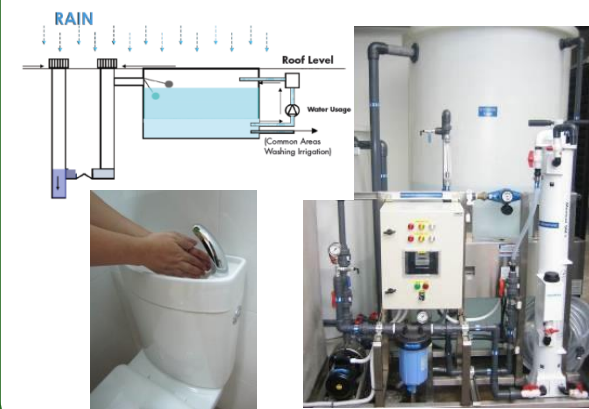
Low Carbon



Waste



Water



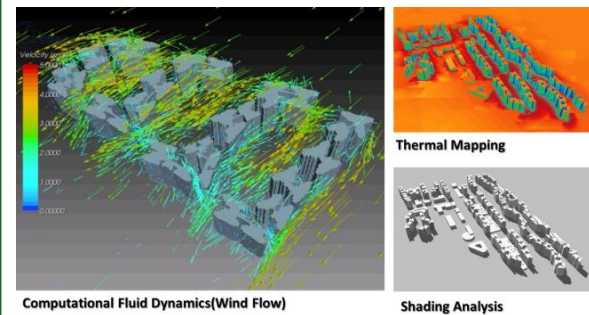
Greenery & Biodiversity



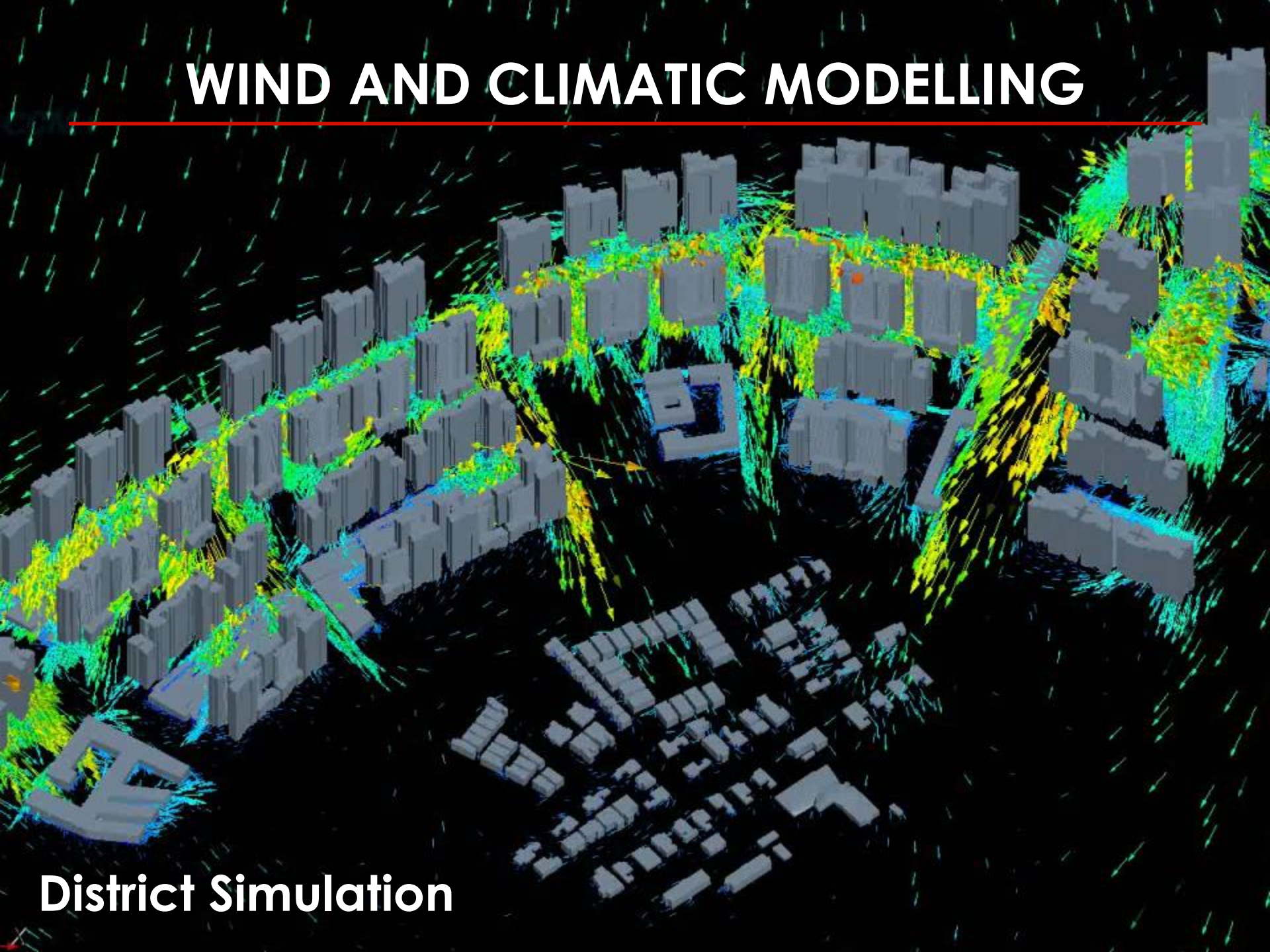
Greener Commute



Living Env

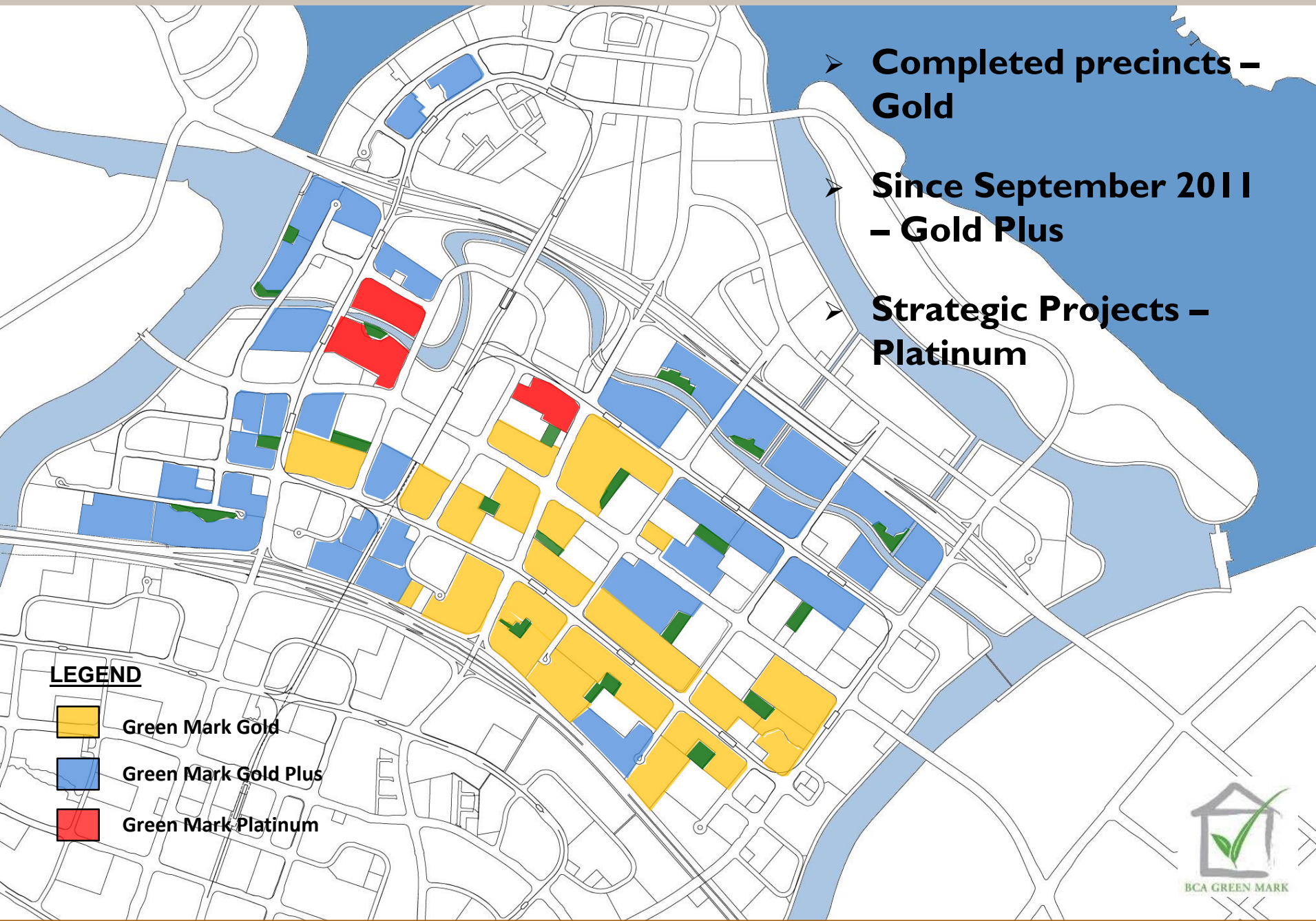


WIND AND CLIMATIC MODELLING



District Simulation

GREEN MARK



GREEN PLOT RATIO

- Green Plot Ratio is the ratio of total leaf area to site area
- Indicates Green Density
- Ensures minimum greenery provision

All precincts (excluding those with landscape deck)	= 3.5 to 4.0
Precincts with landscape deck	= 2.7 to 3.2



Typical Precinct
GnPR – 3.74



Landscape Deck – Constraints on tree planting
GnPR – 2.70

MODEL SMART DISTRICT - NORTHSHORE

- suite of Smart and sustainable initiatives to be implemented in the new public housing projects at Northshore District

Enhancing services and improving quality of living through the use of Smart urban solutions.

1 Smart Irrigation
Senses moisture levels in the soil to enable the irrigation of plants when required.

2 Smart Waste Management
Studying of waste level patterns allow optimisation of waste collection processes.

3 Smart Fan
Activated by human traffic, temperature and humidity to improve thermal comfort levels for people.

4 Smart Car Park
Monitors and temporarily avails the supply of unutilized season parking lots to visitors.

5 Smart Lighting
Optimises lighting levels in common areas based on human traffic patterns.

6 In-Home ICT Infrastructure
In-Home Information and Communications Technology (ICT) Infrastructure allows smart appliances and devices to communicate through a common platform.

7 Smart Elderly Alert System
The system learns the living habits of the elderly at home, and enables timely alerts to their caregiver when irregular patterns in behaviour are detected.

8 Home Energy Management System
Residents can track and manage their home energy consumption, and control their home appliances through this management system.

Visit www.hdb.gov.sg/futurehomesbetterlives to find out more!



Punggol Northshore

A Smart and Sustainable District

Creating a sustainable and comfortable living environment through the provision of green features and facilities.

9 Solar Ready Roof
Solar panels can be easily installed and integrated with building design.

10 Dragonfly Pond
Promotes biodiversity and brings nature closer to residents' doorstep.

11 Community Spaces
Integrated spaces for residents to interact and hold events.

12 Sky Garden
Pockets of lush greenery for residents to enjoy.

13 Stormwater Management System
Regulates and cleanses rainwater discharge.

14 2nd Storey Pedestrian Network
Connects directly between waterfront promenade and LRT station for residents' convenience.

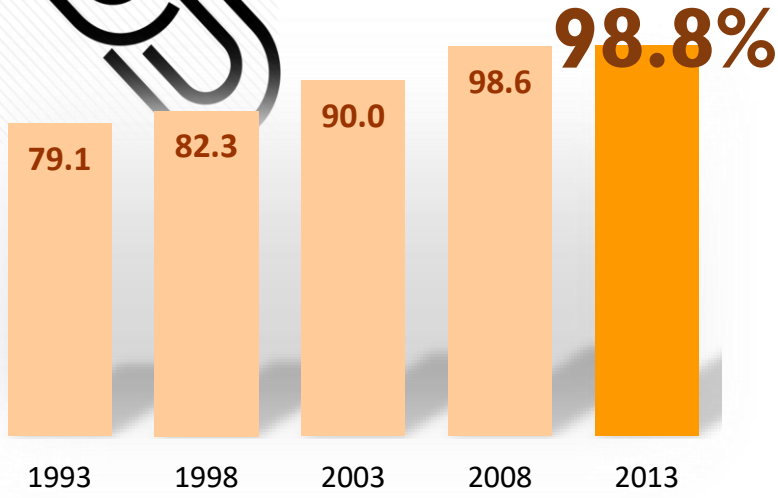
15 Green Commute
Comprehensive cycling networks and secure bicycle parking facilities promote green commuting.

16 Environmental Modelling
Climate modelling analysis helps to design for a comfortable and sustainable living environment.

Overview of HDB Living – Social

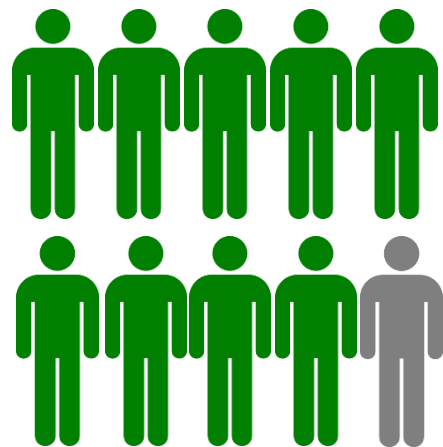
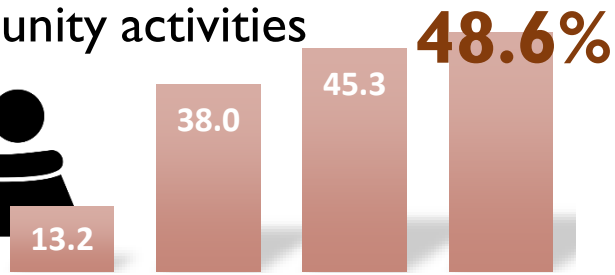
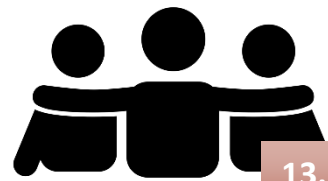


Increasing sense of belonging to town



85.7%
Interacted with
neighbours of other
ethnicities/nationalities

Increasing participation in
community activities



>9 in 10
Proud to be part of
the community

Overview of HDB Living – Physical



Nine in ten

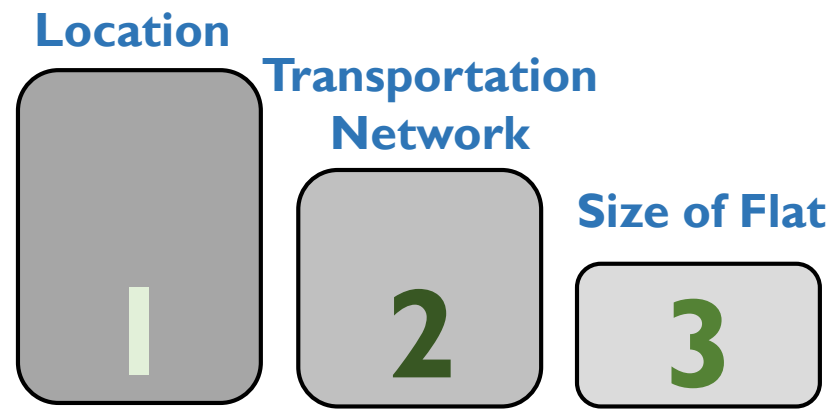
Satisfied with Neighbourhood

- ♥ Friendly environment/neighbours
- ♥ Quiet/peaceful environment
- ♥ Adequate provision of facilities
- ♥ Convenient location



Nine in ten

Satisfied with Estate Facilities



Most Liked Aspects about HDB Living Environment

My Waterway@Punggol

96.7%

Agreed that My Waterway@Punggol
adds **vibrancy** to the town

Unique experience living next to
the Waterway

Get to enjoy the view of the Waterway/
The scenery is nice

The Waterway offers a nice place
to exercise and relax

93.0%

Residents **satisfied** with My
Waterway@Punggol

My Waterway@Punggol

Satisfaction with Precinct Facilities



Precinct Pavilions



Playground

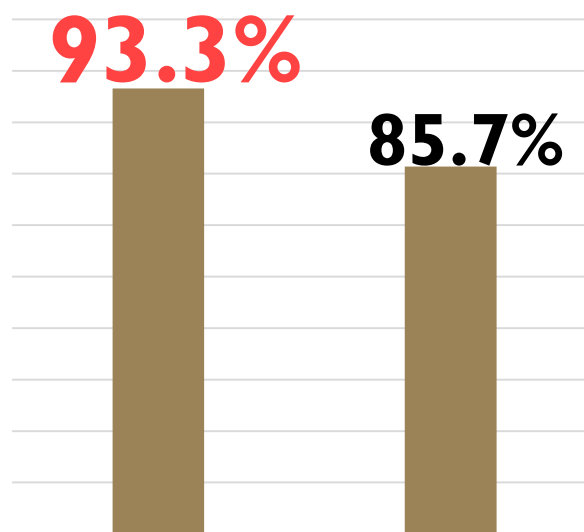


Drop-off Porch



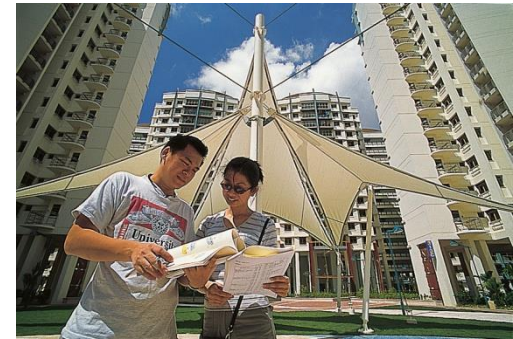
Rooftop Garden

Etc...



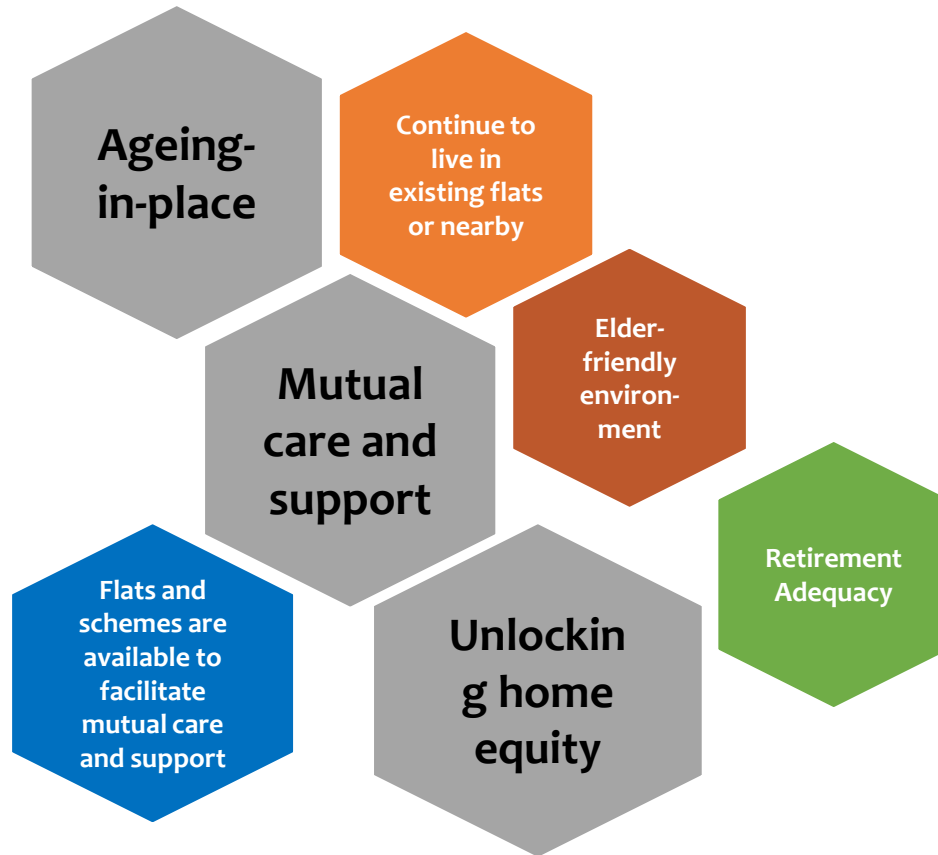
Waterway Contracts All Punggol Contracts

Ageing In Place :



AGEING IN PLACE

Planning for the Elderly

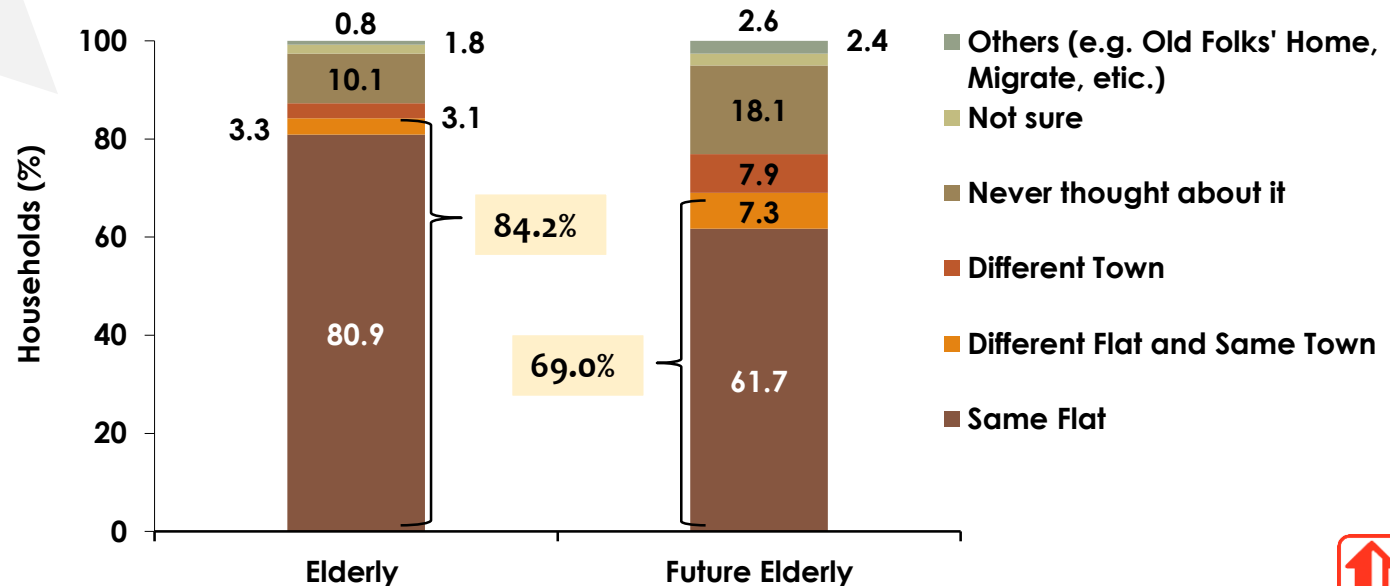


Planning for the Elderly

Aging-in-place | Mutual care and support

Where do you intend to live in your old age?

1. I must live in existing flat for as long as possible
2. I do not mind living in a different flat but must be in the same town
3. I do not mind living in a different flat and different town
4. I do not mind living anywhere except in an institution (e.g. old folks' home, nursing home)
5. I have not thought about it
6. I do not know what to do



Extracted from Sample Household Survey, 2013

Future Elderly refers to respondents surveyed who are not yet 55, but asked based on what they would like to have when they turn 55



Planning for the Elderly

Aging-in-place | Mutual care and support

Enhancement for Active Senior (EASE)

Helping seniors get around with Ease

74,000 households have opted for HDB scheme that makes flats elderly friendly

Yeo Sam Jo

When Mr Krishnamuthi Palappan had his left leg amputated a year ago due to complications from diabetes, moving around at home, especially when going to the toilet, became a struggle.

"It was very difficult to move from my wheelchair to the toilet seat," said the former security officer, who lives in Serangoon.

With the help of social workers, he applied for grab bars to be installed in his master bedroom toilet under the Housing Board's Enhancement for Active Senior (EASE) programme.

The scheme, which started in 2012, allows households with elderly members their flats with safety features such as grab bars, anti-slip tiles, and more. Homeowners pay only a small part of the cost.

Almost 70,000 households have applied for EASE in the first 12 months, said the Housing Board.

45,000 opted for Ease under the Home Improvement Programme, while another 28,600 applied for the safety features directly.

In response to feedback from residents and grassroots leaders, Ease was enhanced in August last year.

The minimum age criterion for direct applications was lowered from 70 to 65, and the improvements were extended to the second toilet in a flat. Because of this, 24,000 households had grab bars installed and slip-resistant floor treatment done in their second toilets.



"Going to the toilet is so much easier now"

Mr Krishnamuthi, 69



Jurong West resident Chew Ang Moh, whose house underwent the Home Improvement Programme in August, said the new anti-slip tiles and grab bars in his toilet has given him more confidence to move on his own in the shower. PHOTO: KEVIN LIM

"The anti-slip tiles and grab bars gave me more confidence to move on my own in the shower"

Mr Chew Ang Moh, 70



Slip-resistant treatment



Grab bars



Ramps

9 in 10 households satisfied with EASE

Helping seniors get around with Ease

(The Straits Times, Page B8, 25/12/2015)



Planning for the Elderly

Satisfaction Levels with Estate Facilities for Elderly among Elderly and Future Elderly

Facilities for Elderly	Households Satisfied (%)			
	2008		2013	
	Elderly	Future Elderly*	Elderly	Future Elderly
Bird singing corner	98.6	97.5	94.4	89.0
Support handbars in lifts/along corridor	98.2	97.4	97.9	96.7
Pebble walk	97.7	97.1	96.4	95.9
Fitness station for elderly	97.0	96.4	96.2	94.8
Ramp	96.9	97.7	97.2	97.5
Lift landings on all levels	96.5	96.0	95.5	94.4
Senior citizens' corner/centre	95.3	94.9	97.7	96.0
Benches/Seats/Tables	93.4	91.2	91.0	86.4

Extracted from Sample Household Survey, 2013

* Refers to respondents surveyed who are not yet 55, but asked based on what they would like to have when they turn 55

High Satisfaction Scores

Overall Perception of EASE

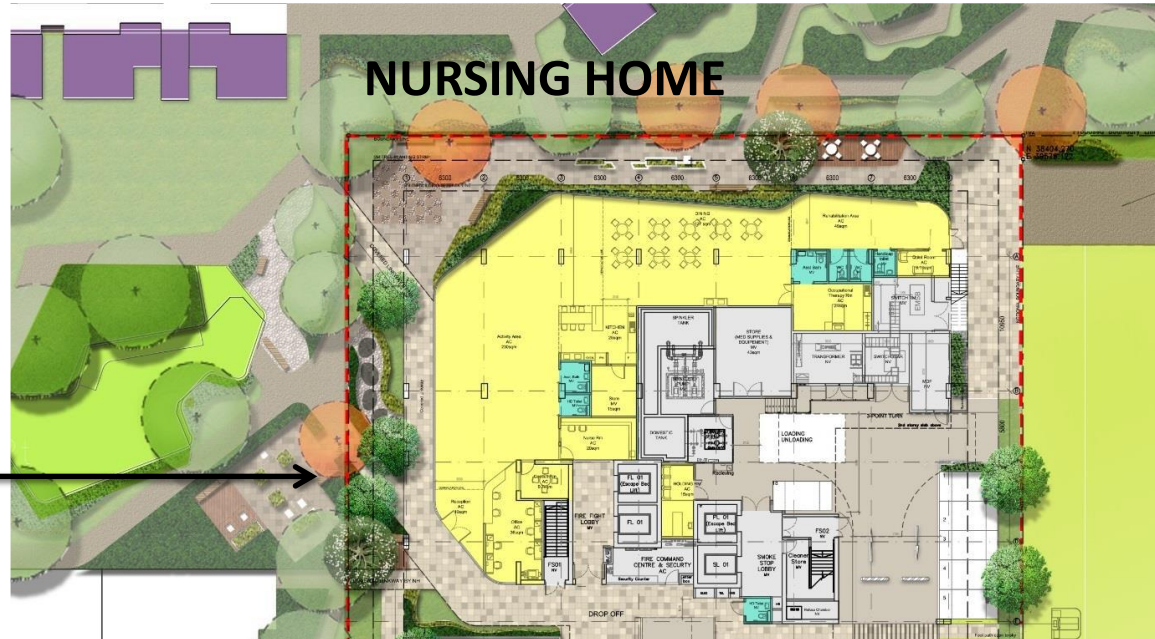
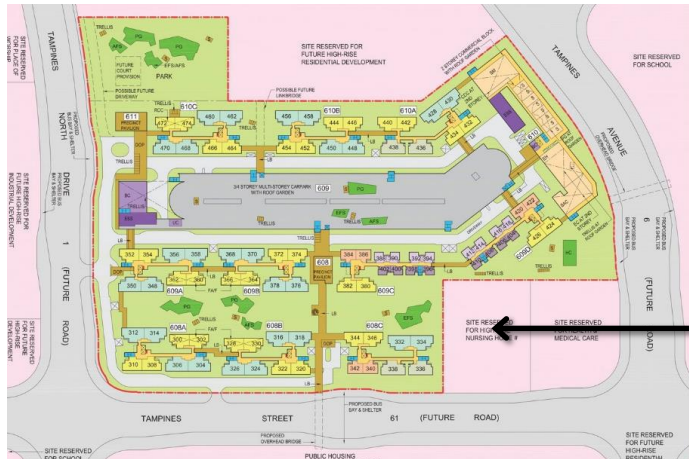
Aspect	All EASE Households (%)	
	Applied under EASE (Direct)	Applied under EASE (HIP)
Overall Satisfaction with EASE	99.1	96.7

Extracted from EASE survey, 2016

AGEING IN PLACE

Piloting horizontal co-location (e.g. Tampines Greenweave)

Promoting fenceless designs to better integrate NURSING HOME with PUBLIC HOUSING



2-room Flexi Scheme (from Nov 2015)

- HDB has discontinued Studio Apartments (SA) for the elderly
- For elderly citizens aged 55 and above
 - Flexibility of lease between 15 and 45 years in 5-year increments, covers up to the age of at least 95 years.



2-room Flexi Type 1 (36sqm)

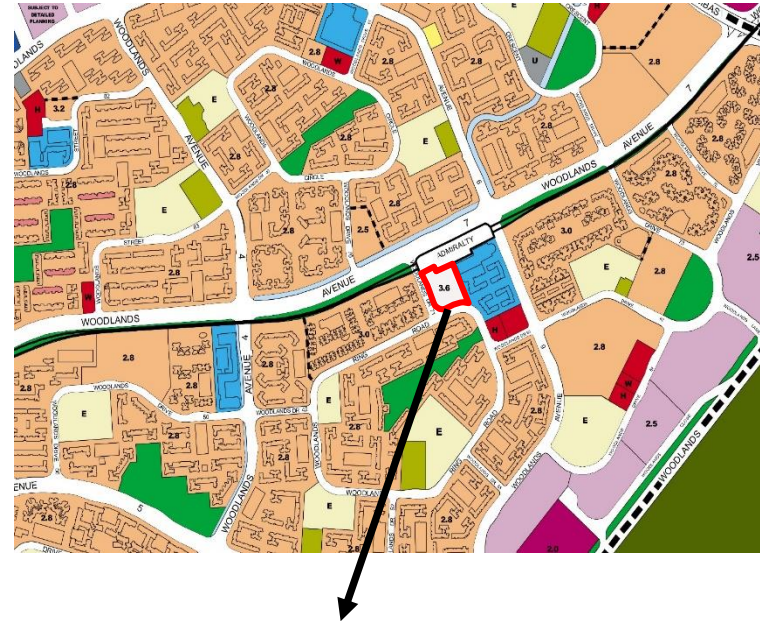


2-room Flexi Type 2 (45sqm)

Kampung Admiralty

Kampung Admiralty is an **integrated development**, that integrates residential with a range of healthcare, eldercare, childcare, and commercial facilities, and demonstrates the teamwork amongst 7 public agencies

- Housing & Development Board (HDB)
- Yishun Health Campus (YHC)
- Ministry of Health (MOH)
- National Environment Agency (NEA)
- Early Childhood Development Agency (ECDA)
- Land Transport Authority (LTA)
- National Parks Board (NParks)



Kampung Admiralty @ Admiralty MRT, Woodlands Town

KAMPUNG ADMIRALTY : Layering of Spaces



Site Area: 0.89 ha

Gross Floor Area: 32,332 sqm

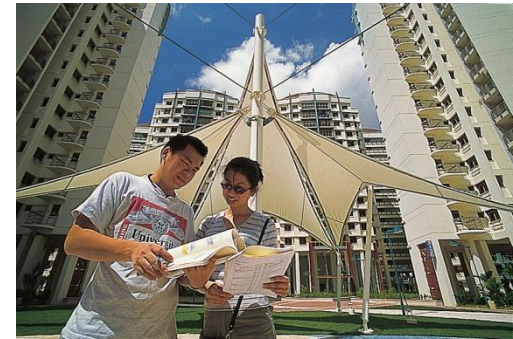
Gross Plot Ratio: 3.6

Housing for the Elderly



The two residential blocks for the elderly are connected to communal facilities such as lush green spaces and fitness corners. Induction Hob and retractable clothes drying rack are some of the new elderly-friendly features in the flats for seniors in Kampung Admiralty

Tengah Forest & Biophilic Town



TRANSFORMATION OF THE WESTERN REGION



JURONG INNOVATION DISTRICT

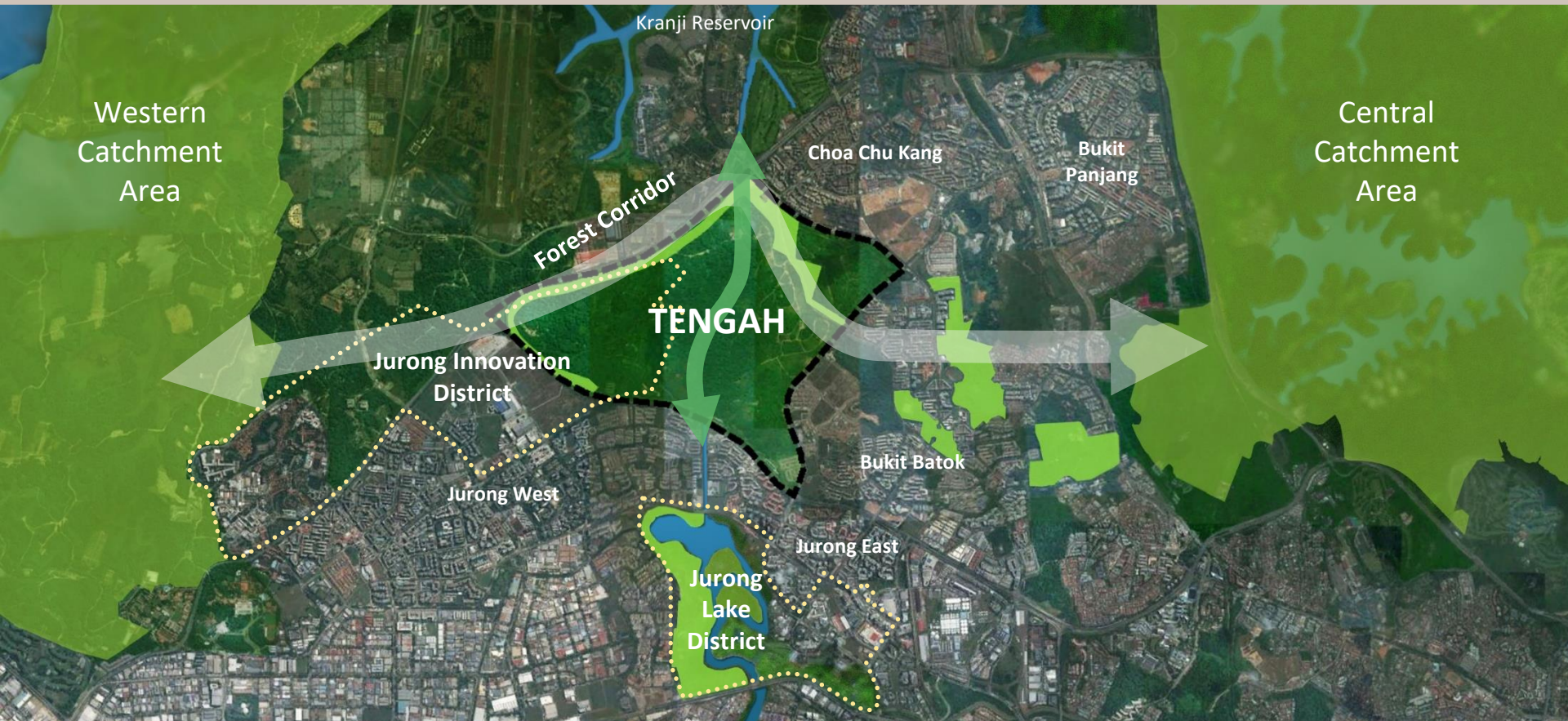
A workplace of the future, it will be integrated with Tengah Town, and support the transformation of Singapore's manufacturing landscape

JURONG LAKE DISTRICT

District of the Future High speed rail

The **24th** HDB town
Singapore's **1st "Forest Town"**
Occupies about **700 hectares** of land
Comprise up to **42,000** new homes
Launched from **November 2018** progressively

Evergreen Forest Town



An Evergreen Forest Town

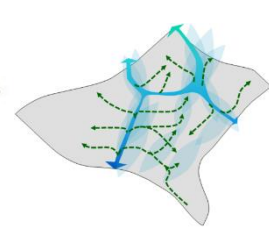
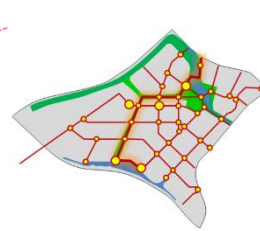
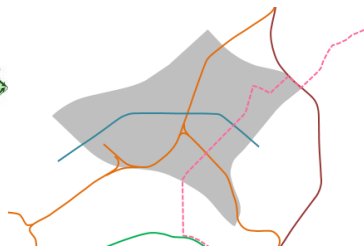
Move around with Ease

Walk & Cycle Everywhere

Close-knit Communities

Five Crafted Districts

Smart & Sustainable



ANATOMY OF TENGAH – 6 BIG IDEAS

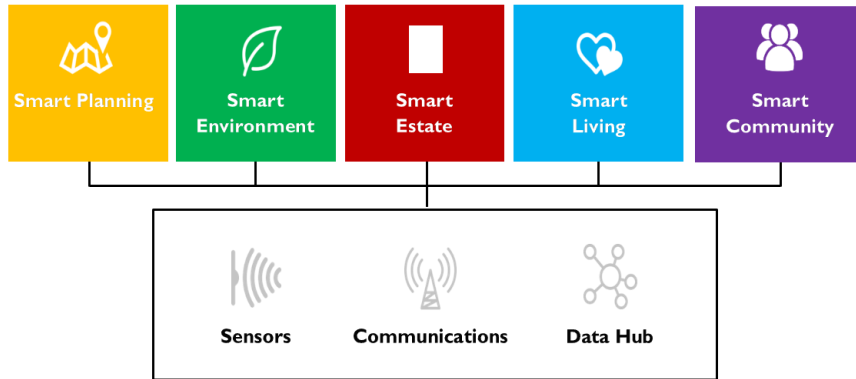
EVERGREEN FOREST TOWN



SMART AND SUSTAINABLE

HDB Smart Town Framework

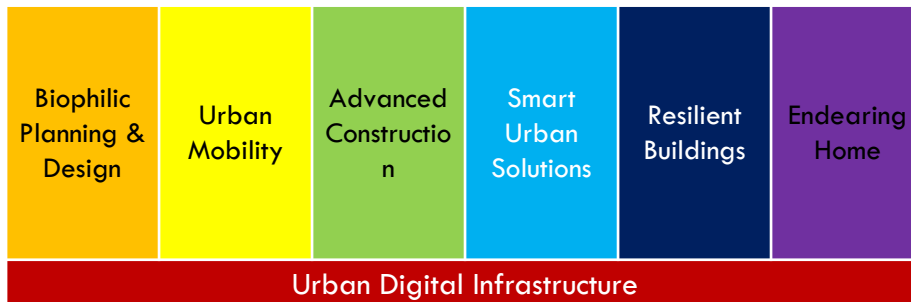
Liveable · Efficient · Sustainable · Safe



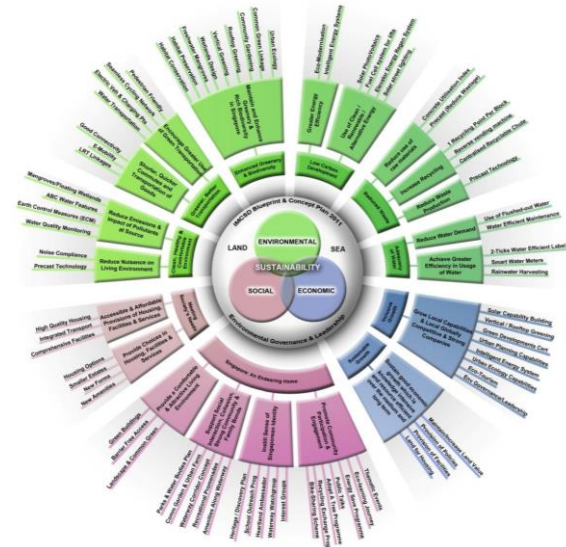
Develop a Town-wide Infrastructure

Living Lab Layers

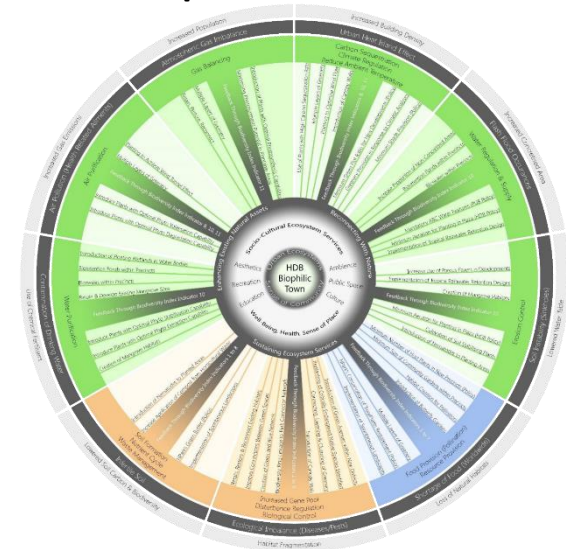
Tengah – Sustainable, Smart, Endearing



HDB SUSTAINABLE DEVELOPMENT FRAMEWORK



HDB Biophilic Town Framework



CAR-FREE TOWN CENTRE



NEW HOUSING IN PLANTATION DISTRICT



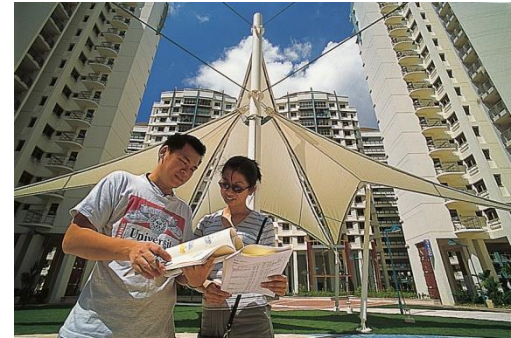
CONCLUSION

Key Success Factors

- Strong government support
- Emphasis on Homeownership
- Comprehensive Town Planning
- Close Coordination with Agencies
- Continuous estate renewal and rejuvenation

Singapore's public housing development will continue to evolve to meet the changing needs and aspirations of Singaporeans

Video



Thank You
