



# SINGAPORE

## SHAPING THE SALUTOGENIC CITY FOR RESILIENT FUTURE

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National University of Singapore



# SINGAPORE

CITY in NATURE & **RESILIENT** FUTURE



**INTRODUCTION**

*to*

**RESILIENT**

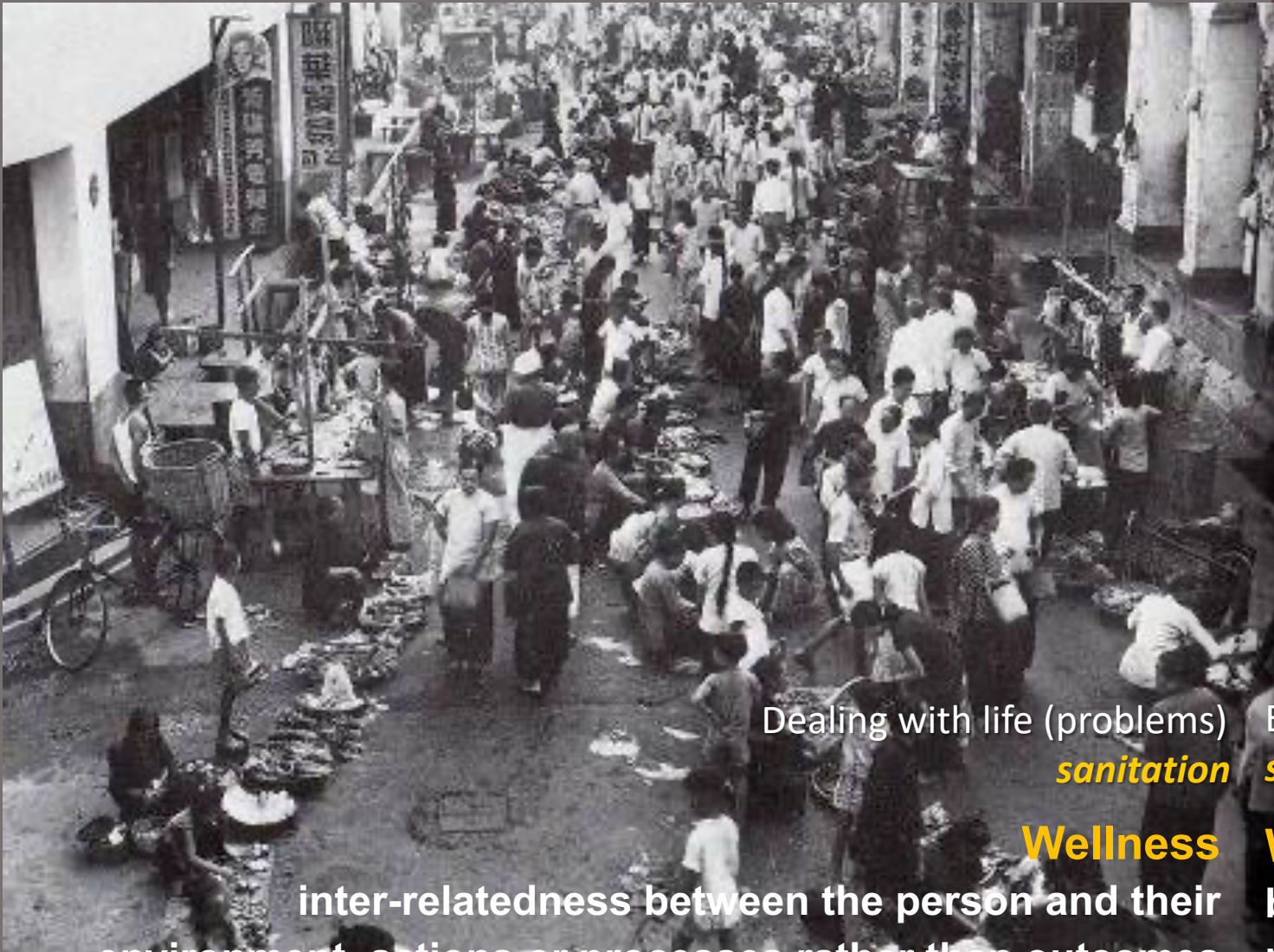
CITY IN NATURE

*design paradigms*



# Resilient city in the Era of Changes

China town - Singapore



Dealing with life (problems)  
*sanitation*

**Wellness**

inter-relatedness between the person and their environment, actions or processes rather than outcomes



Escaping from (life) problems  
*stress*

**Wellbeing**

balance point between an individual's resource pool and the challenges faced



# CONTEXT NOW ERA of CHANGES

GLOBALIZED / CORPORATE WORLD

**SHARED ECONOMY**

THE END OF HISTORY - FUKUYAMA

DEREGULATED CAPITALISM

**GLOBAL UNCERTAINTY**

**SOCIAL INEQUALITY**

FADEING HUMANISM

**AGEING POPULATION**

MILLENIALS, Gen Z, Gen Alpha

**RETIREMENT AS UTOPIA**

**HEALTHCARE AS PERSONAL RESPONSIBIITY**

**12 -14 WORK +**

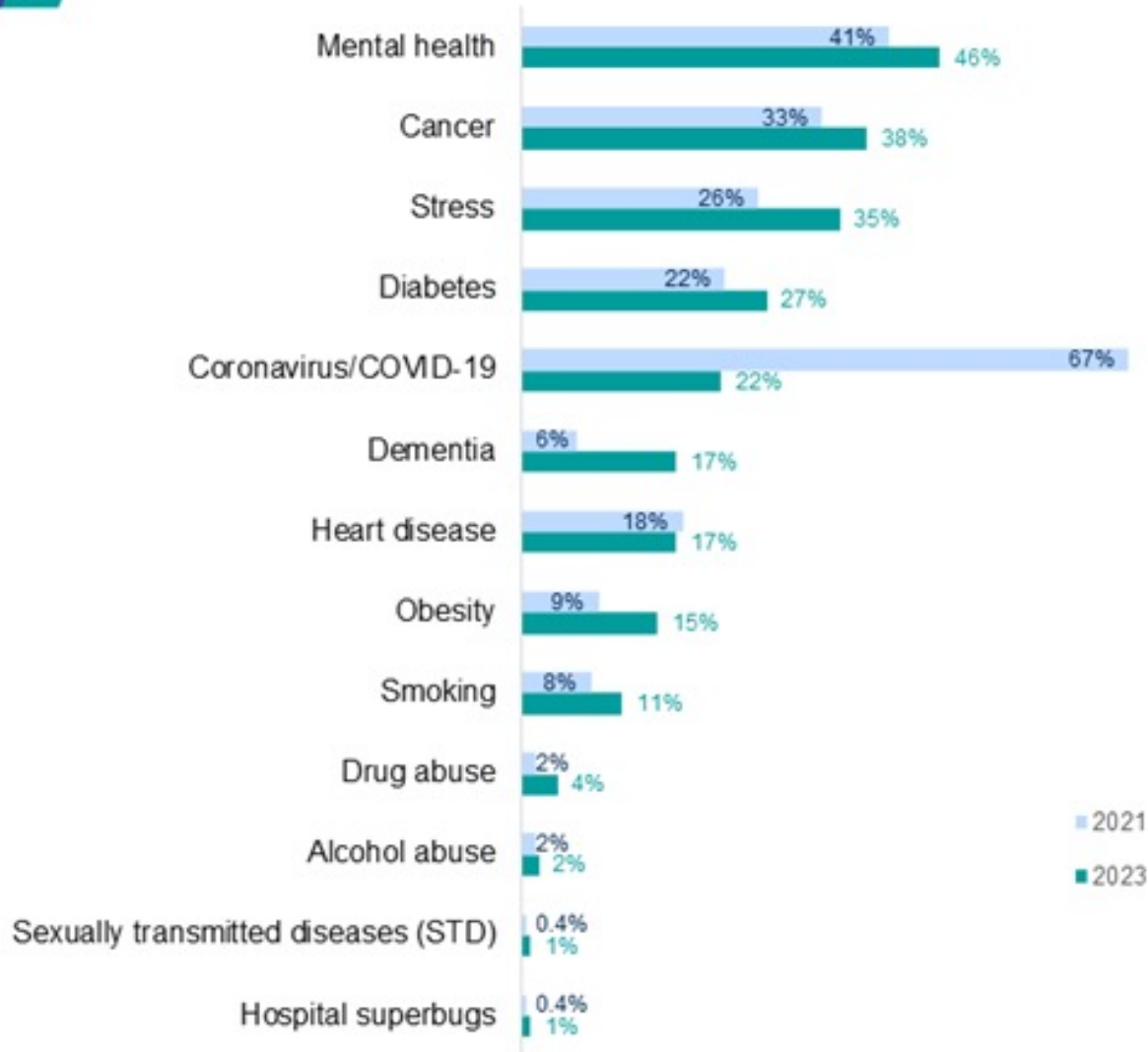
6 Sleep +

4 Live ? +

Transition from **Athens Charter's** functional zoned city to **Smart City**



## Top Health Problems Facing Singapore as Perceived by Singaporeans



2023 Base: 1,001 adults aged 21 – 74 years in Singapore, July 21 – August 4, 2023.

2021 Base: 500 adults aged 21 – 74 years in Singapore, August 20 – September 3, 2021.

<https://www.ipsos.com/en-sg/singaporeans-deem-mental-health-biggest-health-problem>

## facts

life expectancy over 84,

1 in 5 over 65 years by 2030

drop in total fertility rate to 0,9 in 2023

household size (drop to 3,15)

education level -63.1% post-secondary education

Building *more* is an immediate but partial solution, building

# *different*

is a necessity



News, wherever you are.

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We set you thinking  
**TODAY**

WEDNESDAY 22 MAY 2019

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Singapore

World

Big Read

Opinion

Visuals

Brand Spotlight

8 DAYS



## Well-dressed, successful, and depressed: 'High-functioning' depression seen in more patients

<https://www.todayonline.com/singapore/well-dressed-successful-and-depressed-high-functioning-depression-seen-more-patients>



UIA proclaimed 2022 as the

## Year of Design for Health

3 Pillars of the SG Health System

1 Individual

2 Society

3 Government

Healthcare system is ranked first in the world in 2023

health index score of 86.9



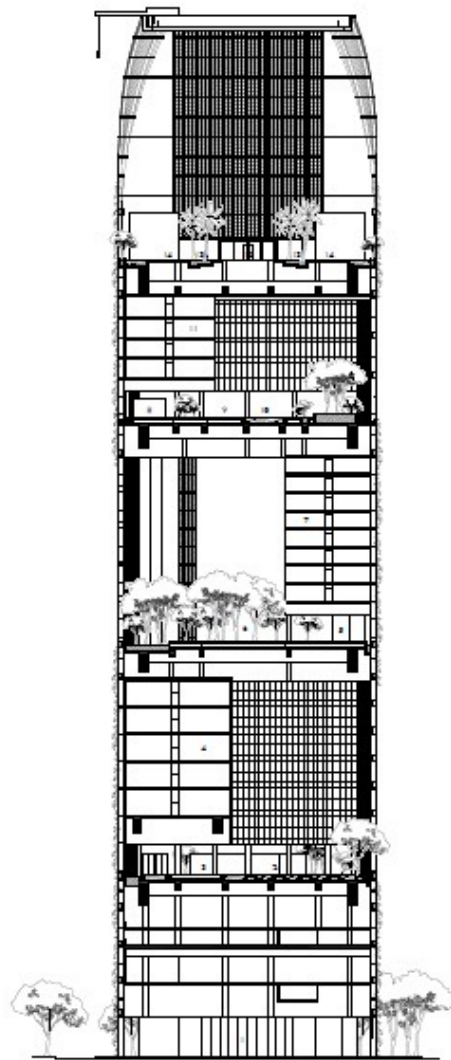






Image Courtesy © Patrick Bingham-H





Khoo Teck Puat Hospital



photo courtesy of : CPG corporation

Ng Teng Fong Hospital





# Khoo Teck Puat Hospital

ward view to roof top garden  
melted with the public domain



**Farming** roof top level





## Ng Teng Fong Hospital



**“EVERY PATIENT HAS A VIEW”**  
*privacy in multi-bed room*



**RISE** *of the*  
**RESILIENT**  
CITY IN NATURE

Although **sanitation, safety** and **efficiency** of urban services and **systems** still defines public health, the imminent future of a *healthy* Singapore transcends dependency on system provisions and relies on **urban & human resilience** rooted in **connectedness**

**Access to IT** (99% households, 99.7% HP owners).

**Gig economy** is attracting more young people (257K in 2022)

**Entrepreneurship – interdisciplinarity** raising economic survival skills





Workplace  
Safety Health

Building  
Inspection &  
Maintain-  
ability

IAQ &  
Energy

Solar PV  
& Smart  
Grid

5G  
NUS 5G Lab  
Smart FM  
Buildings

Building  
Information  
Modelling

5G Drones  
AI Robotics  
AG Vehicles

5G AR VR  
Immersive  
Learning

Digital  
Construction  
3D Printing

Smart  
Digital IoT  
Buildings

Smart  
Facilities  
Management

Nano  
Building  
Materials

Vertical  
Urban  
Farming

# LTPR Themes

URA "LONG TERM PLAN REVIEW" - Strategic document shaping the FUTURE

## URA

URBAN  
REDEVELOPMENT  
AUTHORITY

**Live**

WELL AND TOGETHER

**Cherish**

DISTINCTIVE AND LOVEABLE

**Work**

ANYWHERE AND EVERYWHERE

**Sustain**

LOW-CARBON AND RESILIENT

**Play**

HEALTHY AND HAPPY

**Steward**

THE GREEN AND BLUE

**Move**

EFFICIENT AND CONNECTED

**Paya Lebar  
Air Base**

THE NEXT FLIGHT



# NAIS 2.0

SINGAPORE NATIONAL AI STRATEGY

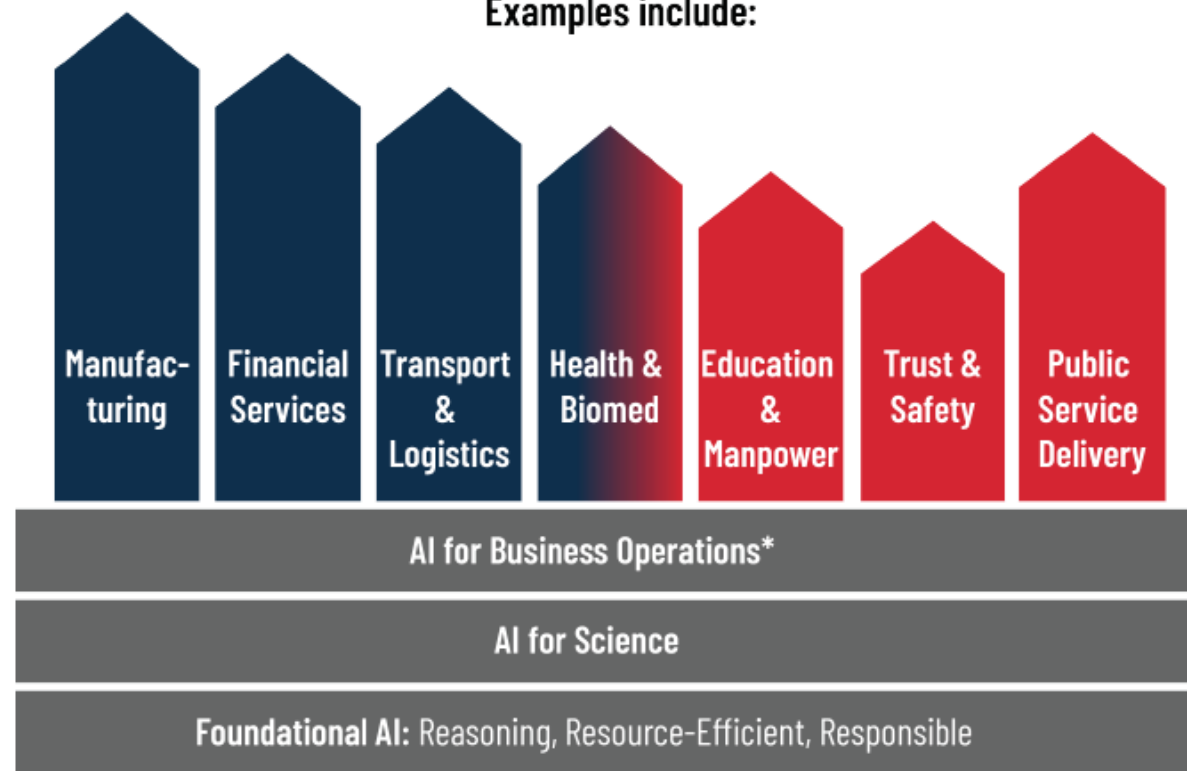
AI for the Public Good  
For Singapore and the World



## Leading Economic Sectors

## Smart Nation Priorities

Examples include:



## Cross-cutting Capabilities

\* E.g. customer relationship management, finance, human resources, legal, sales and marketing, and supply chain.



# 5GSG : Enabler for the next wave of growth in the digital economy

**SG:D**  
EMPOWERING POSSIBILITIES

**IM** INFOCOMM  
MEDIA  
DEVELOPMENT  
AUTHORITY

## PRIMING THE 5GSG ECOSYSTEM IN 4 FOCUS AREAS



## 5GSG: AIMS TO BE A GLOBAL FRONT-RUNNER FOR INNOVATION IN SECURE AND RESILIENT 5G APPLICATIONS AND SERVICES

### WHAT IS 5G?



Full fledged 5G stand alone (SA) capability covering at least half of Singapore by end 2022

Among the first wave of countries to roll out SA 5G NETWORKS

### MILESTONES

2019	MARCH	MAY	JUNE	OCTOBER
	IMDA-PSA opened 5G Trial Tech Call for Ports	2 <sup>nd</sup> Public Consultation	\$40M grant announced for 5G innovation	Launch of Call for Proposal
2020	Singapore is on track to commence 5G deployment			

**\$40M** to kickstart trials  
6 CLUSTERS AS A START

Trials expected to be progressively conducted  
**FROM 4Q 2019**





# RESILIENT SINGAPORE

## Diverse and Robust **Infrastructure**

*Green and Blue Infrastructure, water management*

## Economic Diversity and **Innovation**

Risk Reduction, Preparedness and Response

## **Smart** and Sustainable Development

*Information and Communication Technologies (ICT)*

## Effective Governance and **Leadership**

## **Community** Engagement and Participation

Social Cohesion, Inclusion and Equity

## **Adaptive Planning and Design**

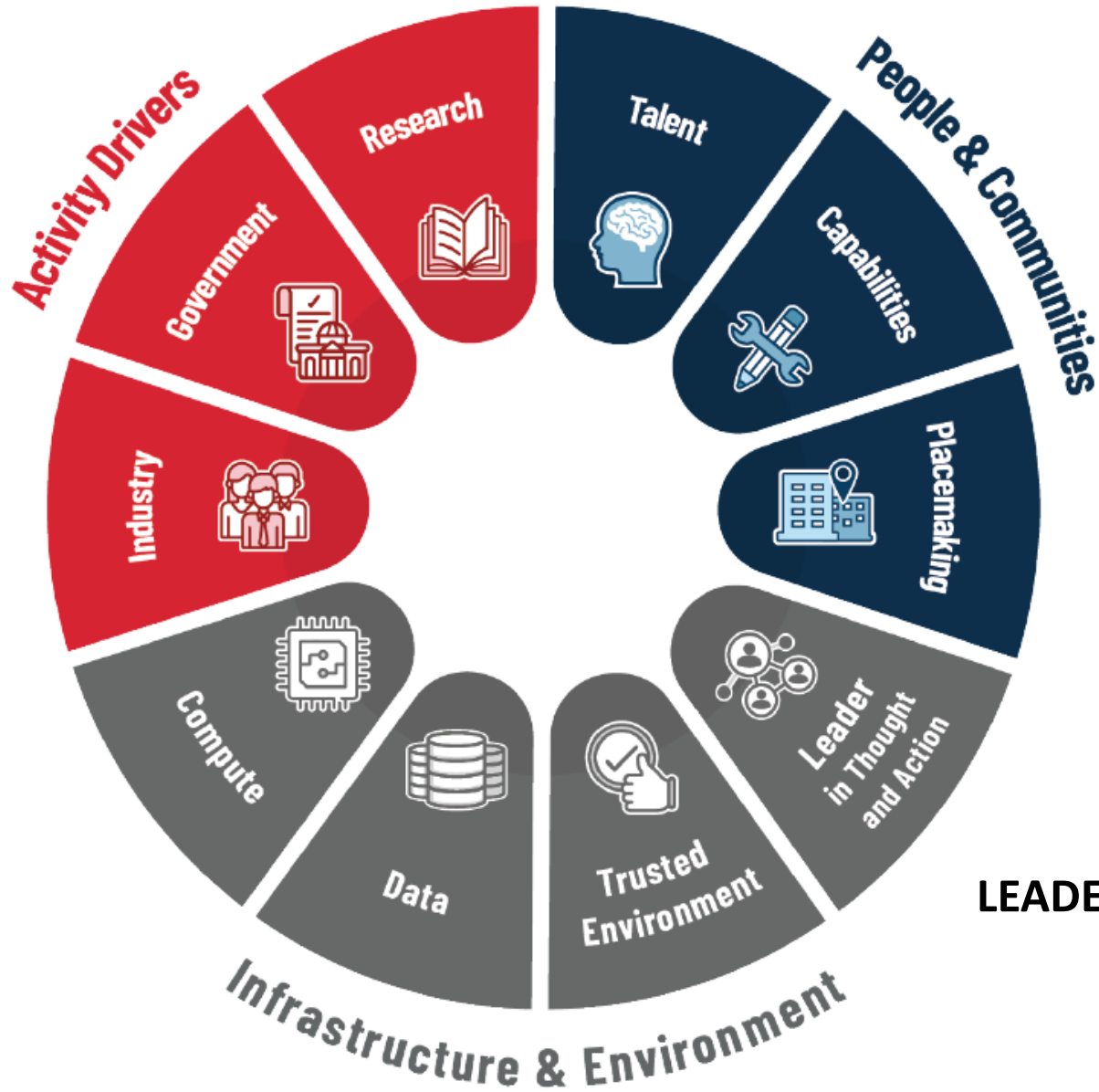
**Environmental Sustainability**

**Continuous Learning and Adaptation**

## Integrated Urban Planning:

land use, infrastructure development, and environmental sustainability are carefully coordinated to optimize space utilization, enhance **connectivity**, and mitigate risks associated with rapid urbanization





LEADER in

**NUS**  
**THOUGHT & ACTION**



TO THE FUTURE!!

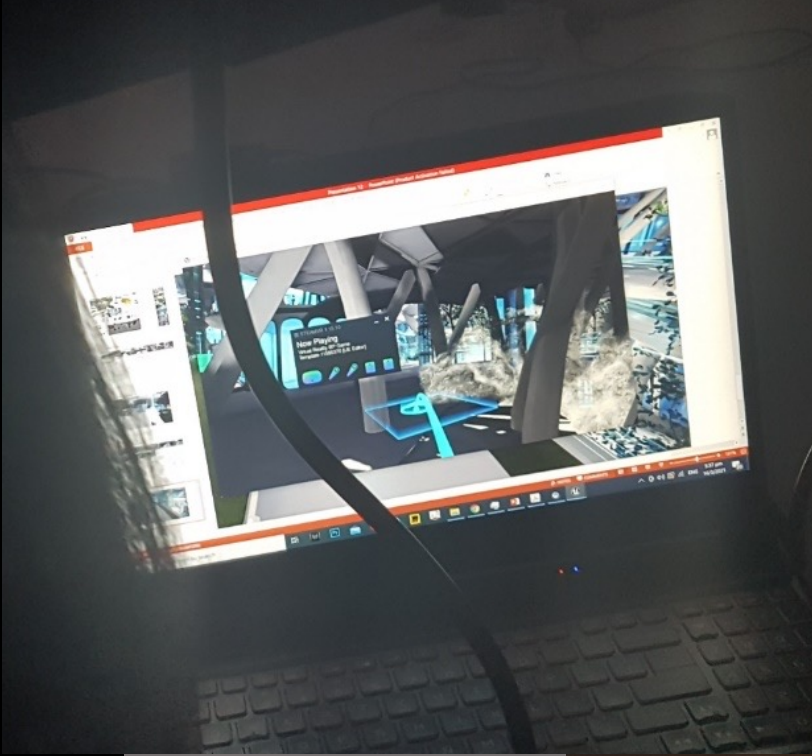


OR TO OUR EXHIBITION AT NLB!

#WaMM

Public Crit

7 December 2019, 11AM-430PM



Relaying on VR for experimentation, testing and presentations



**DESIGN RESEARCH**

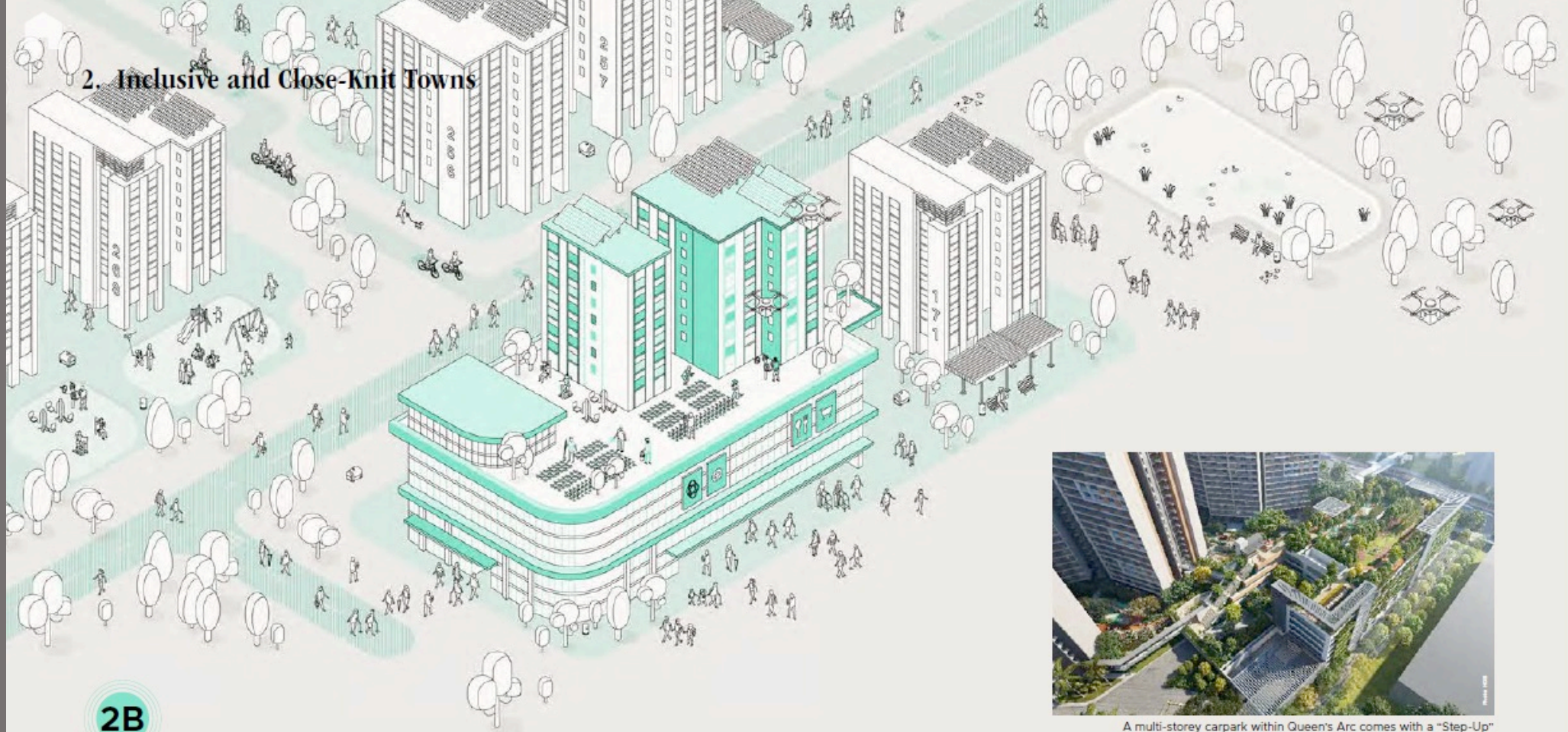
**PREMISES**

**METHODS**

*rethinking design paradigms*



## 2. Inclusive and Close-Knit Towns



2B

## Planning for Health and Well-Being for All Ages

A more resident-centric approach to planning and designing can create a built environment that promotes healthy lifestyles and social connections.



A multi-storey carpark within Queen's Arc comes with a "Step-Up" staircase as well as a roof garden with fitness facilities and jogging loop to encourage residents to keep fit.

## Health District @ Queenstown

Led by HDB, NUHS and NUS, this first-of-its-kind multi-stakeholder collaboration pilots initiatives that promote healthy and purposeful lifestyles in the district. These will be backed by science and co-created with residents and community partners. Viable solutions can then be implemented in towns across Singapore.

Queenstown Health District

<https://www.hdb.gov.sg/cs/infoweb/about-us/news-and-publications/publications/dwellings/Health-District-Queenstown>





What if...



**...our play spaces  
are fused within  
the cityscape to  
ignite our inner  
child-like wonder?**

**“Most people cite the future of play as one that will be based indoors, shaped by virtual reality or enabled by digital technology. However, I hope for future playscapes to be even more experiential, physical, outdoor-oriented and integrated with nature.”**

Jackson Tan, co-founder of creative agency BLACK and creator of Art-Zoo, dreams of a playful city integrated with spaces inspired by his childhood memories of playing at animal-themed playgrounds.

# SMART, WELL, RESILIENT *umbrella topic / title*

Main **goals** set ahead:

1. To understand the **nature of urban change** leading to Salutogenic and resilient city for the future.
2. To look at the transformation at three different scales:
  - 2.1. **MICRO**  
**social housing** transformation +  
**primary healthcare** delivery and integration
  - 2.2. **MEZZO**  
design transformation of **business district**, office buildings, and in-between urban grey-space rethinking other **public-building typologies**
  - 2.3. **MACRO**  
Urban “tube”, designing linear, independent **urban domains with distinct character**
3. To generate designs driven by:  
**smart technologies, holism, social responsiveness**



**MICRO SCALE**

**HOUSING**

PRIMARY HEALTHCARE



HDB blocks





The Pinnacle at Duxton plain

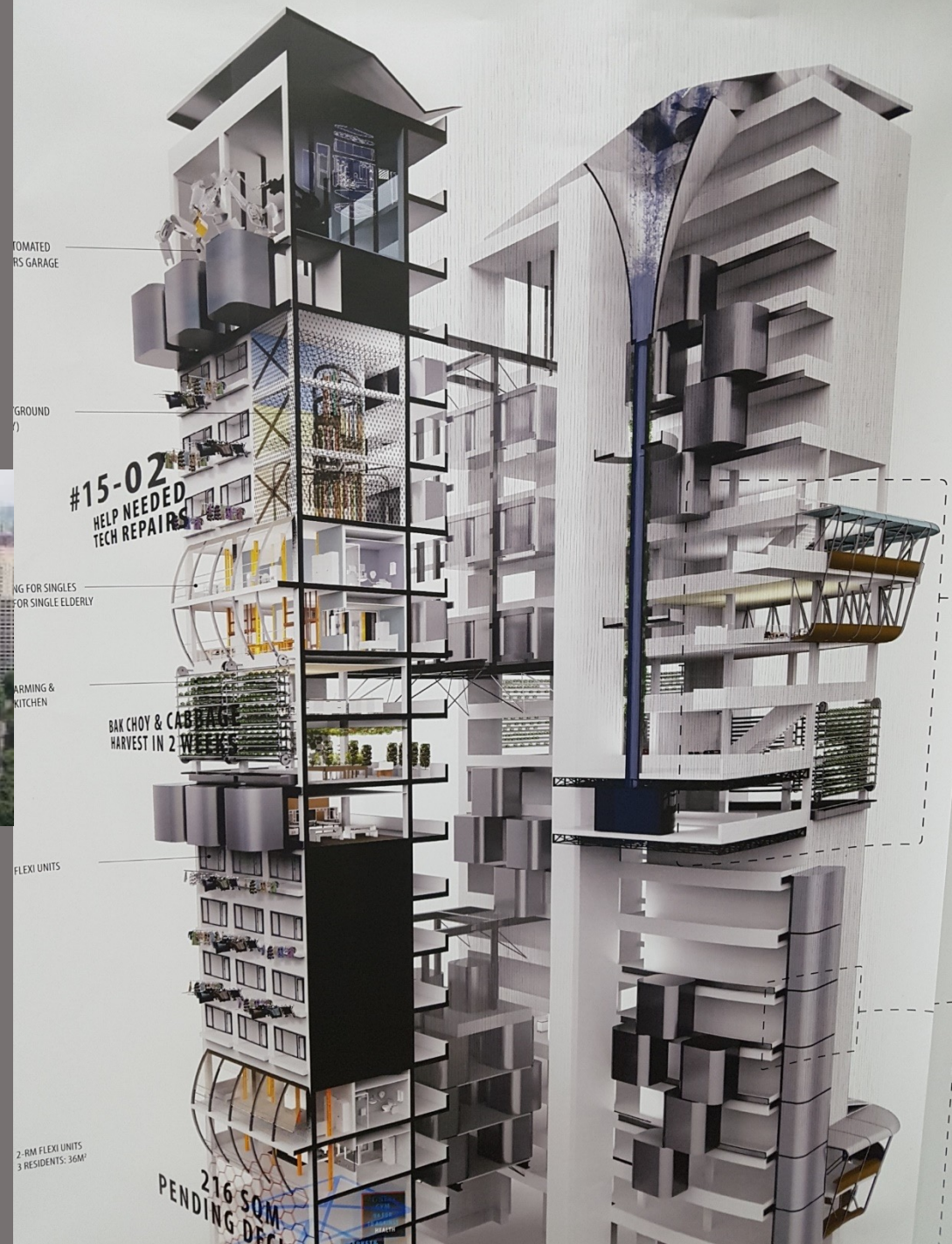


Void Deck in older HDB blocks









Resilient social housing *regeneration* based on:

**volatility**  
**negotiations**  
**subjectivity**

**+**

**SHARED GIG ECONOMY**  
**IT SYSTEMS & PLATFORMS**  
**COMMUNITY NETWORKS**





**Campong Admiralty**  
*Care facilities near home,  
city plaza and busy  
transport node*

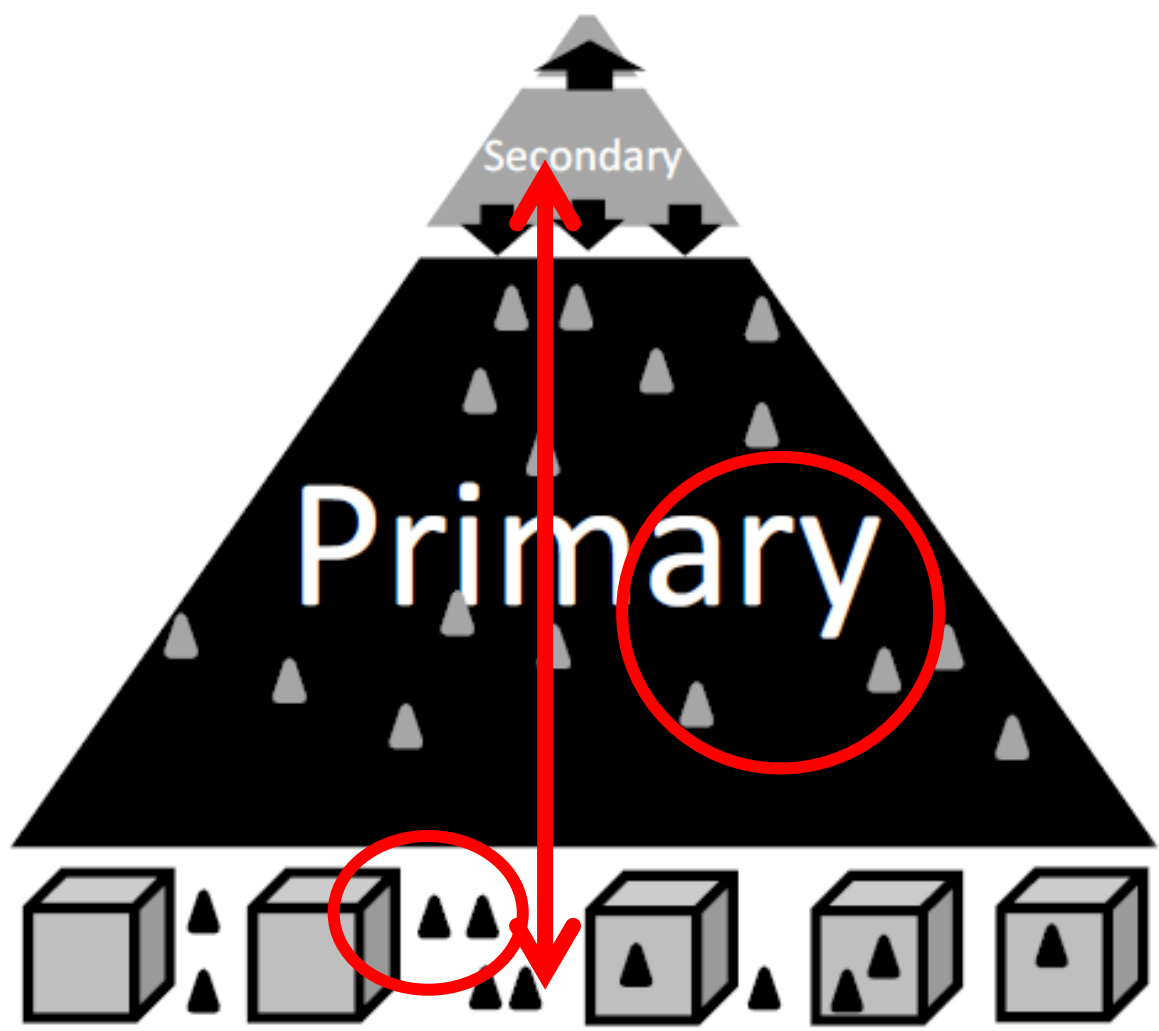
WOHA





# Permeable boundary

between the healthcare pyramid tiers and the housing domain



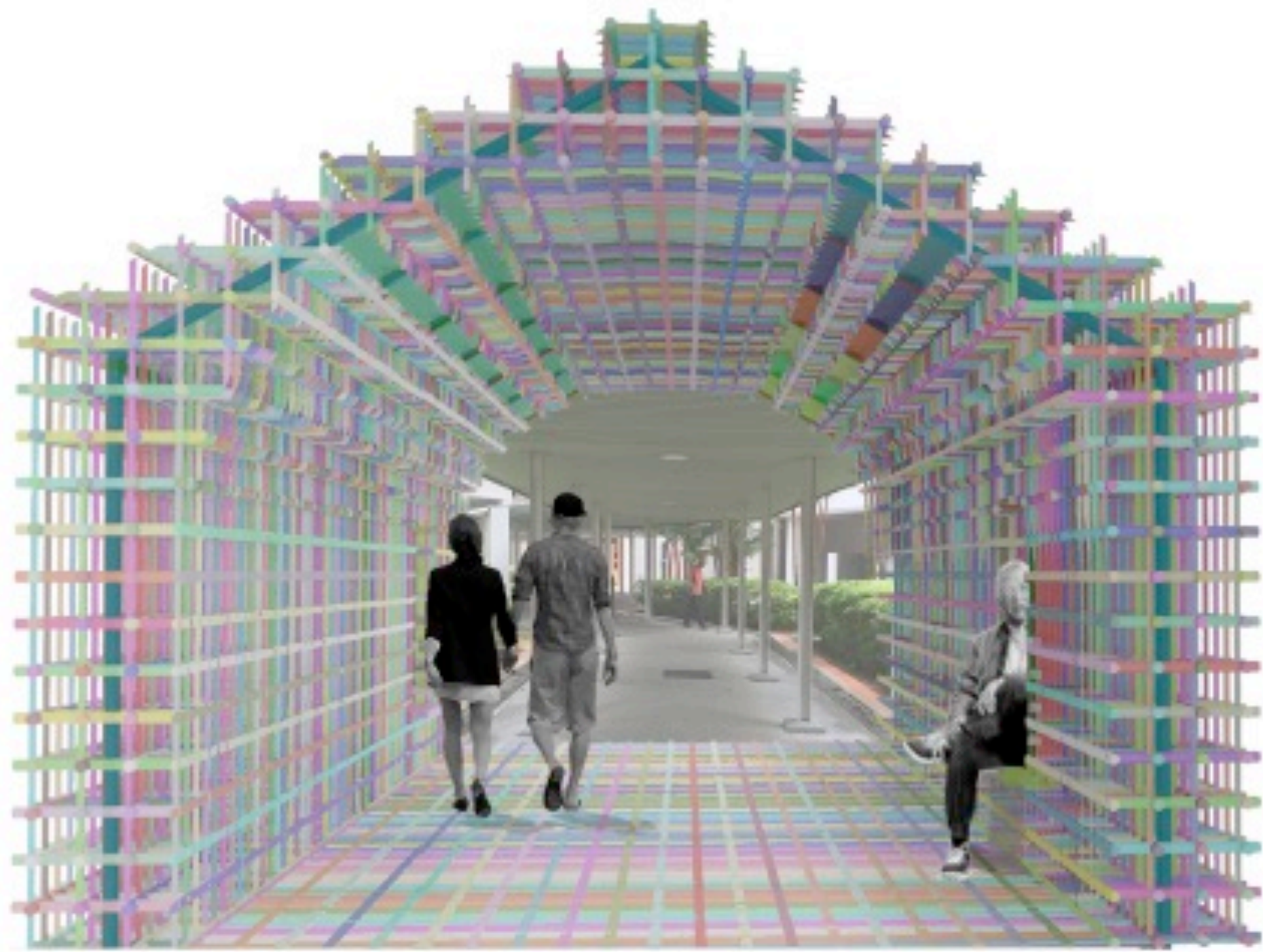
**XXS**  
**HEALTH**  
**KIOSK**  
healthcare bit  
of fractal nature, rooted in community  
connected to higher ranking institutions  
provide basic form of treatment,  
care, and  
counselling



# Smart *cocoon*

*AI supported  
health &  
behaviour  
monitoring  
system*









BEFORE

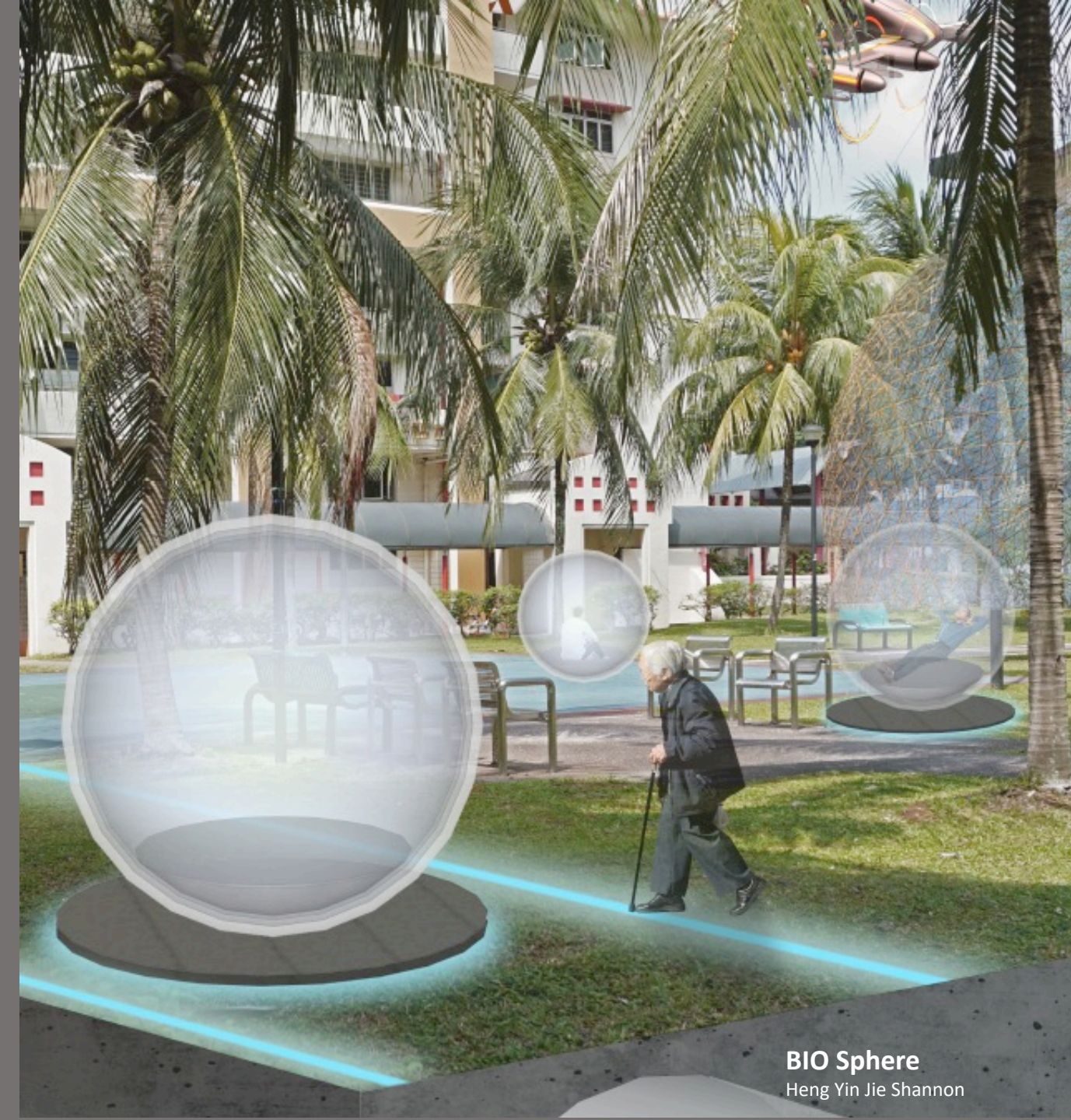


AFTER

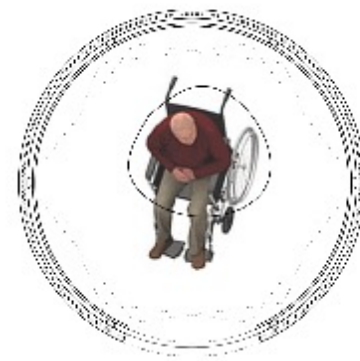


DURING





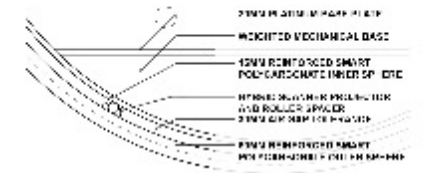
**BIO Sphere**  
Heng Yin Jie Shannon



360 degree projection for Virtual Reality simulation  
SCALE 1:50 @ A3

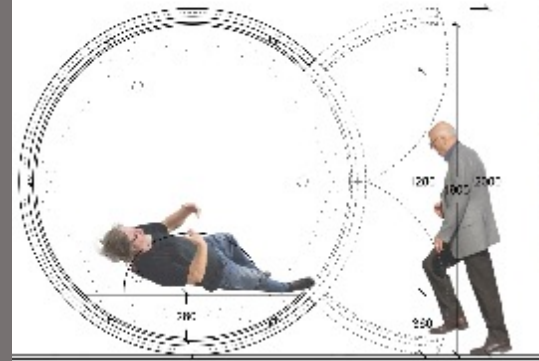


Weighted mechanical base with electromagnetic stabilisation  
SCALE 1:50 @ A3



SECTIONAL DETAIL - MATERIALITY  
SCALE 1:10 @ A3

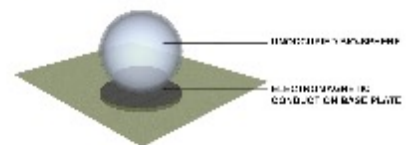
PLAN VIEW  
SCALE 1:20 @ A3



SECTION  
SCALE 1:20 @ A3



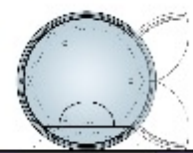
HYPER-SPEED TRANSPORT TUBE CHANNEL  
BIO SPHERES CLUSTERED SETTING



HYPER-SPEED TRANSPORT TUBE CHANNEL  
CONDUCTIVE BASE PLATE

The Bio-Sphere is a risk-free experience that allows users to undergo preliminary checks at the ease of one's neighbourhood. When in medical use, the sphere provides a short simulation for the user with the use of integrated virtual and augmented reality elements and projections, while ensuring that the user is in a safe and mobile environment.

In the event of a medical emergency or an obvious negative health check, the user will be escorted within the Bio-Sphere and "roast" towards the nearest Hyper-speed Transport Tube Channel for easy access to the nearest medical facility. With 360-degree inner projections, the user will be kept in a controlled and calm environment, while the Bio-Sphere itself moves at a fast speed, mitigating time wastage and panic attacks similar to that possibly experienced in a fast moving ambulance.



LOW FRICTION MAGNETIC ELEVATION TRANSPORT TUBE

TO MEDICAL FACILITY

HYPER-SPEED TRANSPORT TUBE SECTION  
SCALE 1:50 @ A3



**MEZZO SCALE**

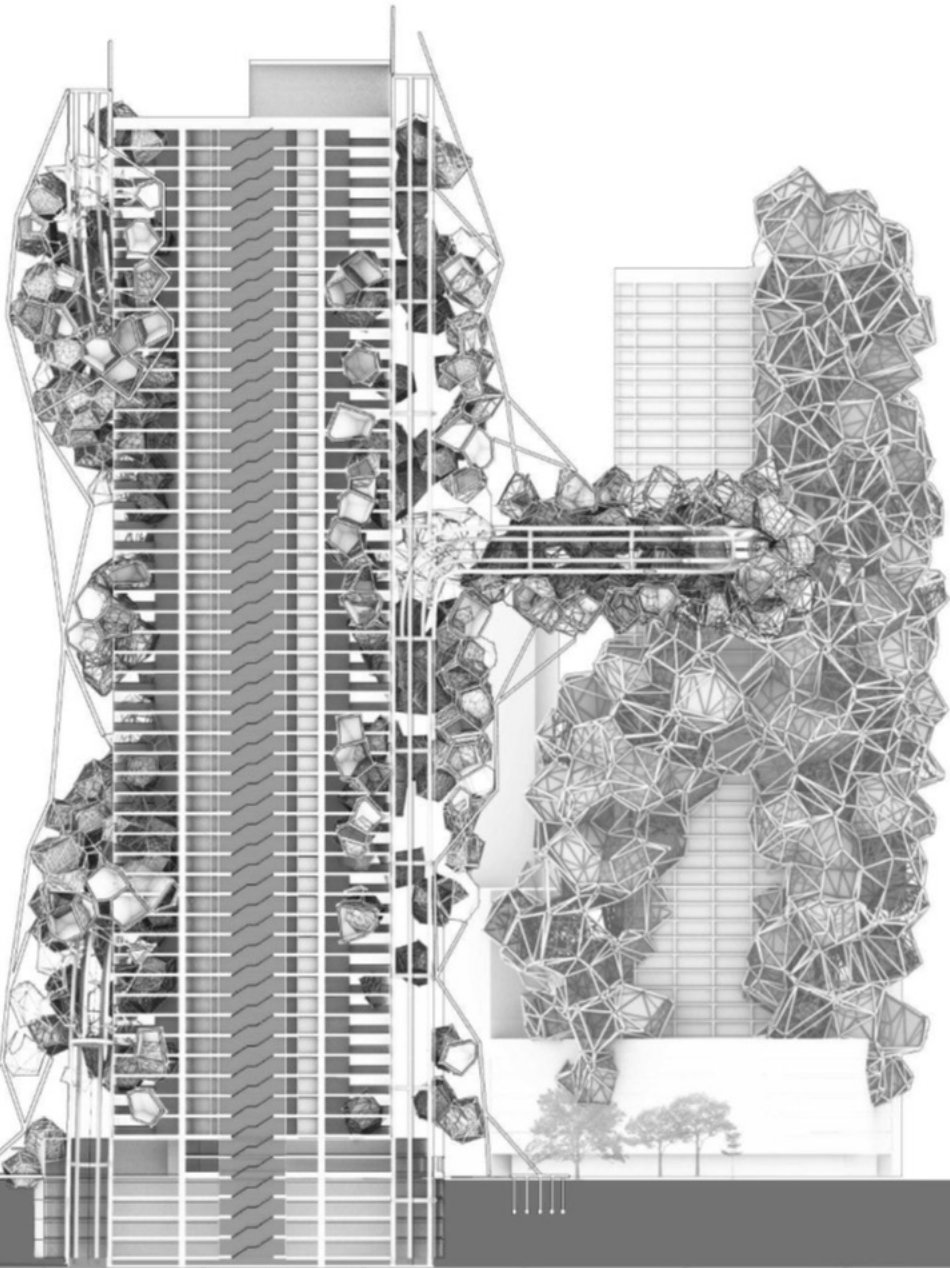
**BUSINESS** *district*

**PUBLIC** *buildings' new design typologies*

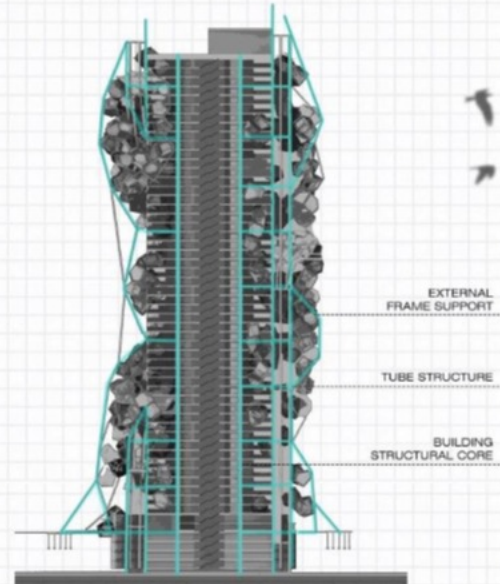






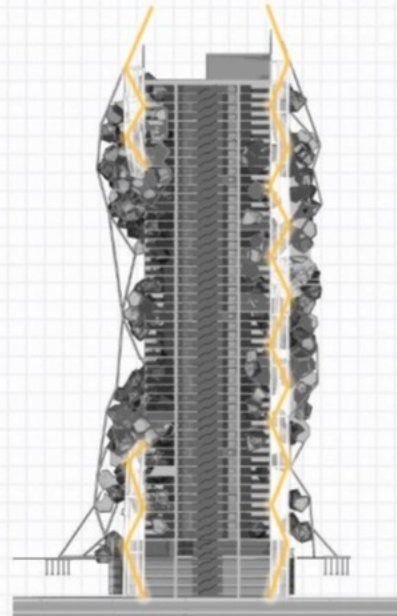


STRUCTURE & SERVICES

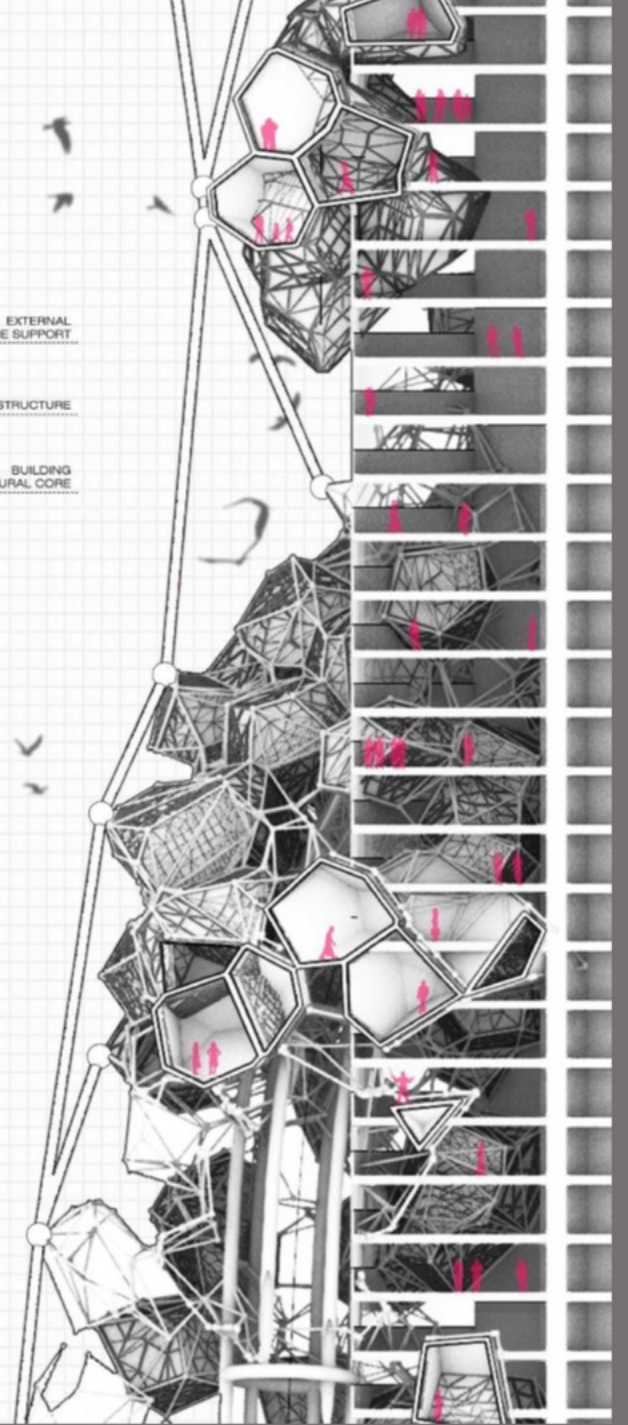


Tube structure (parasite) receives lateral support from building's main core (host) through tension beams that doubles as distribution for M&E services

SUSTAINABILITY



The design takes advantage of the tubes as centralised core lined with solar fiber optic cables to capture sunlight carrying it deep into the plan.







**URBAN MASTERPLAN**  
TO BE CONTINUED...

Rong Guang





# LATTICE CITY

*“...high-density (100,000 people per square kilometer!) tropical city of the future which achieves a **development intensity four times that of the centre of Manhattan or Hong Kong**, with ample public spaces and amenities., multiple 'new ground levels' which could host parks, recreation, industry, horizontal transport systems and even urban farming...*

**WOHA**, 2011”





# ALT EDUCATION

the city of excess antagonism between academia and the real world

Figure 11: Master plan

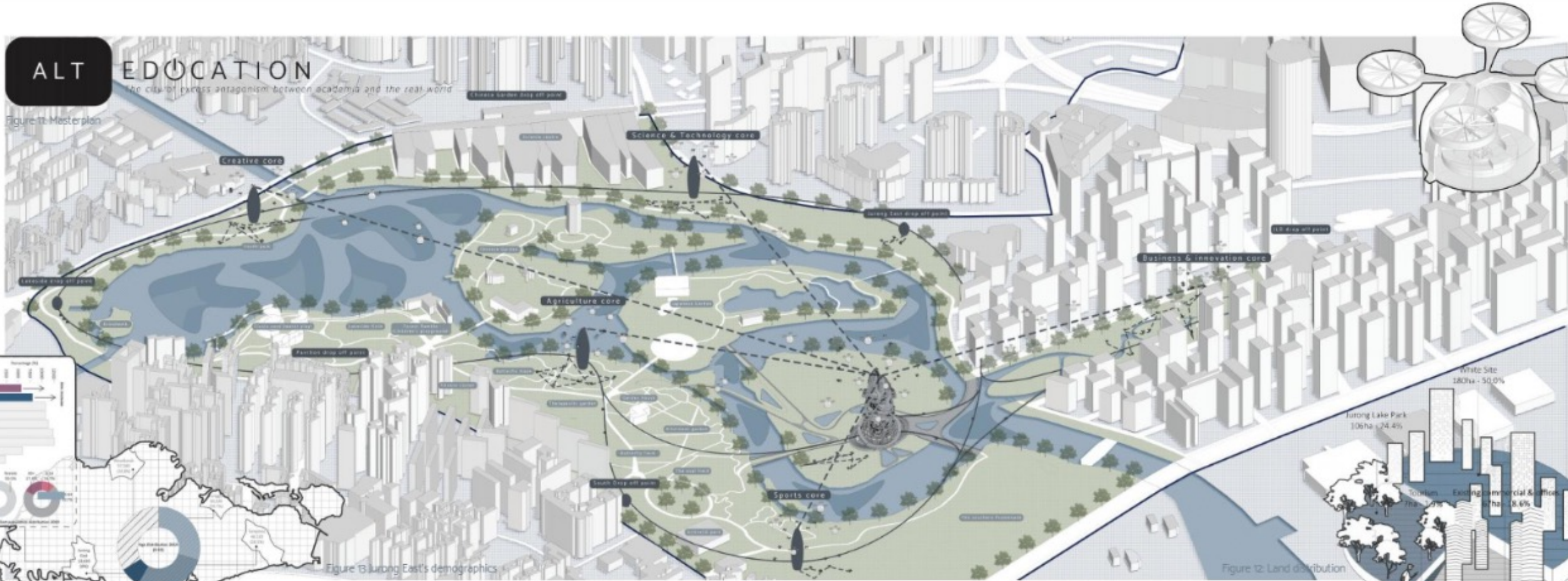
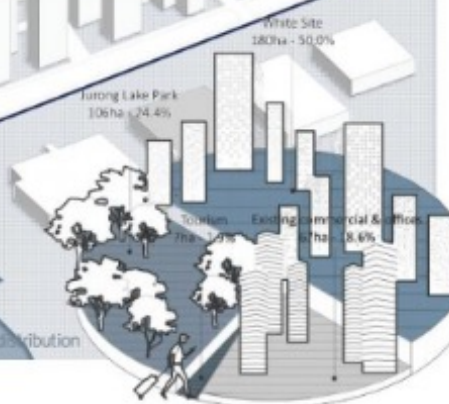


Figure 8: Jurong East's demographics

Figure 12: Land distribution





# Alternative Education

The city of excess antagonism between academia and the real world



Rebecca Chong | A0160533N | NUS MArch Architecture thesis

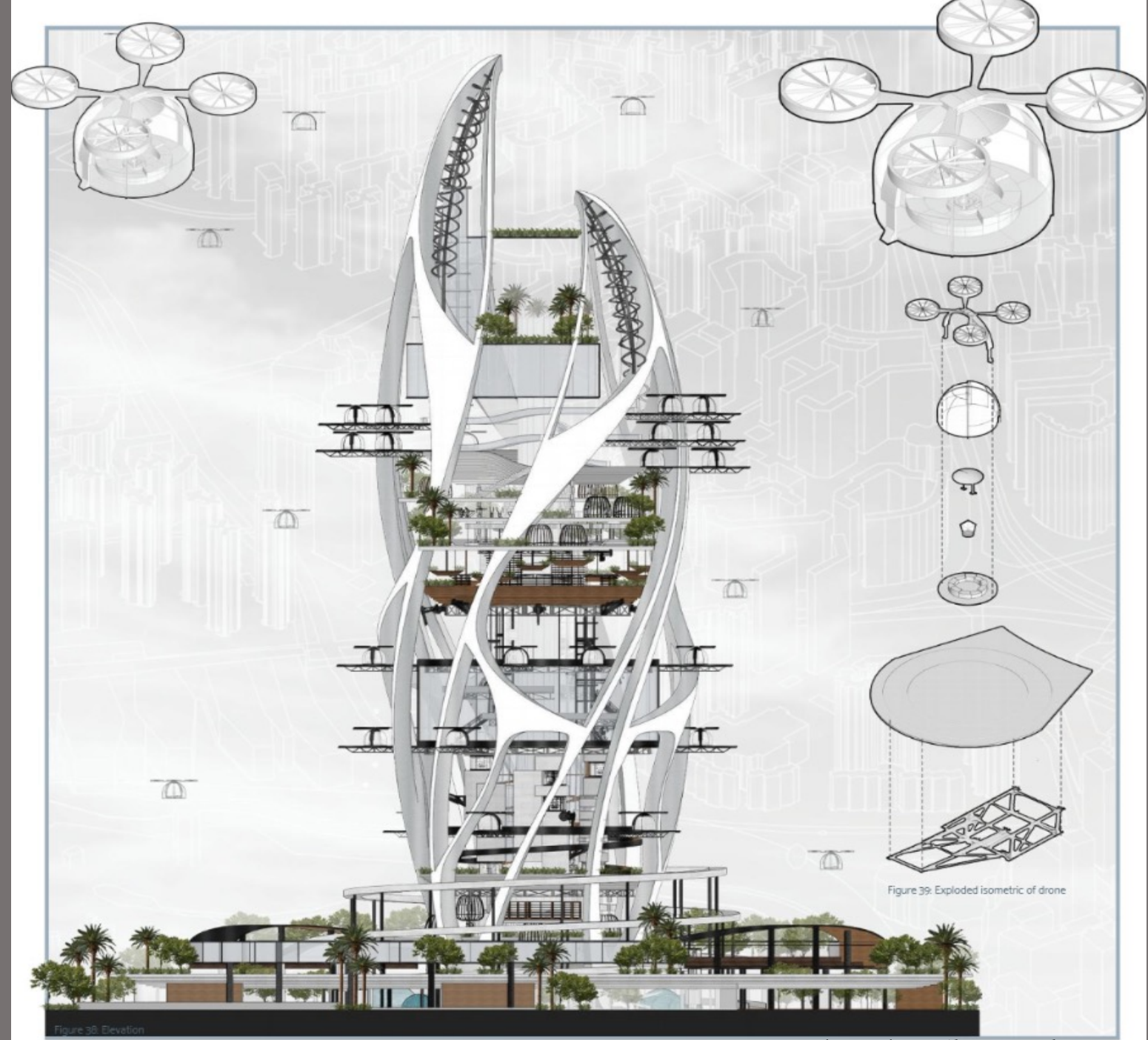


Figure 38: Elevation

Figure 39: Exploded isometric of drone





Figure 24: Overview of communal space



Figure 25: Overview of library



Figure 26: Library

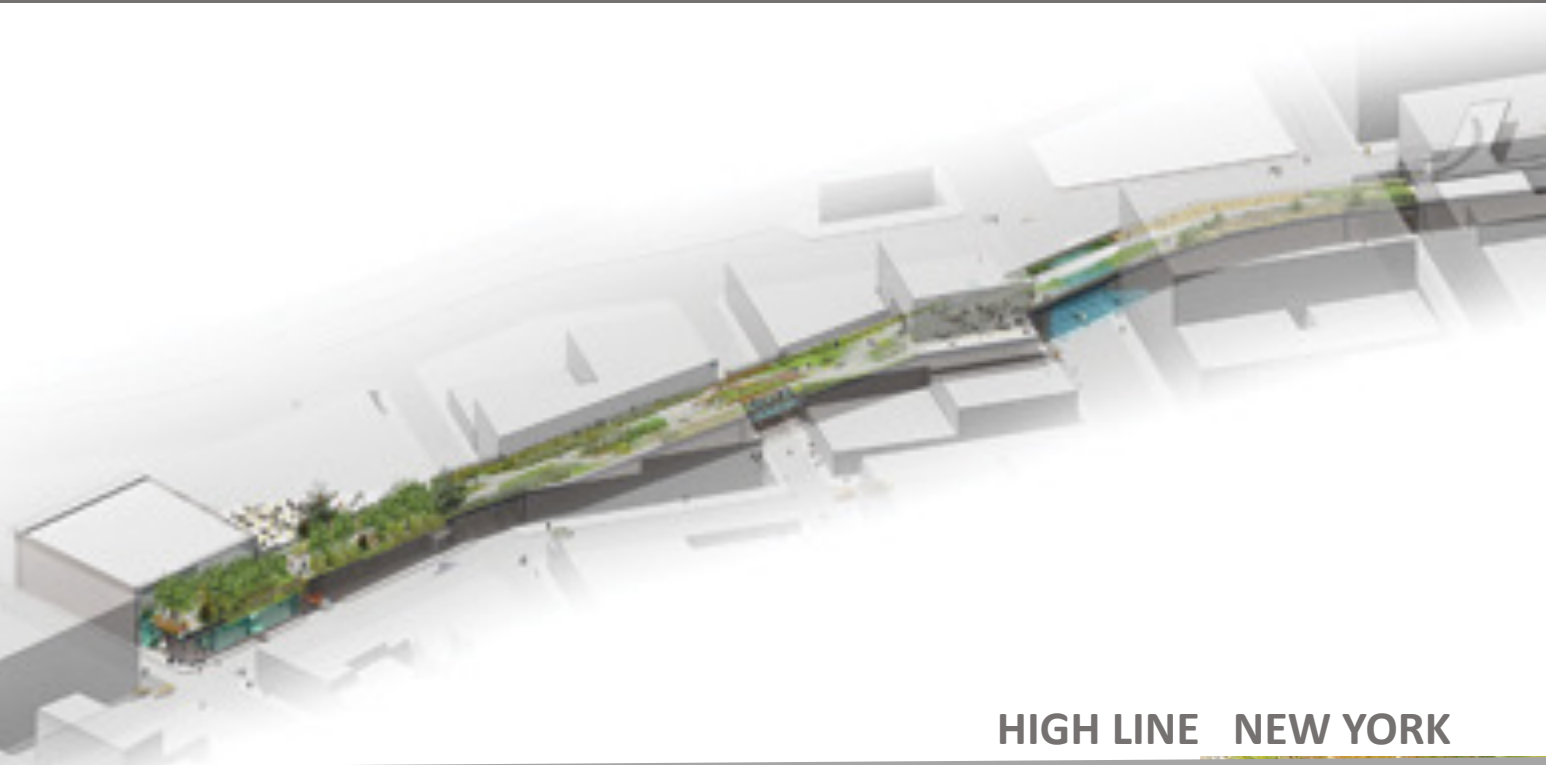


Figure 27: Community kitchen

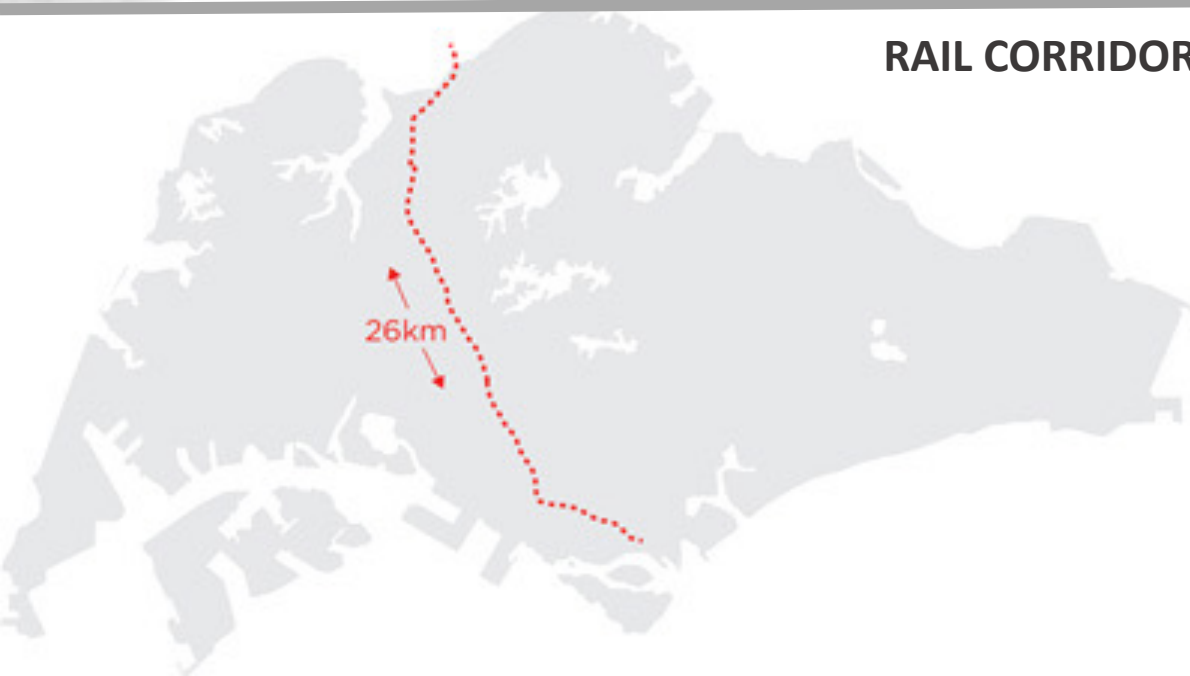


**MACRO SCALE**  
**CREATION** *of* *new, distinct, independent*  
**LINEAR** *domains*





HIGH LINE NEW YORK



RAIL CORRIDOR SINGAPORE





The *Sapeurs* of Brazzaville



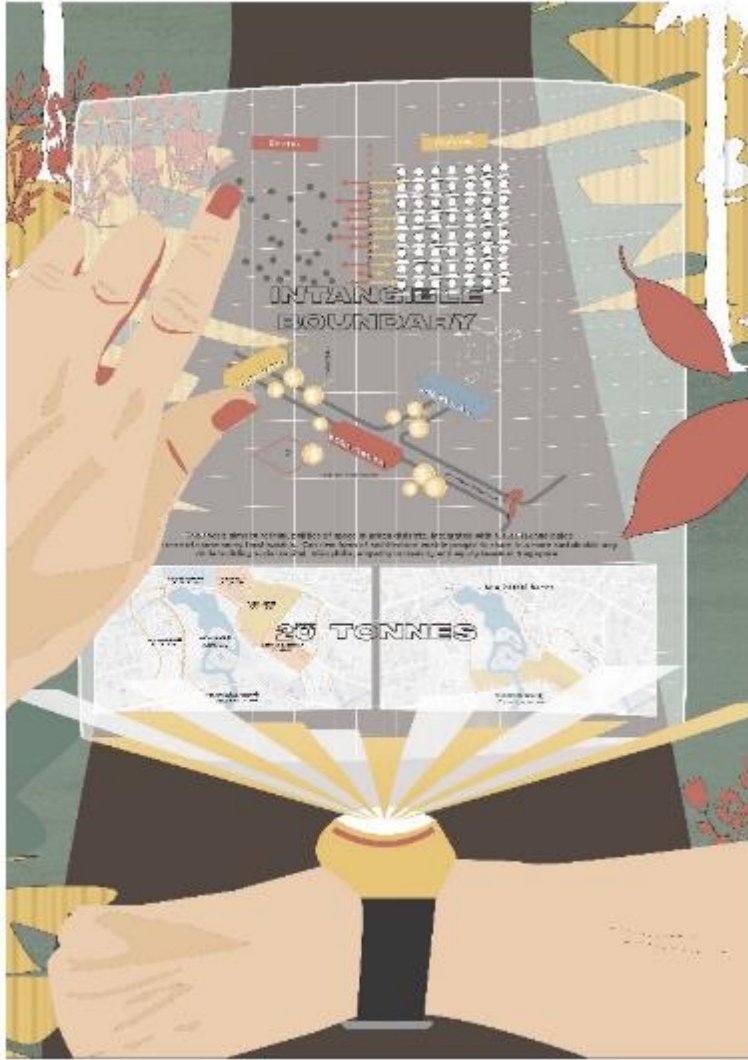
“In the Republic of the Congo, stylish individuals piece together vibrant and sophisticated outfits that function as a form of colonial resistance, social activism and peaceful protest”

*Photographs and text by Tariq Zaidi*



# Food waste treatment plant, food surpluses, food production .... and public park, education, entertainment

The Commons, Smart City & Post-Truth Era



Small text at the bottom of the left illustration, likely a copyright notice or project description.

AUGMENTED TERRITORIES: BUILDING SOCIAL CAPITAL THROUGH COMMONING FOOD SURPLUS

Sequel: The Return of Commons



Small text at the bottom of the right illustration, likely a copyright notice or project description.



Progress: After Capitalism, The Restoration

Humanization of Space, The Act of Communing

The Annual Collective Day



After capitalism, the restoration of community and human connection is the goal.

The humanization of space is the act of communing with others and the world.

The annual collective day is a celebration of community and shared values.



Power to the People

The Art of Sociality & Sharing



Power to the People  
The Art of Sociality & Sharing

Power to the People  
The Art of Sociality & Sharing





RBS STUDIO  
Architectural Design Research  
Semester 1 AY 2020/2021



The Act of Sociality & Sharing

### 2.5.1 A Dystopian World: A Disappearing City

The crisis point of our society is the breakdown of our society. Depression and stress are fast becoming a pandemic due to this competitive nature of today's society which causes people to go to the internet to cope with the stress and the expectation of today's life.



Figure 17 Dystopian empty Singapore



## 2. An Equally Real Virtual World

A hyperreality society. As such our identity is not necessarily defined by the analogue environment but rather what happens within the equally as valid Internet.

## 3. Stop being a useful digital parasite when...



Result in low self control, decline in frontal lobe; youngster would have less self-control and may be involved with more risky behaviour

growth

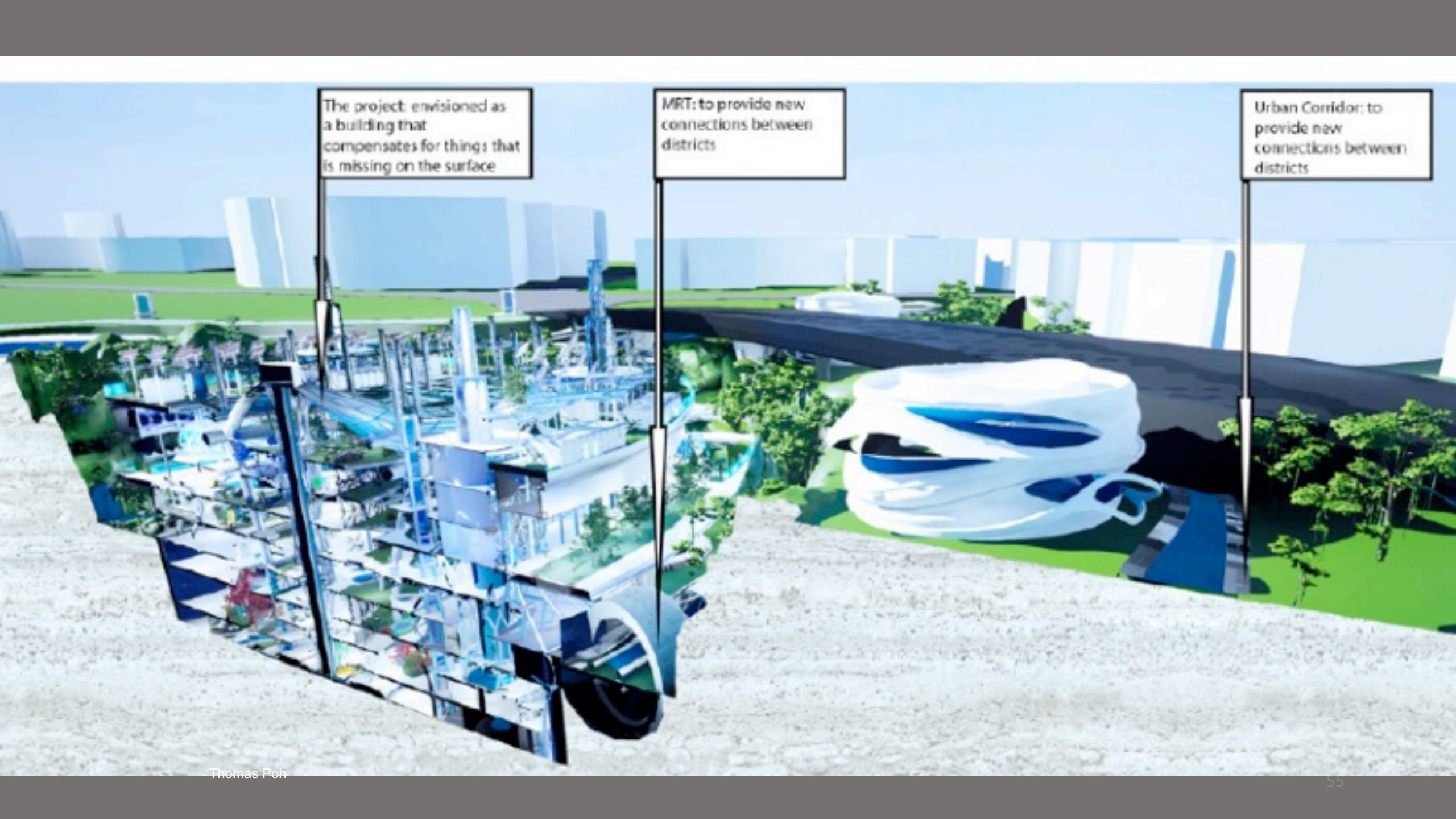












The project: envisioned as a building that compensates for things that is missing on the surface

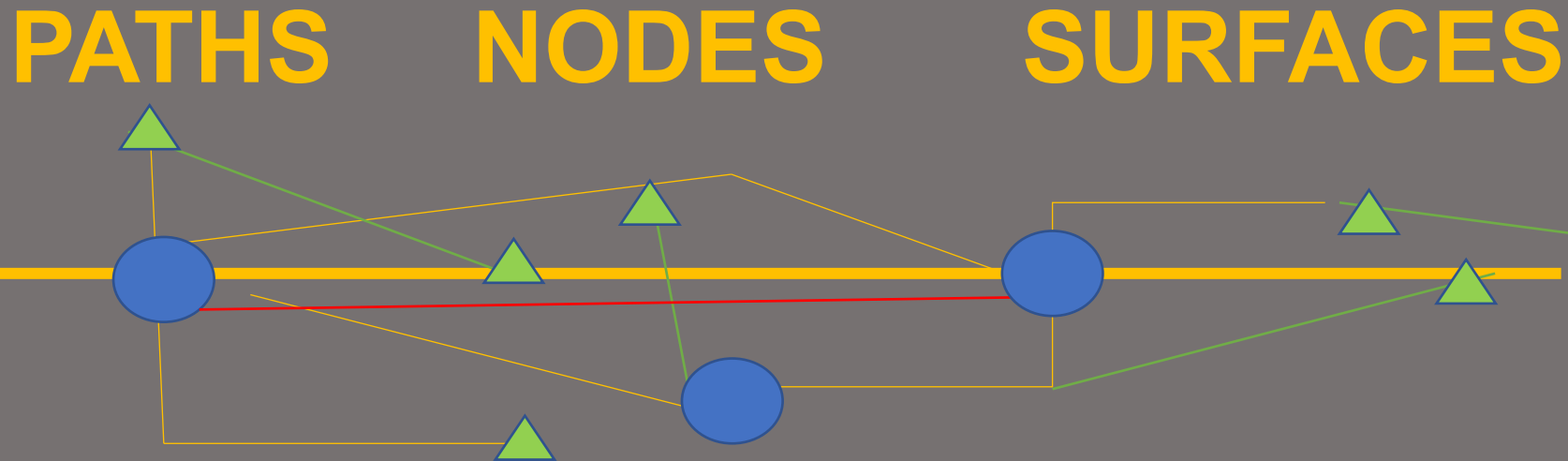
MRT: to provide new connections between districts

Urban Corridor: to provide new connections between districts



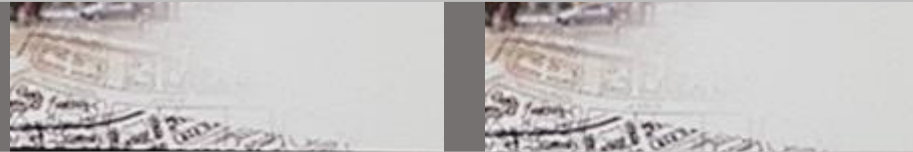
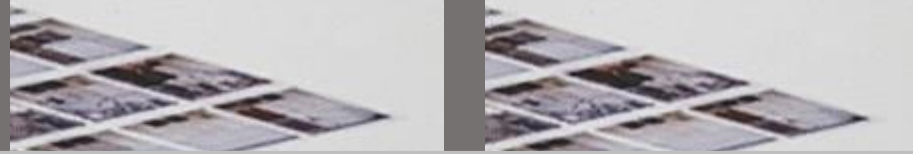
the common **LINEAR MODEL** leading from *needs to design solutions* needs to be upgraded to a more comprehensive **NETWORK MODEL** showcasing the fulfillment of *aspirations* through ***environmental choices & opportunities***.

The synergy between social sciences, technology and architecture is essential





# DESIGN IN 5 LAYERS OF THE ECOSYSTEM



1 USER

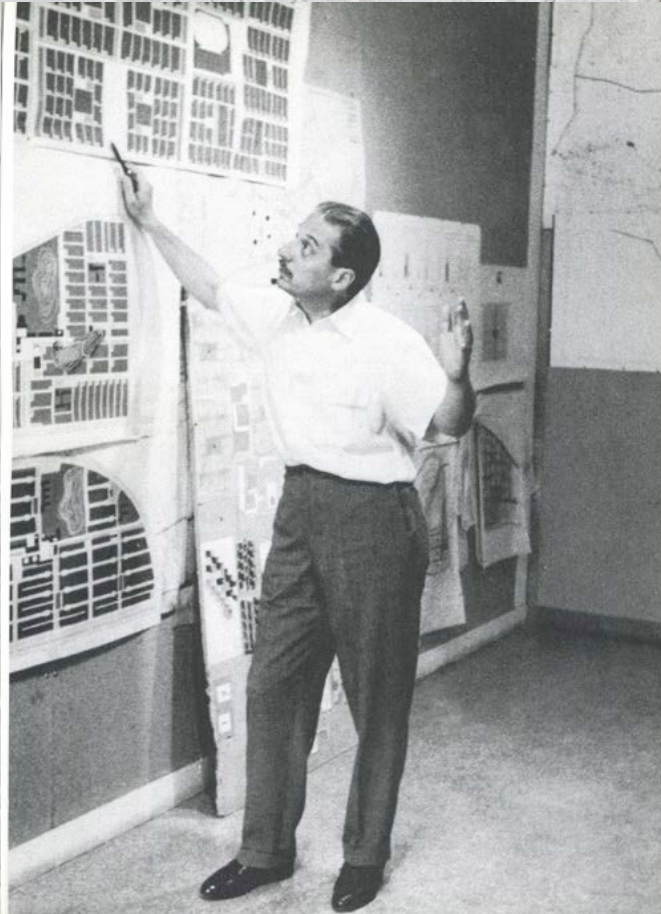
2 INTERFACE

3 CITY

4 CLOUD

5 EARTH





*Constantinos Doxiadis 1913-1975*

**BOLTZMANN & CANTOR** introduced  
**probability** and **entropy** in physics 100 years ago,

**DOXIADIS** | theory of **EKISTICS**

*Non-static system of changing areas grounded on  
information*

*ekistic grid* and five elements:

Nature, Man, Society, **Shells & Networks**



## 2. An Island of Green, Blue and Fun



Our network of nature parks and nature corridors are planned to be multi-functional. Beyond safeguarding our natural capital, many of these green spaces and corridors, like Chestnut Nature Park and the Rail Corridor, also allow us to enjoy outdoor activities such as running, hiking and mountain biking. We will continue to expand this network and establish more islandwide recreational opportunities for different users.

### Growing the Green Network

- Nature Reserves
- Nature Areas
- Parks/Nature Parks
- Marine Parks
- Waterbodies
- Park connectors & trails
- Key recreational routes
- Potential coastal parks/promenade
- Future parks (selected for illustration)

Map for illustrative purposes only



Find out more about our multi-functional green and blue spaces at Steward: The Green and Blue



2A

## Expanding Our Nature-Based Recreation Network

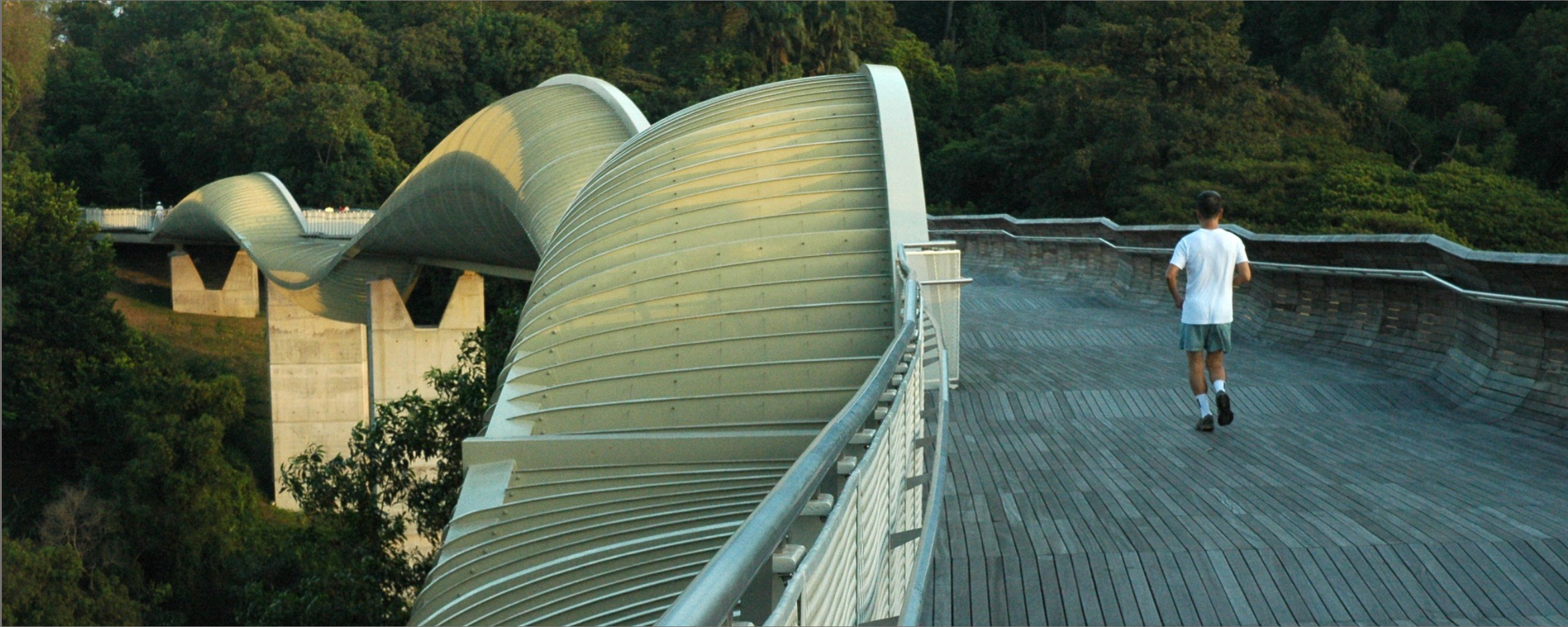
Our green and blue spaces can be unlocked for recreational uses. It will bring us closer to nature and expand the options for leisure and play in our compact city.

Play | 65

Garden City - City in the Garden – **CITY IN NATURE**

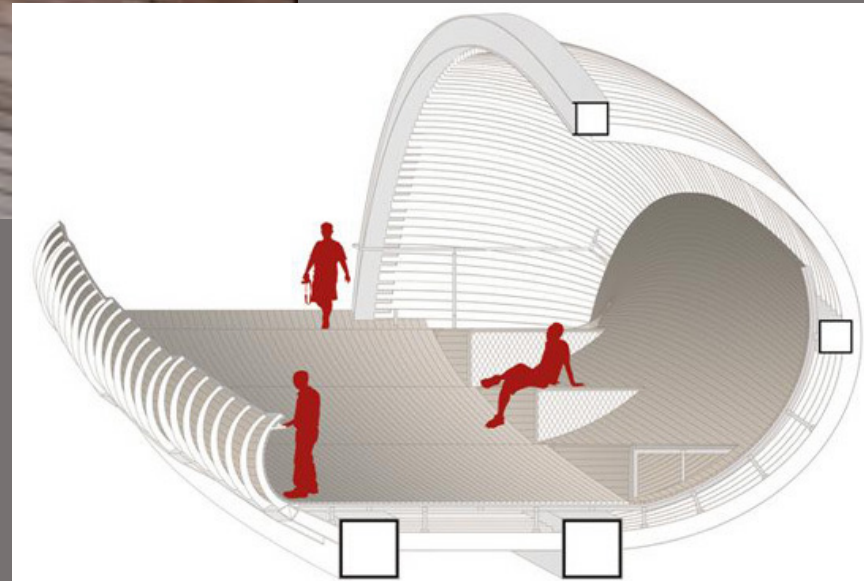






Henderson Waves





SECTIONAL PERSPECTIVE

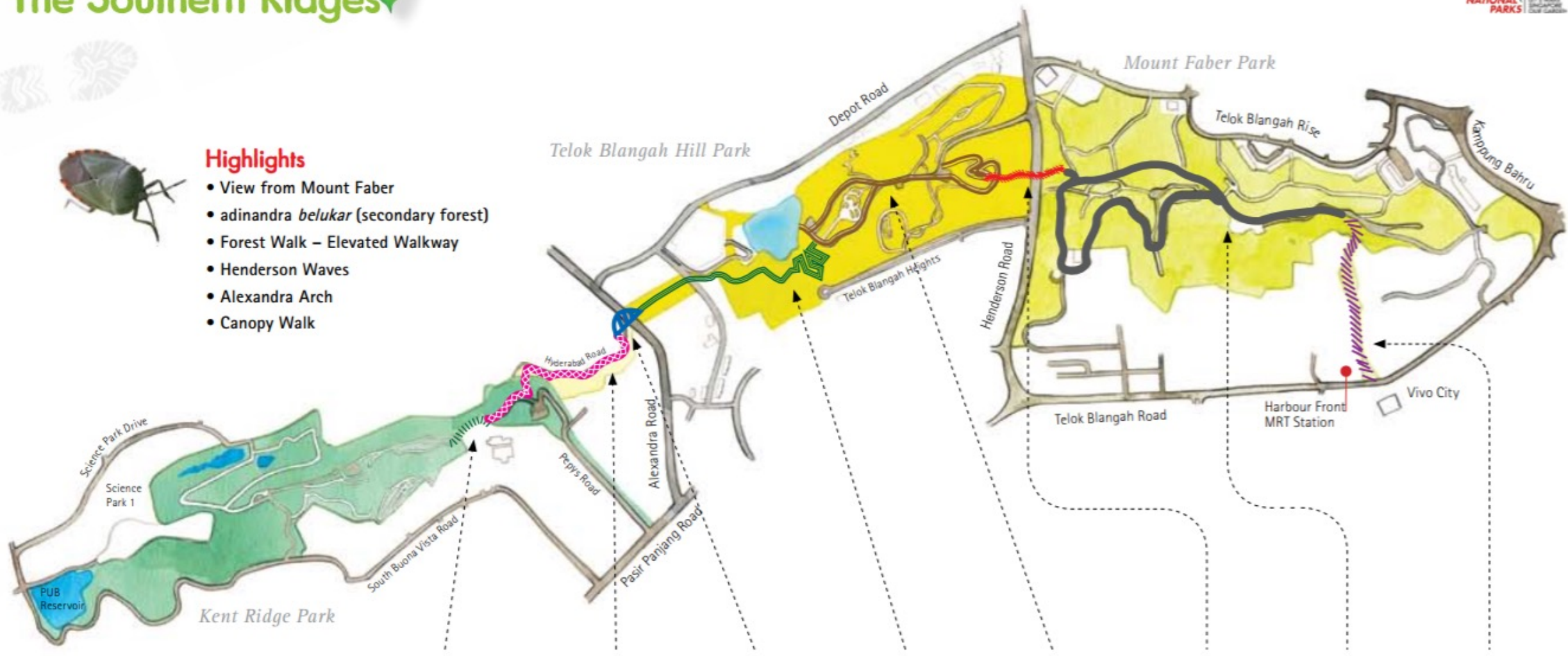


# A DIY Guide to The Southern Ridges

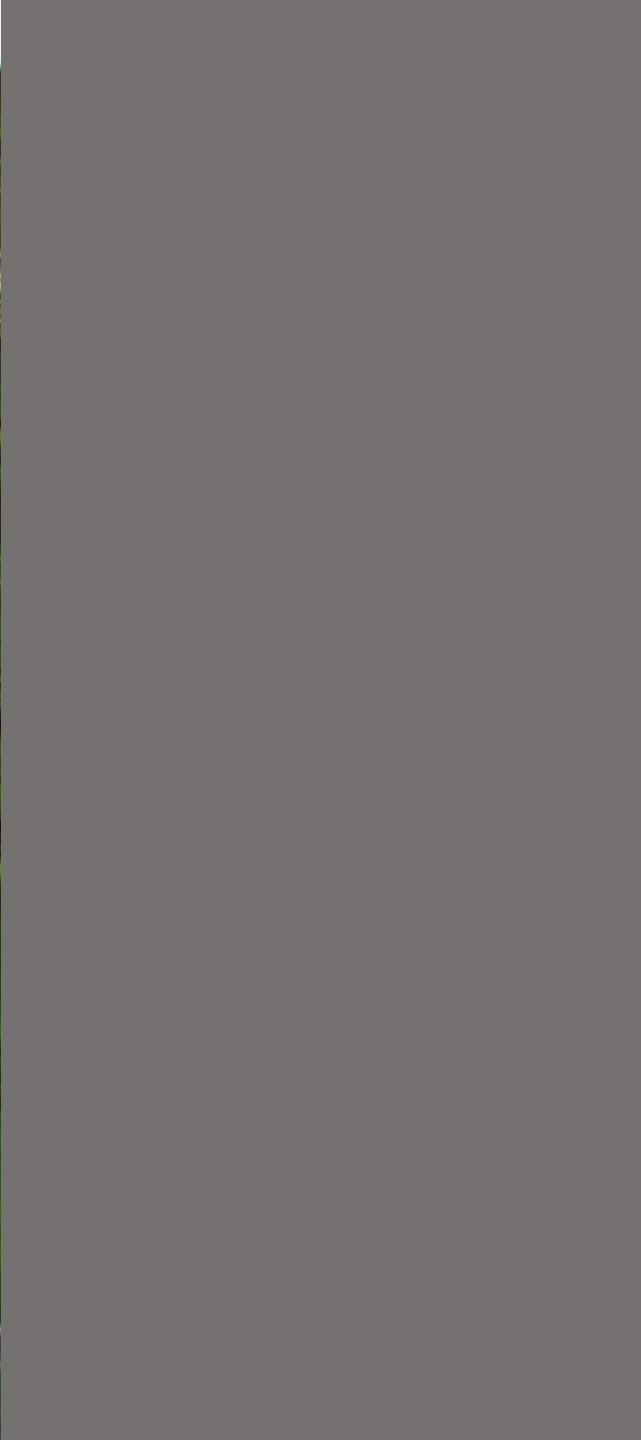


## Highlights

- View from Mount Faber
- *adinandra belukar* (secondary forest)
- Forest Walk – Elevated Walkway
- Henderson Waves
- Alexandra Arch
- Canopy Walk





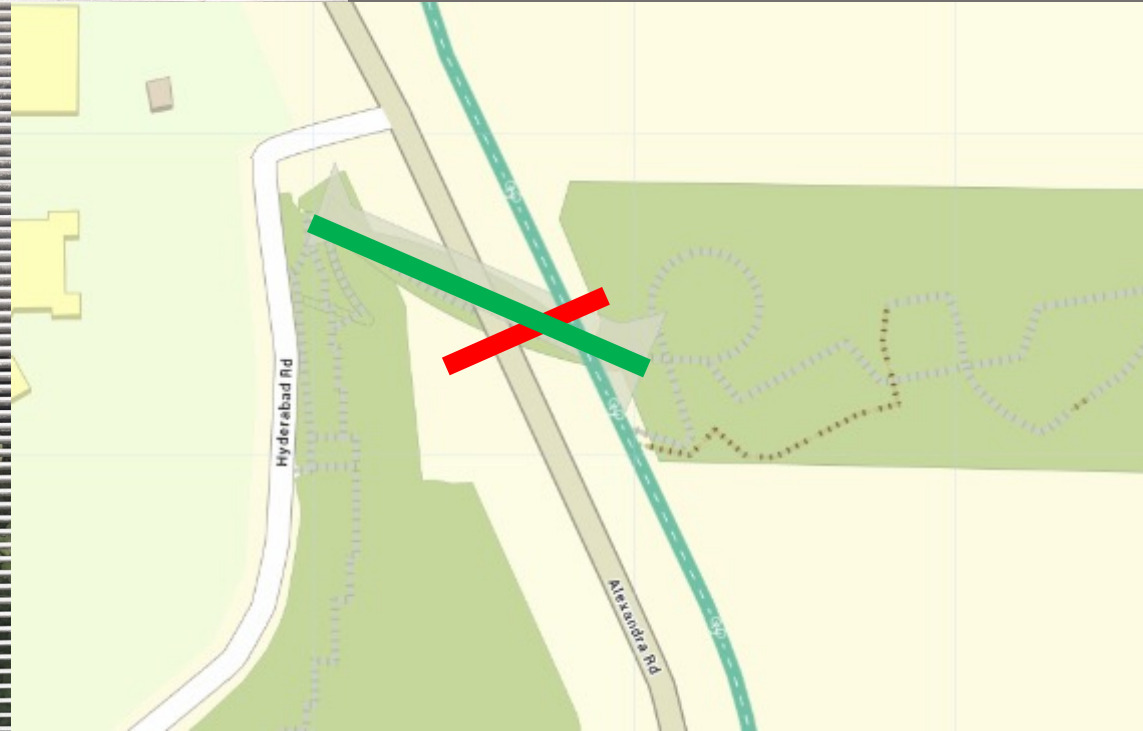






4.5m





The Southern Ridges  
Alexandra garden Trail -Park Connector



Alexandra ARCH





CHAT GPT concluded based on (generic) title only:

*“...in summary, Singapore's vision of shaping the salutogenic city for a resilient future reflects its holistic approach to urban development, where health, well-being, and sustainability are central pillars guiding its efforts towards creating liveable, vibrant, and resilient urban spaces.”*





*“Don’t believe what your eyes are telling you. All they show is limitation. Look with your understanding, find out what you already know, and you’ll see the way to fly.”*

RICHARD BACH, *Jonathan Livingston Seagull*



Thank you





