City in Nature

Outline

- Context
  - From a Garden City to City in a Garden
  - Key Challenges

- Becoming a City in Nature
  - Benefits for Singaporeans

  - Key Strategies to becoming a City in Nature
    - Conserve and extend our natural capital
    - Intensify nature in our gardens and parks
    - Restore nature into the urban landscape
    - Strengthen connectivity between our green spaces

  - Community is key to success of City in Nature

  - Science and Technology to support City in Nature

Garden City

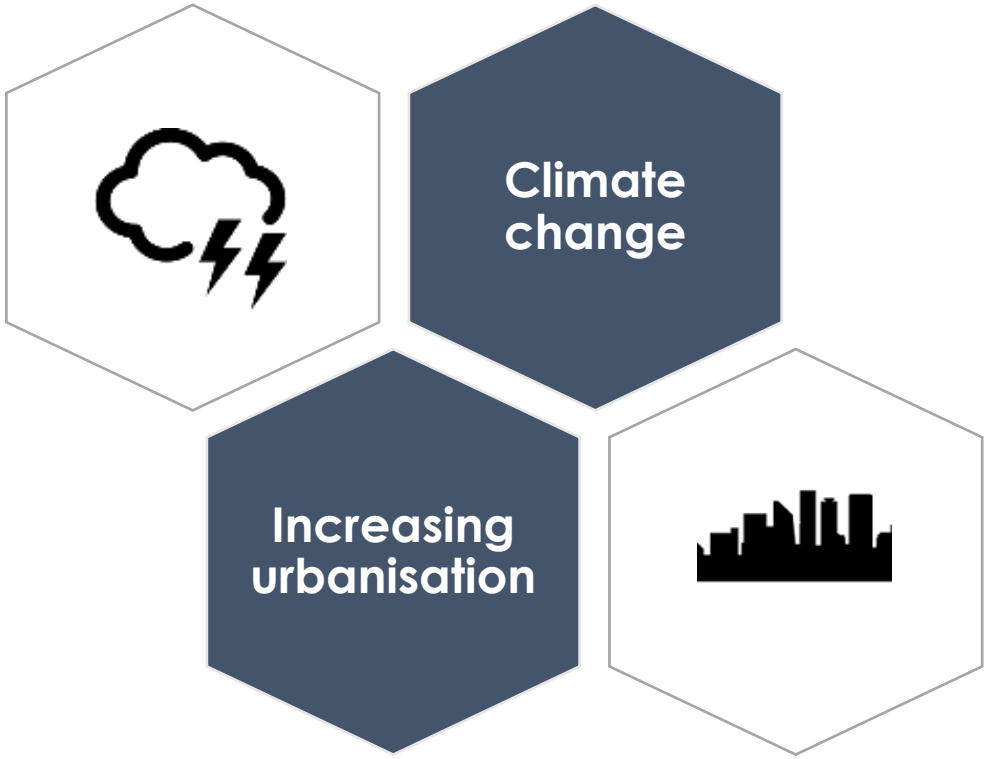
More than 50 years of greening:

- Intensified tree planting
- Strengthened connectivity of parks and greenery with PCN
- Integrated greenery with built environment

City in a Garden

Key Challenges

*how do we **mitigate the impacts** of climate change and **build resilience**?*



*how do we **ensure a quality living environment** amidst increasing urbanisation?*

TODAY World MENU

S'pore among world's major cities to face 'unprecedented' climate conditions by 2050

TODAY Singapore MENU

Temperatures in Singapore could hit 40°C as early as 2045: Scientists

THE STRAITS TIMES

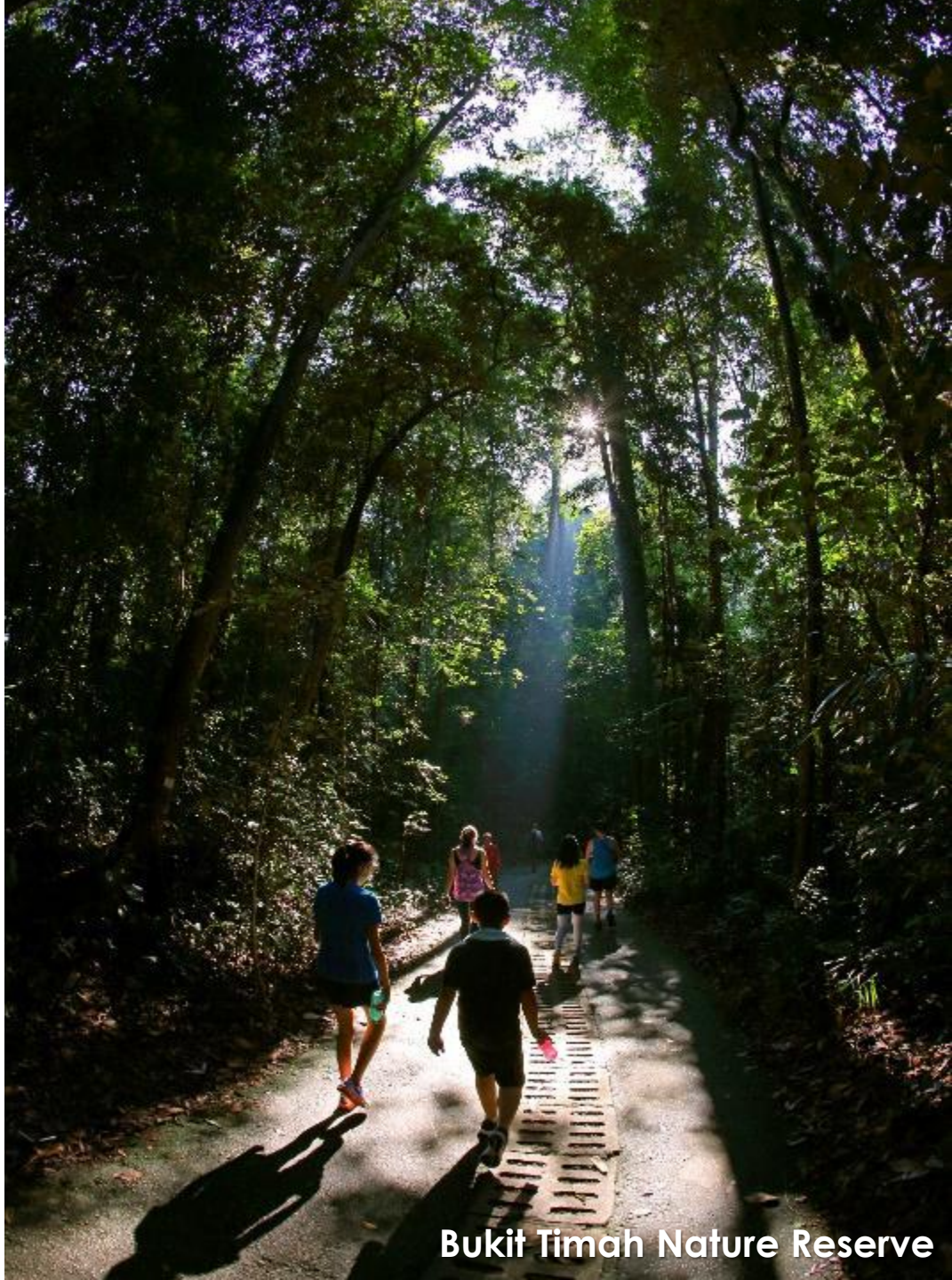
SINGAPORE › Courts & Crime Education Housing

More people, urbanisation 'behind rise in dengue cases'

Ecosystem Services

A healthy natural ecosystem brings about:

- Cleaner water
- Fresher air
- Cooler urban temperatures
- Health and well-being



A New Paradigm

Lakeside Garden - Rasau Walk

City in Nature

Restoring nature into the city for liveability, sustainability and well-being

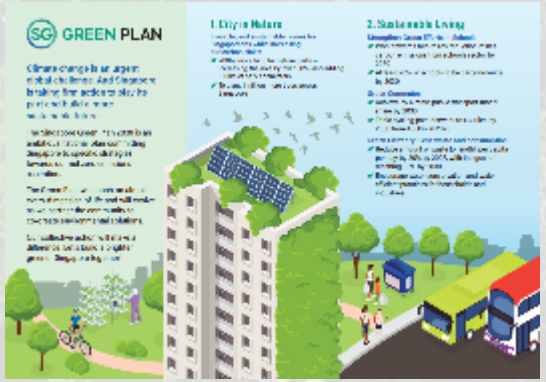
Applying nature-based solutions towards achieving:

- Climate Resilience
- Ecological Resilience
- Social Resilience

City in Nature – a pillar in Singapore Green Plan 2030

To create a **green, liveable and sustainable home** for Singaporeans

Various City in Nature targets subsumed under SGP30



Becoming a City in Nature

Key Strategies

1. Conserve and Extend our Natural Capital
2. Intensify Nature in our Gardens and Parks
3. Restore Nature into the Urban Landscape
4. Strengthen Connectivity between our Green Spaces

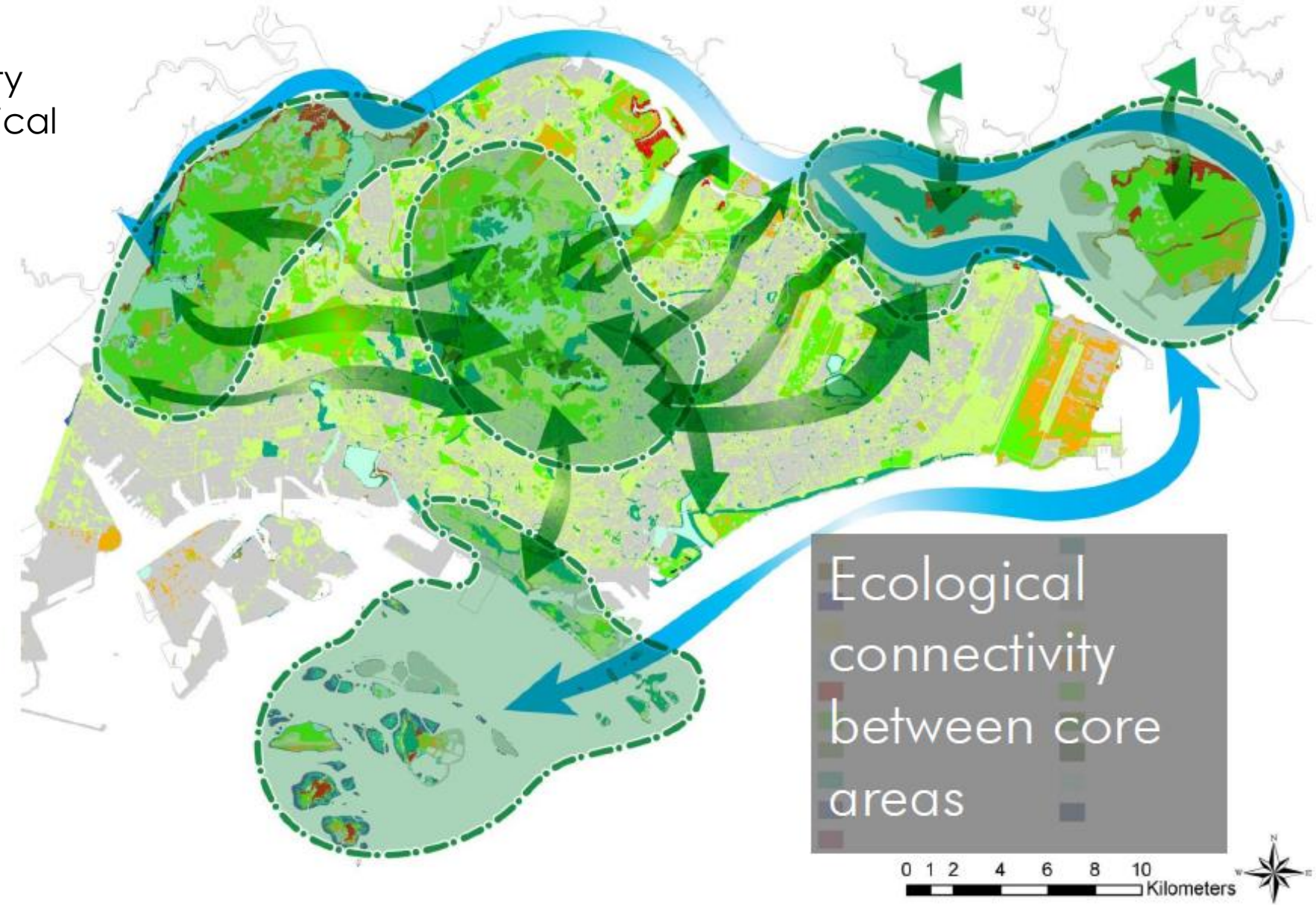
Community Stewardship

Advancing Digitalisation, Science & Technology, Industry

1 Conserving and Extending our Natural Capital

Growing our Nature Park Network

- Connect core biodiversity habitats through ecological corridors – conservation outside reserves
- Facilitate movement of fauna such as birds and butterflies
- Enhance ecological resilience

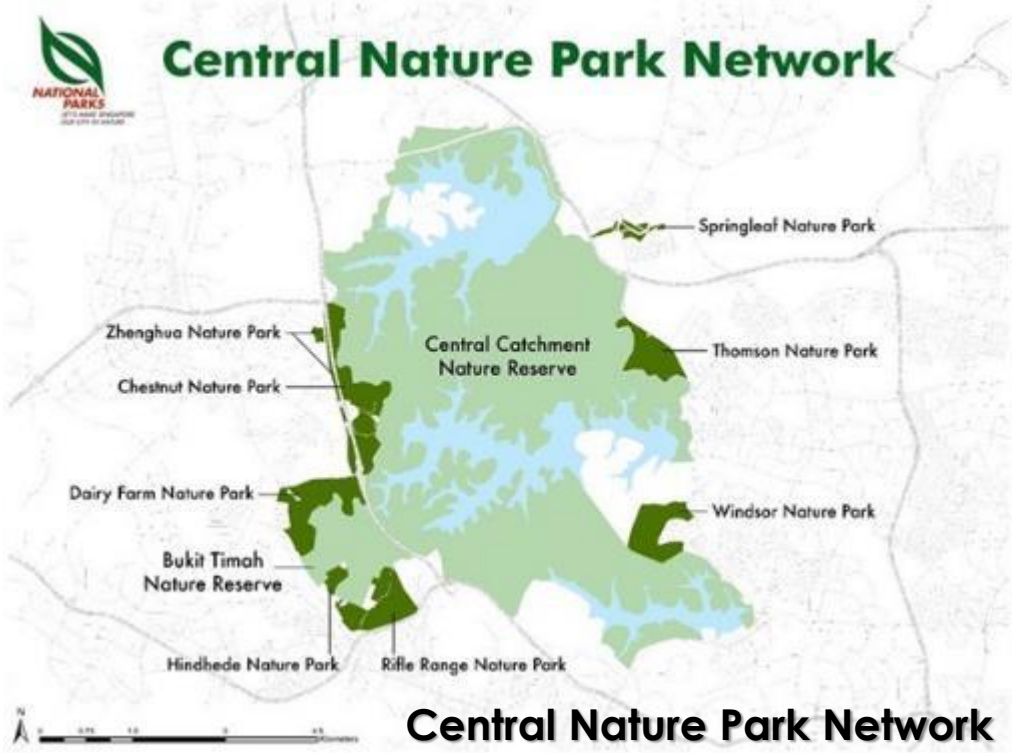


Strategy 1 : Conserving and Extending our Natural Capital

Growing our Nature Park Network

Nature Parks

- Rustic and forested parks which buffer Nature Reserves
- Provide complementary habitats for flora and fauna from Nature Reserves
- Serve as compatible nature-based recreation



Central Nature Park Network

Sungei Buloh Nature Park Network


Rifle Range Nature Park

1 Conserving and Extending our Natural Capital

Nature-based Recreational Network

Clementi Nature Trail at Forest Stream

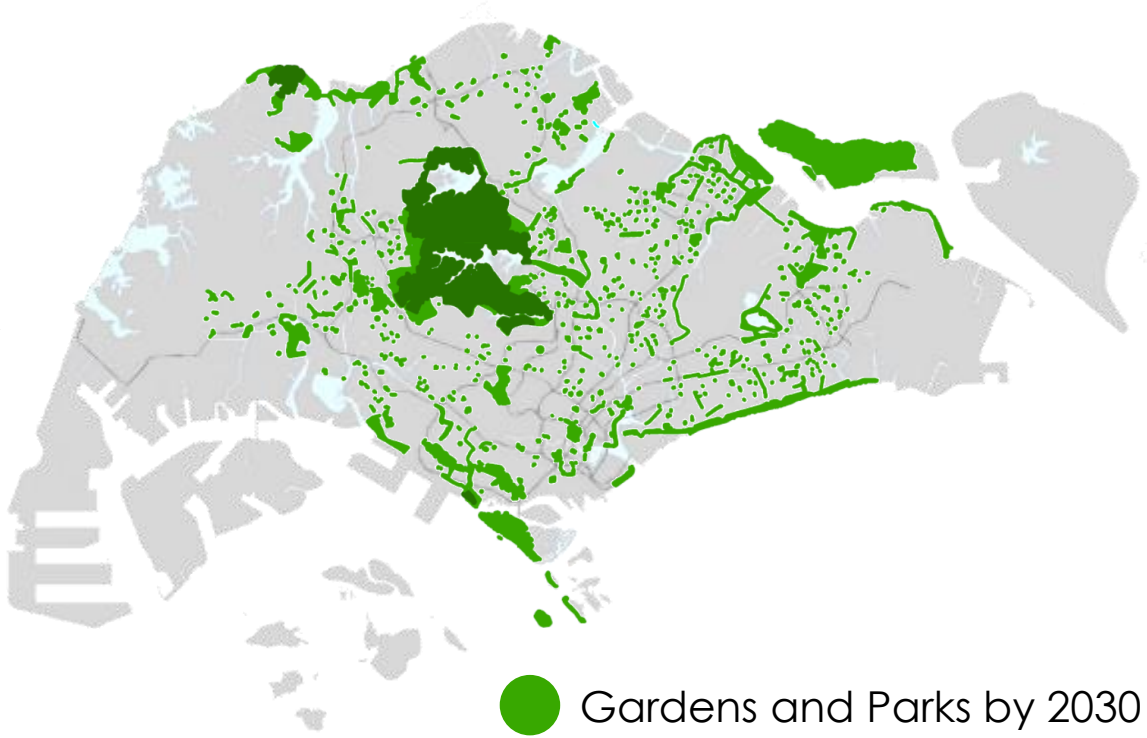
Clementi Nature Trail at Bukit Timah First Diversion Canal

Trail at Nature Park at Ulu Pandan West Greenfield Site

Old Jurong Line Nature Trail

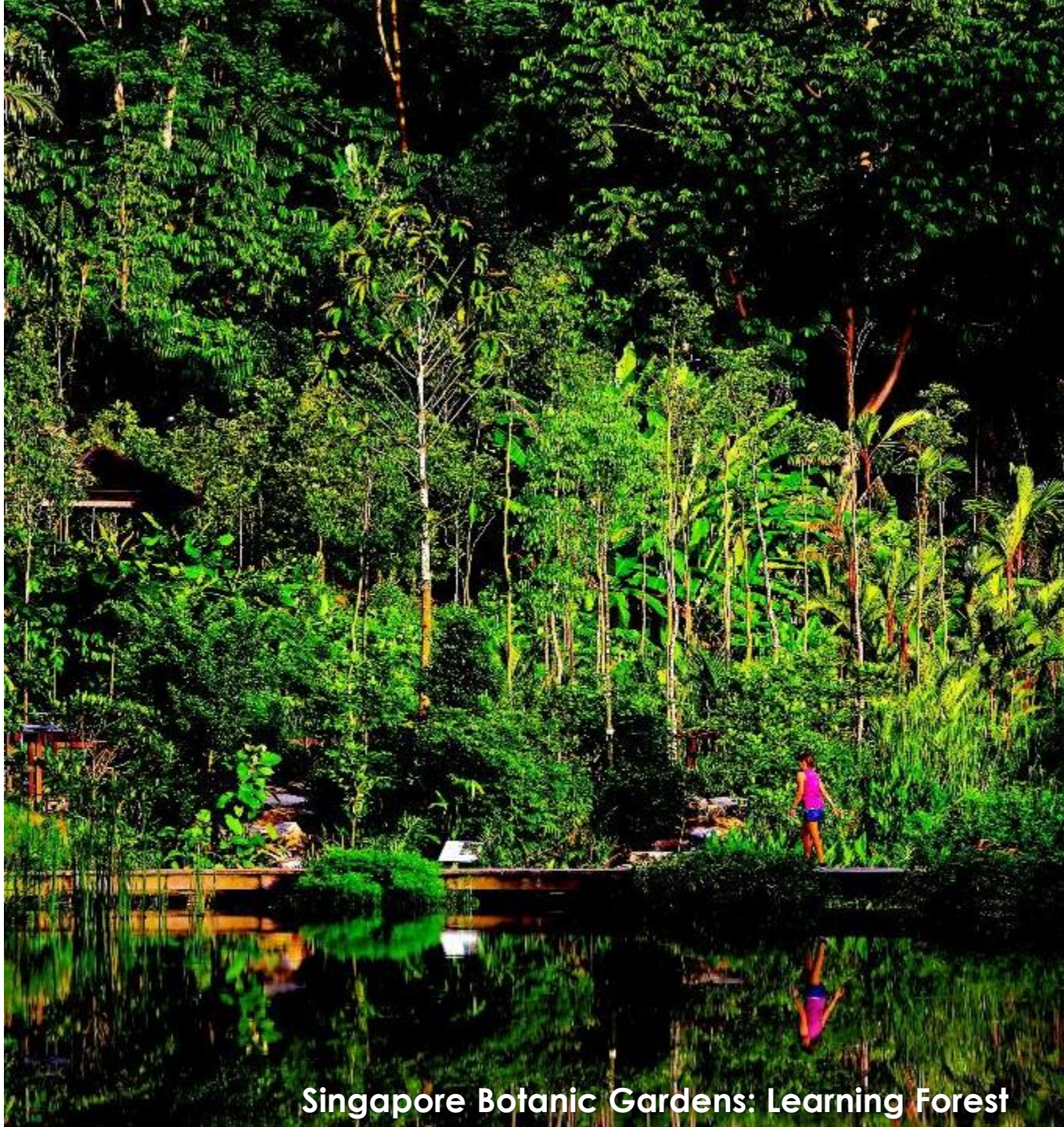
Strategy 2 : Intensifying Nature in our Gardens and Parks

Making Gardens and Parks more Natural



Gardens and Parks by 2030

- > 300ha of new and redeveloped parks will feature more lush vegetation and natural landscapes by 2026



Singapore Botanic Gardens: Learning Forest

2 Intensifying Nature in our Gardens and Parks

Habitat Restoration

Forest Restoration Action Plan at Rifle Range Nature Park

2 Intensifying Nature in our Gardens and Parks

Species Recovery

Straw-headed Bulbul
(*Pycnonotus zeylanicus*)

Singapore Freshwater Crab (*Johora singaporensis*)

Singapore Kopsia
(*Kopsia singapurensis*)

2 Intensifying Nature in our Gardens and Parks

Naturalising Waterways and Waterbodies

Riverine and coastal parks design to enhance flood resilience

2 Intensifying Nature in our Gardens and Parks

More Therapeutic Landscapes in Gardens and Parks

Therapeutic Gardens (TG)

- Therapeutic horticulture shown to improve well being of elderly in Singapore
- Customised design and programming for seniors, children and those with dementia, autism, ADHD

HortPark Therapeutic Garden

2 Intensifying Nature in our Gardens and Parks

Reconnecting our Children with Nature

Nature Playgardens

- Improve mental and physical well-being
- Improve cognitive functions
- Improve self-esteem and confidence
- Encourage creativity and interaction
- Reduce stress
- Nature stewardship from young

HortPark Nature Playgarden

Strategy ❸ : Restoring Nature into the Urban Landscape

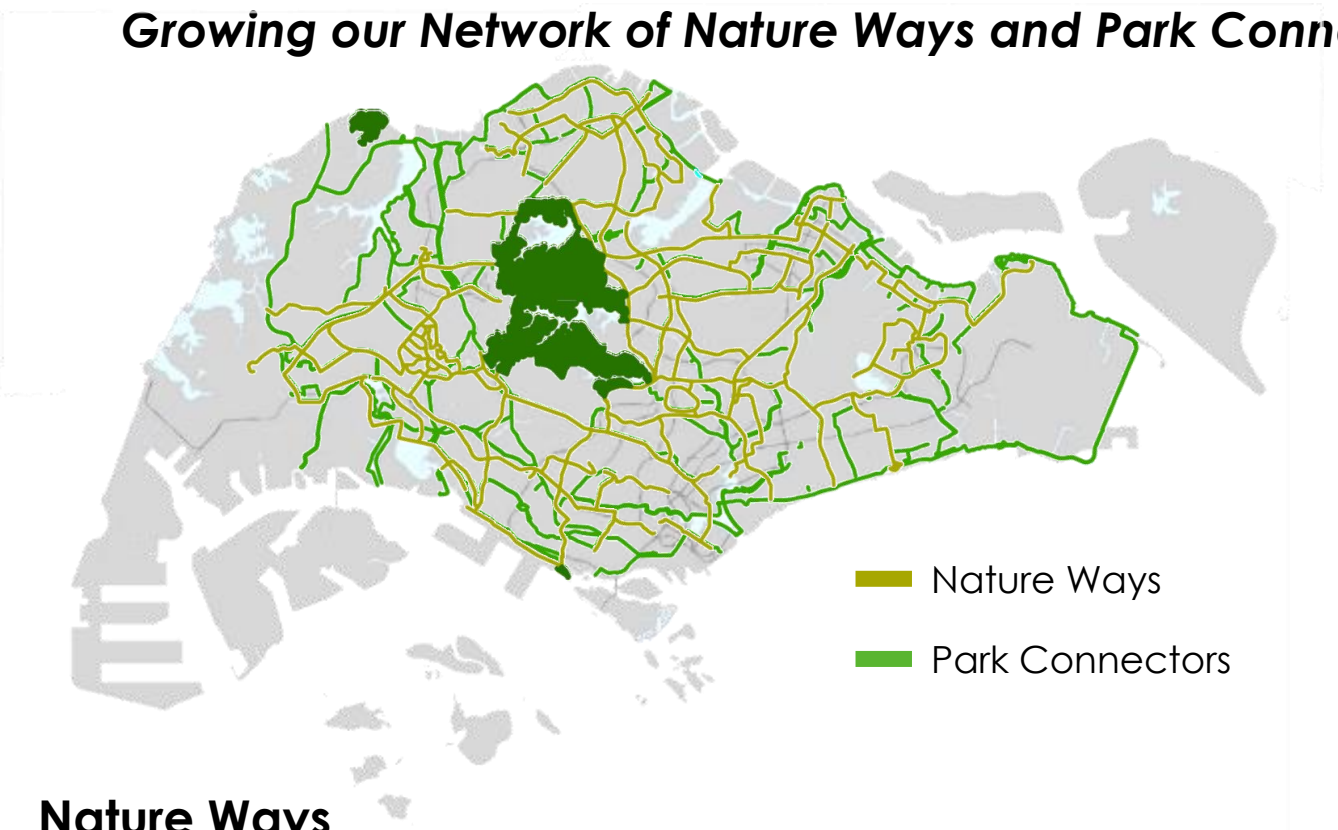
Cooling our City with Skyrise Greenery & Multi-Tiered Forest-Like Planting

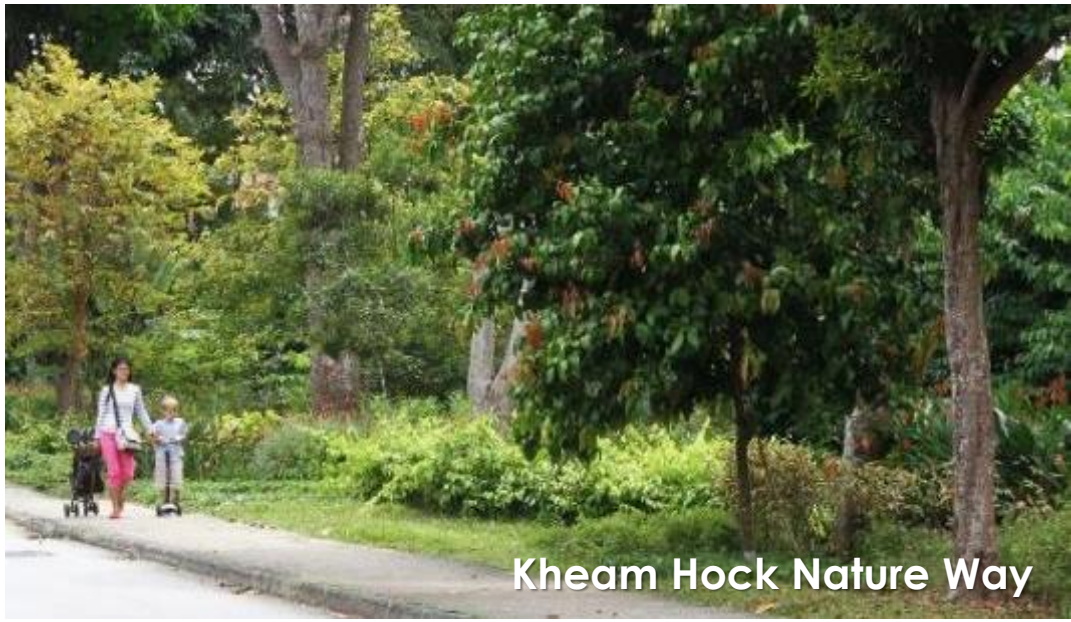
Skyrise Greenery at Kampung Admiralty

Enhancing streetscapes on Jurong Island to mitigate heat and improve air quality

Strategy 4 : Strengthening Connectivity between our Green Spaces

Growing our Network of Nature Ways and Park Connectors





Nature Ways

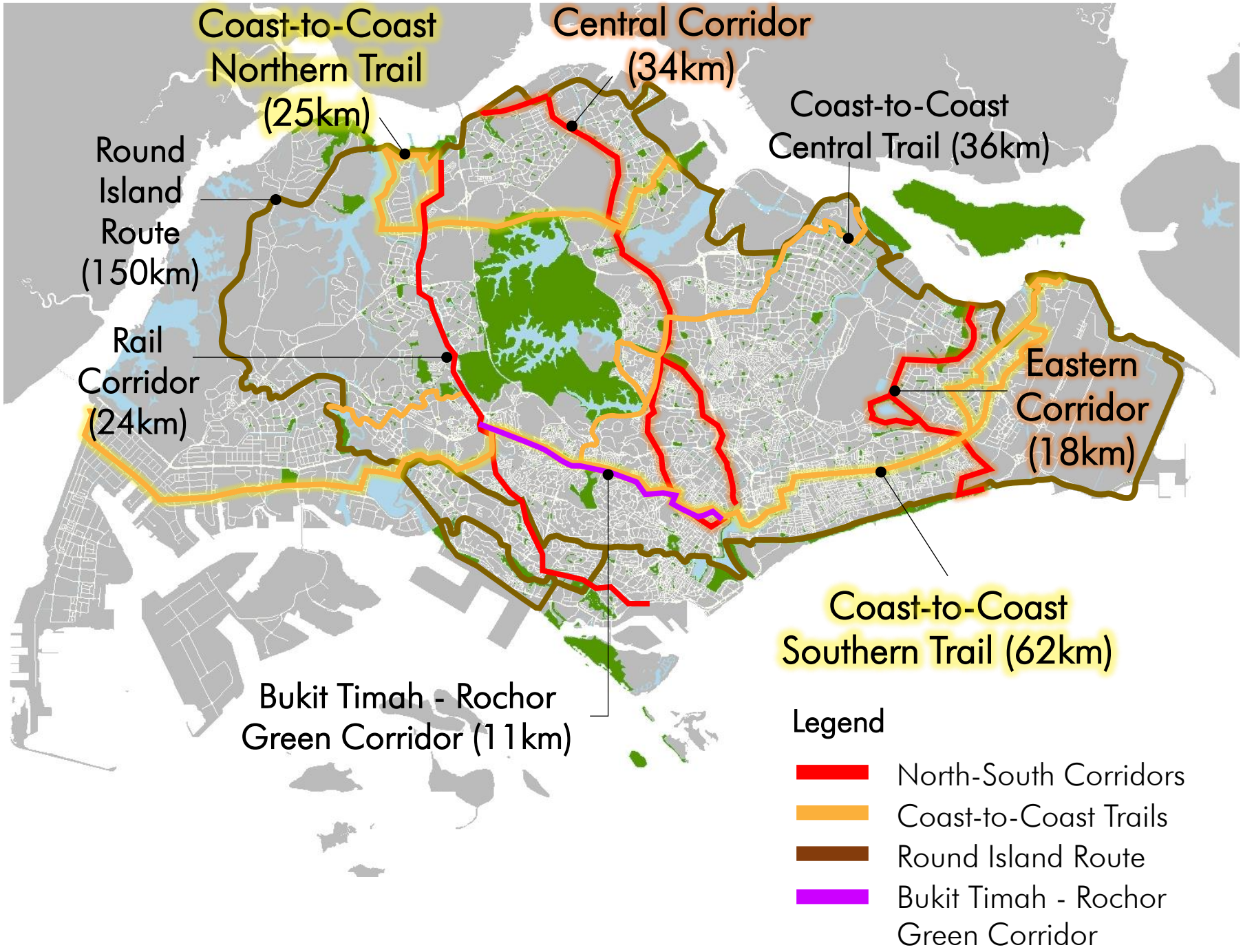
- Routes planted with native trees and plants, to mimic rainforests and facilitate movement of birds and butterflies

Park Connector Network (PCN)

- Island-wide greenery network that connects parks, nature areas and open spaces

4 Strengthening Connectivity between our Green Spaces

- 100% of households within 10 min walk from a park by 2030



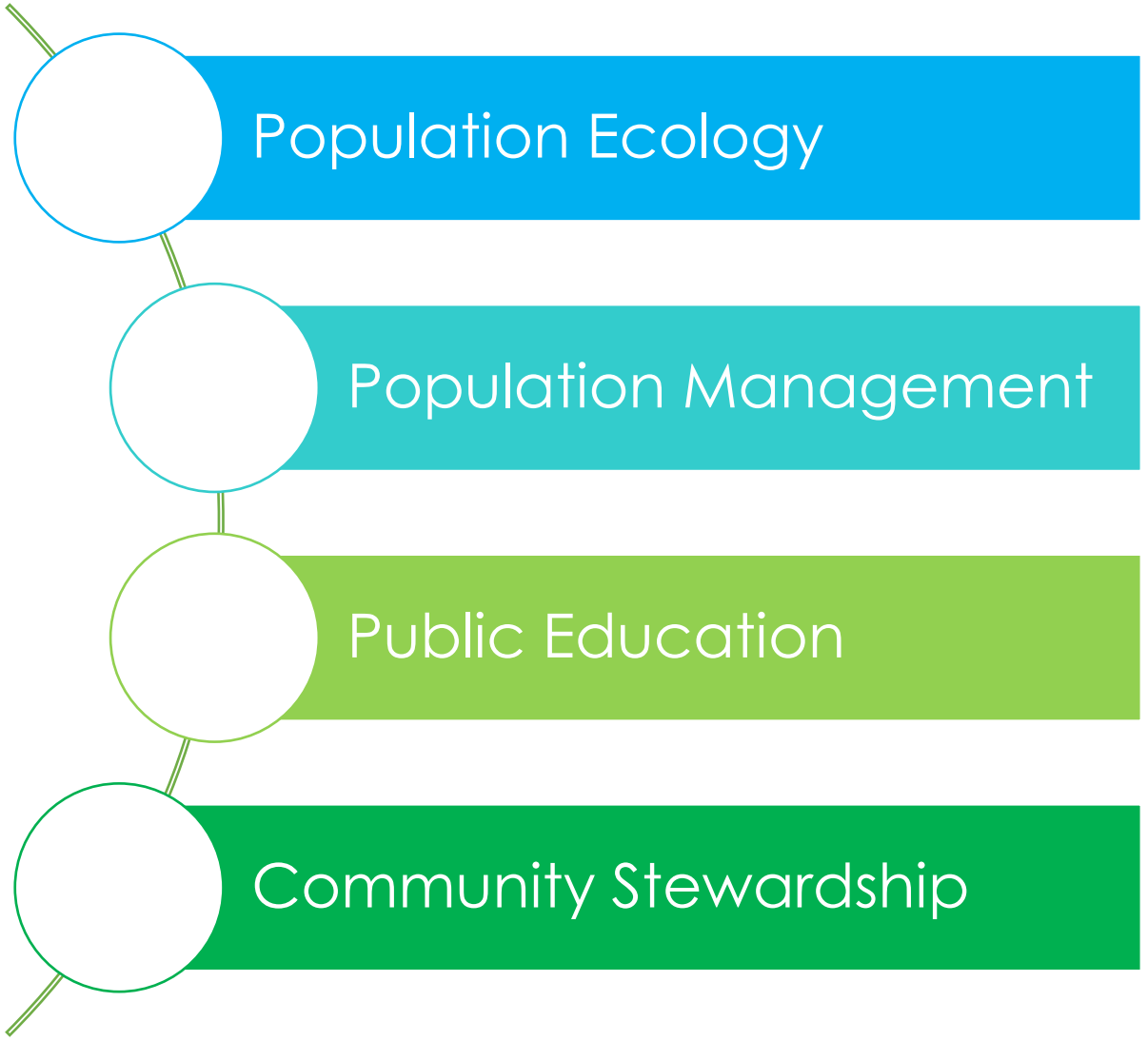
Wildlife Management

5 Enhance Veterinary Care and Animal Management

Community- and Science-based Approach to Wildlife Management

Management Philosophy

- Scientific and ethically acceptable approach
- Evidence-based and humane population control strategies
- Four-pronged approach



5 Enhance Veterinary Care and Animal Management

Pet Sector

- Strengthen resilience of animal health system
- Reduce stray animal population
- Enhance professionalism of the veterinary sector
- Raise standards for pet industry
- Promote education and outreach

5 Enhance Veterinary Care and Animal Management

Centre for Wildlife Rehabilitation

- Builds NParks' expertise in the rescue, treatment and release of wildlife

Centre for Animal Rehabilitation

- Marks a key milestone in our science-based efforts to manage the stray animal population as Singapore's first dedicated facility for animal behavioural rehabilitation

Community Stewardship

Community Stewardship

OneMillionTrees Movement led by Community

- *>550,000 trees planted by >75,000 members of the community*

Community Stewardship

Enhancing Stewardship of our Greenery and Biodiversity – Friends of the Parks




Extension of Friends of the Park Programme to over 50 parks in the next 5 years:

Design

Ideation

Concept development

Construction

Groundbreaking

Implementation

Landscaping

Nursery work

Gardening

Operations

Programming

Education

Maintenance

Community Stewardship

Growing our City in Nature – Gardening with Edibles

Youth@SGNature

Community Stewardship

Nature Kakis Network

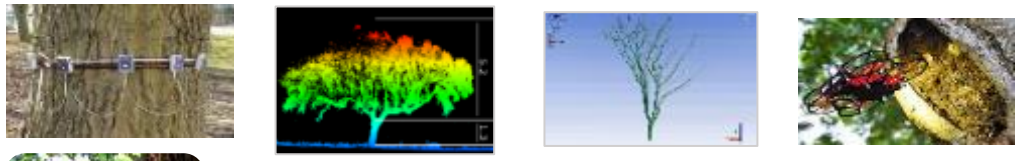
- Extend reach and engagement touchpoints further into the community to grow a network of nature-centric volunteers at the grassroots level

- Nature Kaki chapters, facilitated by NParks, will self-organise and lead projects in areas of biodiversity appreciation, community gardening, tree planting etc.

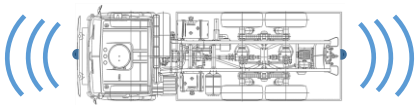
Advancing Digitalisation, Science & Technology, Industry

Common platform for sharing data and integrating work processes

Everything we do, starts with a Map

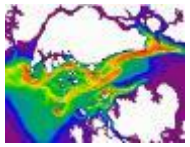


Tree Management

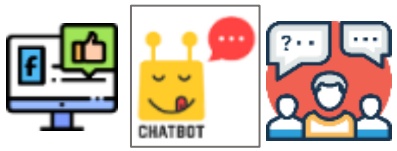


Parks Planning, Design & Development


Nature Conservation & Biodiversity Management

Community Engagement



Animal Management & Biosecurity




Park Management




Industry Development



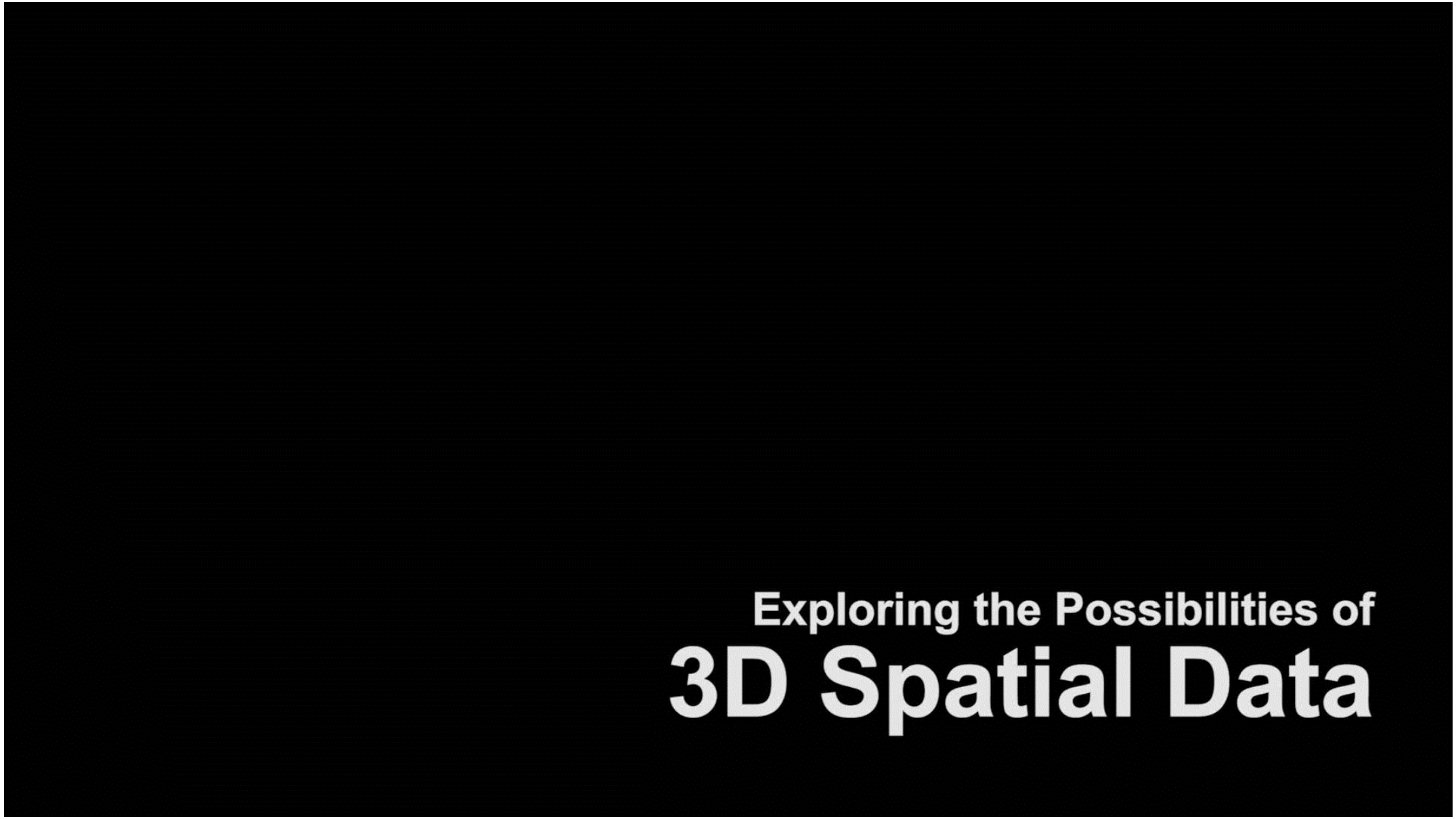
Corporate Support



MAVEN II

NParks Digitalisation Masterplan

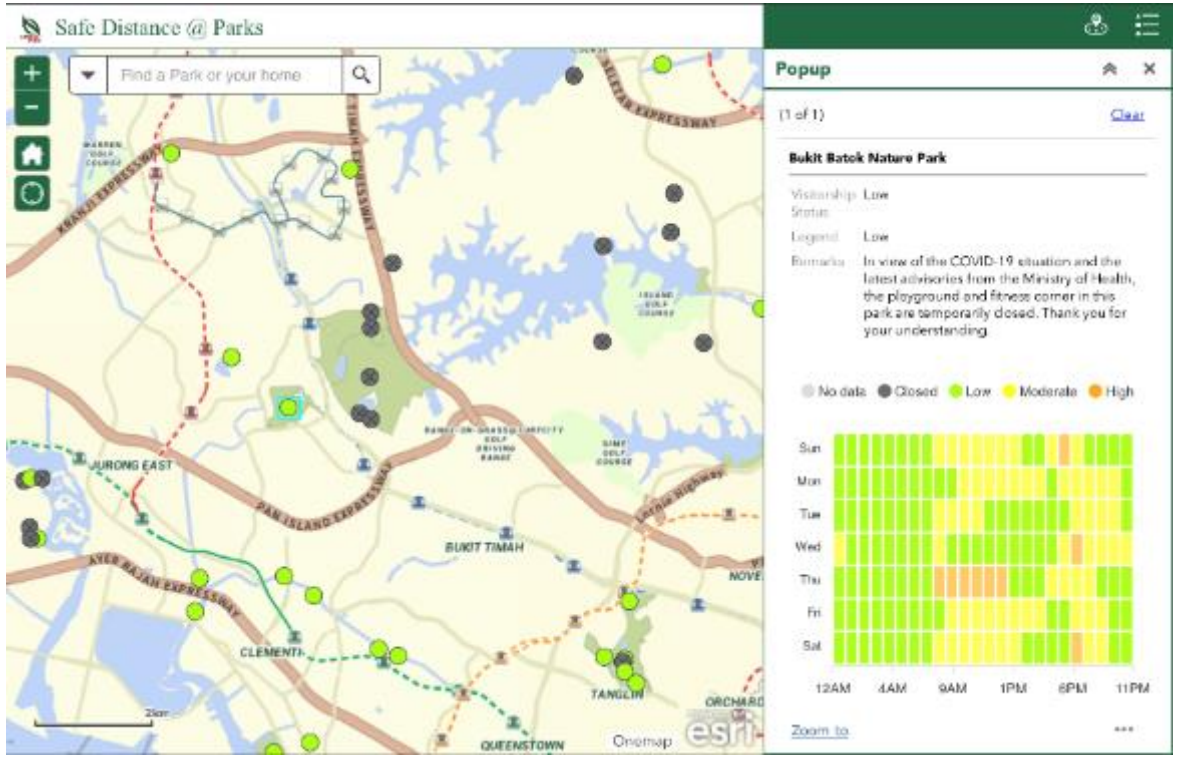
LiDAR Technology : Digital Twin of Trees



Advancing Digitalisation, Science & Technology, Industry

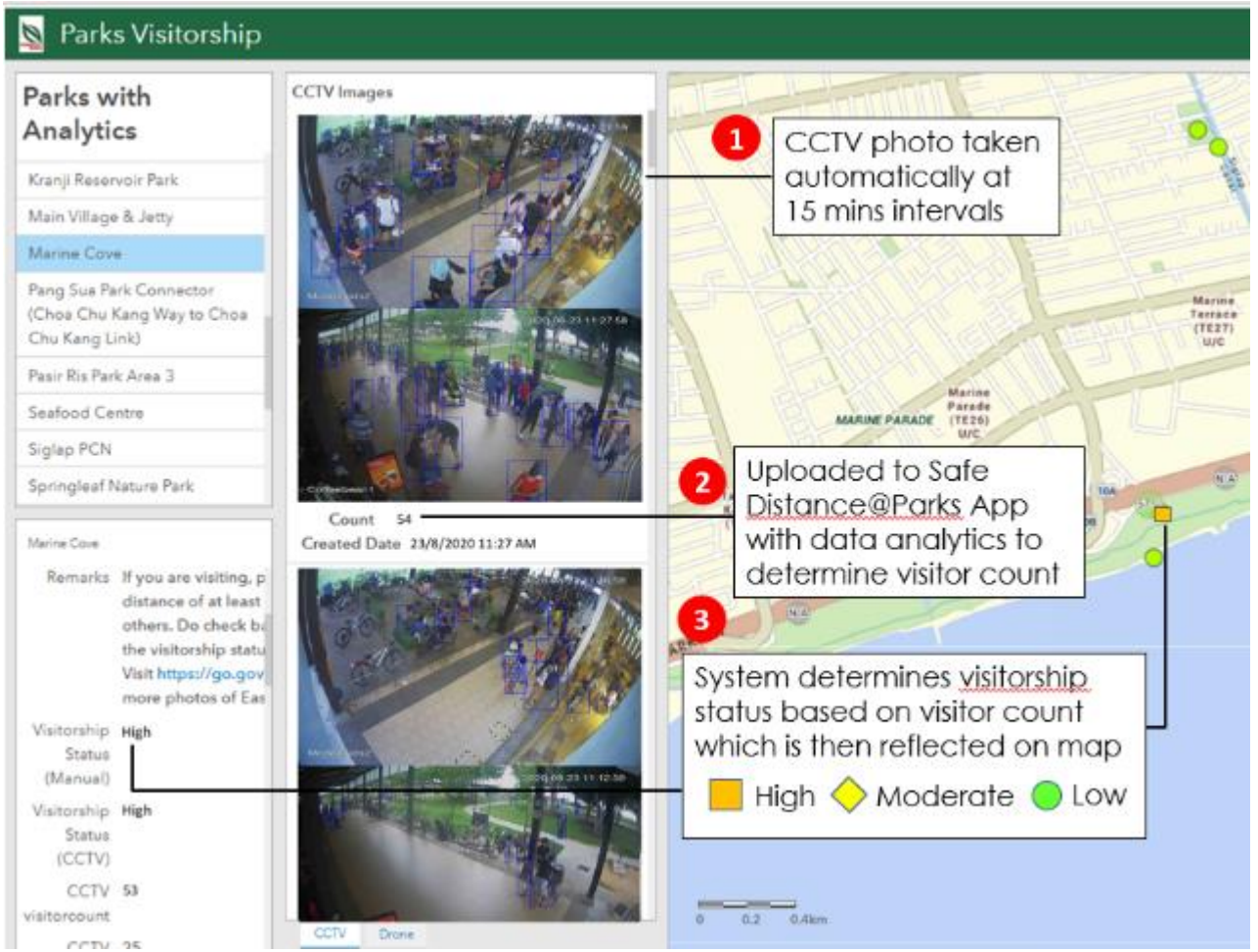
Agile and ecosystems approach

- Allows for progressive roll out of digitalisation efforts and ability to adapt to changes



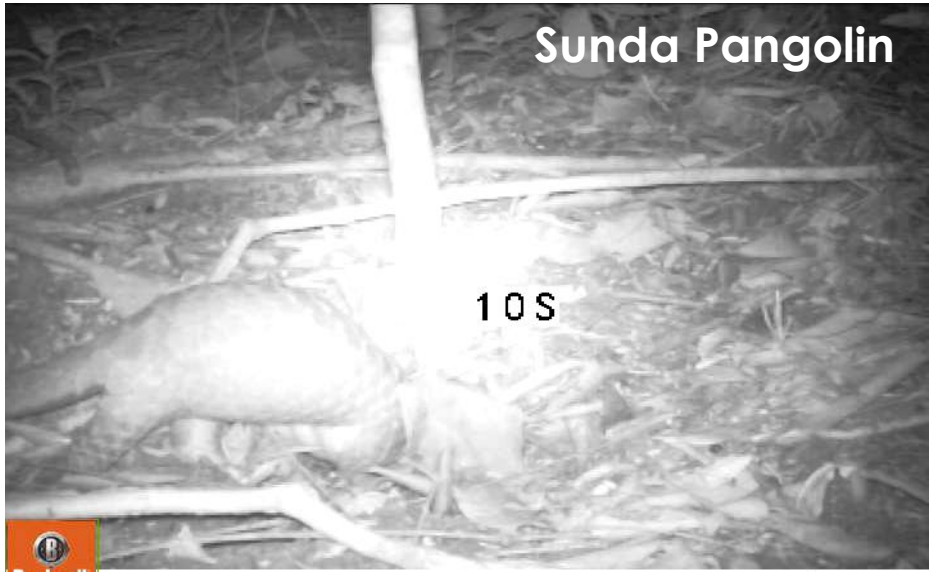
Rapid development of **Safe Distance@Parks App** by leveraging existing digital tools

- Allows public to check park visitorship levels and trends to avoid crowded parks



Park Visitorship Assessment System

Camera & Video Traps: Wildlife in Nature Reserves and Parks



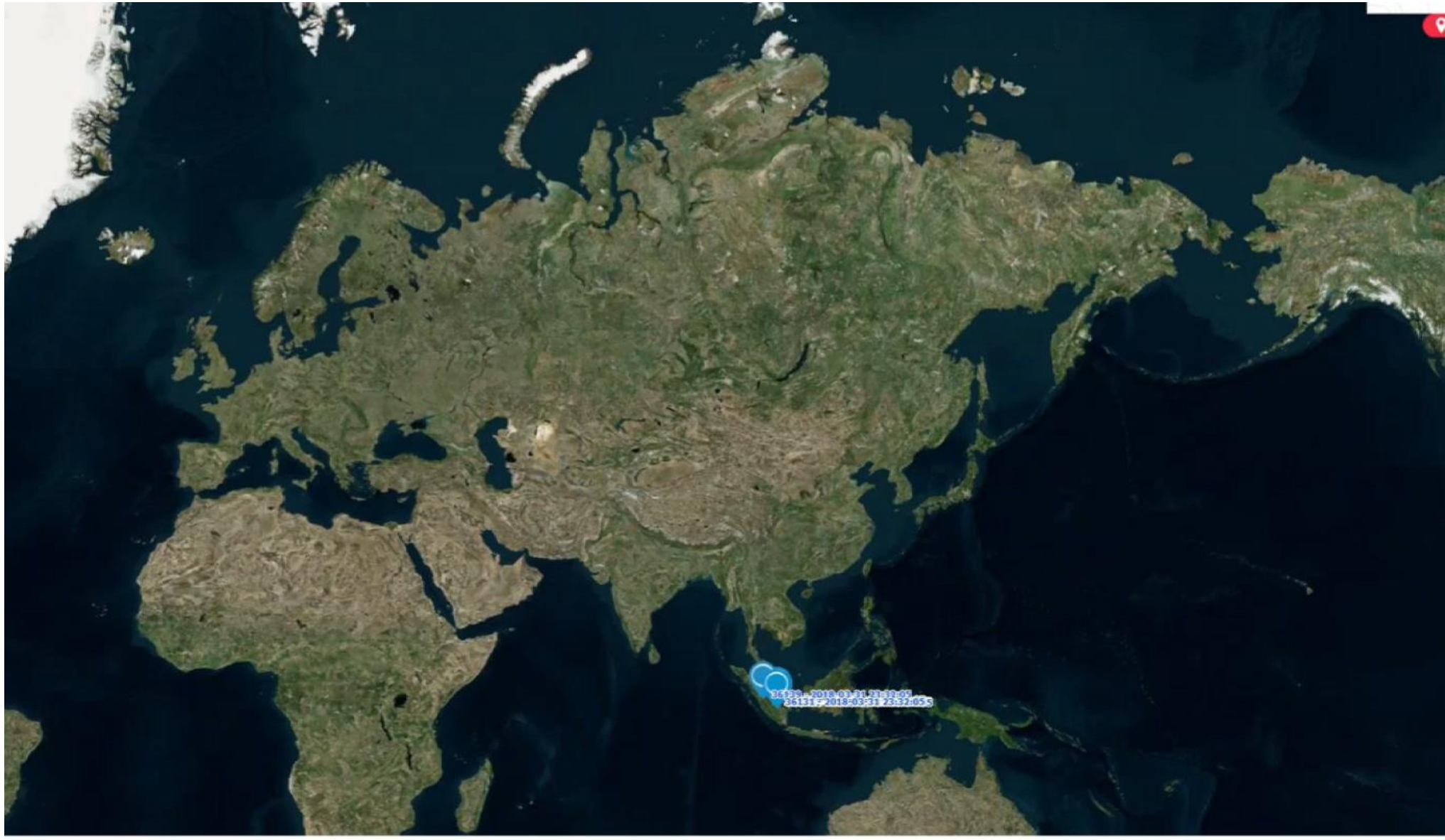
Camera & Video Traps: Wildlife in Nature Reserves and Parks

Raffles Banded Langur crossing rope bridge at Thomson Nature Park

Night Vision Camera - **Sambar Deers**

Satellite Tracking of Migratory Birds

- Common Greenshank B7
- Common Redshank WU
- Common Redshank A00
- Common Greenshank B6
- Pacific Golden Plover F3
- Common Redshank EP
- Grey Plover B3
- Whimbrel E9
- Whimbrel E6
- Whimbrel E7
- Whimbrel E8



Advancing Digitalisation, Science & Technology, Industry

Taking Digitalisation to the Industry

Bishan-AMK Digitalisation Pilot

- Test out new digital tools and technologies with and for the industry
- Work with the industry and IHL to build digitalisation capabilities through various training initiatives

1 SURVEILLANCE CAMERAS, VIDEO ANALYTICS AND PARK VISITOR ASSESSMENT SYSTEM

- Surveillance cameras, some with video analytics integrated into their systems, have already been implemented to monitor visitorship levels and safe distancing in parks and gardens amid the pandemic.
- They are also able to alert NParks staff to breaches of safe distancing rules, such as gathering in groups larger than eight or when visitors remove their masks in non-exercise areas.
- NParks is working to incorporate these technologies into its operational park management to streamline processes and allocate resources more efficiently. For instance, it can provide more benches where people tend to congregate, or set up bike lanes on paths frequented by cyclists.

2 TREE TILT SENSOR

- The wireless electronic tilt sensor is attached to trees, and helps to monitor tree movements or detect lean in trees that might result from progressive weakening over the years.
- The sensors guide staff on risk mitigation measures.

3 REMOTE TREE MEASUREMENT SYSTEM

- The system uses machine learning to extract the locations and physical parameters of trees, such as height and girth, from Light Detection and Ranging (Lidar) scans.
- The information collected is automatically uploaded onto a central platform, allowing NParks' arborists to efficiently get an overview of trees in a given area, reducing the need for fieldwork and manual records.
- The system allows trees in poorer health to be highlighted so they can be attended to earlier.

4 GRASS HEIGHT SENSOR

- The sensor reduces the need for NParks' staff and contractors to perform site checks as they can remotely track, using GPS data, areas where the grass has been cut.
- The hip-worn sensors can also detect grass height, to confirm that work has been completed. With these updates, contractors can be paid as soon as possible upon completing their tasks.

5 CONTRACTOR FLEET MANAGEMENT SYSTEM

- Landscaping worksites are located at various locations across the island, and individual teams are constantly on the move.
- The management system consists of GPS trackers, sensor devices and video camera recorders installed on vehicles used by NParks contractors performing greenery maintenance.
- This allows managers to conduct remote monitoring and location tracking, and get live updates on work progress.


Thank You