

# Clean Cities

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# Outline

- Resource conservation
- Transportation
- Pollution prevention
- Greening
- Green economy
- Urban planning
- Sharing the Singapore experience

# Singapore – a City-State's Challenges

- 710km<sup>2</sup> land area
- 5.08 million population
- Limited natural resources (lack of energy sources, lack of water, and limited potential for alternative energy)



# Singapore – meeting the Challenges

Key Challenges:

Population growth and diverse needs

Resource Constraints

Maintaining economic competitiveness

Vision:

**“A LIVEABLE and SUSTAINABLE city state, one that Singapore residents love and are proud to call home.”**

Strategies:

Dynamic Economy and Sustained Growth

*(Resource-Efficient)*

Talent Attraction



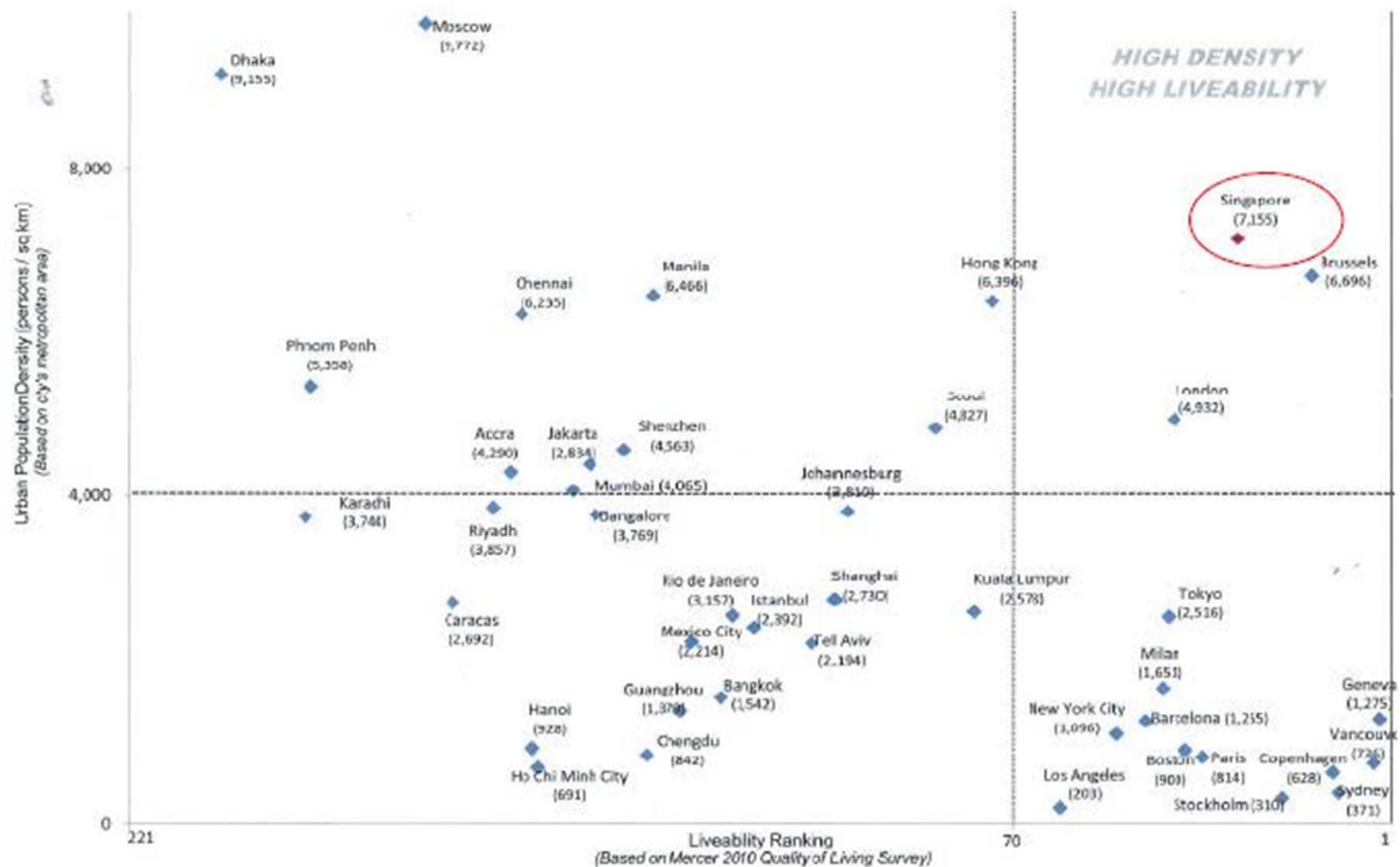
Urban Innovations

High Quality Living Environment

*(Clean, Green, Healthy)*



# Density and Liveability







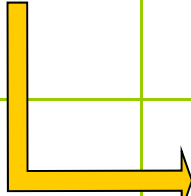


# 1. Resource Conservation

- Limited resources and global climate change = need to manage energy, water, and waste
- Conservation and efficiency can create a dynamic economy and sustained growth



# Analysis of Energy Use

	 Electricity Generation	 Industry	 Transport	 Buildings	 Households	 Others
Primary Consumption (fuels)	48%	33%	17%	1%	~1%	-
Secondary Consumption (electricity)		21%	2%	14%	9%	2%
Overall		54%	19%	15%	10%	2%

# Energy Efficiency

- Programmes for energy efficiency in each of the 5 sectors
- Power generation – shift to efficient natural gas plants
- Industry – work with industry associations
- Transport – usage charges for cars, good public transport network
- Buildings – green building standards
- Households – appliance efficiency





# Water Efficiency / Conservation

- Ensuring a diversified, adequate and sustainable source of water



# Encouraging Water Conservation

- Active, Beautiful, and Clean (ABC) Waters plan to turn Singapore into “a city of gardens and water” and bring Singaporeans closer to water





# Waste Management

15,350 tonnes / day  
generated

**54% recycled**

- National Recycling Programme

**43% incinerated**

- Waste-to-Energy: 2-3% of electricity needs

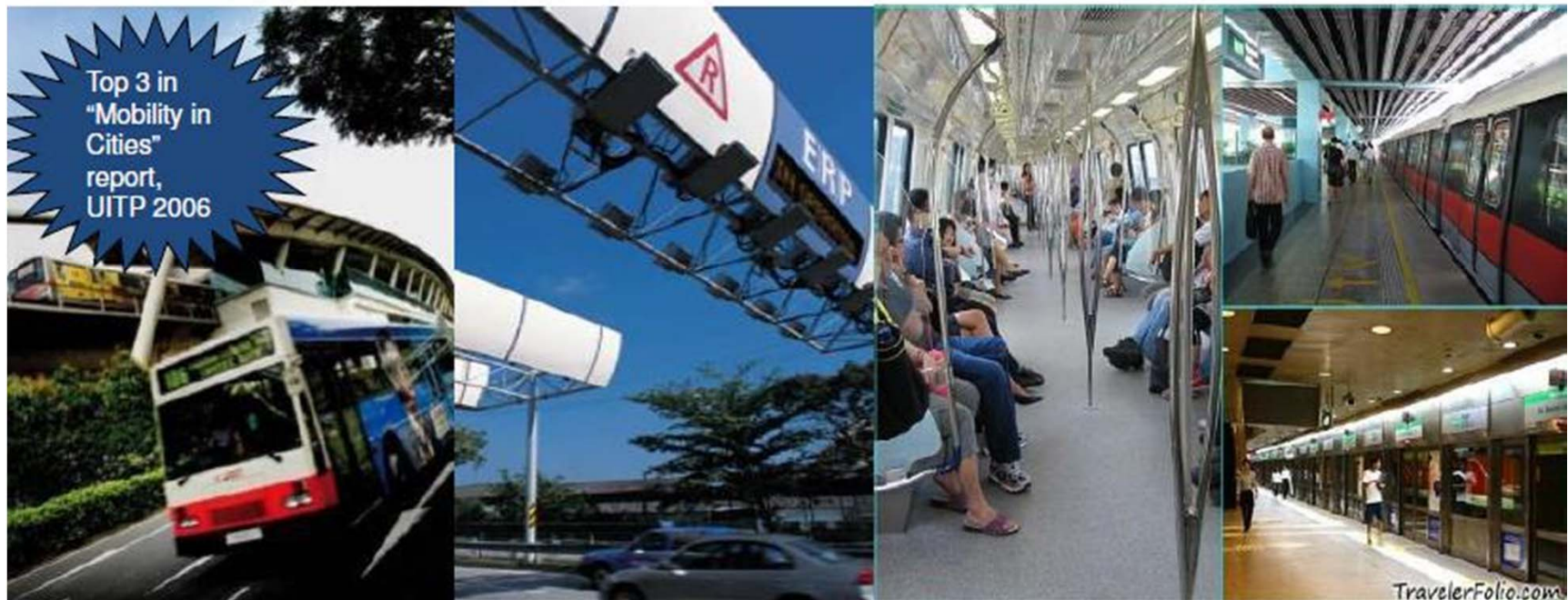
**3% landfill**

- Last 40 years, part of future landstock
- Biodiversity haven



## 2. Transportation

- **Infrastructure** for island-wide public transport (master-plan).
- **Policy** for private car ownership
  - Congestion charging since 1975
  - Vehicle Quotas from 1990
- **Hub-and-Spoke Model** – Seamless interchange between different modes of transport





### 3. Pollution Prevention

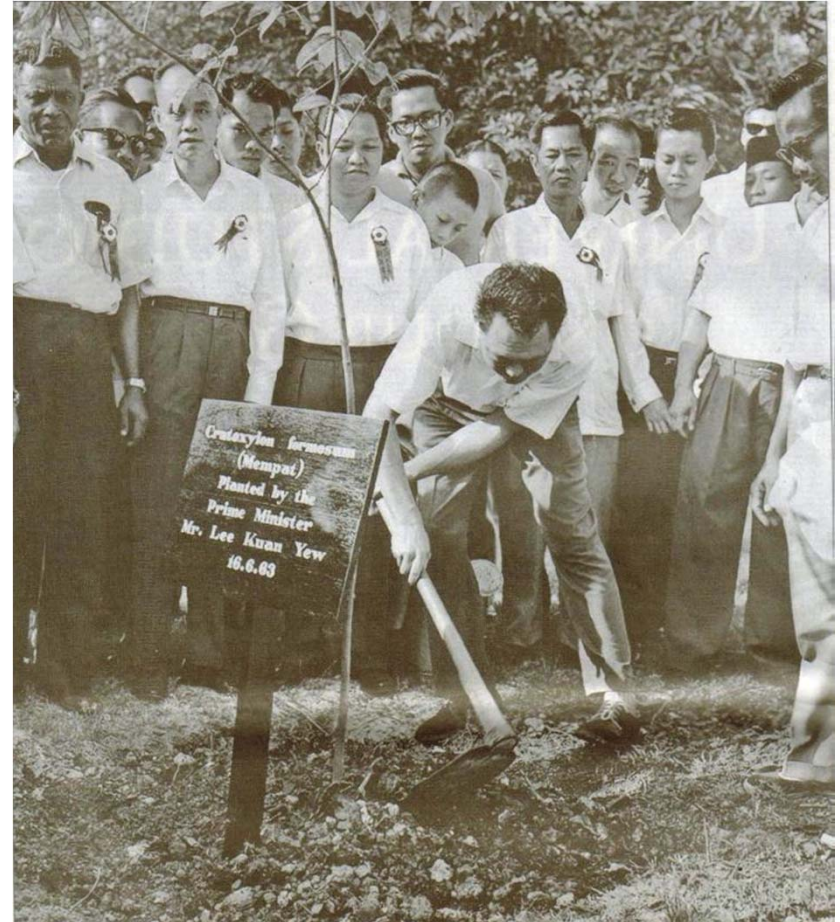
- Pollution affects health of population
- Also affects economic development
- Air pollution: understand sources (diesel vehicles, power plants, industry) and address sources
- Water pollution: prevent discharge

# Enforcement



## 4. Greening

- From a 'Garden City' to a 'City in a Garden'
- "After independence, I searched for some dramatic way to distinguish ourselves from other countries. I settled for a clean and green Singapore" – Mr Lee Kuan Yew, first PM of Singapore



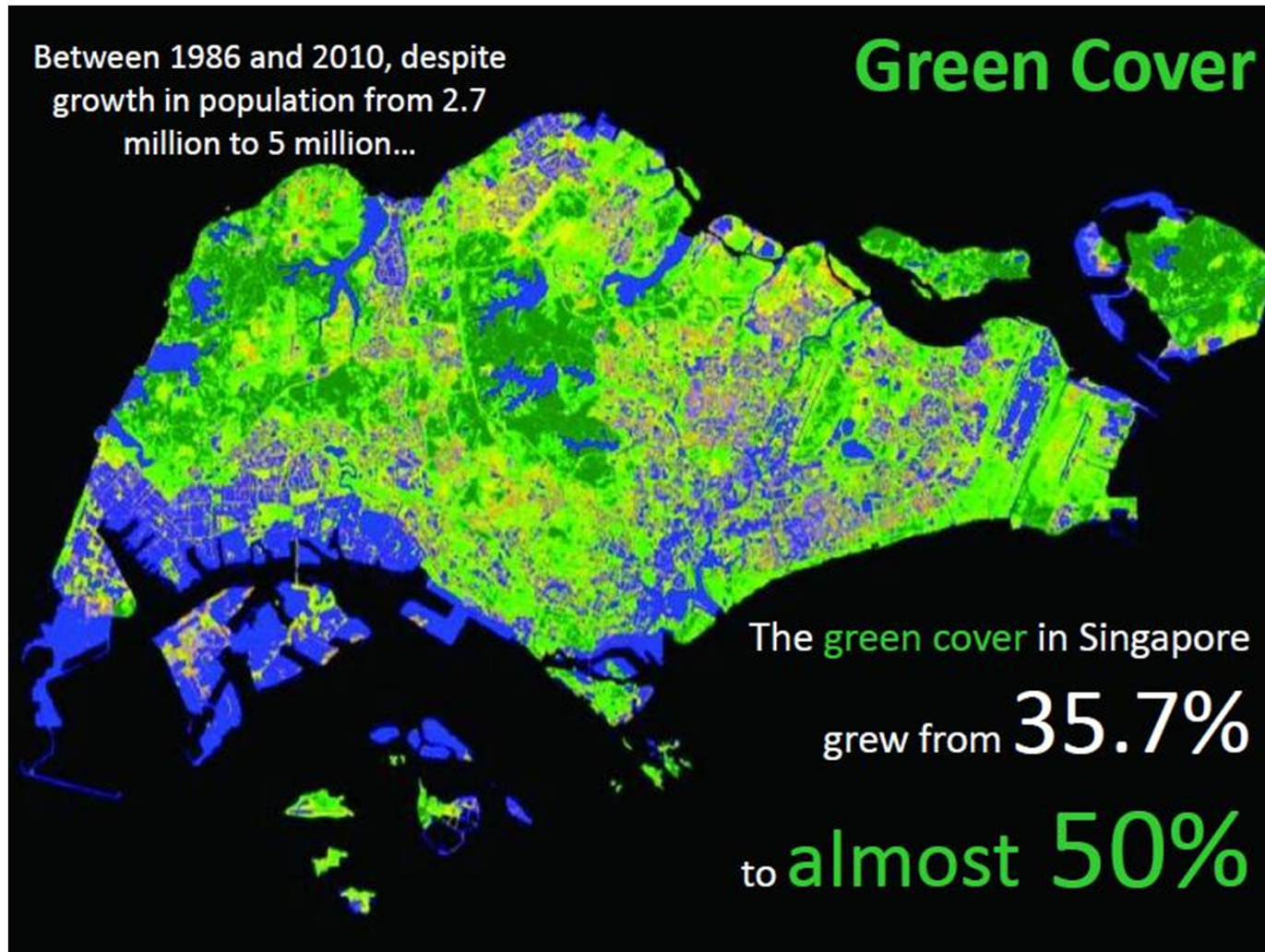
# Benefits of Greening

- Environmental – reduced urban heat island effect
- Psychological – improved morale, helped give Singaporeans a sense of pride
- Economic – well-managed greenery convinced investors that Singapore had discipline and order, as well as attracted people to live in the city



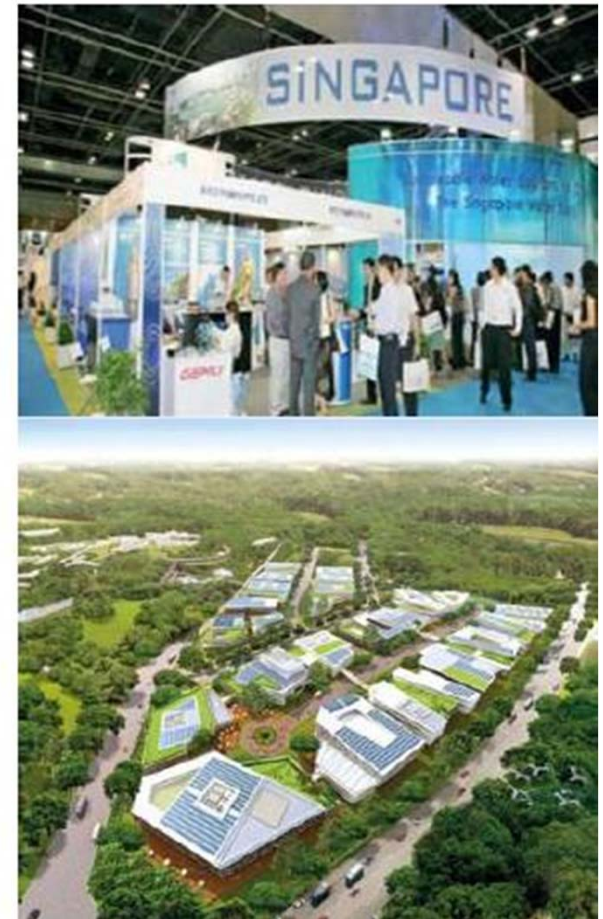


# Increasing Green Cover



# 5. The Green Economy

- Singapore as Knowledge Hub and Provider of Clean Technology and Sustainable Urban Solutions
- R&D, testbedding and manpower development
- \$680 million for Clean Energy and Water Technologies
- International knowledge-sharing: Centre for Liveable Cities, World Cities Summit, Singapore International Water Week
- 55ha CleanTech Park at Jalan Bahar
- Solar Energy Research Institute of Singapore (SERIS)
- DHI-NTU Water and Environment Hub
- Singapore Membrane Technology Centre
- Singapore Delft Water Alliance



## 6. Urban Planning

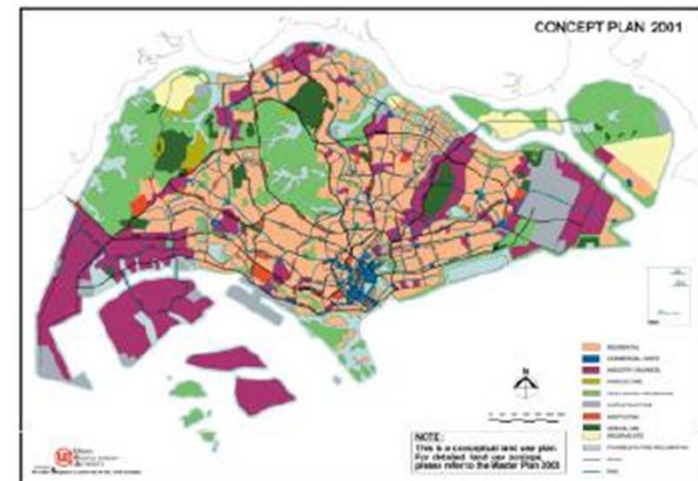
- Long-term integrated urban planning is necessary for clean cities
- Important to plan and act in unison towards sustainable growth





# Concept and Master Plan

- Concept Plan - strategic land use and transportation plan to guide development for **40 to 50 years**.
- Reviewed every **10 years**.
- Established process involving multi
- agencies to resolve conflicts.
- Master Plan – guides development **over the next 10 to 15 years**.
- Reviewed every **5 years** & translate the broad long-term strategies of CP into detailed plans to guide development.





# Public Housing

- Quality public housing at affordable prices for majority ( $> 85\%$ ) of Singaporeans
- High-rise and high-density flats.
- Self-contained satellite towns with schools, supermarkets, clinics, hawker centres, sports and recreational facilities.
- Universal designs & age-friendly facilities.



# High Quality Living Environment

Marina Bay



Chinatown



Southern Ridges



Orchard Road



Public Housing

## 7. Sharing Singapore's Experience

- More than half the world's 7 billion people live in cities today
- Over next 10 – 15 yrs, an estimated 400m people will move from rural areas to urban areas in China = 20 – 30 more Shanghais!
- Rapid urbanisation happening in Southeast Asia, India, Brazil, Africa, etc.

# Suzhou Industrial Park

- Mooted by late Chinese leader Deng Xiaoping in 1992  
“Singapore enjoys good social order and is well managed. We should tap on their experience, and learn how to manage better than them.”
- China-Singapore Suzhou Industrial Park jointly developed by the 2 governments.
- Total jurisdiction area of 288 sq km. The China-Singapore cooperation area covers 80 sq km with a planned residential population of 1.2 million.





# Sino-Singapore Tianjin Eco-City

- Eco-City Master Plan: guidelines for scalable, practicable and replicable model
- Holistic approach: a liveable, efficient and compact city, developed in an ecologically sound and environmentally sustainable manner



# Further Info

- Singapore's Sustainable Development Blueprint  
[www.sustainablesingapore.gov.sg](http://www.sustainablesingapore.gov.sg)
- Centre for Liveable Cities, Singapore  
[www.clc.org.sg](http://www.clc.org.sg)
- World Cities Summit  
[www.worldcities.com.sg](http://www.worldcities.com.sg)

Thank You

