



veritas **lecture**
SERIES #13

AUDREY TEO LOH
8th AUGUST 2019

FORWARD

MOVING PENANG
INTO THE FUTURE

Value capture for Transit Infrastructure Development

VALUE CAPTURE

Investments in Transit Infrastructure improves the built environment, create opportunities and foster development along the service corridors, at the nodes, and where land are reclaimed to facilitate the Transit project.

Capturing the value of this benefit through various tools is gaining interest as a finance mechanism for infrastructure investments.

Where is “Value created” ?

Capture by Whom? And How?

The Mechanisms to capture value, as shown in other parts of the world will be discussed. Could these measures be suitable for Penang?

*Not (re) inventing the wheel!
It is in virtually all countries
Some existing legal proviso*

*value Capture makes good
Sense!
Some value captured in all
countries even if
unintentionally or implicitly!*

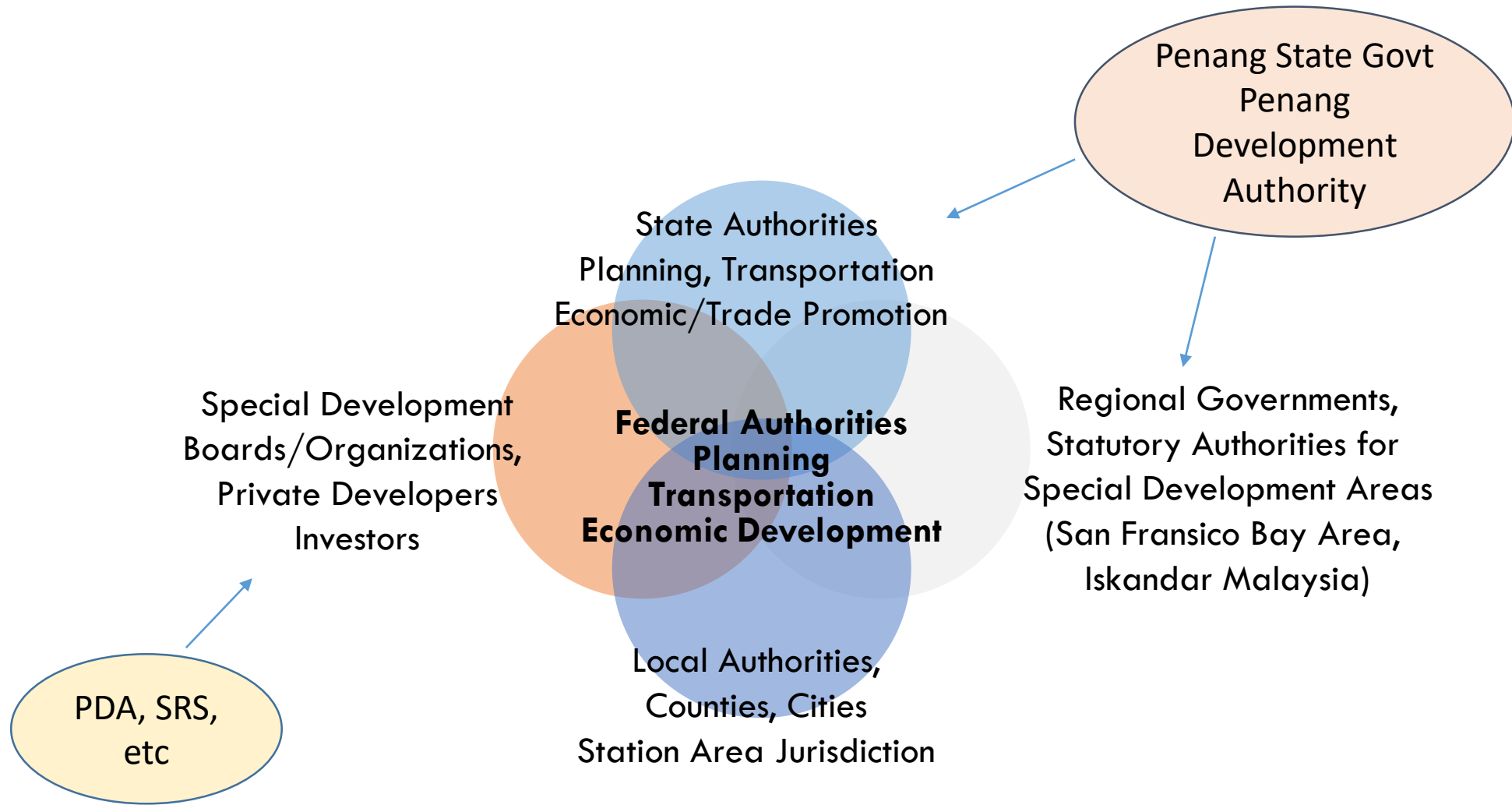
*...Says Martin Smolka
Lincoln Institute of Land Policy
UN HABITAT*

Agenda

1. Transit Development Stakeholders and Constituency
2. Economic Modeling and Value Capture
3. Overview of Different Mechanism
4. Models of intergovernmental and private sector VC coordination
5. Value Capture with Urban Quality
6. Key Takeaways

Transit Development Stakeholders and Constituency

Legal and Economic Framework



Economic Modeling and Value Capture

Political, Social and Economic goals

- **VISION**
- **Masterplan for Long term Growth**
- **Monitor and Research Trends & Distribution**
- **Short term Goals and Implementation Strategy**
- ***RESISTANCE in the 4 I's** (*M. Smolka, UN Habitat)
 - Ideology
 - Interest
 - Ignorance
 - Inertia

**“Kashiwano
ha Smart
City” to
serve as
global
models for
resolving
issues**

**An environmental
-symbiotic city**

- Centralized management of energy as a region
- Promote energy conservation, energy creation and energy storage
- “Local production for local consumption” of energy and food
- New low-carbon urban transportation
- Secure lifelines even in the event of a disaster

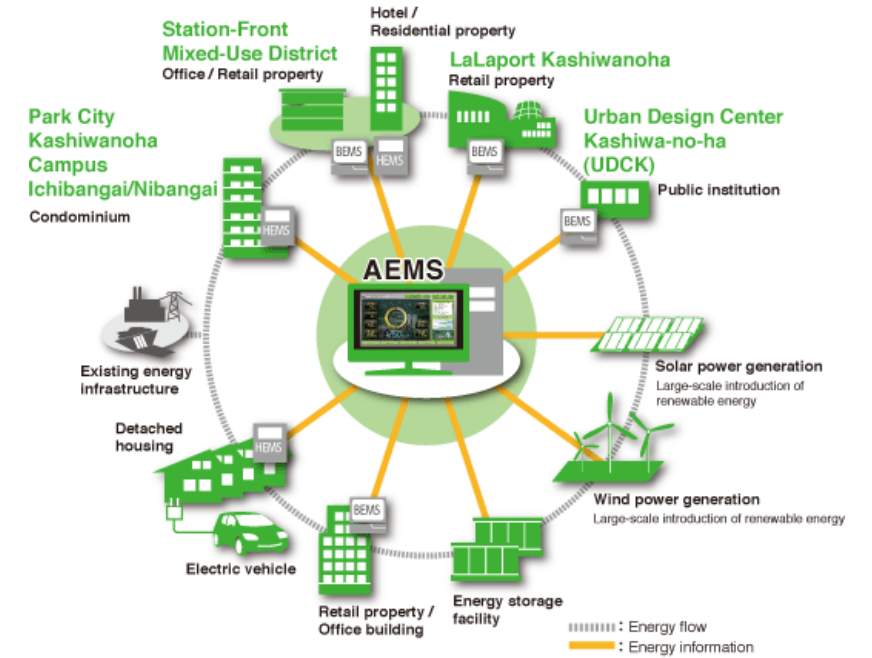
**A city of
health and
longevity**

- Disease and long-term nursing care prevention through local collaboration
- Elderly's proactive participation in society
- Society in which multi-generational interaction utilizing ICT enables everyone to lead a vibrant life

**A city of
new industry
creation**

- Locally support startup companies that utilize Japan's proud “technological strengths”
- New industries that support green economy
- Form international community of startup companies

**Safe,
secure and
sustainable
smart city**

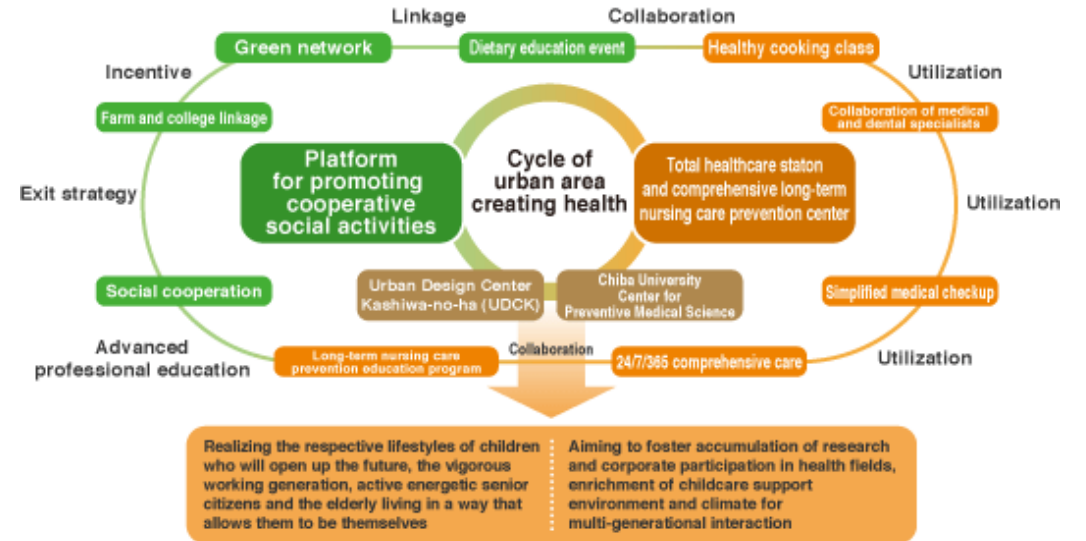


**Mitsui-Fodusan Group
Long Term Vision 2025**



**Ecosystem for innovation along
the Tsukuba Express**

Building a locally-based sustainable support system for business startup primarily for entrepreneurs and startup companies



Realizing the respective lifestyles of children who will open up the future, the vigorous working generation, active energetic senior citizens and the elderly living in a way that allows them to be themselves

Aiming to foster accumulation of research and corporate participation in health fields, enrichment of childcare support environment and climate for multi-generational interaction

Economic Modeling and Value Capture

- Future proofing evolving cities to mitigate growing concerns of traffic congestion
- Anticipating the growth of the population and planning in accordance to public mobility demands
- Looking at land asset management and future development of land in conjunction with the growth of the city
- Pre-empting and allocating resources according to plans in place for the future
- Managing changing urban density in view of urban sprawl development

DENSITY

DISTANCE

DEMAND

DIVERSITY

DESIGN

DESTINATIONS



Density impact

Washington DC Metro

Project Essentials for Transit Projects

1. Financing: Capital Cost & Cashflow
2. Planning & Design: Location of Stations, Linkages
3. Externalities: Technical Constraints, Construction Impact, Sequential Development
4. Sustainability: Operations, Market Demand, TOD

VALUE CAPTURE TOOLS

DIRECT

Land Sale (Sales of Transit Sites)
Betterment Contribution
Land Readjustment
Land Leasing of Public land
Land Value Tax – incl Progressive
Land Value Increment Tax
Development Charge and fees
Charges to Building rights
Urban Operations
Certification of Additional Potential CePAC
Construction Bonds

INDIRECT

Property Tax
Special Districts – BIDS
Expropriations
Exactions
Tax Increment Financing – TIF
Linkage Operations
Transfer of Development Rights (TDR)
Land Banks – Territorial Reserves
Declaration of Priority Development
Preemption Rights
Announcement of the Project
Negotiations of Special Licence

Developer Exactions— Developer Pays

- ✓ **Developer exactions are directly linked to granting land use approvals and permits**
 - Type of exactions:
 - Land dedications
 - In-kind provisions (service or physical facilities)
 - In-lieu fees (e.g., impact, linkage, tap fees)
 - Legal/constitutional issues related to takings
 - “Essential nexus/rough proportionality” test per *Nollan/Dolan/Koontz*
 - Developers pay in downcycle but passed onto property owners (buyers) in upcycle

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Stanford University

Other Innovative Emerging Tools— Investor Pays

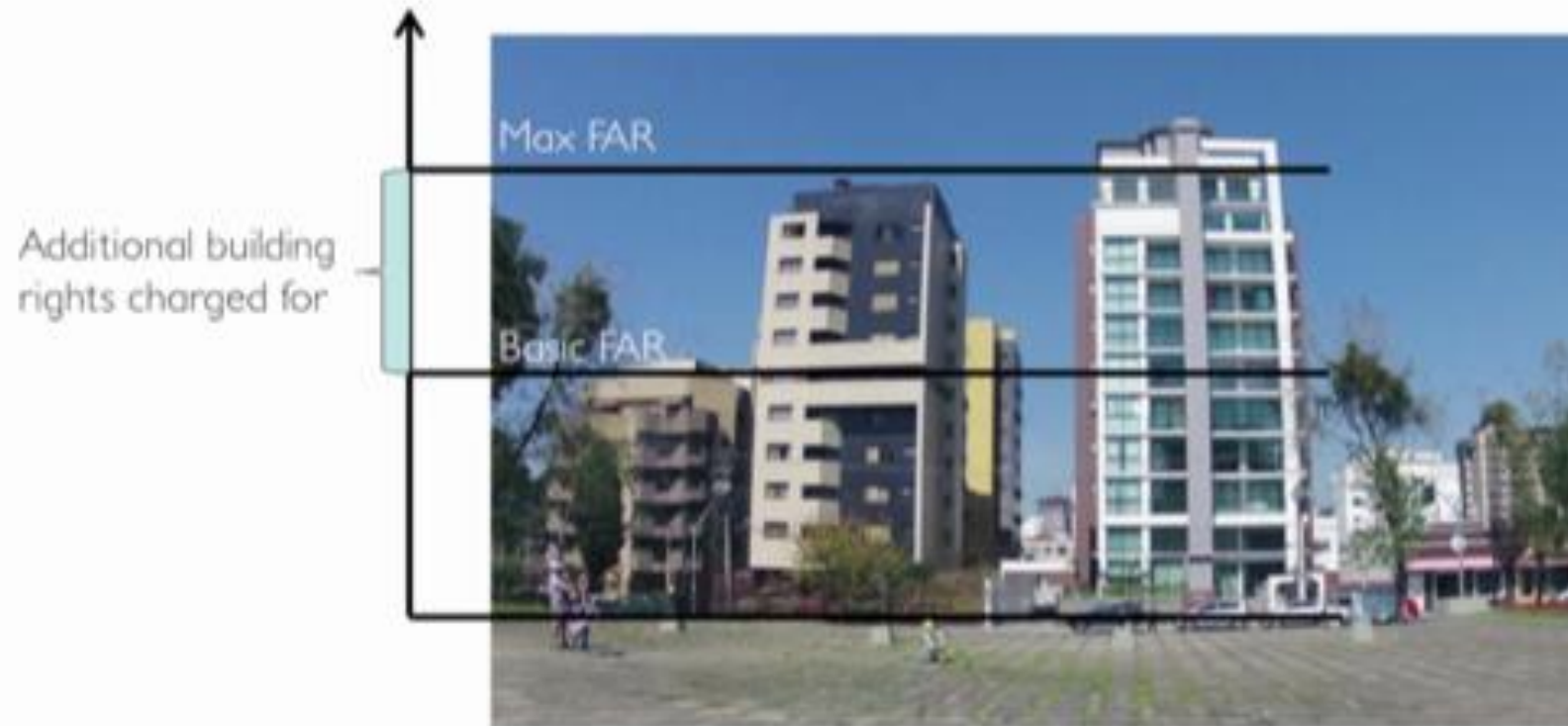
- ✓ **CePAC (Certificate of Potential Additional Construction), Sao Paulo, Brazil**
 - Monetize land use entitlements thru upzoning
 - Additional development right sold in public auctions
 - Proceeds used for affordable housing, infrastructure
 - Improvements made early and independent of potential delay in project development
 - Transparent and market-based value assessment of incremental density
 - Top-down upzoning policy tool to encourage smart growth, TODs
 - Paid for 15% of City's capital investment needs using less than 0.1% of total developable land

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CePAC – Certificate of Potential FAR Entitlement

CHARGE FOR BUILDING RIGHTS



In Curitiba, Brazil, the taller building on the left graphically illustrates the area above the basic FAR of about six stories for which building rights were charged. The taller building on the right also paid for additional building rights but did not demonstrate that fact in its design (C) Gislene Pereira

CROSSRAIL - LONDON

London levied an incremental tax known as business rate supplement (BRS).

£0.02 supplement on business rates for properties of a rateable value over £55 000 per annum, with this threshold ensuring that smaller premises were exempt and the burden would fall on the larger businesses which were more able to absorb the cost, and most of which were along the line of the proposed route in any case. **The BRS generates around £225 million per annum, which for the GLA could support borrowing of around £3.5 billion.** The levy is expected to fall away once the bonds are fully repaid, which is forecast to be in the 2030s.

Political risk of imposing a levy across the city region, the mayor had to determine the rate to be applied, ensure the collection and underwrite the subsequent bond letting process to meet the funding commitments to the project.

The attractiveness of the BRS was that, as a supplement to an existing taxation base, it was easily levied and collected, and the proceeds were very predictable – the income realised has slightly exceeded TfL's forecasts.

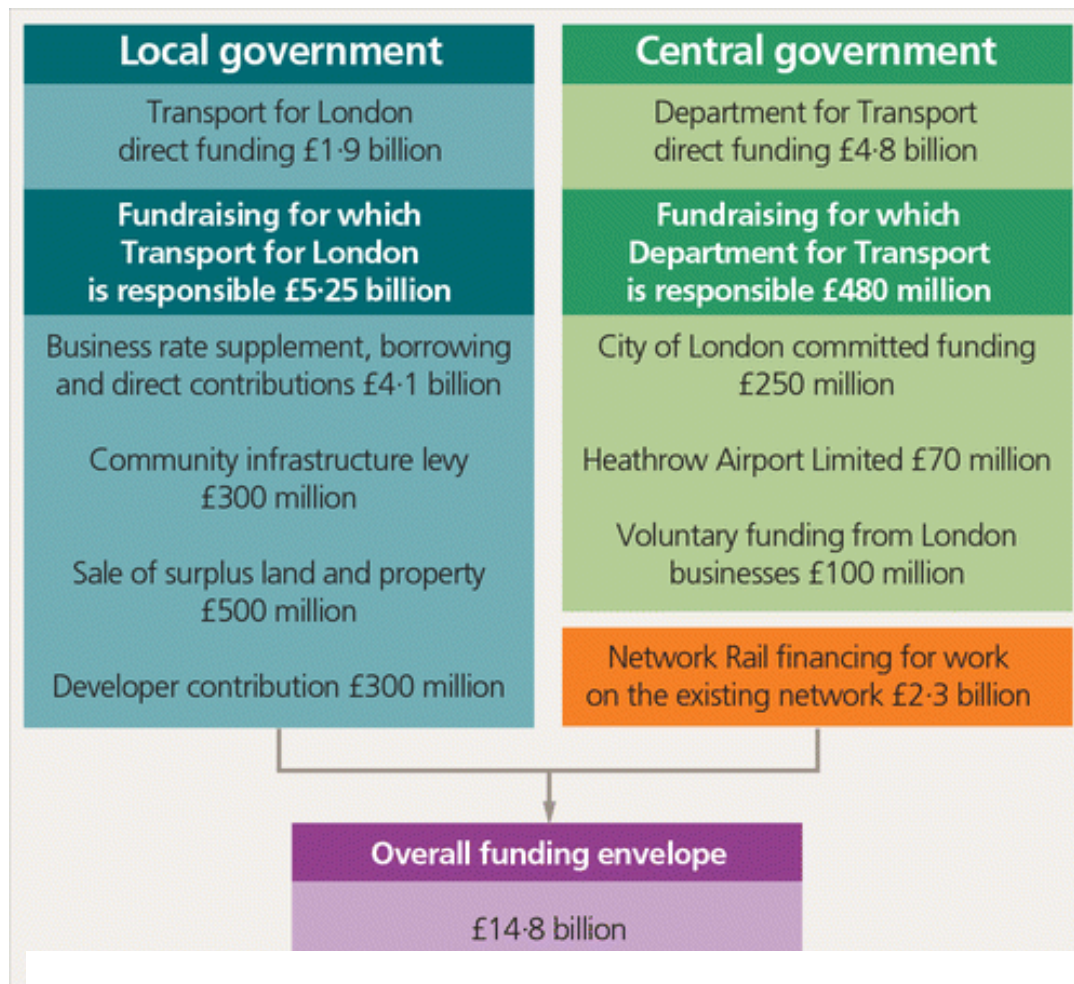
This predictability also made it relatively easy to raise capital to be repaid through its proceeds.

CROSSRAIL – LONDON

Transit Oriented Development

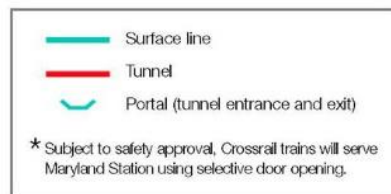
The £14.8 billion Crossrail project to deliver the new Elizabeth line east–west railway across London is the UK's largest transport project. Possible only through an innovative programme of finance, funding and value capture, which saw London business and future passenger revenues contribute approximately two thirds of the cost.

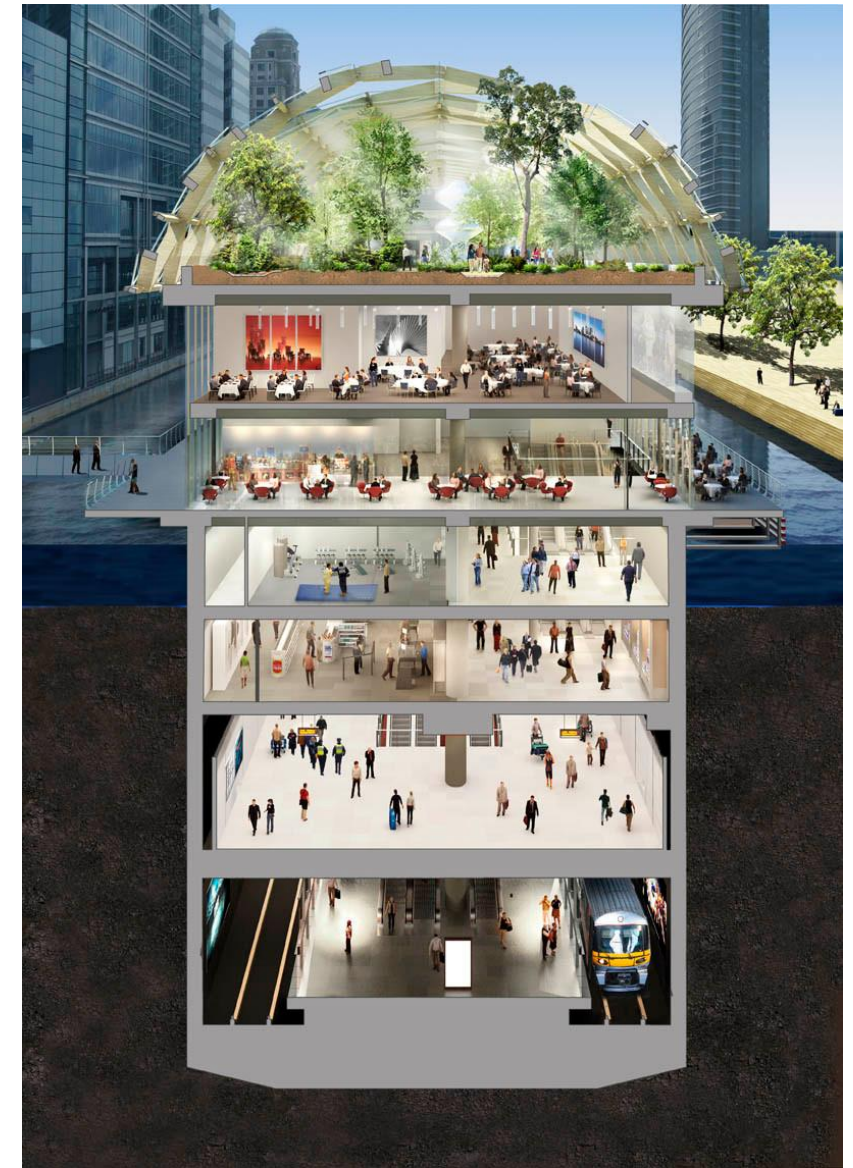
The commercial realisation of the value potential from property development opportunities above or in the vicinity of Crossrail stations has formed an important part of Crossrail's core funding proposition. As a consequence, the design of stations, over-station developments (OSD) and the surrounding urban realm was delivered on an integrated basis at a dozen key sites.



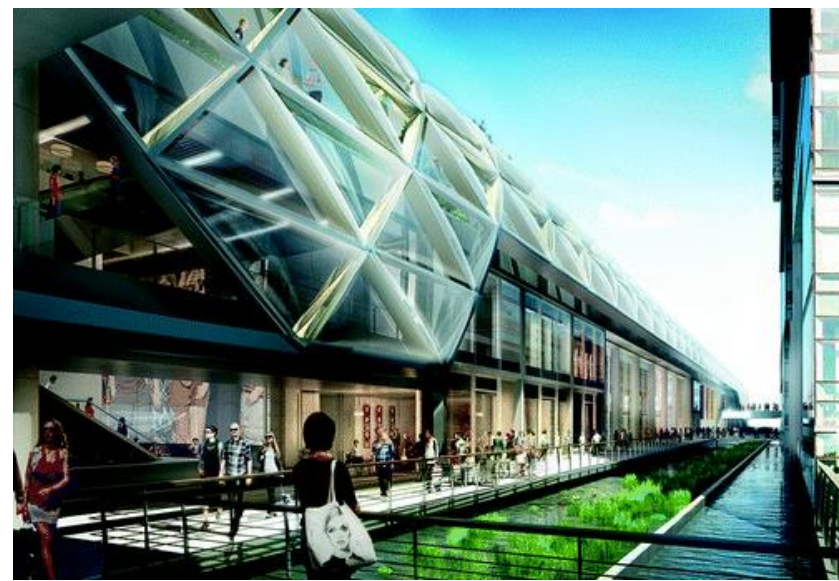
Crossrail

Route Map





Canary Wharf Station topside development by Canary Wharf Group



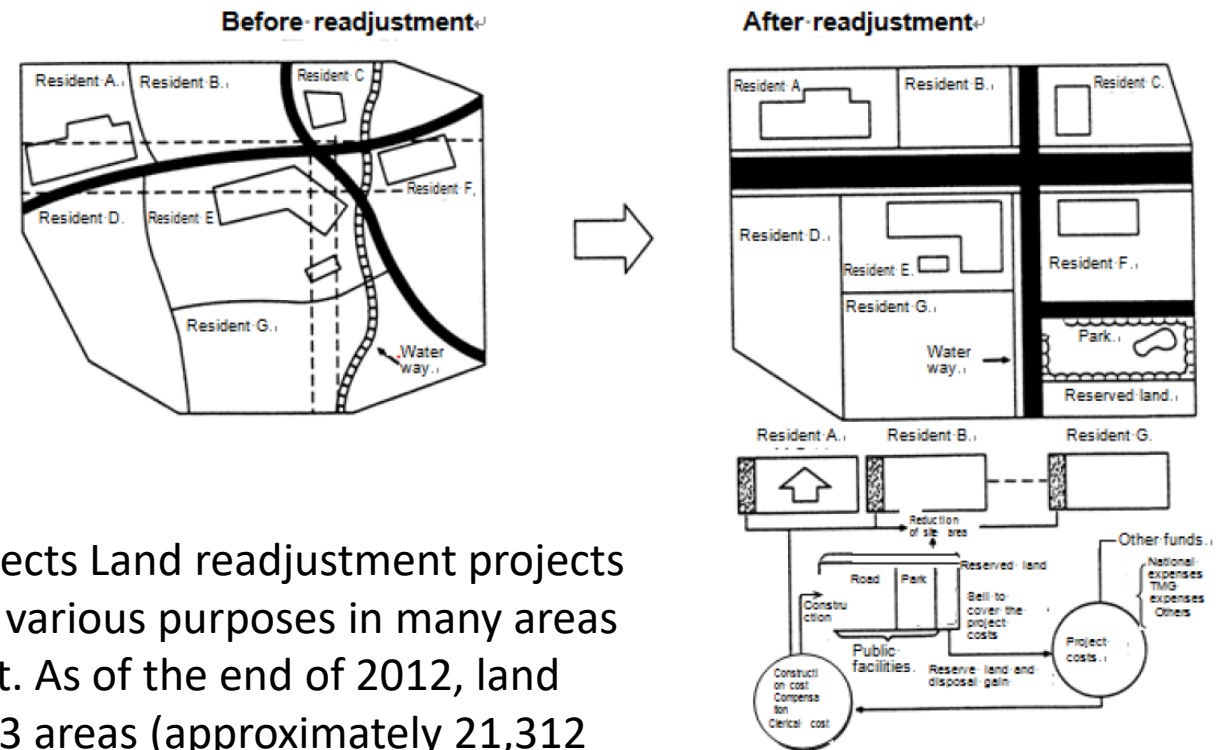
Canary Wharf Station with topside development



Aerial view of Woolwich Station with Berkeley Homes Topside developments

Land Readjustment - Japan

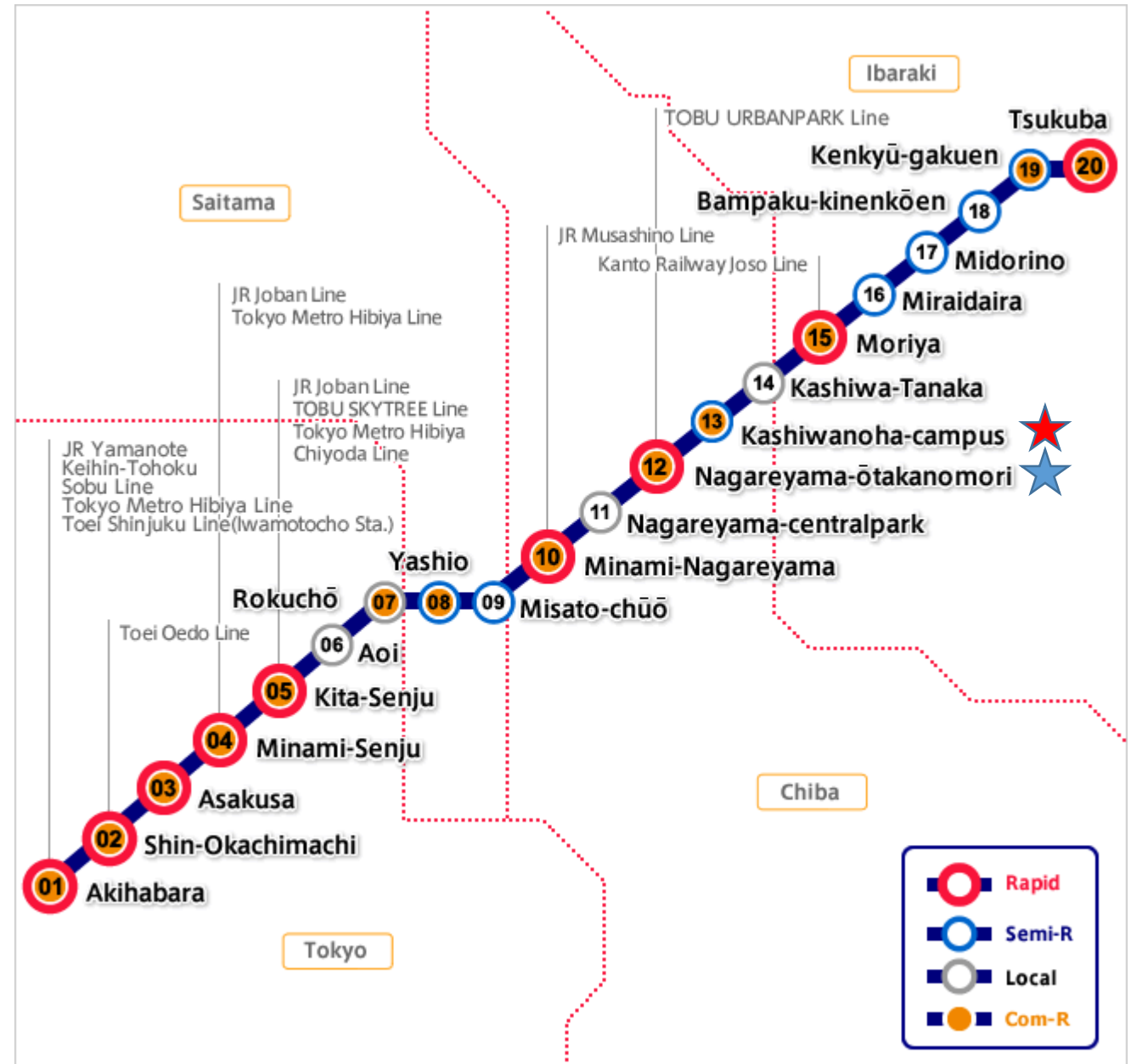
An illustration of land readjustment



Implementation Status of Land Readjustment Projects Land readjustment projects in Tokyo have been utilized in order to respond to various purposes in many areas as a method of comprehensive town development. As of the end of 2012, land readjustment projects have been completed in 593 areas (approximately 21,312 ha)

Land Readjustment Projects in Redevelopment of Built-up Areas In the Mizue Station West, Shinozaki Station East, Rokucho, Hanahata North, and Tabata districts, the Tokyo Metropolitan Govt (TMG) are involved in the areas along the Toei Shinjuku Line and the **Tsukuba Express Line**

The Tsukuba Express Project characterizes the development of public transport systems and housing development along the line under a special law to facilitate it, and is a representative example of Transit-Oriented Development (TOD) cases that have taken place in recent years in Japan. The TX Project brought a major change - emphasizing "*bus and train rides*" combining the use of TX and highway bus services, forming a multimodal transport network for the area.





Suburban-type transit-oriented development

Tsukuba Express Town



Nagareyama-Otakanomori district

★ Nagareyama - Otakanomori



★ Kashiwanoha Smart City Project

Mitsui-Fodusan Group
Long Term Vision 2025

Autonomous urban development through partnership among the public sector, private sector and academia is being advanced based on a flat platform that enables anyone, including universities, companies and citizens, to participate in urban development.

Land Reclamation Value Capture Financing

Augment property value better through large scale Integrated Development

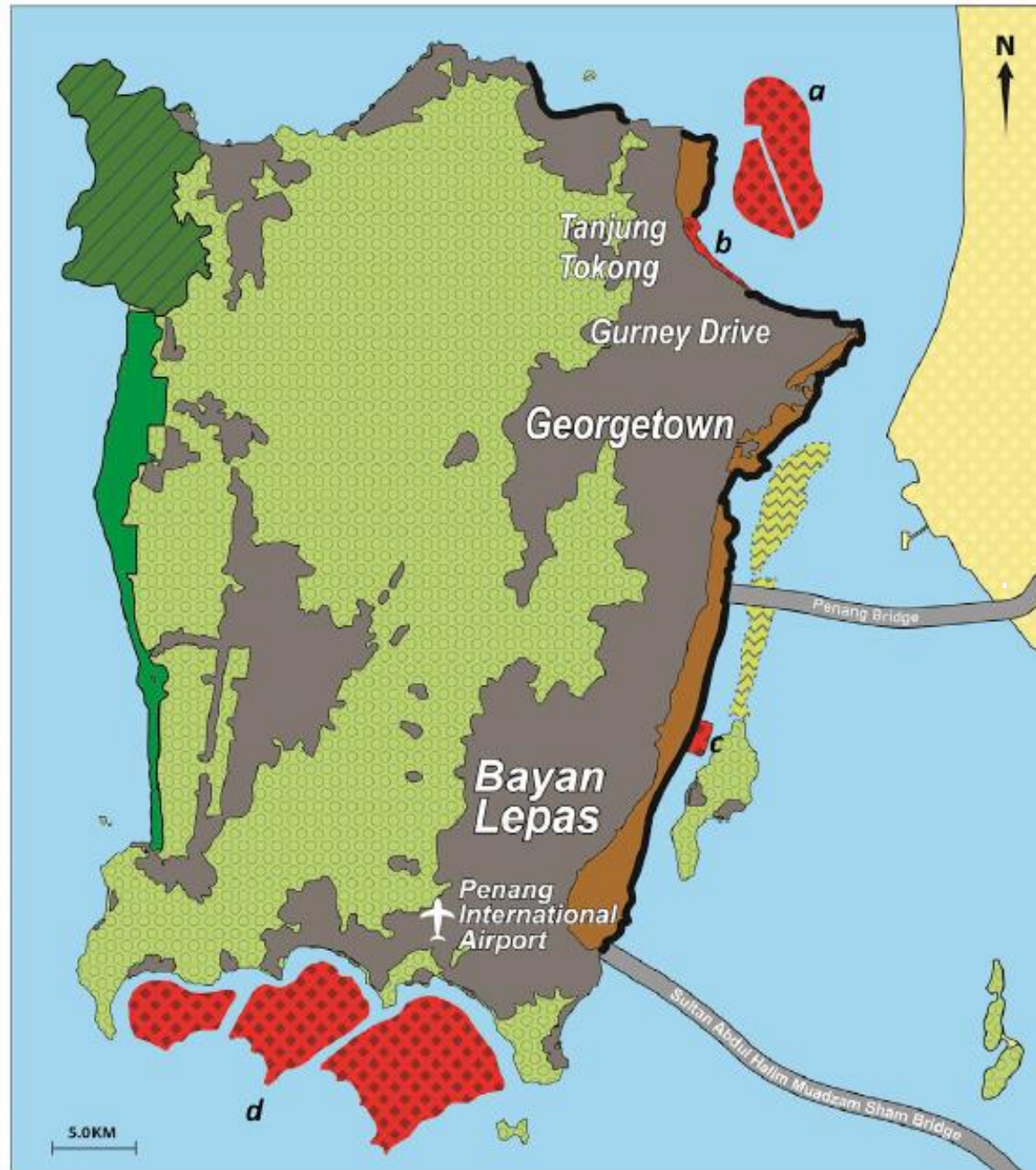
Possible to increase Plot ratio/intensity of development – TOD compact development within easy walking distance can accommodate broad mix of uses, such as housing, offices, commercial retail, F&B, services shops.
Minimize impact of traffic

Ensure ridership

Commuters working in the new development, commuters (clients) drawn to the new development

Optimize costs and benefits of integration within the railway & development entity

Minimize risk of conservative structural overprovision for appropriate support in design for integration and linkages



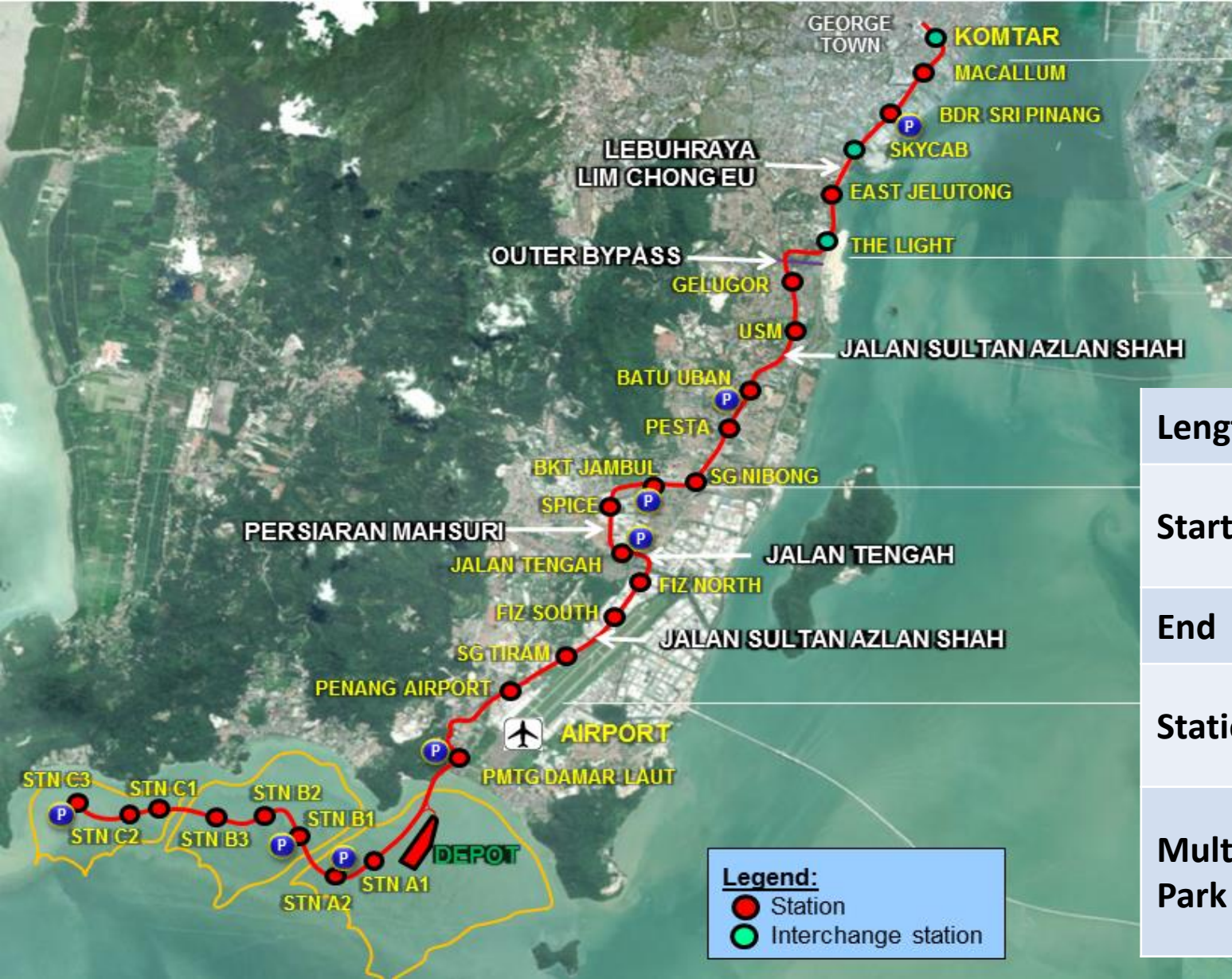
LEGEND

-  Forest
-  Mangrove
-  Urban Area
-  Reclaimed Area
-  Proposed Reclamation
-  Seagrass Meadow
-  Penang National Park
-  Artificial Coastline



Fig. 4. Drone image indicating Pulau Jerejak, felled mangroves, and reclamation underway for both Gurney Wharf and an artificial island taken in April 2017. (Image by Hong Chem Wern).

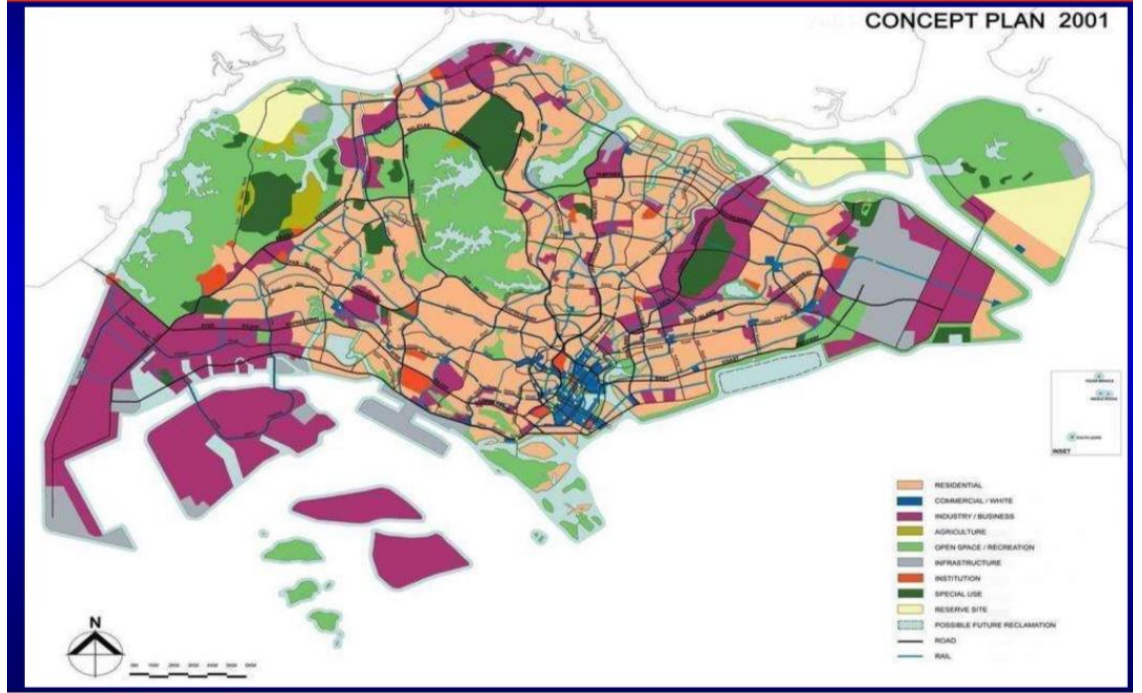
Bayan Lepas LRT Alignment



Length	29.5 km
Start	George Town
End	Island C
Stations	27 nos. (8 on PSR)
Multi-storey Park & Ride	8 nos. (3 on PSR)



Concept Plan 2001



Jurong Lake District



(b) Artificial island with eco-engineering

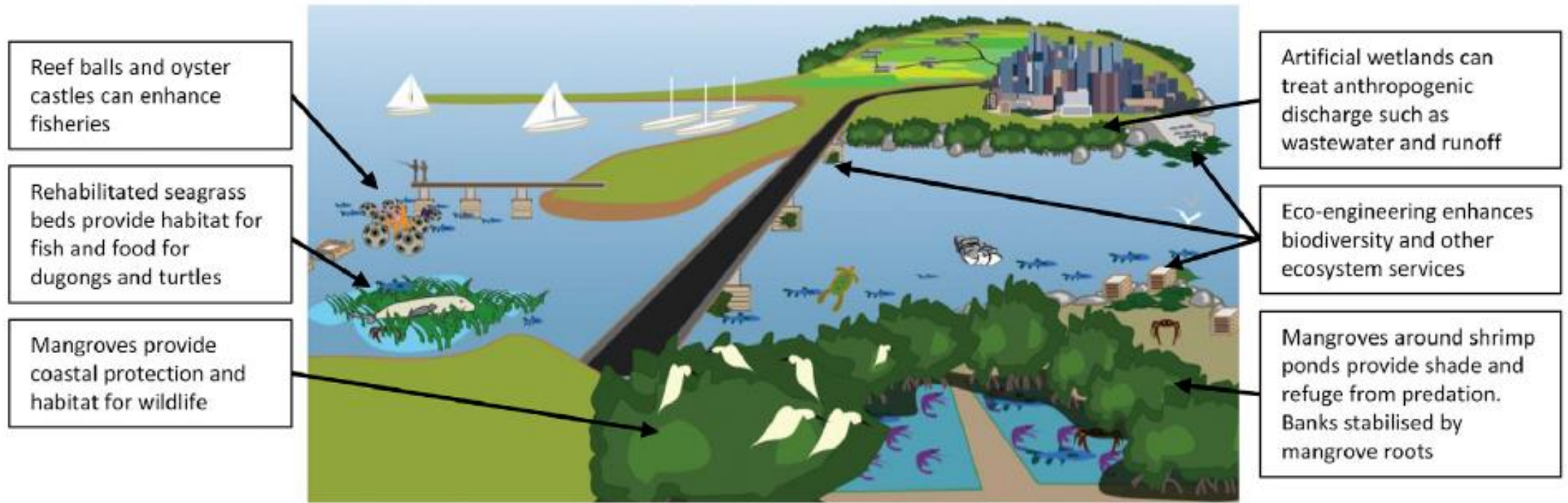


Fig. 5. Conceptual diagram, providing examples of (a) an artificial island without eco-engineering, and (b) the way in which eco-engineering can be applied on an artificial island as a management solution. Figure produced by by Shaun Lewin (Plymouth University).

Development Strategy

Design out the conflicts & constraints

- Land Bank – existing, create new ones, consolidate remnants of irregular plots of land, land readjustment
- Optimize Transit Alignment and Urban design
- Identify station area development potentials -TOD
- Intermodal hub
- Underground & overhead pedestrian network plan
 - Streetscape improvements
 - Historic preservation
 - Green space
 - Including barrier free commuter provisions

Hong Kong Case : Rail + Property (R+P)

Effective tool to finance railway construction

- Government collects land premium from operator before rail construction, and increased tax revenues with appreciation of property & land value going forward
- Construction costs of rail & development transferred to operator
- Development is constructed together with rail line
- Cross subsidization of rail and property development

Allow developers and Transit Authority to respond to market needs, and leverage upon development trend & latest construction processes.

Hong Kong Case: Rail + Property (R+P)

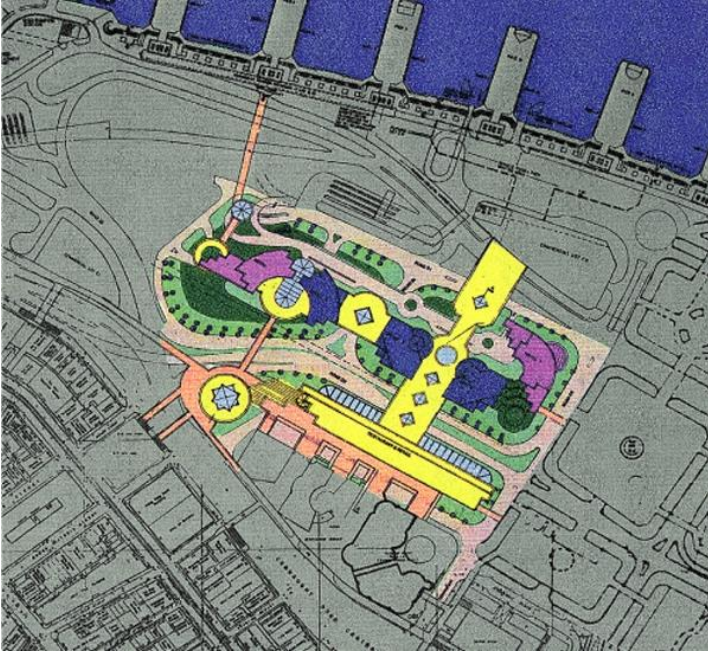


**Kowloon Bay
Station**



**Telford Garden and Plaza - R+P Project
Mixed-Use: Residential, Shopping, Office**

Hong Kong Case: Rail + Property (R+P)



Hong Kong Station

MTRC owns 18 floors
of the office tower as an asset
in the integrated
development sale

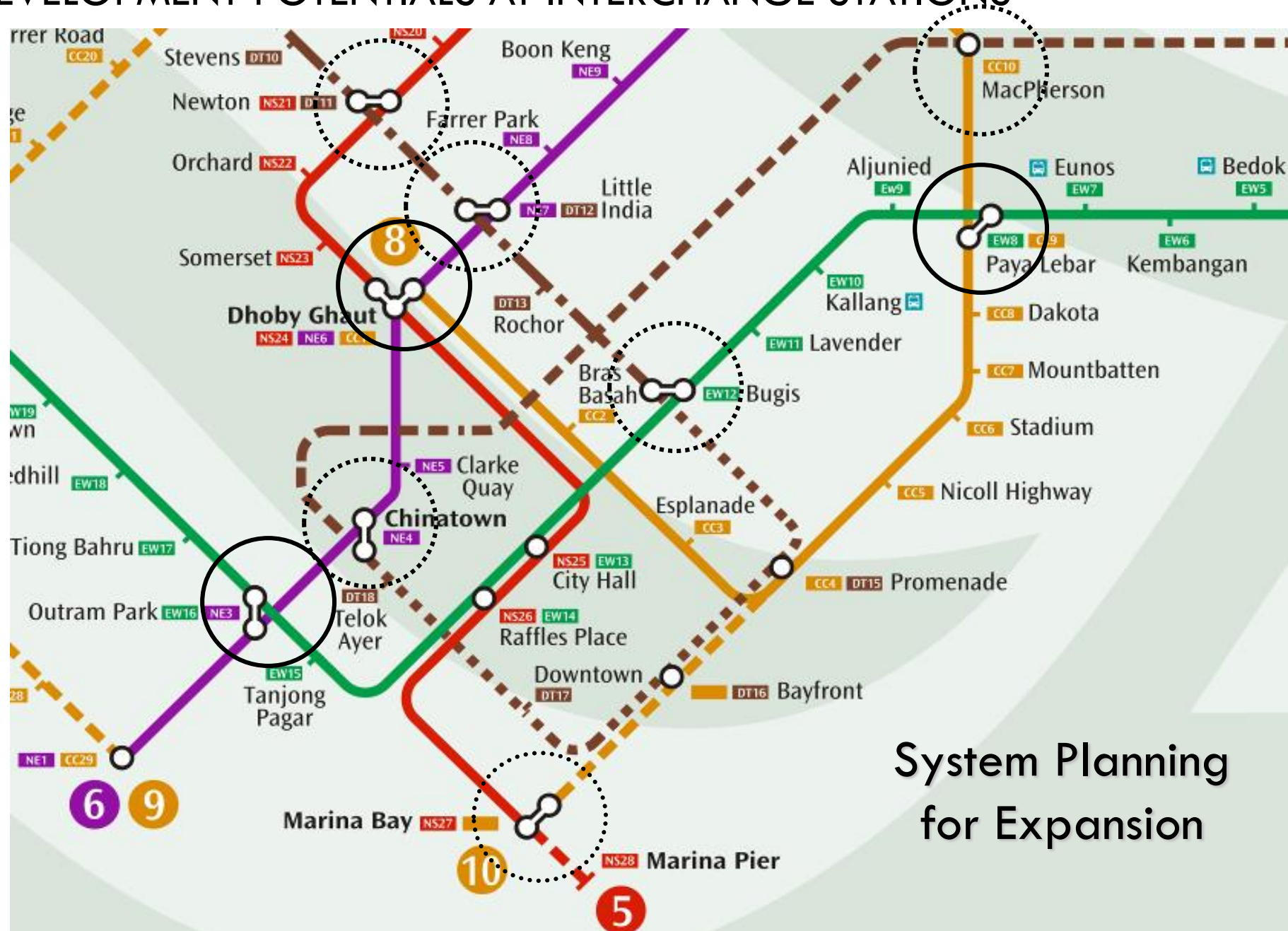


International Financial Centre Tower

Singapore Case

1. Transit infrastructure projects are important components of the nation's economic development
2. Separate government agencies have focused competence but collectively act on “whole of government” basis
 - Ministry of Finance – provides complete project funding
 - LTA's technical competence on transit design, project construction and implementation
 - URA is the competent authority for the nation's Master Plan to optimize landuse, development intensity and transit alignment. URA also implements the government land sales program with other government agencies.
3. LTA & URA proactively collaborate for development integration and pedestrian connectivity upfront

DEVELOPMENT POTENTIALS AT INTERCHANGE STATIONS



System Planning
for Expansion

VALUE CREATED, VALUE CAPTURE

Key Strategy:

Timing the Tender

Leverage on network growth & interchanges

Imposing appropriate Technical Conditions of Tender to optimize

- ☐ **LandUse**

- ☐ **Plot ratio**

- ☐ **Connectivity**

Award to developer with design and price that provides best value above Reserved Price

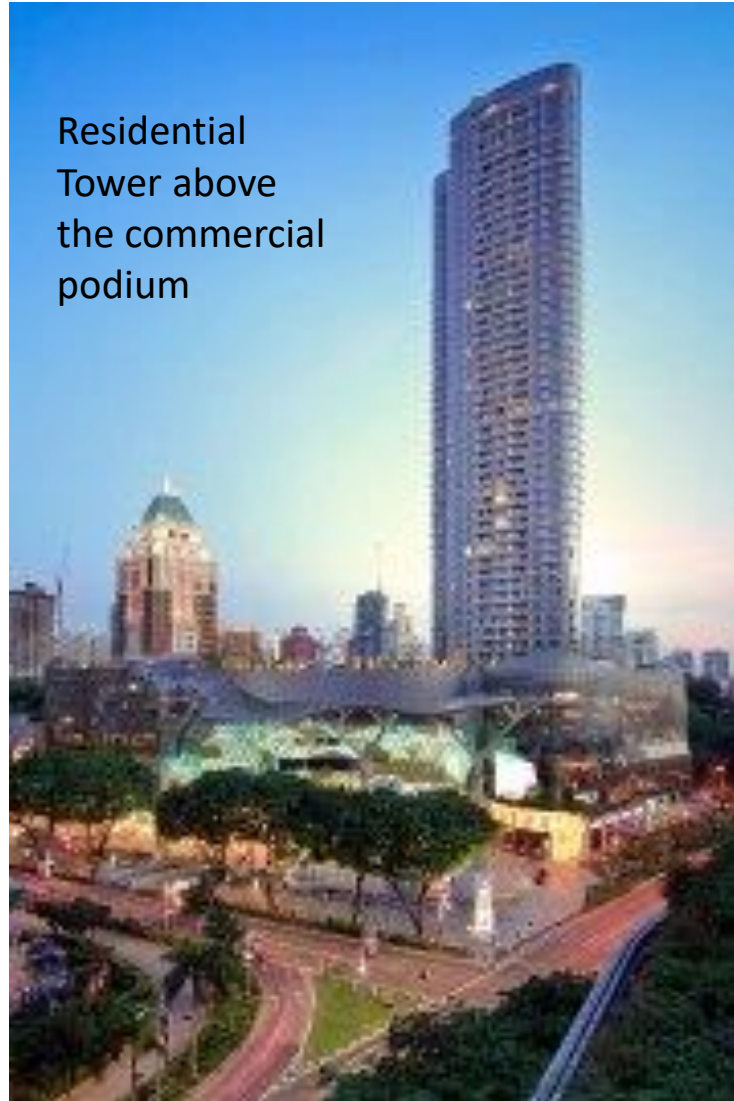
Orchard ION MRT: Before



Orchard ION MRT: after



Orchard ION MRT: After



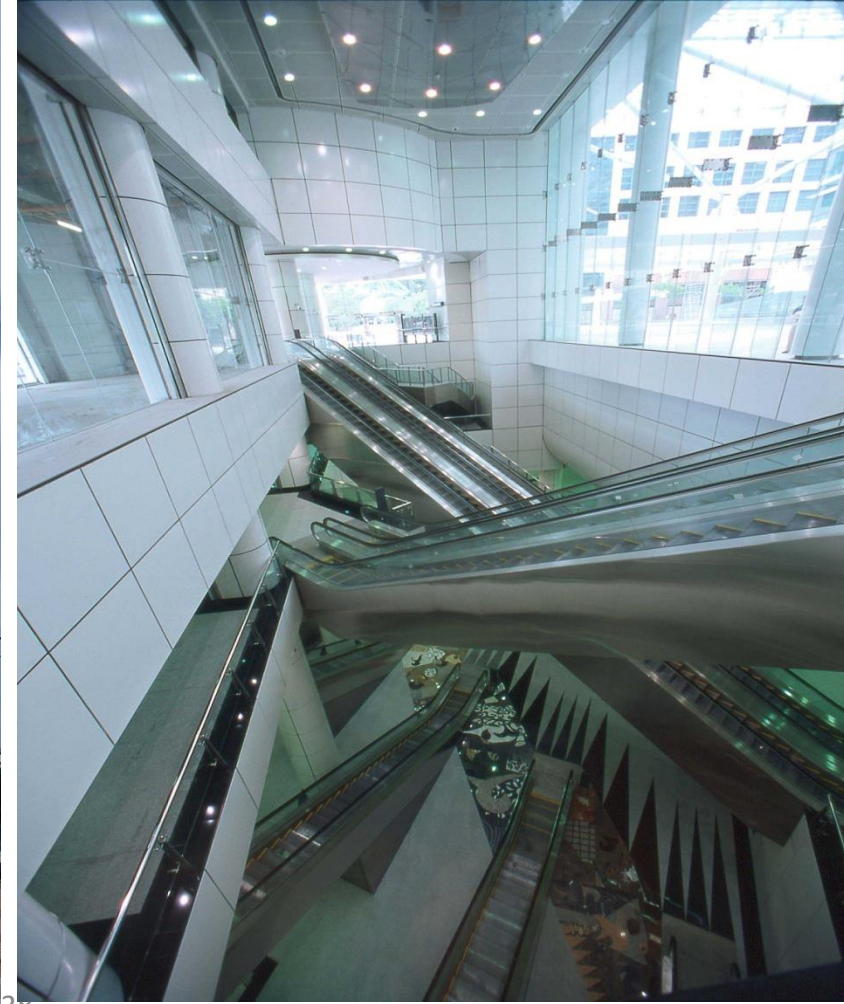
Residential
Tower above
the commercial
podium



9 storey podium commercial development
above the Orchard MRT station

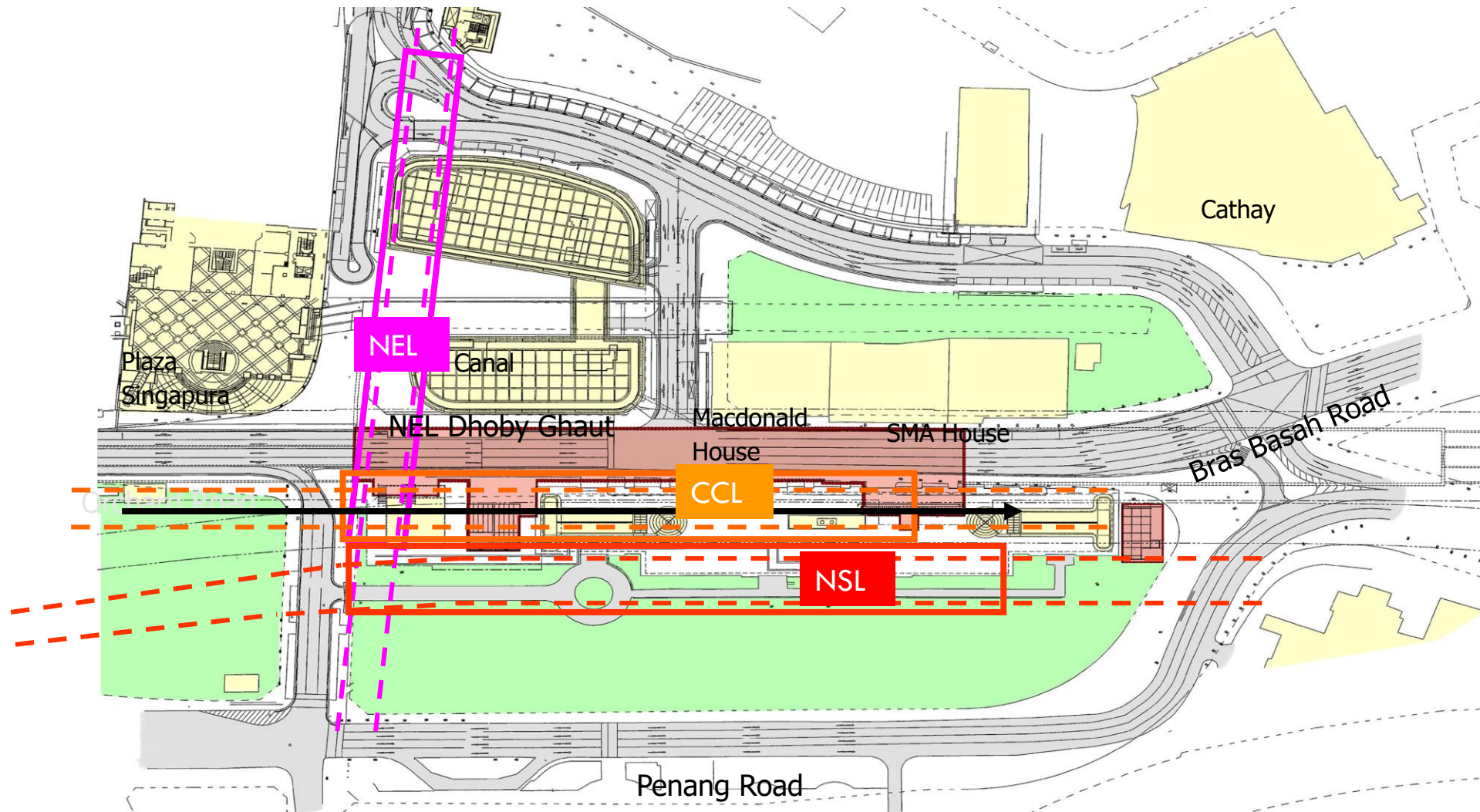
Plaza area

Dhoby Ghaut Interchange

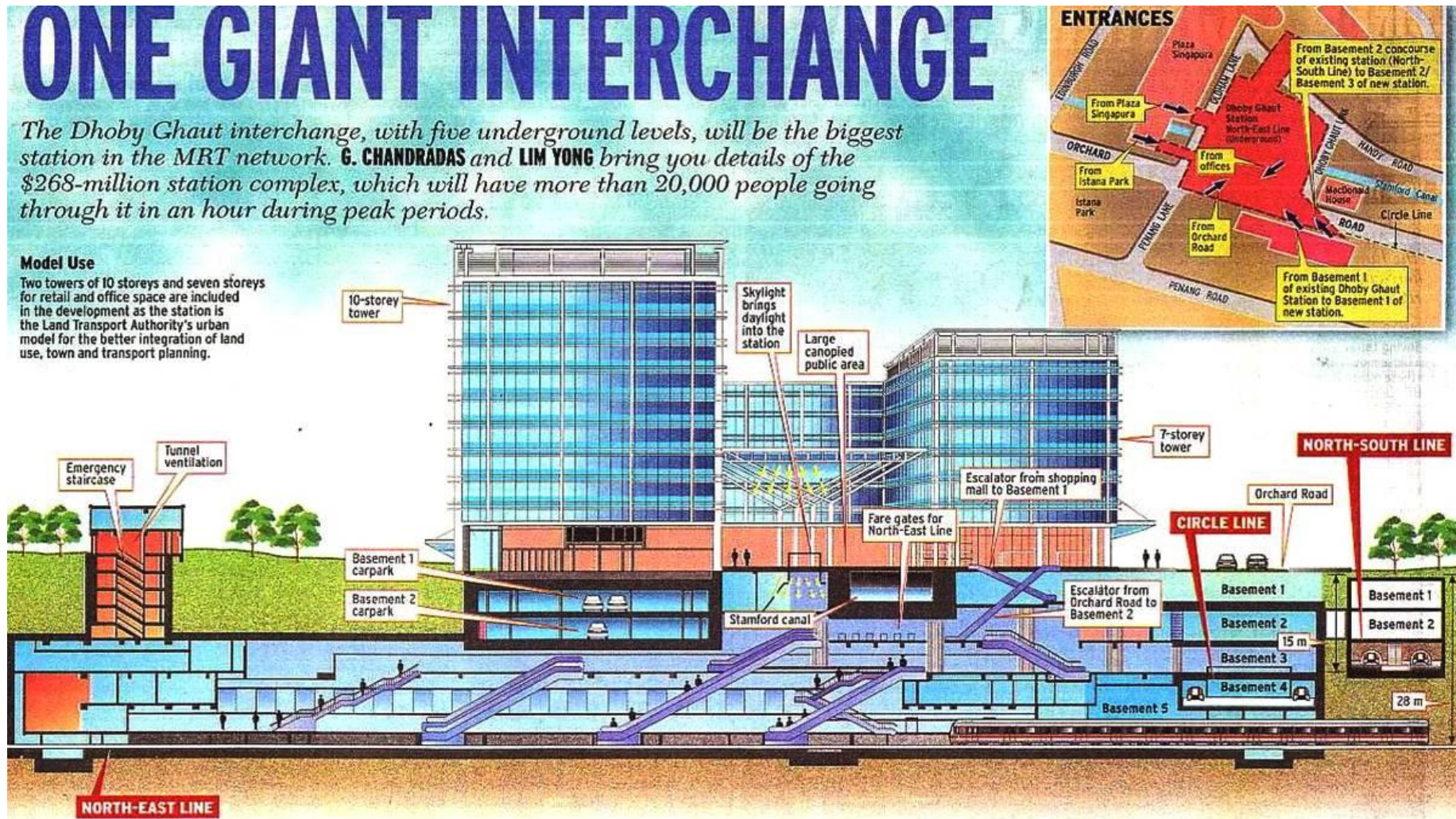


Dhoby Ghaut Interchange:

Integration of 3 Stations and Commercial Development



Dhoby Ghaut Interchange



INTEGRATED TRANSPORT HUB

Clementi Bus Interchange



Residential and Commercial developments are above a Bus Interchange and directly linked to the elevated CLEMENTI MRT Station

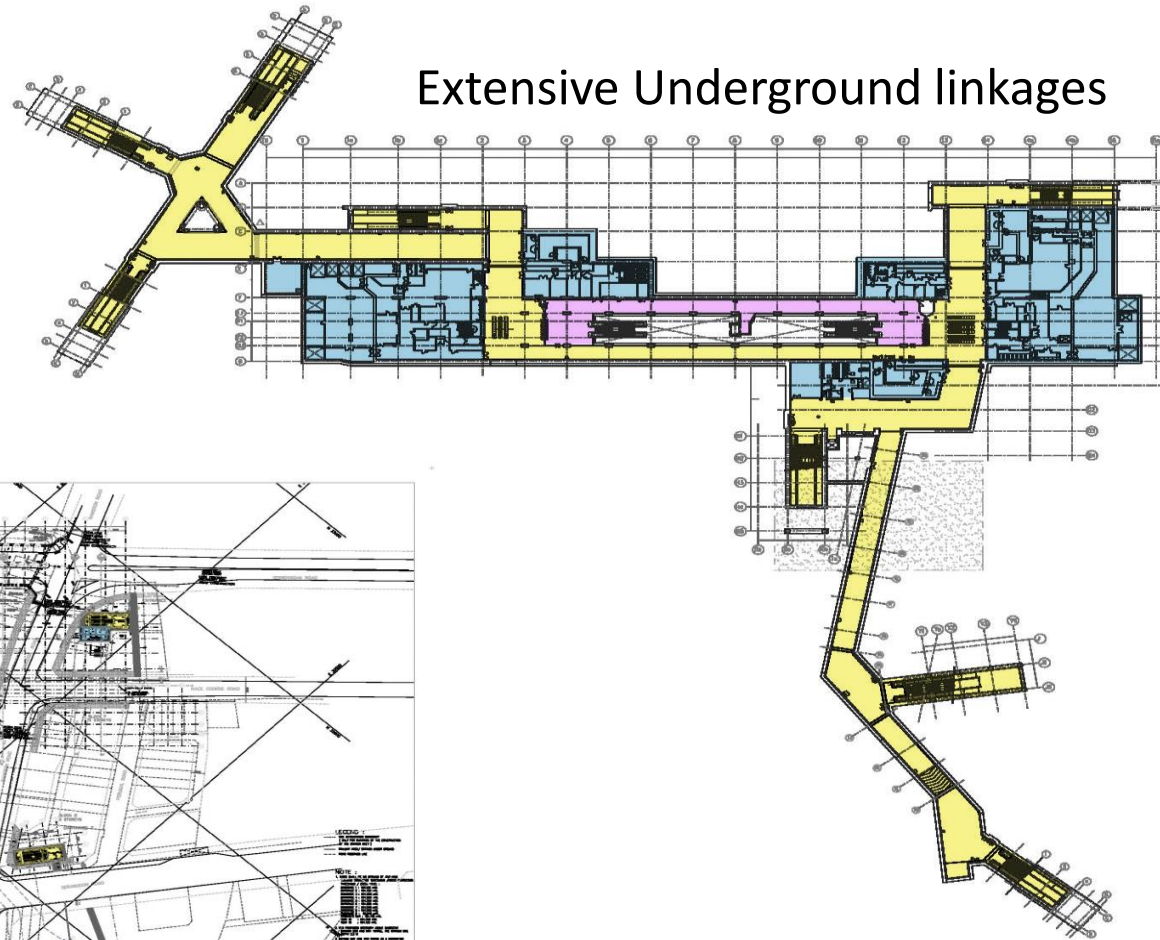


Creating Development Opportunities

Farrer Park Station

ADDITIONAL ENTRANCES
created to extend the
reach of the station to
vacant plots

Extensive Underground linkages



Extending the Reach of the Transit System to surroundings



Audrey Teo Loh, 7/29/2011

FARRER PARK STATION

VALUE CREATED, VALUE CAPTURED

@ FARRER PARK STATION away from the City Business District

URA's record for June 28 to July 5, 2011 showed a 570sqft studio apartment at **City Square Residences** sold for \$975,000, a record at \$1,709psf. Another unit, a 840sqft two-bedroom sold at \$1.39 million, or \$1,656psf. Connectivity to the MRT Station and the lifestyle commercial mall integrated development **City Square Mall** is a primary contributing factor



Audrey Teo Loh, 7/29/2011

BAYFRONT STATION at the Marina Bay Area

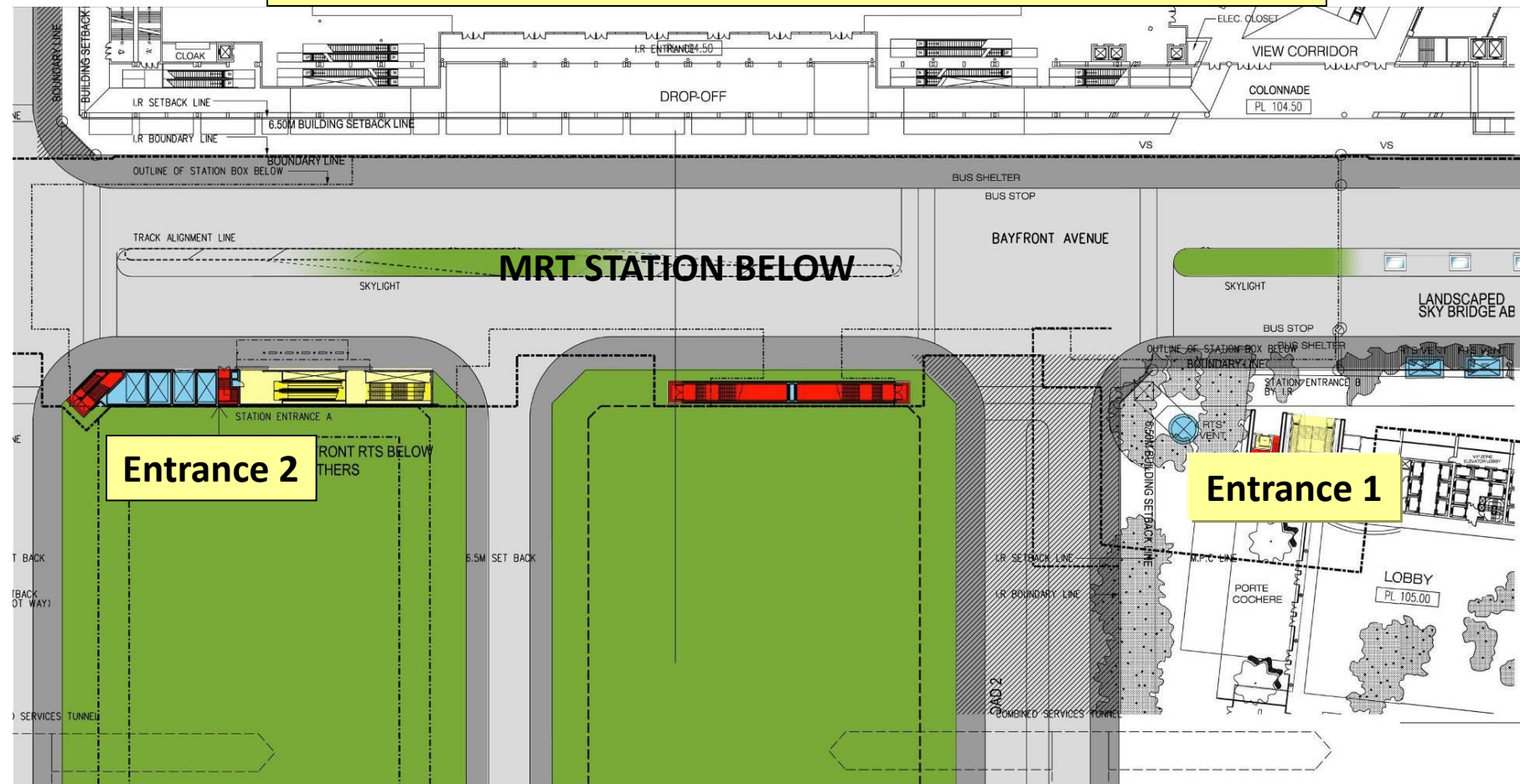


MRT Stations integrated with Marina Bay Sands, A Casino, Hotel and
Convention Center & Shopping Complex⁴⁵

Audrey Teo Loh, 7/29/2011

BAYFRONT STATION at the Marina Bay Area

Additional Entrances integrated within development



BAYFRONT STATION at the Marina Bay Area



**ADDITIONAL
VALUE CAPTURE
AT ADJACENT VACANT PLOTS
TO LEVERAGE on EXISTING ICONIC
DEVELOPMENT AND DIRECT
CONNECTION TO THE BAYFRONT
MRT STATION**

Audrey Teo Loh, 7/29/2011

Economic Modeling:
Monitor and Research Trends & Distribution

**Cross-sectional and Time series analyses for
Station locations**

Critical to have data base, eg

Real Estate Data & Information (URA Website)

**Sectors included Private Residential, Commercial and
Industrial.**

Property Market Updates

Property Transactions with Caveats Lodged

Rental Details

Prices of Units Sold in Private Residential Properties

Private Residential Projects in the Pipeline

Economic Modeling: Two Simplified Models

Hong Kong

- **2 Sources of Value:**
 1. Current value: \$A
 2. Rental revenue: \$B/year for 25 years
- **Value Today:**

$$V = A + \sum_{i=1}^{25} \frac{B}{(1+r)^i}$$

Assumption: Average annual discount rate r

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Singapore

- **1 Source of Value:**
 - ▣ Proceeds from sale in 25 years
 - Current value: \$A
 - Appreciation rate in year i : x_i
- **Value Today:**
$$V = A \frac{\prod_{i=1}^{25} (1+x_i)}{(1+r)^{25}}$$

Economic Modeling: Simple Unified Model

- Current value of land: \$A
- Average annual discount rate: $r\%$

Hong Kong

- Annual rental revenue: $y\%$ of current value
- Value Today:

$$V = A + \sum_{i=1}^{25} \frac{sA}{(1+r)^i}$$

Singapore

- Average annual appreciation rate: $x\%$
- Value Today:

$$V = A \frac{(1+x)^{25}}{(1+r)^{25}}$$

Economic Modeling: Breakeven point

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☐ Calculating the breakeven point:

$$A + \sum_{i=1}^{25} \frac{sA}{(1+r)^i} = A \frac{(1+x)^{25}}{(1+r)^{25}}$$



$$x = (1+r) \left(1 + \sum_{i=1}^{25} \frac{s}{(1+r)^i} \right)^{\frac{1}{25}} - 1$$

☐ Example:

- ☐ Rental = 1%, Discount = 5% \leftrightarrow Appreciate at 5.6%
- ☐ Rental = 1%, Discount = 3% \leftrightarrow Appreciate at 3.7%

Key Takeaways – Growing Popularism

- Re-democratization, increased social awareness, demands for equitable public policy responses
- Changing attitudes toward privatization and public-private partnership
- Influence of multilateral agencies Funding (UN-Habitat, ADB, World Bank, Asian Infrastructure Fund)
- Sustainable Economic Development and Fiscal decentralization
- Progressive strategies for Urban Planning and Management– Green initiatives, low carbon approach, Livable cities – future proofing for change
- Pragmatism - Integrated Transport Hub as the model for Public Transport and Development, Barrier-Free Accessibility, Universal Design