



# Innovative TOD Strategy on PPP & Financing Structure

International Conclave on Clean & Low Carbon Transport Strategies for Clean Air

Speaker: Girish Ramachandran

4<sup>th</sup> September 2018

27ADVISORY Social Trans

# An Overview of Current Indian Railway

Some major investments & development in recent years:

- A US\$ 14.52 billion high speed passenger corridor project between Ahmedabad to Mumbai was undertaken in Railway Budget 2016-17. Estimated to be operational by 2022.
- In May 2018, Parcel Cargo Express Train (PCET)
  commenced operations. The train connects the NorthEastern region with the coast as its initial and
  penultimate stops are New Guwahati in Assam and
  Kalyan in Maharashtra.
- In March 2018, Alstom completed production of the first all-electric locomotive at the manufacturing facility in Madhepura, Bihar
- In order to develop three new arms of Dedicated Freight Corridor (DFC) in the various regions of the country, Indian government is planning to invest Rs 3,30,000 crores (\$50.98 billion).



#### **Key Facts:**

- One of the world's largest rail networks.
- Route length of rail network = 67,368 km (as of 2016-17)
- Passenger carried (2016-17) = 8.1 billion / 22 mil per day

**1,65,292.20** (in crore) during 2016-17 Gross Traffic Receipts of Indian Railways

**1,59,029.61** (in crore) during 2016-17 Total Working Expenses of Indian Railways

**6,262,59** (in crore) during 2016-17 Net Traffic Receipts of Indian Railways

#### Recent news on Indian Railways

#### THE ECONOMIC TIMES

# Railways to spend Rs 9000 crore in 3 years on new wagons

By Rajat Arora, ET Bureau | Apr 16, 2018, 11.16 PM IST

"The Indian Railways will spend Rs 9,000 crore over the next three years to procure new wagons as it seeks to up its game in goods transportation."



# Indian budget trebles railway investment

02 Feb 2018

"A major increase in Indian Railways' capital expenditure to Rs1 485bn in the 2018-19 financial year was announced by Finance Minister Arun Jaitley as part of the national budget unveiled on February 1. This is almost three times the Rs540m allocated for capital works in 2013-14."

#### THE ECONOMIC TIMES

# Railways to use Rs 73,000 crore on safety: Piyush Goyal

PTI | Feb 01, 2018, 08.25 PM IST

"The railways will spend over Rs 73,000 crore on safety out of the Rs 1.48 lakh crore capital expenditure earmakred for it in 2018-19 union budget"

Piyush Goyal, Railway Minister

### Delhi ranked the top in terms of transport-related emission in megacities

# DownToEarth

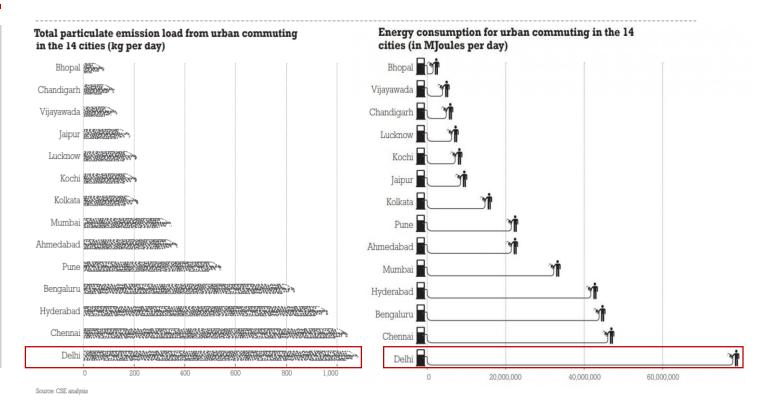
By DTE Staff

Last Updated: Friday 24 August 2018 | 06:30:08 AM

Based on a dianogstic analysis of key cities of India by the Centre of Science & Environement (CSE), Delhi ranks the worst in terms of overall toxic emissions, heat-trapping emission and energy consumption, due to highest vehicle stock and relatively higher population than other megacities.

# Transport-related emissions in megacities: Delhi on top, Bhopal emits the least

Urban commute in even smaller cities is becoming highly polluting and energy-intensive, finds CSE's latest analysis

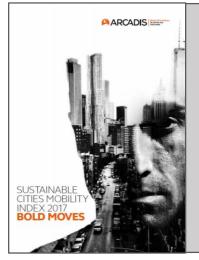


27ADVISORY Socio-Economic Transformation

Source: DownToEart.Org

# New Delhi ranked 60<sup>th</sup> worldwide in terms of Sustainable Cities Mobility

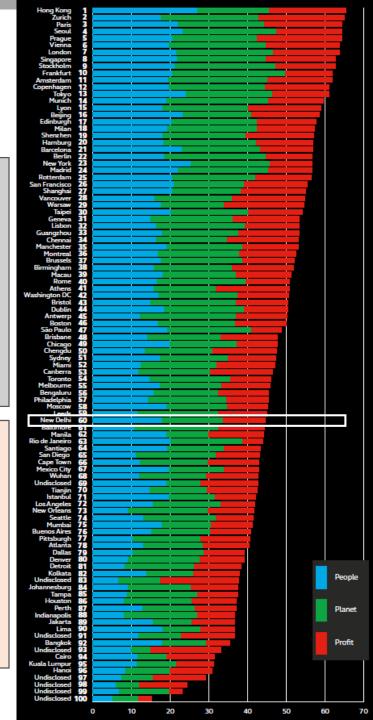




Mobility systems are key to the everyday functioning of a city. Arcadis' 2017 Sustainable Cities Mobility Index, compiled in partnership with research firm, Cebr, tracks the overall performance of the mobility systems in 100 cities around the world. The Index is built from 23 individual indicators, each reflecting a component of urban mobility, from infrastructure spending commitment to affordability of public transport. These indicators are grouped into *three sub-indices*: *People, Planet and Profit*. Combining these individual metrics and sub-indices into an overall Index score gives an indicative picture of the current state of a city's urban mobility environment.

#### **Key Takeaways**

- New Delhi ranked 60<sup>th</sup> over the 100 cities evaluated.
- By region, European cities most consistently rank the highest, occupying seven of the top ten spots.
- Asian cities also rank highly, taking three of the top ten spots. Modern metro systems, large airports and low usage of private vehicles help boost the rankings of developed Asian cities such as Hong Kong and Singapore.
- The data highlights that the **wealth**, **size or age of a city does not necessarily equal sustainable urban mobility**.
- Mobility favors the bold. Those cities that have pursued bold moves of innovation and planned for future growth see the greatest sustainability and quality of life benefits.





### **Driving factors for TOD**



People are keen and looking forward to a TOD with the following reasons:-

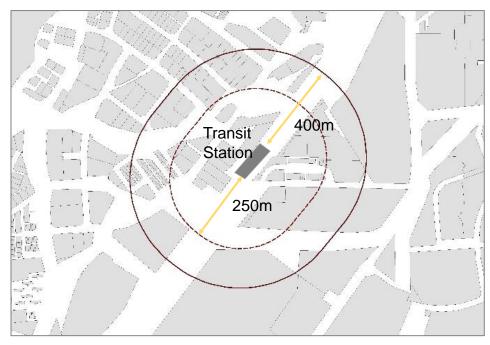
- ✓ Rapidly growing, mind-numbing traffic congestion nation-wide
- ✓ Growing desire for quality urban lifestyle
- ✓ Growing desire for more walkable lifestyles away from traffic
- ✓ Changes in family structures: more singles, empty-nesters, etc.
- ✓ Growing national support for Smart Growth
- ✓ New focus of Federal policy

"Traffic congestion has increased so much in virtually every metropolitan area that two-hour commutes now are routine. Attempts to alleviate the problem by constructing more highways almost always have led to more sprawl and, eventually, more congestion."

Jim Miara

# Components of Transit Oriented Development

The rule of thumb is that TOD occurs within **400m radius**, or a 5 to 7 minute walk, of a transit station, while Transit Planning Zone (TPZ) occurs within **250m radius** of a transit station.

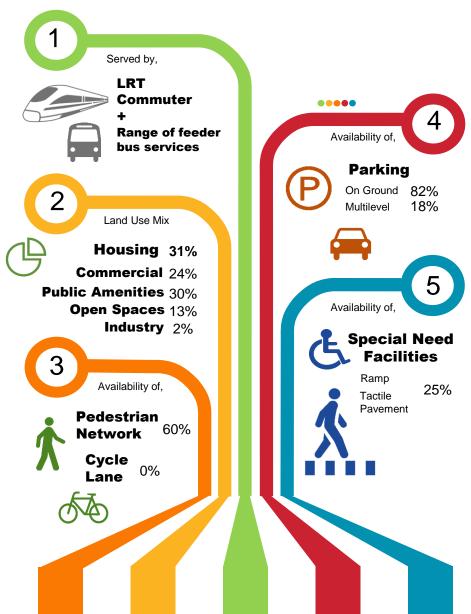




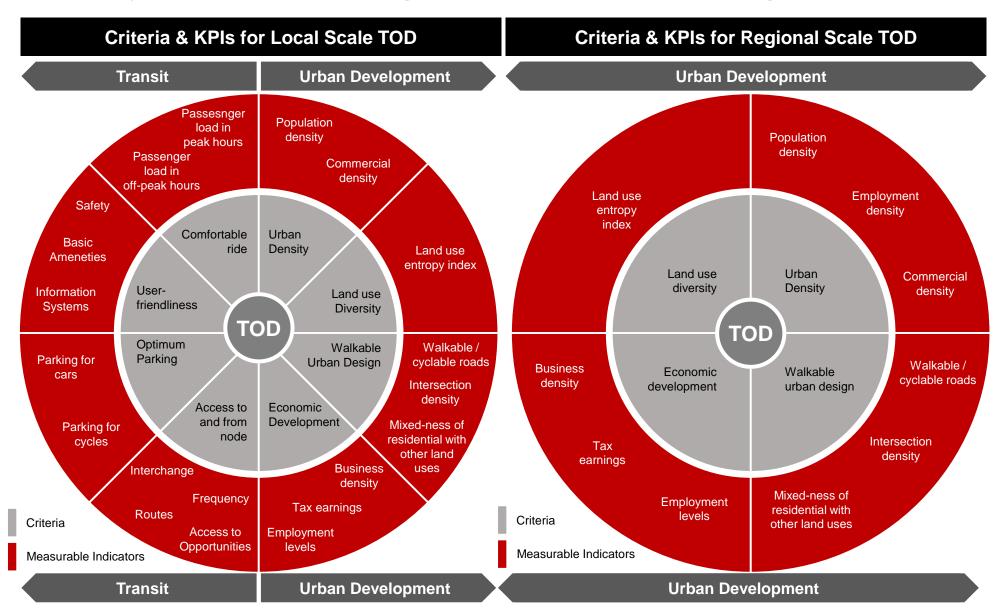
Platform Transit Planning Zone

Transit-Oriented Development

#### Facilities / Infrastructure within a TOD



# Some key criteria in measuring the TOD at local scale & regional scale



Source: University of Twente

#### Benefits of TOD





- Increase access to jobs and amenities city wide
- Improve access to a low cost transport solution (public transit/ walkable urban space/ bicycle infrastructure)
- Reduce automobiledependency



**Social Benefits** 

- Revitalize neighborhoods
- Promote social equity through creation of mixed-income housing near transit
- Increase accessibility for less mobile
- Improve health and increase physical activity through creation of walkable neighborhoods



**Environmental Benefits** 

- Lower air pollution and GHG emissions by reducing automobiledependency and urban sprawl
- Reduce energy consumption
- Conversation of green and natural spaces

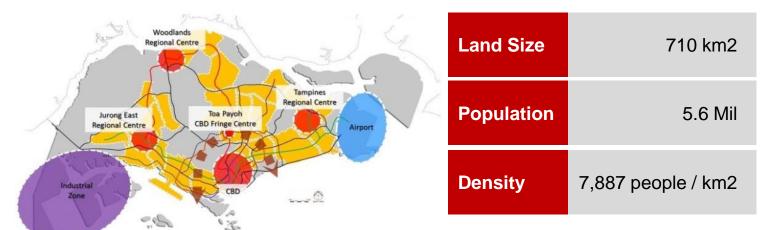


**Economic Benefits** 

- Increase agglomeration and access to employees
- Encourage economic resilience through diversity
- Energize local economy
- Increase property values along corridors to help fund needed infrastructure
- Reduce infrastructure costs
- Reduce transport cost



### Case Study: TOD in Singapore



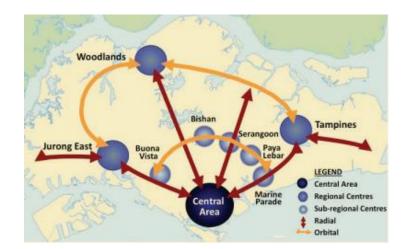




Singapore is a small island state that can be traversed through within one work day.

But in its development planning, which looks at future prospects in magnitudes of decades rather than years, space is a constraint requiring specific attention. As part of a national economic development strategy, Singapore has embraced Scandinavian planning principles that call for radial corridors that interconnect the central core with master-planned new towns.

Its structure plan, called the *Constellation Plan*, looks like a constellation of satellite "planets," or new towns, that surround the central core, interspersed by protective greenbelts and interlaced by high-capacity, high-performance rai transit.



### Implementation of Singapore New Rail Financing Framework





#### **New Rail Financing Framework (NRFF)**

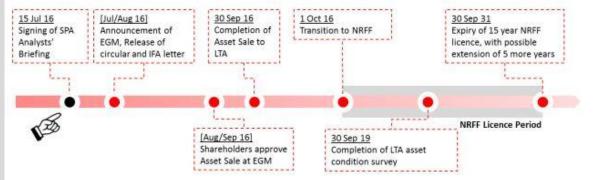
SMRT and the Land Transport Authority (LTA) have agreed on a new rail financing framework in 2016. Rail operating *assets* will *now be owned by LTA*, who will decide when to build up, replace and upgrade the operating assets to meet rail ridership and commuter expectations.

The intention behind this move is to *free the rail operators*, SMRT and SBS Transit, *of heavy capital expenditure*. The Government has been taking over all operating assets from SMRT from Oct 2016.

LTA will pay SMRT the net book value of its operating assets as at Sept 30, 2016. This amounts to \$991 million or \$1,060 million including GST. There are over 60,000 operating asset items. These include the trains, signalling system, maintenance equipment such as rail grinding vehicles, electrical and fire protection equipment, as well as equipment for power and building services.

LTA owns and makes decisions on building-up, replacement and upgrading while **SMRT remains responsible for maintenance**.

#### **Chronology of Key NRFF Events**



#### **Key benefits to Commuters**

More responsive to increased ridership

Enabling the Government to ensure timely procurement of additional trains and operating assets to enhance reliability and keep pace with growing ridership demand

Focus on providing reliable services

Relieving rail operators from heavy capital expenditure and large fare revenue risks so that they can focus on their core role of operating and maintaining the rail network

More competitive rail industry

3

Making the industry more contestable by shortening the licence period from 30 – 40 years under the previous financing framework to 15 years, with a possible 5-year extension

Source: Land Transport Authority

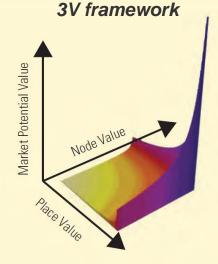
# Comparison between Previous and New Rail Financing Framework

•	<b>3</b>		
Key Elements	Previous Financing Framework	After Transition	
License Period	30 to 40 years	15 years, and possibly a 5-year extension	
Rail Infrastructure (Viaducts, tunnels, tracks, etc.)	LTA owns and make decisions on building-up, replacing and upgrading while Rail Operator maintain the rail infrastructure		
Operating Assets (Trains, signalling system, etc.)	Rail Operators own, maintain and make decisions on building-up, replacement and upgrading	LTA owns and make decisions on building-up, replacement and upgrading, while Rail Operator remains responsible for maintenance	
Regulatory Regime	Outcome-based regulation	Outcome-based regulation coupled with process- based regulation for maintenance (e.g. Maintenance Performance Standards)	
Revenue Risk	All fare and non-fare revenue risk borne by Rail Operators	LTA shares in revenue risk with Rail Operator	
Regulatory Risk	All regulatory risk borne by Rail Operators	If there are any regulatory changes introduced by LTA after 1 October 2016 that results in changes to costs or revenues, LTA may provide grants to Rail Operator (if Rail Operator' costs increase or revenues decrease consequentially) or require Rail Operator to reimburse LTA (if Rail Operator' costs decrease or revenues increase)	
License Charge	No License Charge	Rail Operator pays an annual License Charge into the Railway Sinking Fund, which will help pay for the building-up, replacement and upgrading of operating assets	
Operators' Profit Margin	No cap on EBIT margin	In line with comparable asset-light rail operators in other jurisdictions. The License Charge which Rail Operators pay to the Railway Sinking Fund increases with higher profits	
Fares	Regulated by Public Transport Council		

### TOD in Singapore are adopting a framework similar to the "3V"

#### 3V Framework

Singapore has been planned for decades along principles of integrated land use and transport planning similar to the



The 3V Framework is applicable to large cities with extensive networks and smaller cities with only a few mass transit lines or a bus rapid transit system. The model works for growing cities and declining ones. It seeks to determine the relative areas of potential within a city rather than across cities.

#### The 3 values are:

- 1. Node Value = the level of access offered by a mass transit station
- 2. Place Value = the attractiveness of the area in terms of diversity and accessibility of community spaces
- **3. Market Potential Value** = the prospects of the community in the future.

Policy Levers to Increase Value			
Node Value	Place Value	Market Potential Value	
<ul> <li>Increase the number of hubs and the number of lines/modes</li> </ul>	<ul> <li>Increase compactness (proximity to existing urban activity and</li> </ul>	Increase residential density.	
they connect to.	short travel time to main destinations).	Increase job density.	
<ul> <li>Interlink neighboring stations into clusters.</li> </ul>	Increase the diversity     of uses.	Increase human density.	
<ul> <li>Increase accessibility for all within the network.</li> </ul>	<ul> <li>Increase the concentration of commercial, cultural, and educational amenities.</li> </ul>	<ul> <li>Increase the diversity of land parcels to create a vibrant land market.</li> <li>Increase floor area</li> </ul>	
	Design neighborhoods that promote walking and cycling.	ratios.	
	Create a vibrant public realm.		

27ADVISORY Source: World Bank



### Case Study: TOD in Hong Kong



While a stable fare revenue is one of most important sources of recurrent income for the Hong Kong MTR. They also use a number of proven financing models such as the Rail plus Property model, Public-Private Partnerships, and service concessions and cash grants to support the delivery of high quality railway services over the long term.





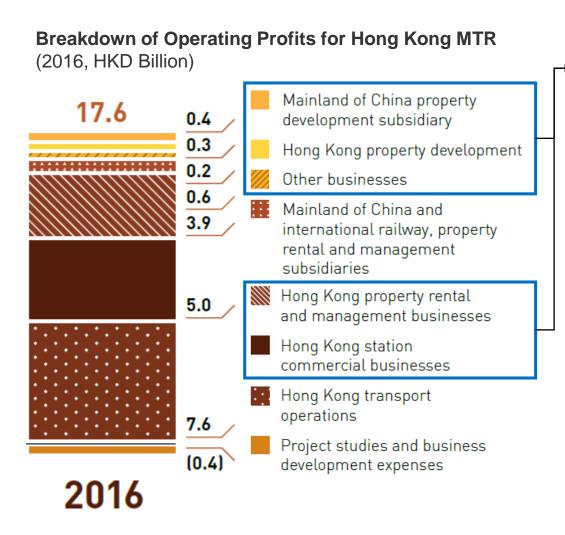


In 2016, on average we carried approximately 5.6 million passengers each weekday across our rail network and bus passenger services in Hong Kong.

Integration of land use and transit planning has put 75 percent of people and 84 percent of jobs in Hong Kong SAR, China, less than 1 kilometer from a mass transit station. The city has one of the highest rates of public transit use (90 percent of motorized journeys) and lowest rates of car ownership (56 cars per 1,000 people, compared with an average of 404 in OECD countries).

27ADVISORY Source: MTR, World Bank

### An Overview of the Hong Kong MTR's Financial Performance

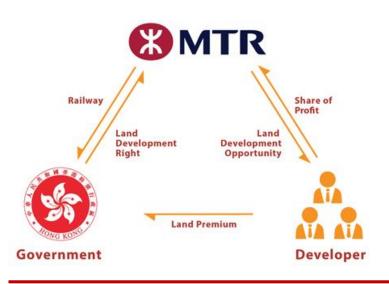


HKD 9.8 billion (56%) out of the HKD 17.6 billion operating profits, are from non-fare box receipts

These non-fare box receipts are mainly come from:

- Station Commercial Businesses (Retail Rental, Advertising, Telecommunication)
- Property Businesses
   (Property Rental, Property Management, Property Development)
- Mainland China & International Businesses
   (Railway, Property Rental & Management subsidiaries, Property Development subsidiaries, Railway subsidiaries)

### A self-sustainable model: Rail + Property

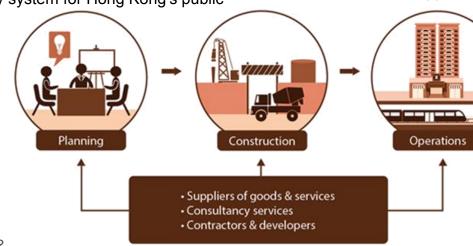


One important reason the system has been able to perform so well is that the government of Hong Kong has enabled MTR to make money from the property-value increases that typically follow the construction of rail lines. The key is a business model called "Rail plus Property" (R+P).

The Mass Transit Rail (MTR) Corporation was established in 1975 as a government-owned enterprise to build, operate, and maintain a mass transit railway system for Hong Kong's public transport needs.

Key components which bring in most of the revenue for MTR:

- Retails & Shopping mall
- Office
- Residential
- Advertising



MTR has applied the R+P model extensively. Buildings sit over about half of the system's 87 stations, amounting to 13 million square meters of floor area. New projects being planned or developed will add another 3.5 million square meters.

Services for

 Tenants in shopping malls

Station retailers
 Advertisers

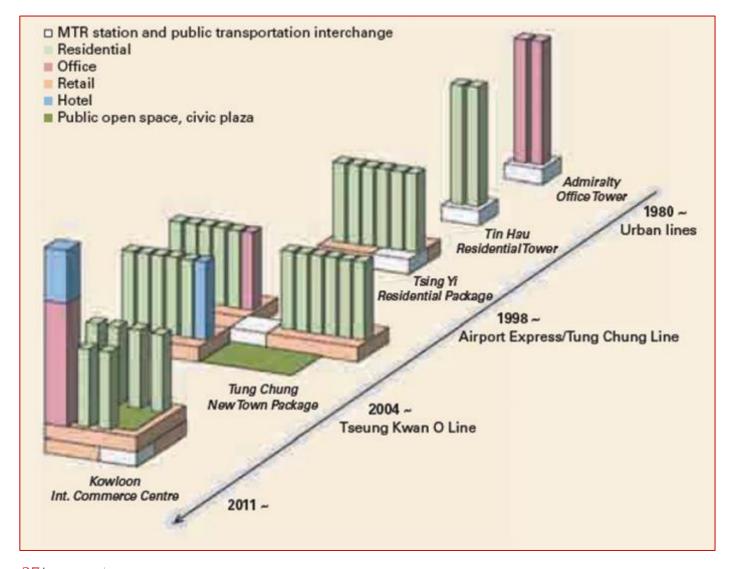
Services for

Customers
 Tenants in managed properties

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Source: MTR

### Physical typology & evolution of the Rail + Property Model



The design principles of R+P have evolved over the past 35 years. Since the late 1990s, development has integrated transit-oriented development design concepts – high -density, mixed-use, and pedestrian-friendly—in a more physically comprehensive manner than seen in the 1980s

Profits from property development and related business of MTR Corporation, including HK station commercial business and HK property rental and management business, have accounted for more than 50 percent of MTRC's total profit between 2000 and 2015.

From 1980 to 2005, the government received an estimated HK\$140 billion (US\$ 18 billion) in net financial returns (nominal value).

27ADVISORY Source: MTR

# Summary of the sustainability benefits of *Rail + Property Model* in Hong Kong

#### Low Public Spending

Development right granted by Government minimises public spending on rail infrastructure, with sustainable long-term rail construction model



#### Safe & Healthy Community

Segregation of vehicles and pedestrians to create a safe and healthy living environment

# Modern & Efficient City Living

Better land utilisation and reduction of road traffic

#### People - Oriented

Seamless connection between railway station and property development provides maximum convenience and achieves time efficiency

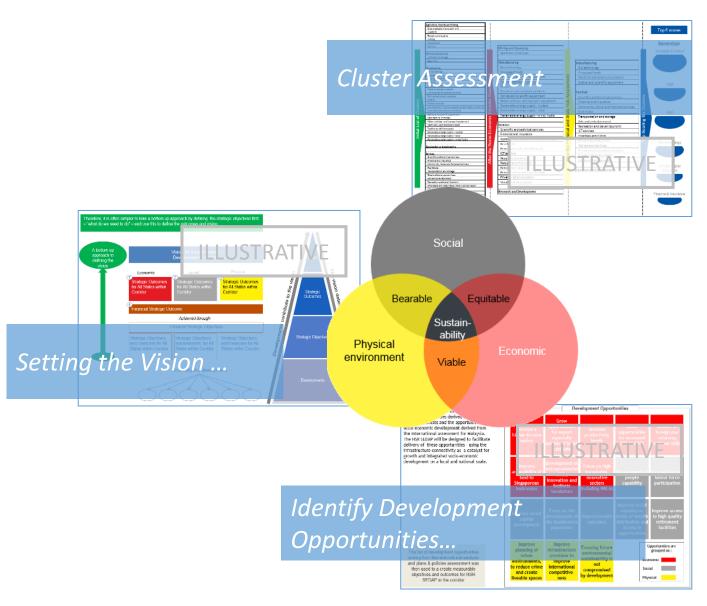


## Case study: MY-SG HSR

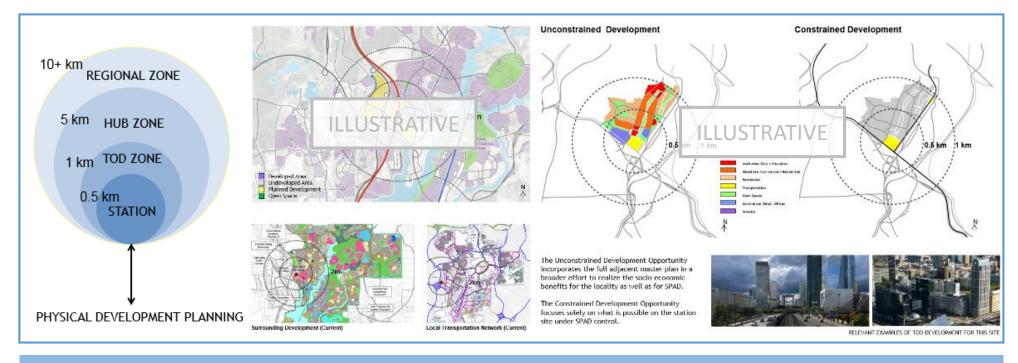
MY HSR is an iconic HSR project in Malaysia that linking the two capital cities: Kuala Lumpur & Singapore





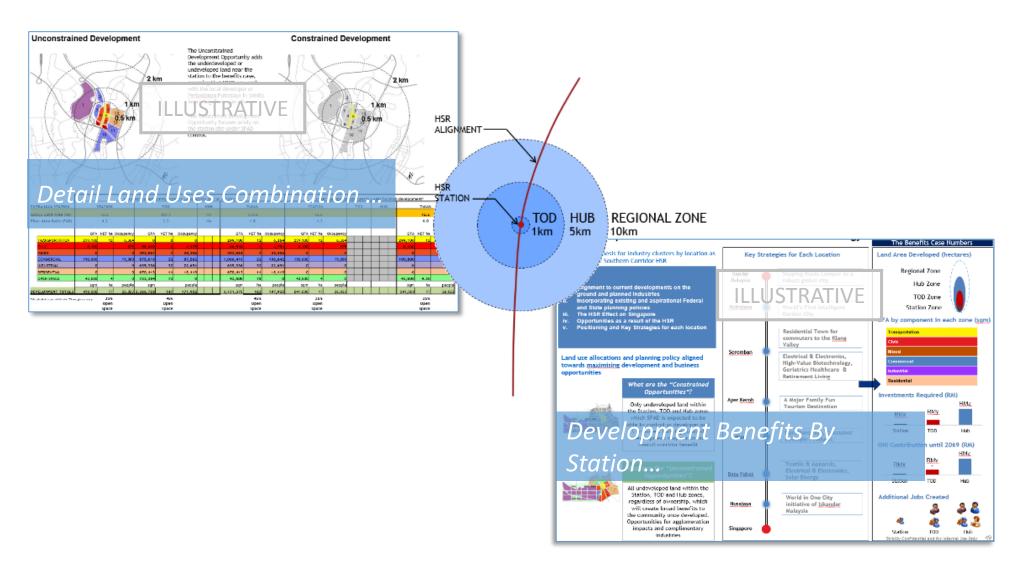


### Comparing the Unconstrained Development & Constrained Development

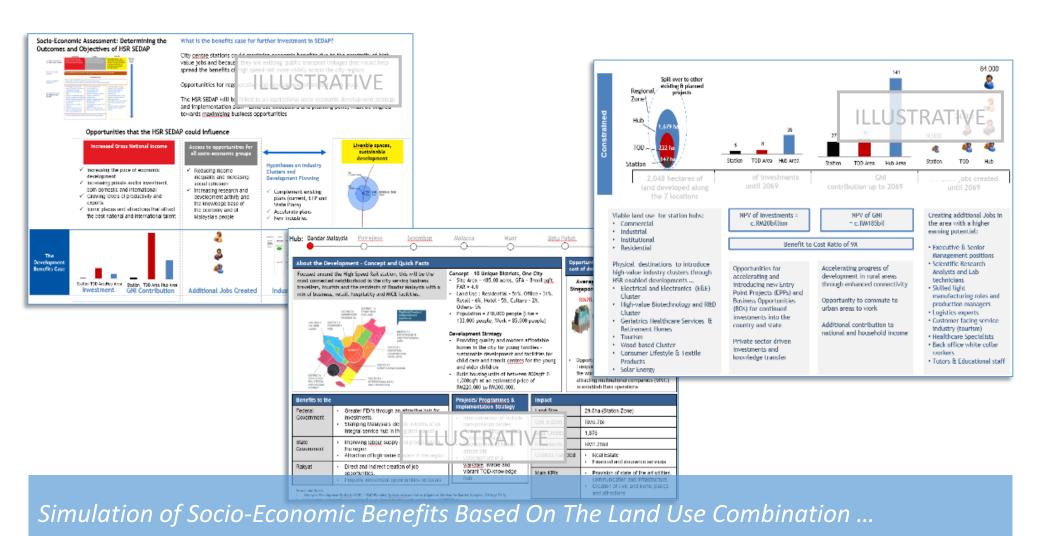


Physical Assessment & Land Uses Evaluation...
Comparing "Unconstrained Development" & "Constrained Development"

# Simulation of benefits by stations according to land use combination



### Simulation of Socio-economic benefits to be arise from the development



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#### Potential new revenue stream that a TOD can deliver

Walkable design with pedestrian as the highest priority

Bikeshare rental system and bikeway network integrated into stations

**Business** incubator

Large ride-in bicycle parking areas within stations

Reduced and managed parking inside 10-minute walk circle around town center / train station High density, walkable district within 10-minute walk circle surrounding train station

Collector support transit systems including streetcar, light rail, and buses, etc

Specialized retail at stations serving commuters and locals including cafes, grocery, dry cleaners Train station as prominent feature of town center

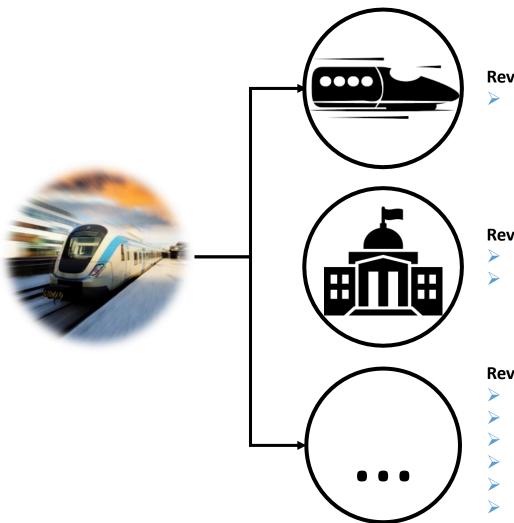
Public square fronting train station

Designed to include the easy use of bicycles and scooters as daily support transport

A regional node containing a mixture of uses in close proximity (office, residential, retail, civic)

# Allowing the project stakeholders to capture multiple revenue streams

Unlocking the land value to capitalize on the appreciation of land value & people flow



#### **Revenue Options for Rail-related Operation**

Ticket sales for transport operations

#### **Revenue Options for Government Policy**

- Business rate supplement (BRS)
- Community Infrastructure Levy

#### **Revenue Options for Non-Rail Operations**

- Ancillary services Last miles transportation (Bus & Taxi)
- Property rental & management business
- Rental of Commercial & Retail Spaces at rail station
- Advertising at rail station, rolling stocks & other vehicles
- > Telecommunication services
- Engineering Services



#### Introduction of Socio-Economic Modelling (SEM)

Socio-Economic Model is a handy tool to creating development strategy for mega development projects such as HSR Development

#### **Mega Development Projects**



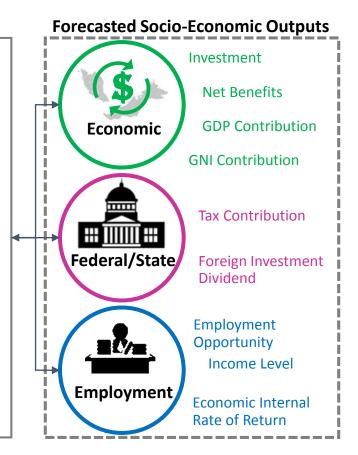
#### **Socio-Economic Modelling**

An Excel-based model which simulates the potential socio-economic impact to the Economic, Federal/State, and Employment from the development and creating customized development strategies to:

- Optimizing land opportunities and land use
- Maximize potential socio-economic benefits

#### And ultimately

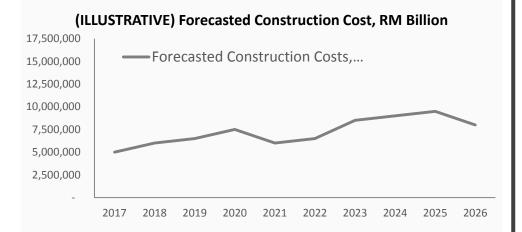
Ensure the development can meet the project vision



### Conventional Construction Modelling VS Socio-Economic Modelling (SEM):

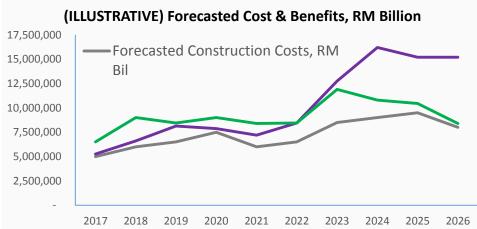
Traditional modelling only considered the costs & benefits arise directly associated to the construction

# **Conventional Project Modelling for Construction or Major Developments**



Only focus on the direct project costs from the construction alone

#### **Socio-Economic Modelling**



- Looking at the "Unconstrained Potential Developments"
- Considered more aspects which contributed to the cost & benefits of the development

#### Methodology to built up the SEM

The methodology to obtain the assumptions for building a SEM can be separated into two major category and a typical SEM would requires an interchange use of both

Top-Down Approach

- Benchmarking of similar developments, focusing on the resources required and outcomes delivered. Same type of project within the same vicinity in recent years is preferred.
- Developed & extrapolate assumptions based on the data gathered
- Lesser time required to construct the model but the accuracy and reliability might be slightly lower than the Bottom-Up Method

Both approaches will be used to obtain the critical assumptions required to construct the SEM that related to:

- Industry data (revenue size, operations cost, labour force requirement, and profit margin)
- Labour force requirement (construction & operations)
- Labour force requirement (businesses & commercial)
- Ratio of revenue to operating cost of the HSR

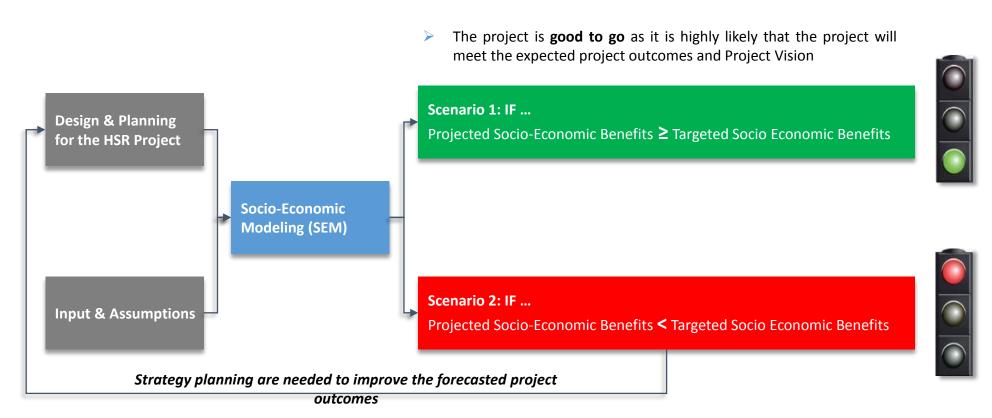
**SEM** 

Bottom-Up Approach

- Take into account **all the associated costs** related to future activities within the projection period (based on the current designs & planning and the targeted economic activities)
- Construct the cost profile base on the associated costs
- More reliable & provides more certainty in projection outcomes but requires more time to gather the accurate assumptions

#### The "True Value" of SEM lies in its flexibility ...

This allows strategy planning which aligned the forecasted project outcomes with the vision of a multi billion project



- The project still **requires more attentions** on the design and planning as it is unlikely to deliver the expected project outcomes
- Strategies are needed to tackle the corresponding issues which are likely to cause the failure of project

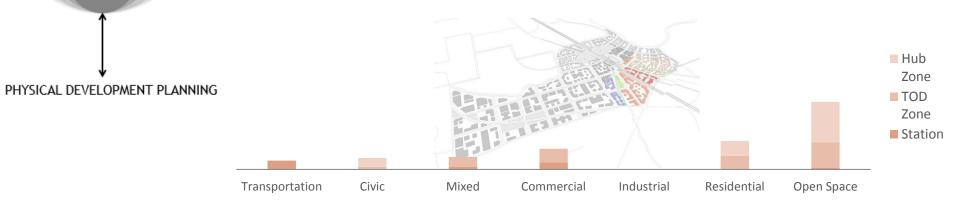
#### Getting the right mix of cluster developments

Comparing the Unconstrained Development & Constrained Development options





# Gross Floor Areas (GFA) for Different Development Components – Constrained Development (ILLUSTRATIVE)





**STATION** 

### All successful developments start from the beginning of the project ...

#### The Green Line

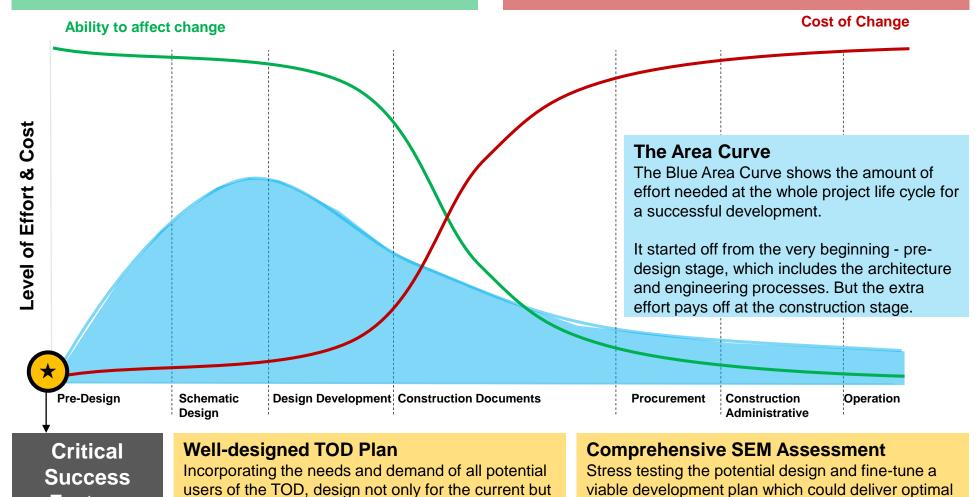
The ability to impose a change on a development project is greatest at the beginning, and diminish as the project started.

also for future generations.

#### The Red Line

The cost of imposing changes to a development is lowest at the beginning, and gradually increase as the project started.

socio-economic benefits to all stakeholders.



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**Factors** 





### An introduction to 27Group of Companies

#### **Unlocking Potential. Delivering Results. Rebuilding Humanity**

27Group is a network of strategic consulting and advisory firms with a shared vision of rebuilding humanity.

The 27Group was founded by like-minded professionals with a shared vision on rebuilding humanity with a unique blend of consulting services. The founders have collectively accumulated more than 100 experience years corporate restructuring & recovery, corporate finance, management consultancy specialising in natural & built assets services.



With their combination of corporate exposure & experiences in design & engineering of projects, 27Group's delivery model infuses human values into strategy, creates innovative funding solutions & implements development management to ensure your project success.

## Our service offerings

#### Corporate Restructuring

#### Strategic Business Planning

# OUR ECOSYSTEMS & SECTOR

Our core focus areas are Government & PPP, Cities & Real Estates, and Industrial Parks & Industry 4.0. We also support the ancillary segments around the core focus areas.

Development

Investor

Management

Management

Project Management

**Project** 

Transformation

Our Services Menu Master Plan Development

> Capital & Debt Advisory

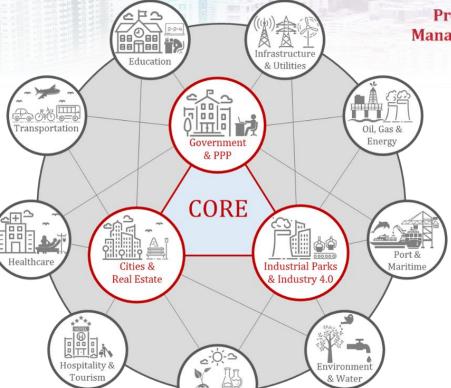
Deal Transaction Support

Business Transformation

Digital & Technology

# OUR VALUE OFFERINGS

We provide a wide range of services to complement each stage of a business life cycle



Agriculture & Bio-economy

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### Why us?



# FUNDING SOLUTION: INTERNAL & EXTERNAL FUNDING SOURCES

We have capabilities to assist in sourcing and procuring external equity and/or debt funding to finance projects and corporate transactions. We may also fund selected projects / transactions from our internal funding sources which could facilitate immediate kickstart of your project.

#### WHY 27GROUP?



#### COLLECTION OF SUCCESS FEE UPON SUCCESSFUL IMPLEMENTATION

We offer special payment milestone – based on success fee and a minimal professional fee to cover for basic expenses. By doing so, our interests and that of our client's will be aligned. Both parties stand to "win" under this success fee payment model, as it rewards based on outcome.



# ONE STOP SOLUTION: STRATEGY + INVESTMENT + IMPLEMENTATION

Our multi-disciplinary team offers a wide range of services to complement each stage of a business or project life cycle: from crafting of business plan, investor sourcing and fund raising to project management and implementation. Our emphasis is on making it happen for our clients.





# End of Presentation

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Socio-Economic Transformation