Rail-integrated Urban Development

Japanese Experience and Its Implications

October 10, 2016

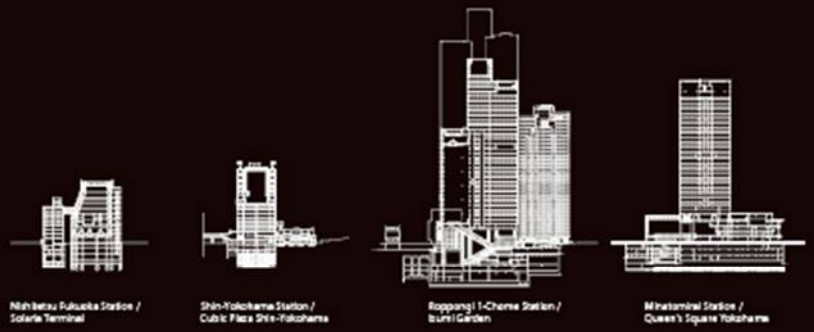
中分毅/Takeshi NAKAWAKE
Executive Vice President
NIKKEN SEKKEI Ltd.

NIKKEN SEKKEI

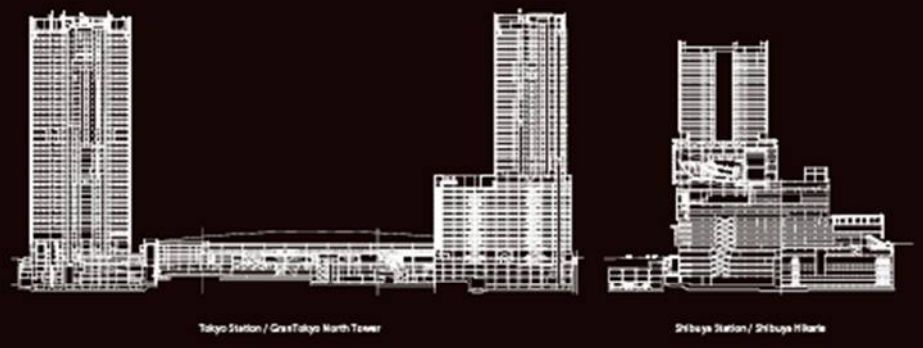
A Professional Services Firm covering Architectural Design, Urban Planning/Design, & Environmental Engineering

TID - Terminal Integrated Development

Comprehensive Revitalization of the Station and the Town



Nishitetsu Fukuoka Station / Solaria Terminal
Shin-Yokohama Station / Cubic Plaza Shin-Yokohama
Roppongi 1-Chome Station / Izumi Garden
Minatomirai Station / Queen's Square Yokohama



Tokyo Station / GranTokyo North Tower
Shibuya Station / Shibuya Hikarie

Roppongi 1-Chome Station / Izumi Garden

Minatomirai Station / Queen's Square Yokohama

Tokyo Station / GranTokyo North Tower

Shibuya Station / Shibuya Hikarie

NIKKEN SEKKEI

WA 100 2015

WORLD ARCHITECTURE TOP 100

The big list WA100 is BD's annual survey of the world's largest practices ranked by the number of fee-earning architects they employ. There has been a reshufle among the practices in the top 10 and a new number one for 2015

RANK 2015	RANK 2014	PRACTICE NAME	COUNTRY	ARCHITECTS EMPLOYED	ARCHITECTS PREVIOUS YEAR	FEE INCOME (US $MILLION)
1	2	Aecom	USA	2,100	1,410	
2	3	Nikken Sekkei	Japan	1,672	1,053	$500-599m
3	1	Gensler	USA	1,614	1,468	$800-900m
4	6	Perkins & Will	USA	1,065	888	$250-259m
5	5	Aedas	China	927	919	$210-219m
6	11	HDR	USA	828	715	$300-309m
7	7	Woods Bagot	Australia	817	792	$150-159m
8	4	IBI Group	Canada	798	1,035	$210-219m
9	10	P+T Architects and Engineers	China	793	750	$160-169m
10	9	DP Architects	Singapore	748	756	$100-109m

Self-introduction

Profession:

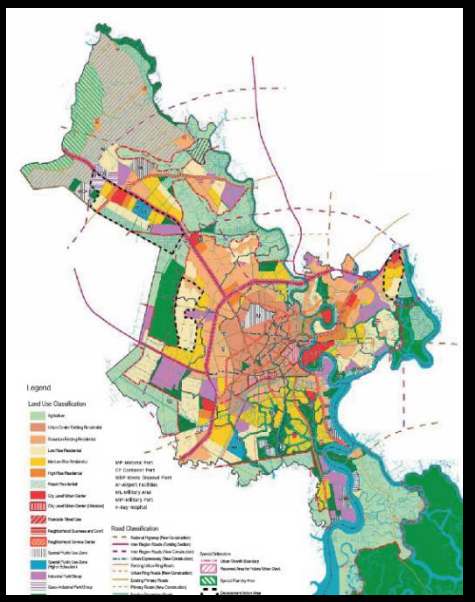
Environmental Engineering & City Planning

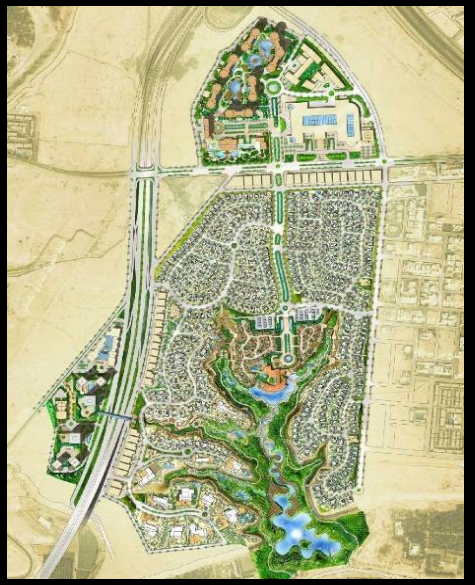
Projects:

- Strategic Plan for Whole City
- Brownfield Redevelopment
- City Center Redevelopment
- New Town Development
- Japan, China, Malaysia, Russia, KSA Vietnam, India

Current concerns:

- TOD(Transit Oriented Development)
- Brownfield Regeneration
- LVC(Land Value Capture)
- Economic Value of Green Development

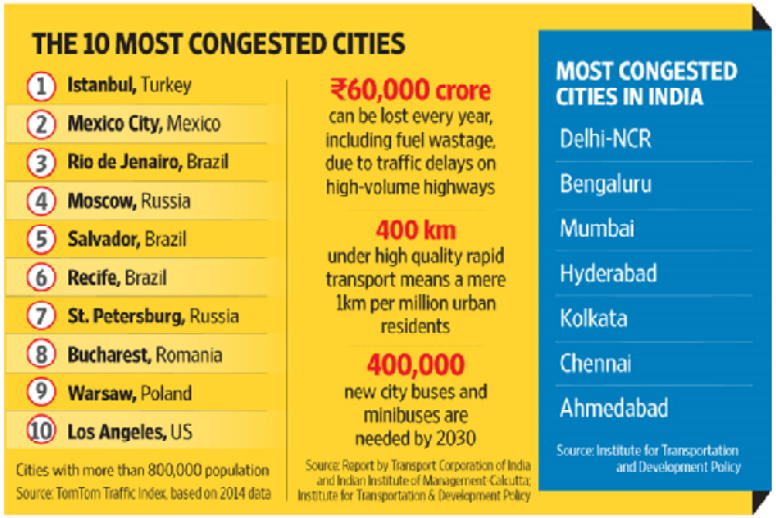




Traffic congestion is a major Headache that spoils Economic Efficiency & Citizen Mobility

How expensive is a traffic jam for you?

In a traffic jam, a vehicle consumes almost 20% more fuel, making travelling a costlier affair



http://www.livemint.com/Money/tlifa0Dp55LFayFmq8xQIJ/How-expensive-is-a-traffic-jam-for-you.html

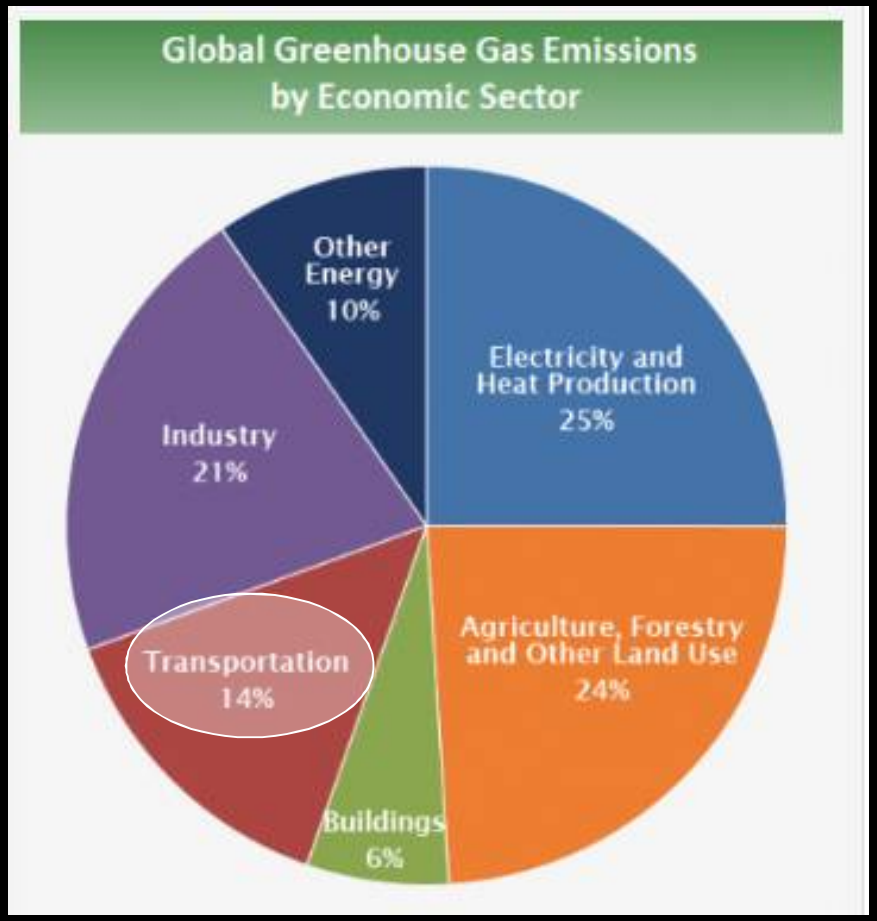
Economic Toll Of Traffic Congestion High

by J. Yogaraj

In Sri Lanka, traffic has been a longstanding issue which has become a never ending problem at present. Even the changing governments could not find a permanent solution to this problem. This is like a slow poison killer of the nation's economy.

http://www.thesundayleader.lk/2015/12/27/economic-toll-of-traffic-congestion-high/

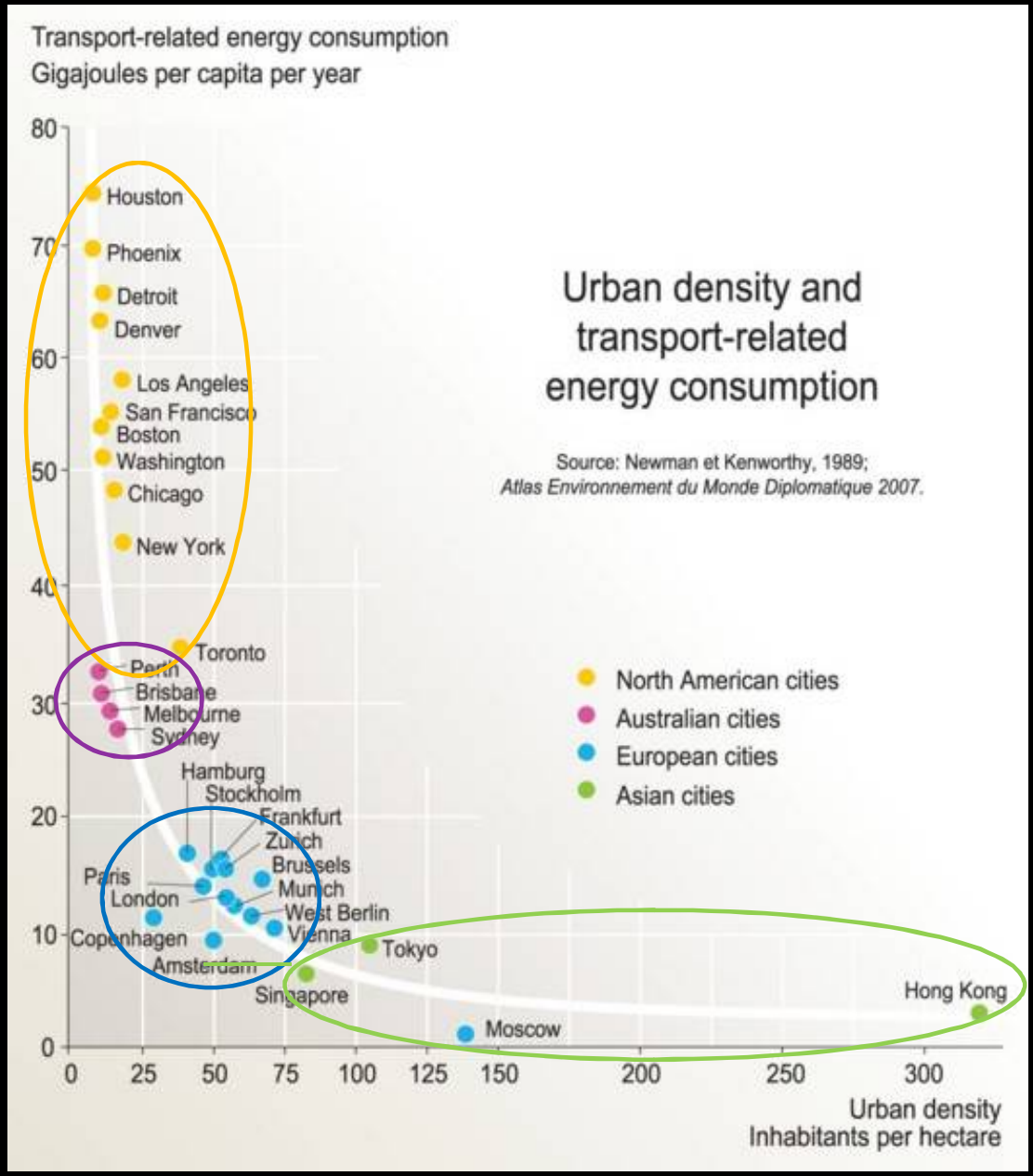
The transportation Sector is one of the major sources of GHG & Air pollution



SOURCE:IPCC(2014)

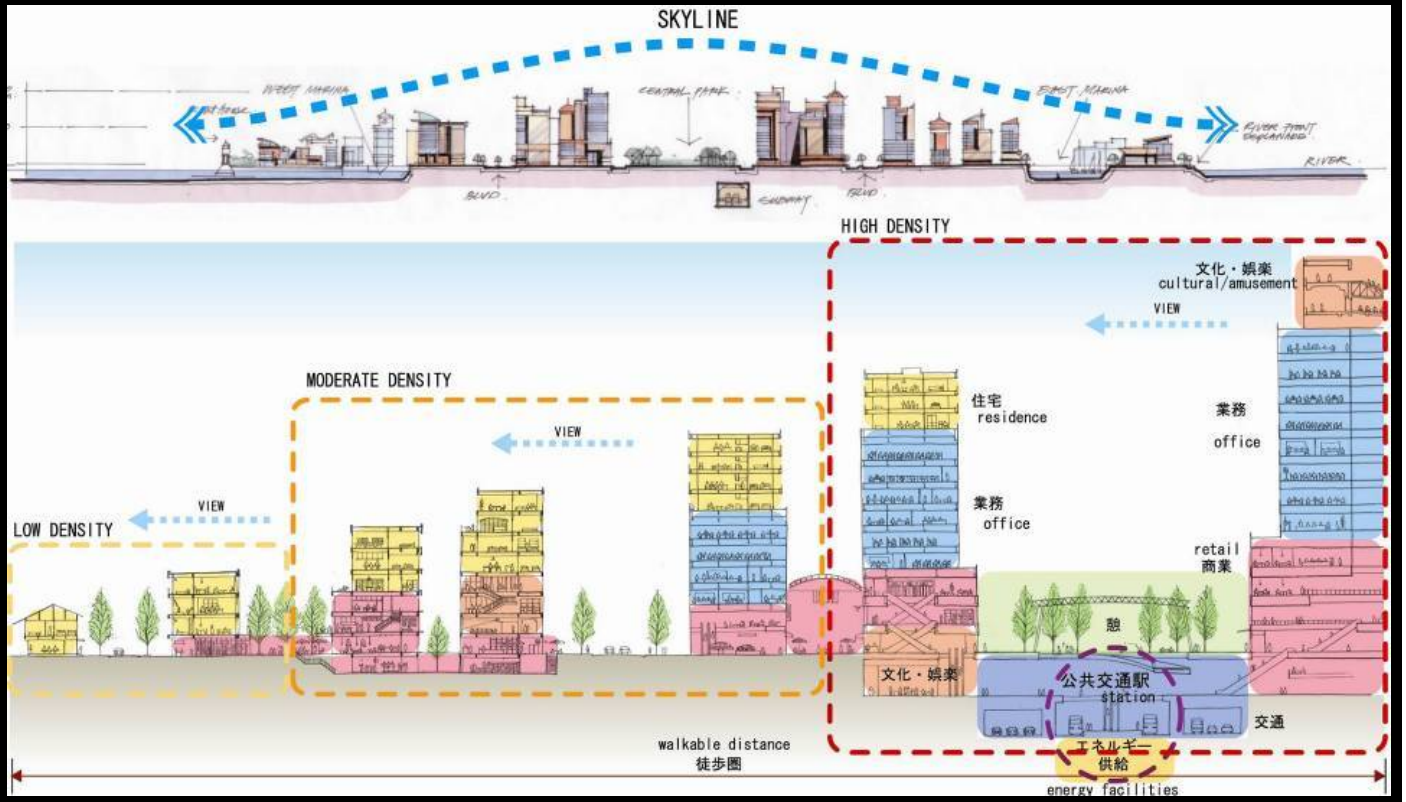
SOURCE:TOKYO METROPOLITAN GORVERNMENT

Urban Density & Transportation-related Energy Consumption



TOD is now one of promising approaches for GREERN DEVELOPMENT

What is TOD? Transit Oriented Development

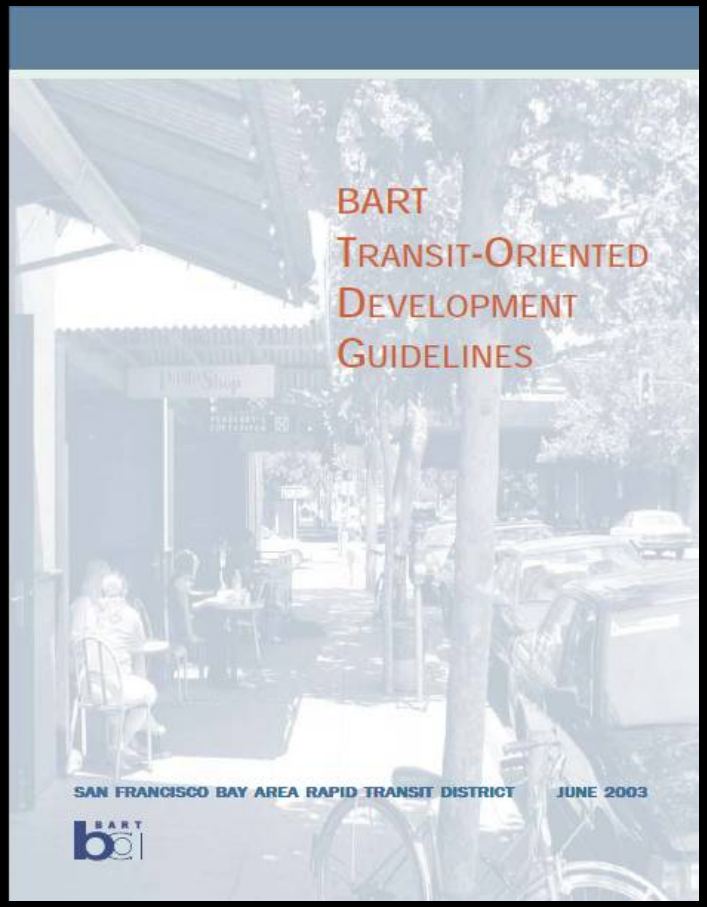


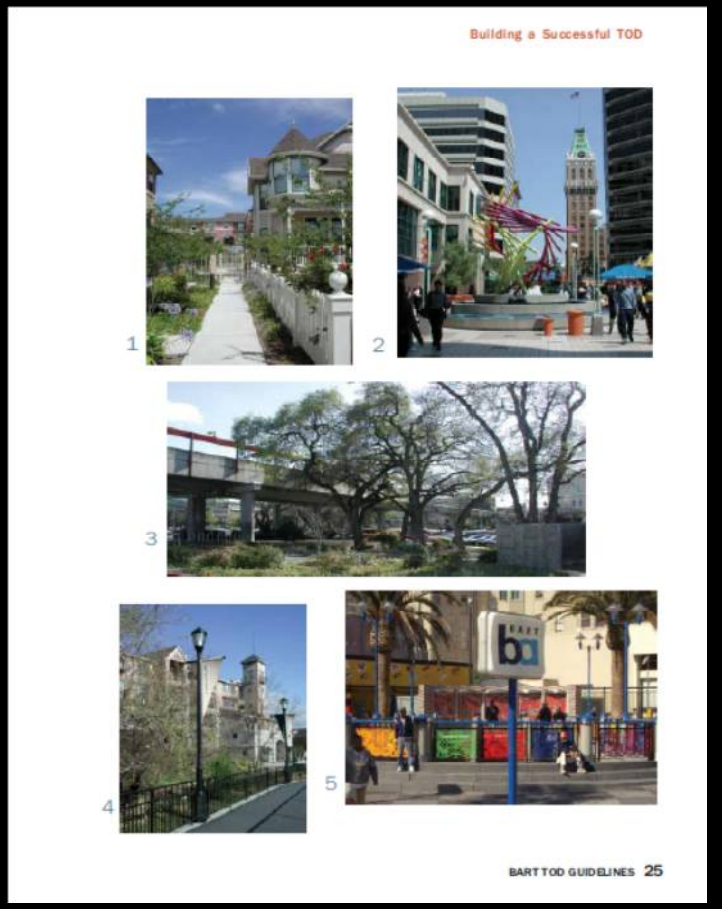
SOURCE:NS INTERNAL

Transit Oriented Development (TOD) refers to residential and Commercial Centers designed to maximize access by Transit and Nonmotorized transportation, and with other features to Encourage Transit Ridership. A typical TOD has a rail or bus station at its center, surrounded by relatively high-density development, with progressively lower-density spreading outwards 300 to 800 meters, which represents pedestrian scale distances.

TOD is now one of promising approaches for GREERN DEVELOPMENT

In the US, TOD is considered to be important

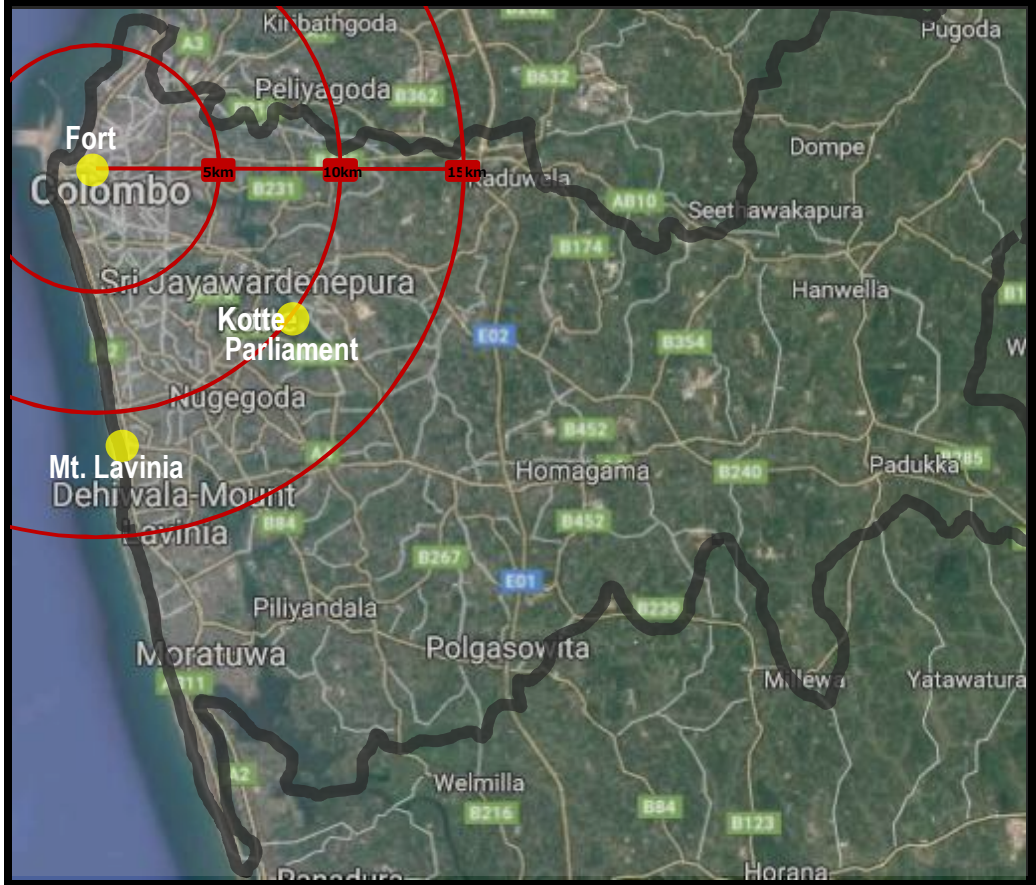




SOURCE: BART HP

COLOMBO & TOKYO

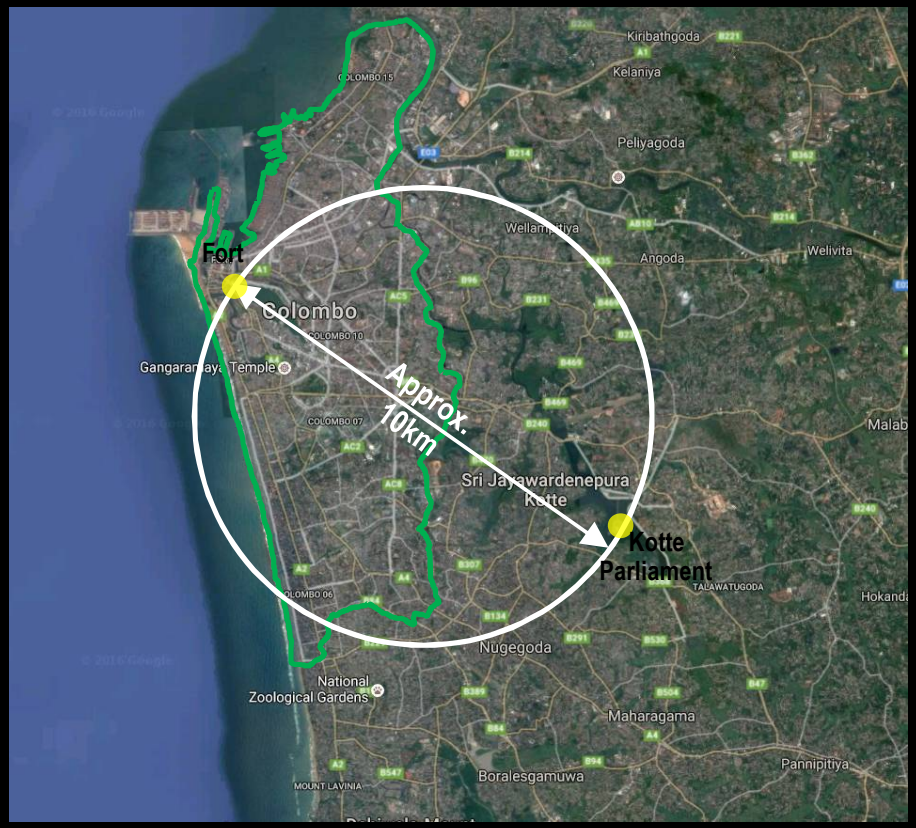
Scale Comparison: COLOMBO District & TOKYO 23 Wards

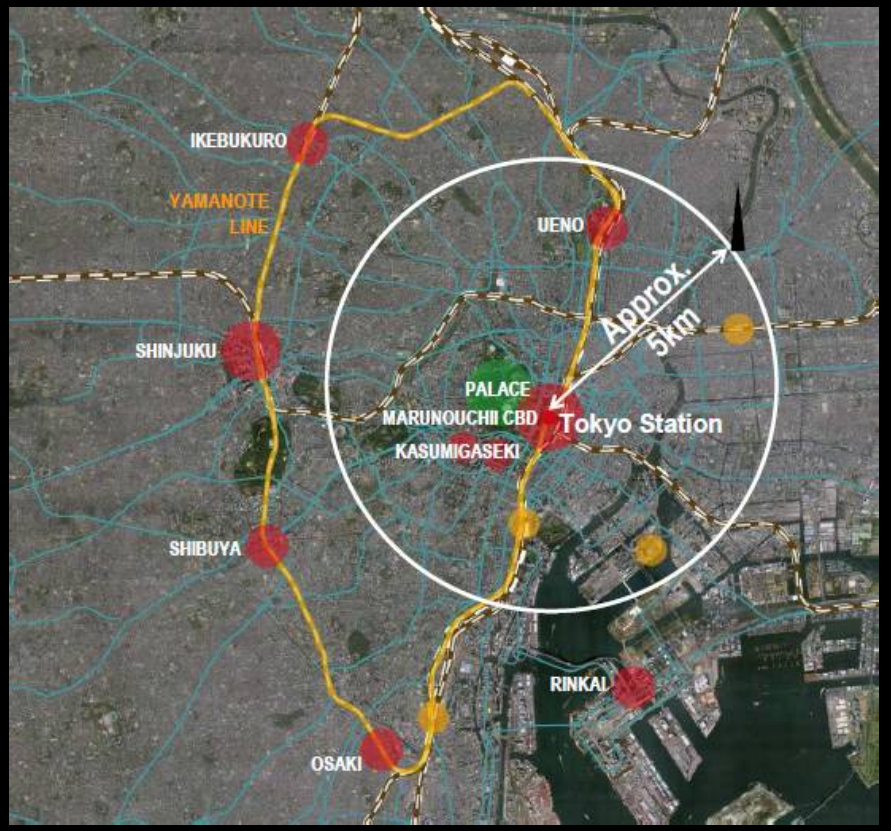


COLOMBO				TOKYO			
	Area (㎢)	Population	Population Density		Area (㎢)	Population	Population Density
				Metropolitan Area	2,191	13,613,600	6,214
District	699	2,309,809	3,304	23 Wards	621	9,360,390	15,073
City	37	752,993	20,182	Central 3 Wards	42	440,724	10,461

COLOMBO & TOKYO

Scale Comparison: Central COLOMBO District & TOKYO

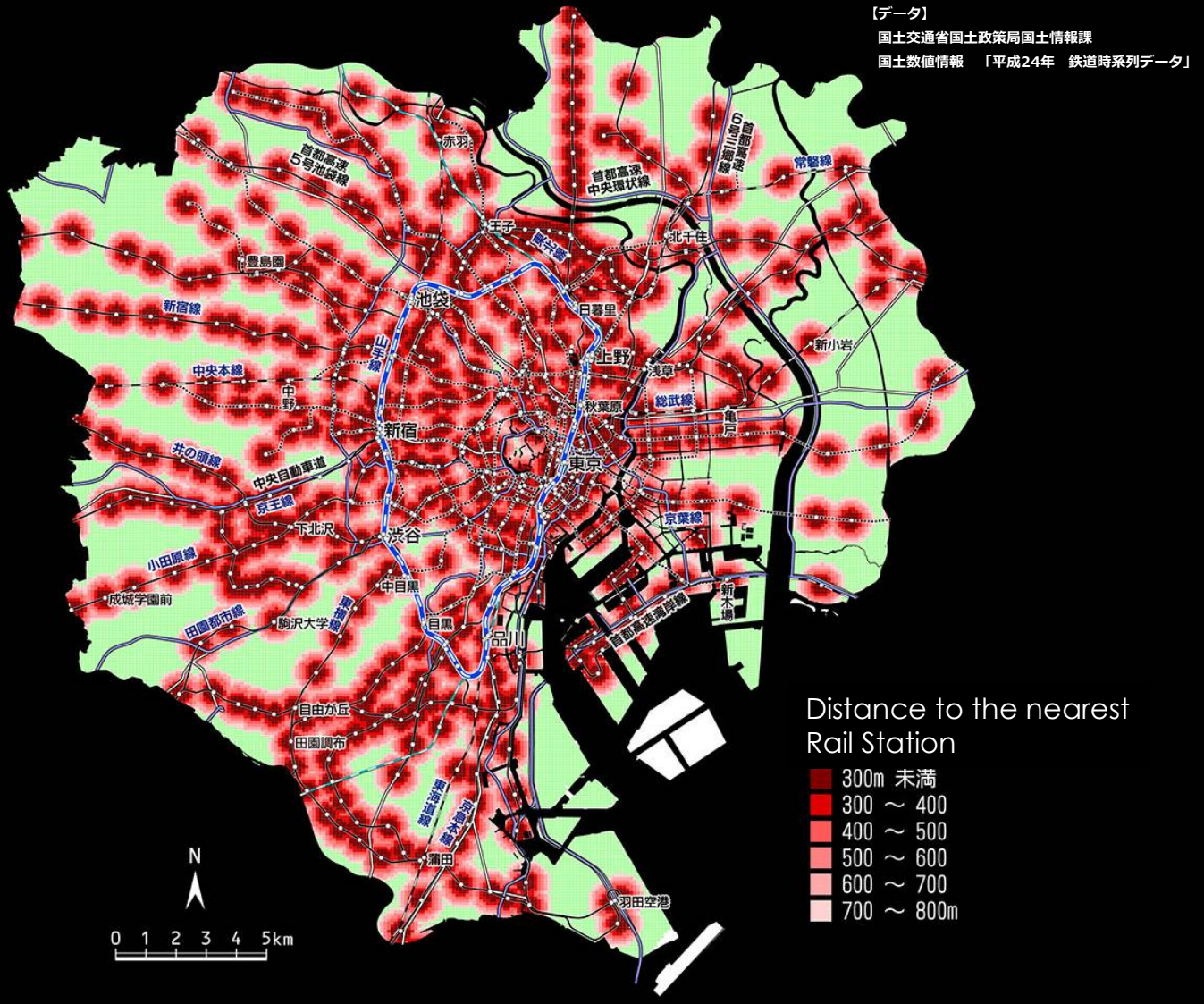




COLOMBO				TOKYO			
	Area (㎢)	Population	Population Density		Area (㎢)	Population	Population Density
				Metropolitan Area	2,191	13,613,600	6,214
District	699	2,309,809	3,304	23 Wards	621	9,360,390	15,073
City	37	752,993	20,182	Central 3 Wards	42	440,724	10,461

How about Walkable Cells in TOKYO?,

TOKYO 23 Wards: Distance to the nearest Rail Station



City Structure of TOKYO is poly-centric

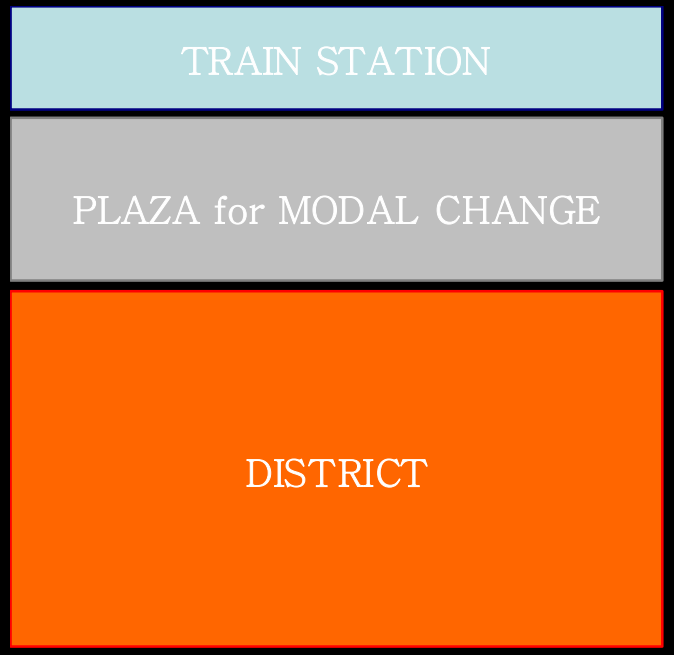
It is an agglomeration of TODs, each with its own unique characteristics

This diversity enabled the speedy recovery of TOKYO after the crash of the bubble economy.

Problems with Conventional type Terminal Stations

- Low utilization of economic potential
- Barriers between stations and neighboring districts
- Uncomfortable, unsafe, inconvenient pedestrian circulation
- Less attractive place
- Less contributions to rail-business

1914 Marunouchi station building of Tokyo station



Practices of Hub Station Redevelopment

TOKYO STATION Rehabilitation

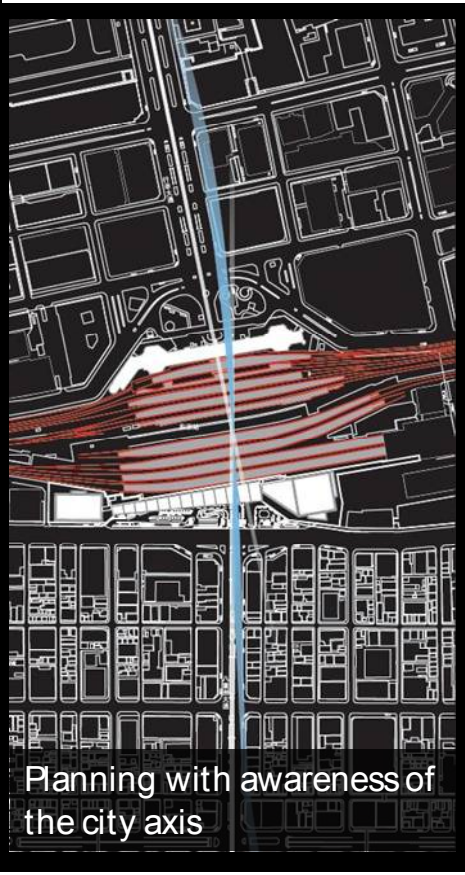
Iconic composition of the old and the new

TOKYO STATION Rehabilitation

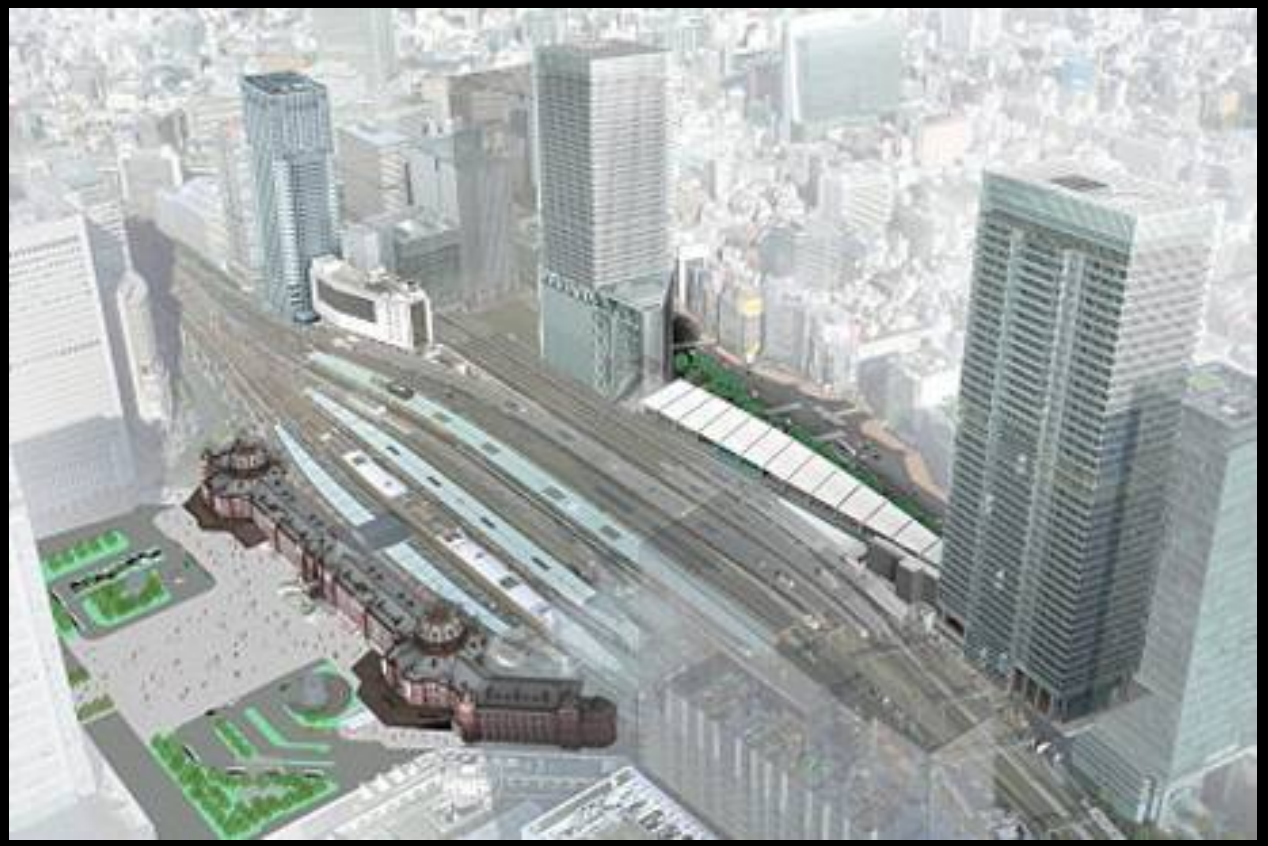
TOKYO STATION CITY Development

東

TOKYO STATION CITY



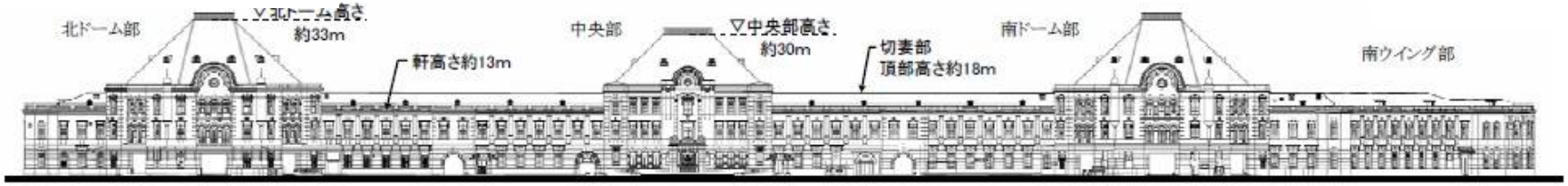
Planning with awareness of the city axis



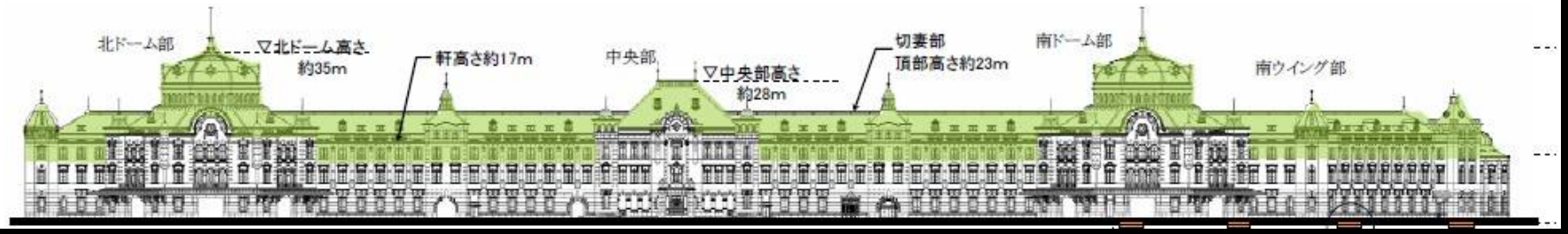
TOKYO STATION Rehabilitation

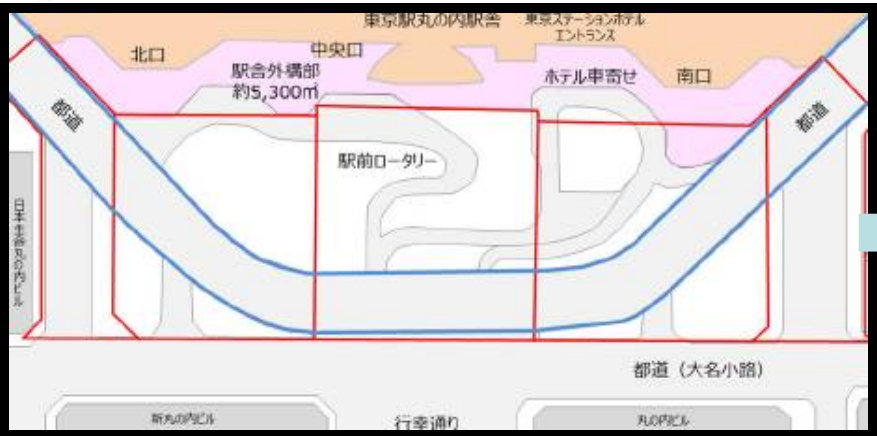
Traditional TOKYO STATION BUILDING Restoration & Realignment of Traffic Plaza for Pedestrian Circulation

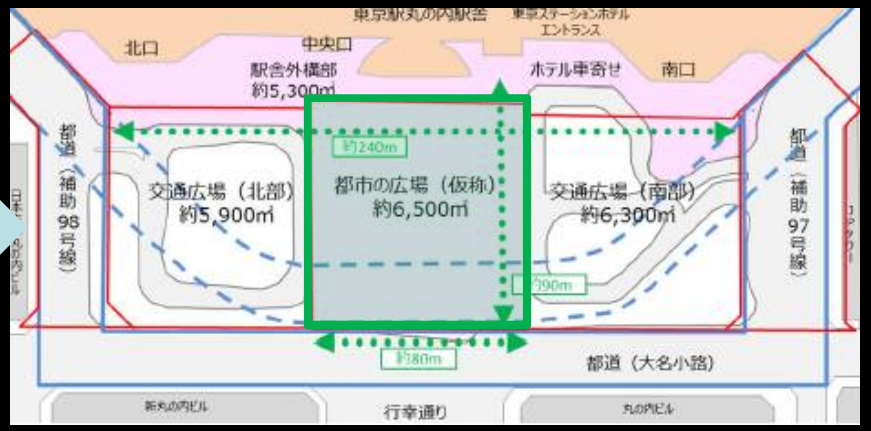
Elevation: Before



Elevation: After





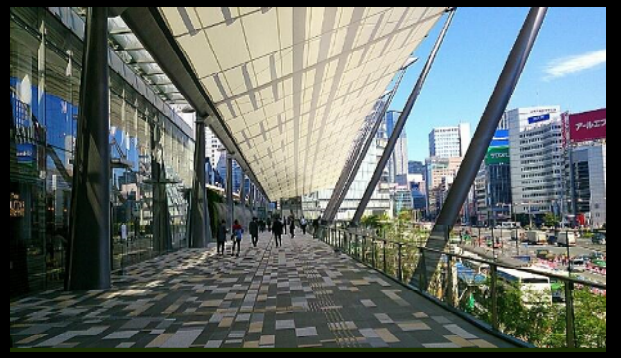


TOKYO STATION Rehabilitation

Traditional TOKYO STATION BUILDING Restoration
Air-rights Transfer to adjacent plots

TOKYO STATION Rehabilitation

Rearrangement of YAESU SIDE

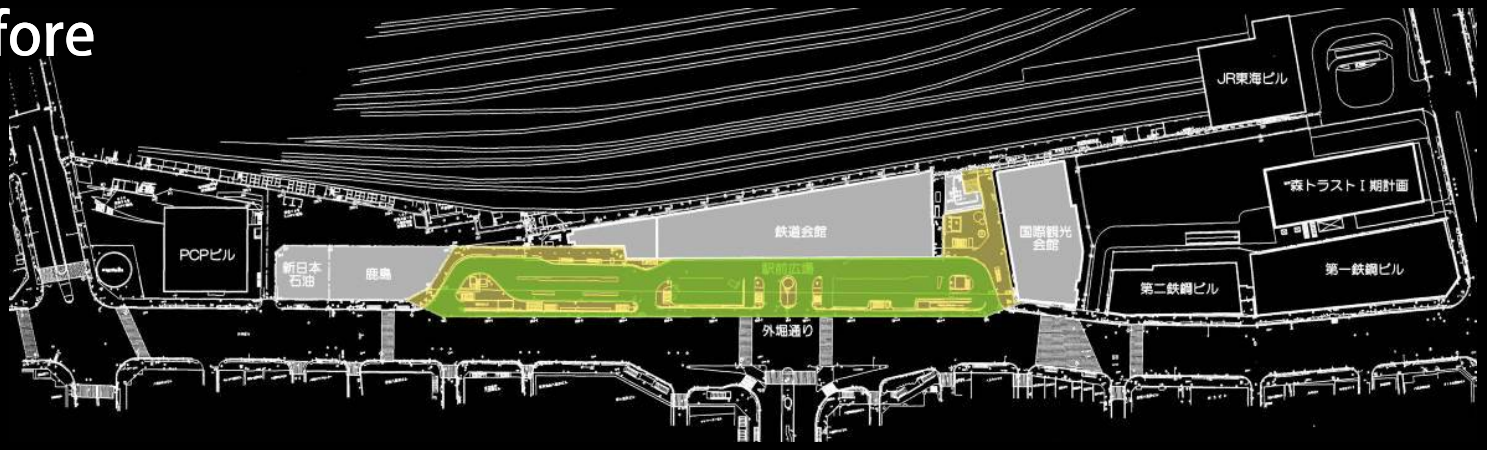


Iconic roof and plaza defines a recognizable station front

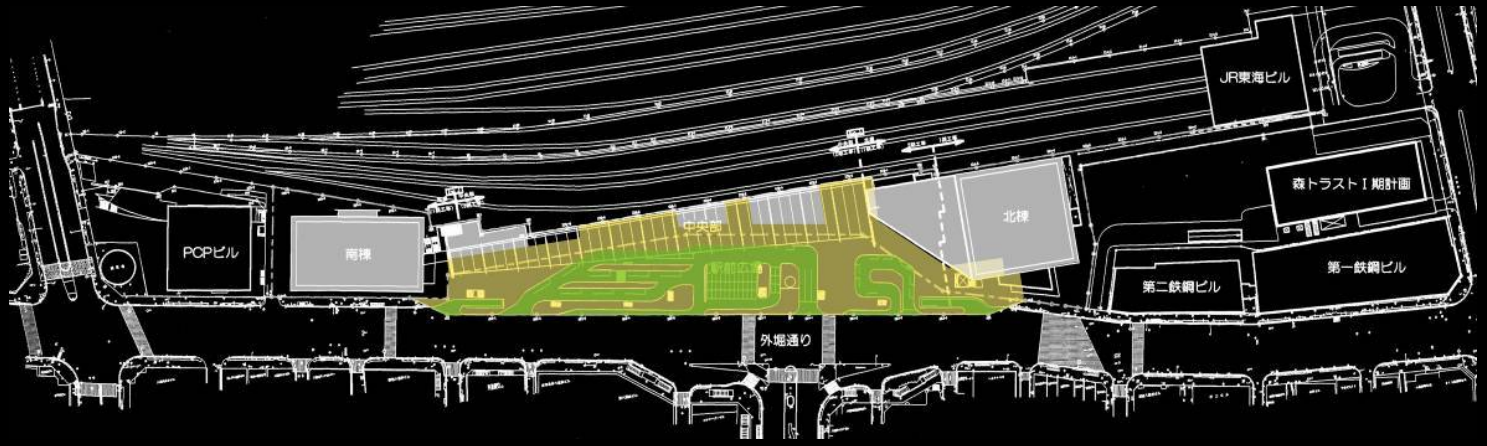
TOKYO STATION Rehabilitation

Traffic Plaza Reconfiguration

Before



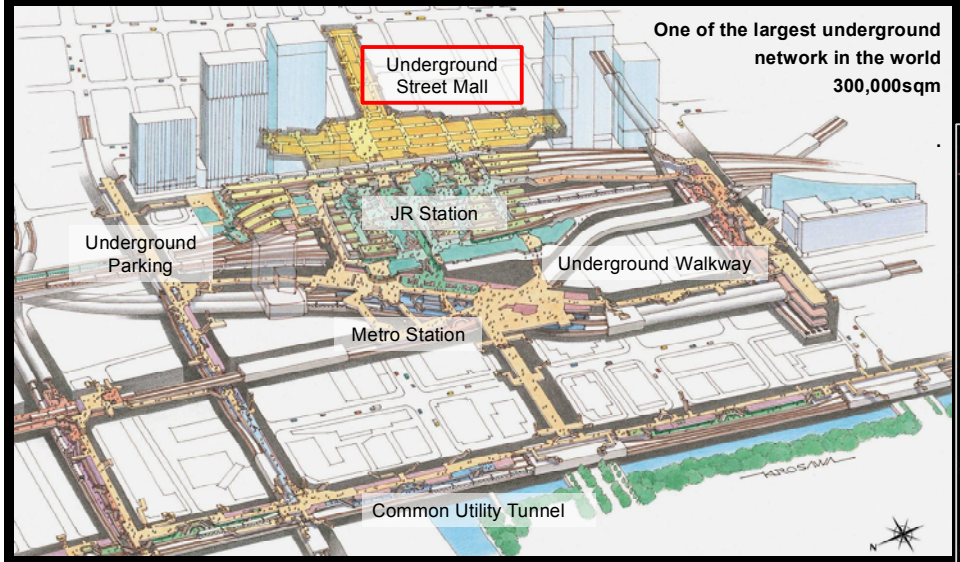
After

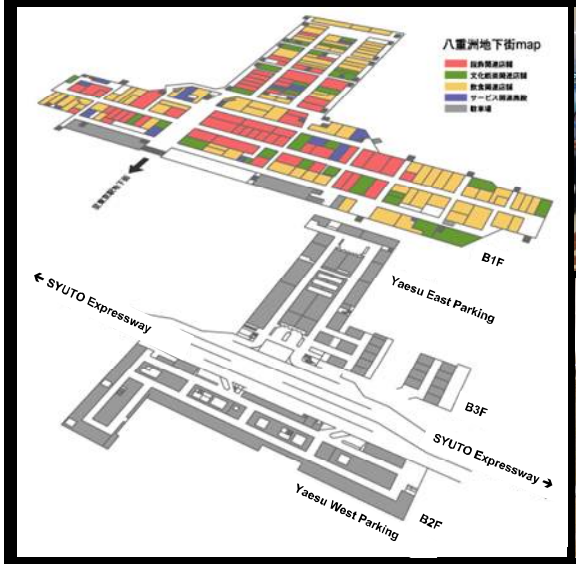


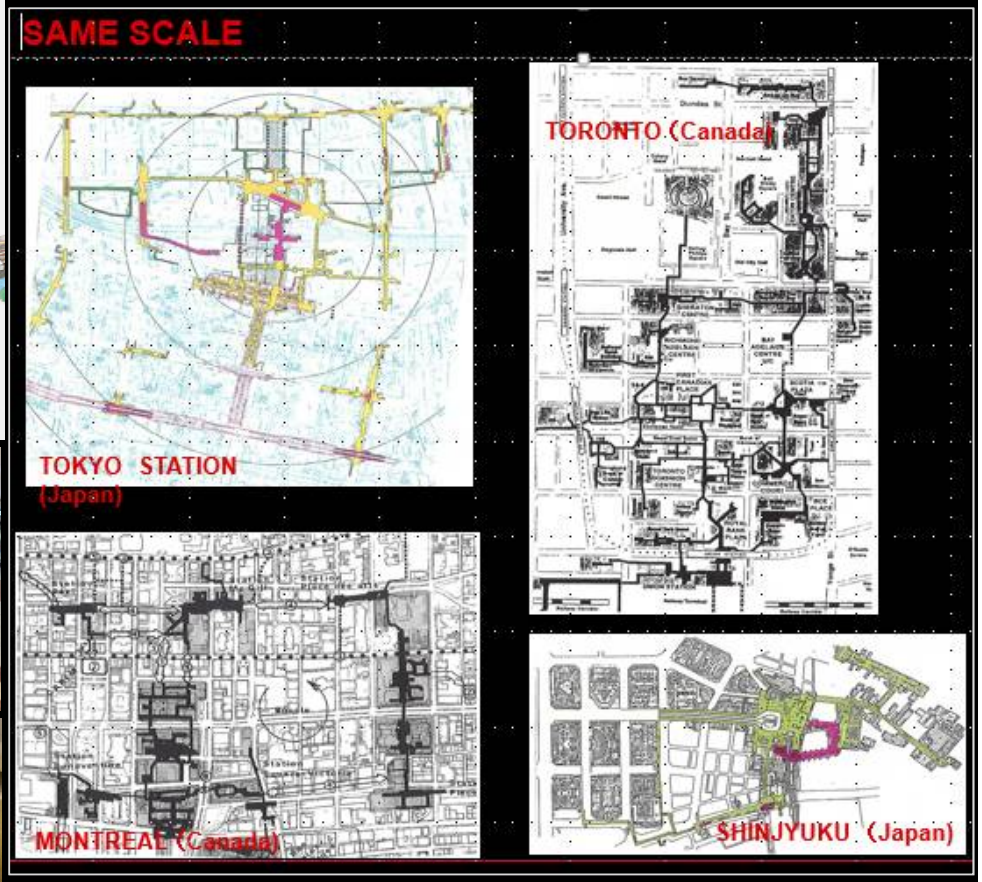
Building
Car
Pedestrian

TOKYO STATION Rehabilitation

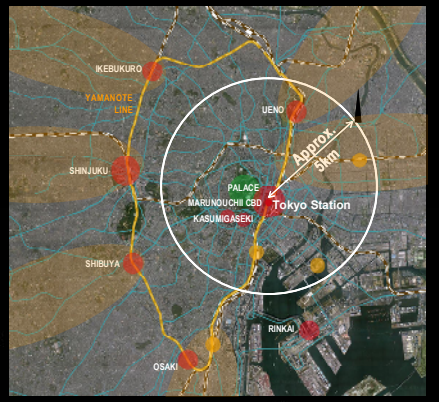
Underground Pedestrian Network Rennovations







Typical Rail-integrated Urban Development in TOKYO along Private Commuter Lines



Business Model A

New-Town Development in Suburb Areas

Spreading Urban Area

City Center with Business / Retails

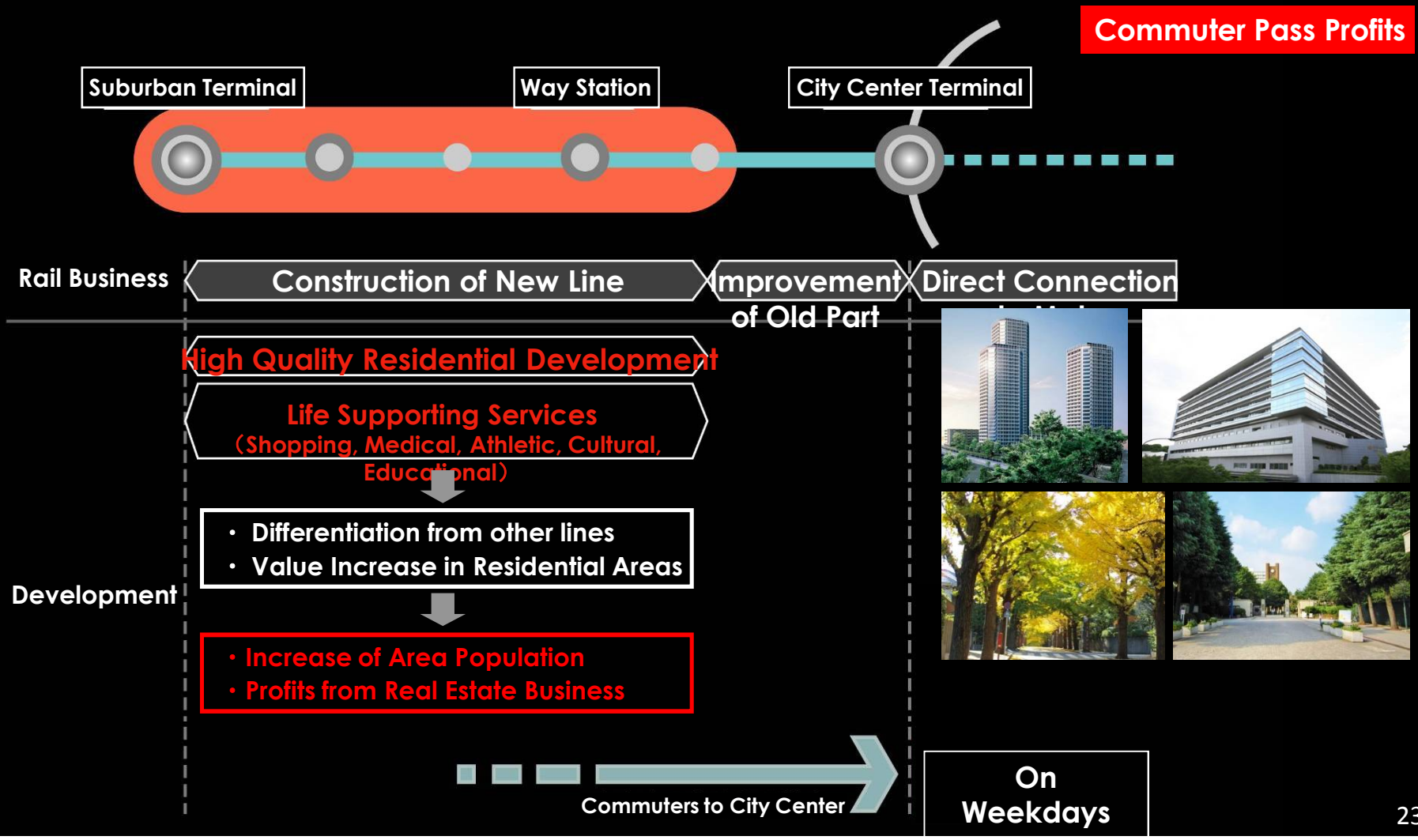
Ring Rail

Business Model B

Terminal Developments in both Ends

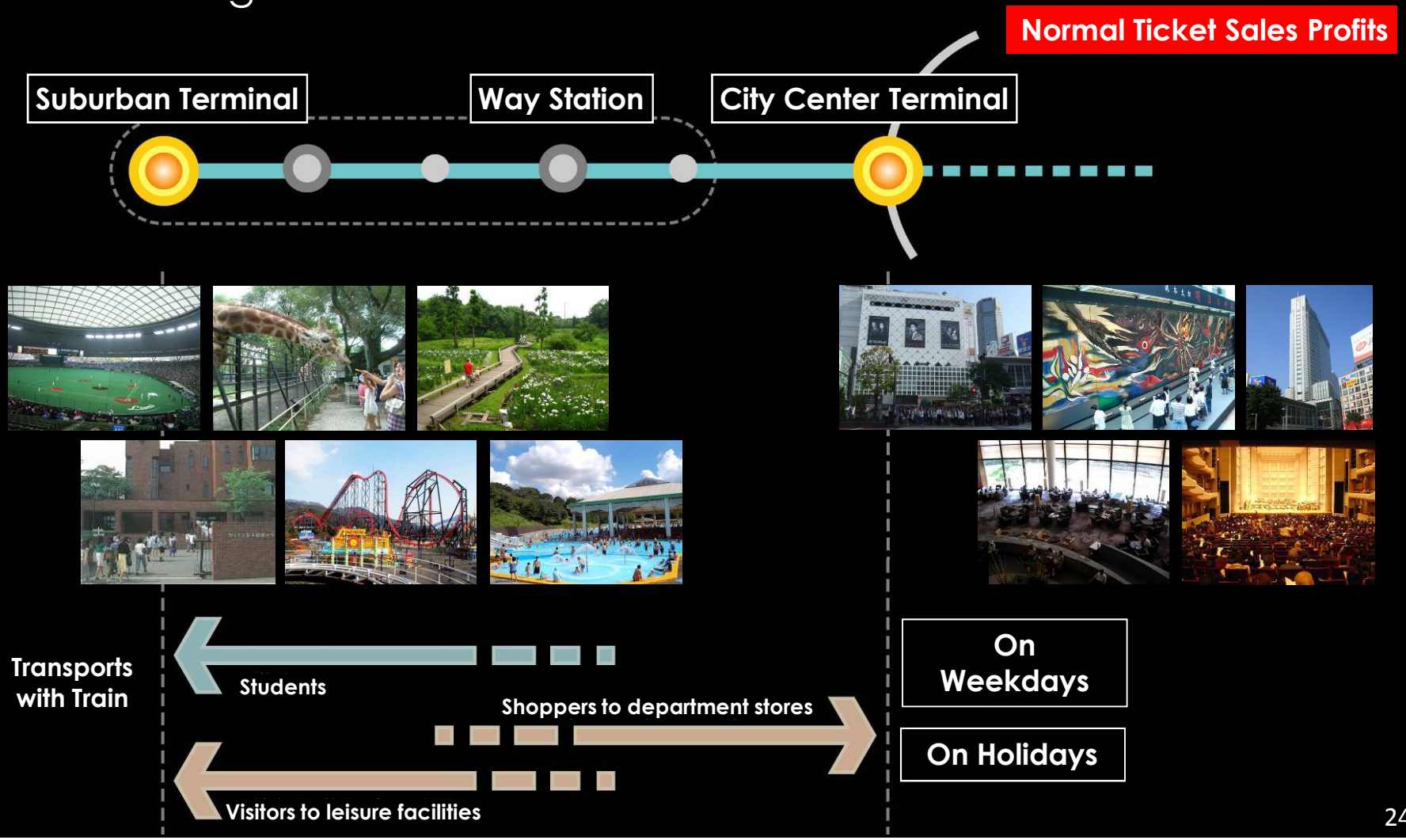
Business Model A

- Constant Income for Rail Sectors from Population Increase in Rail Areas
- Real Estate Profits by Land Value Increase in Residential Areas

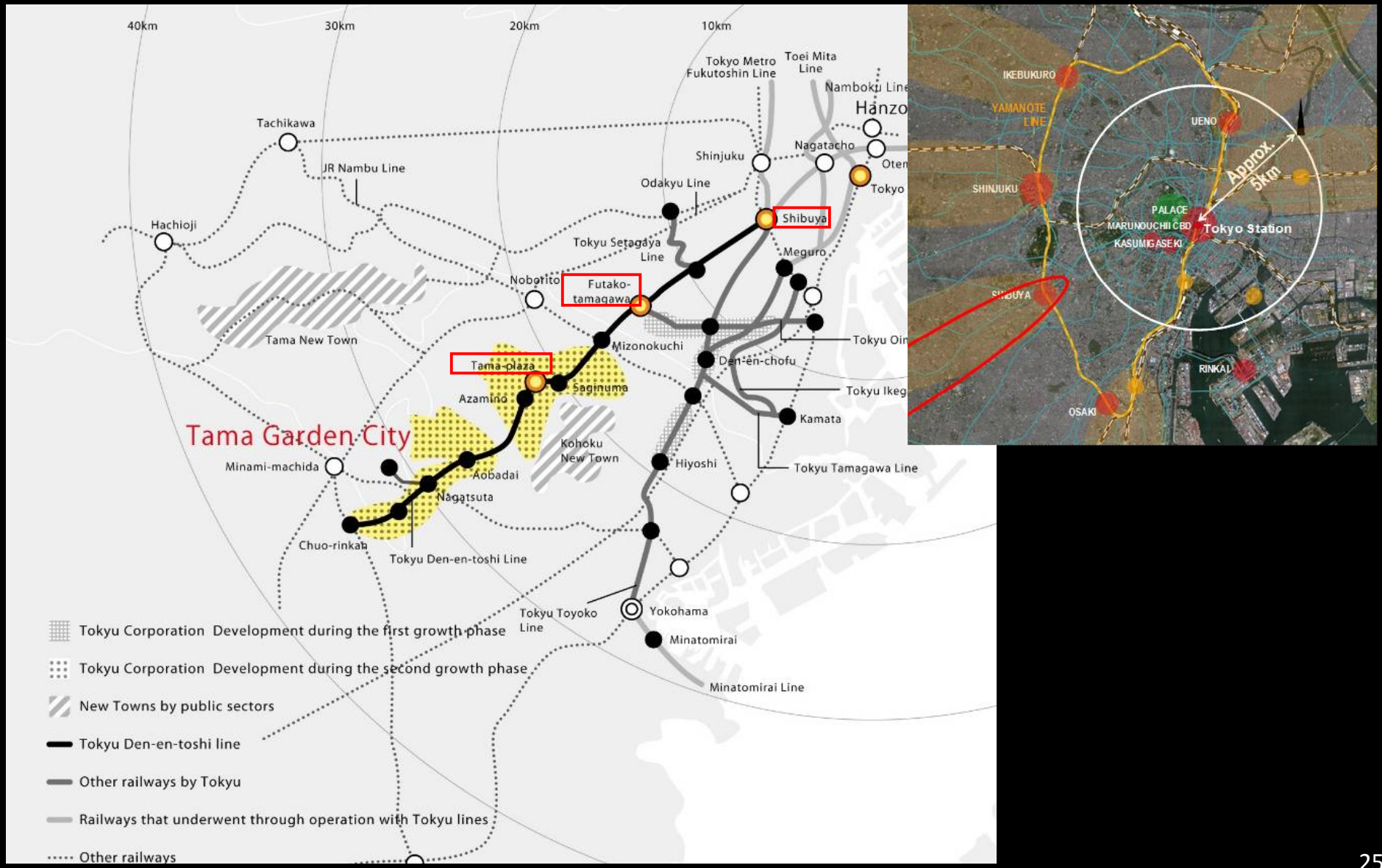


Business Model B

- Encourage brand image of Rail Line and Areas through Terminal Development
- Population Fluidity with Development of Attractive Function in Stations brings Rail Profits

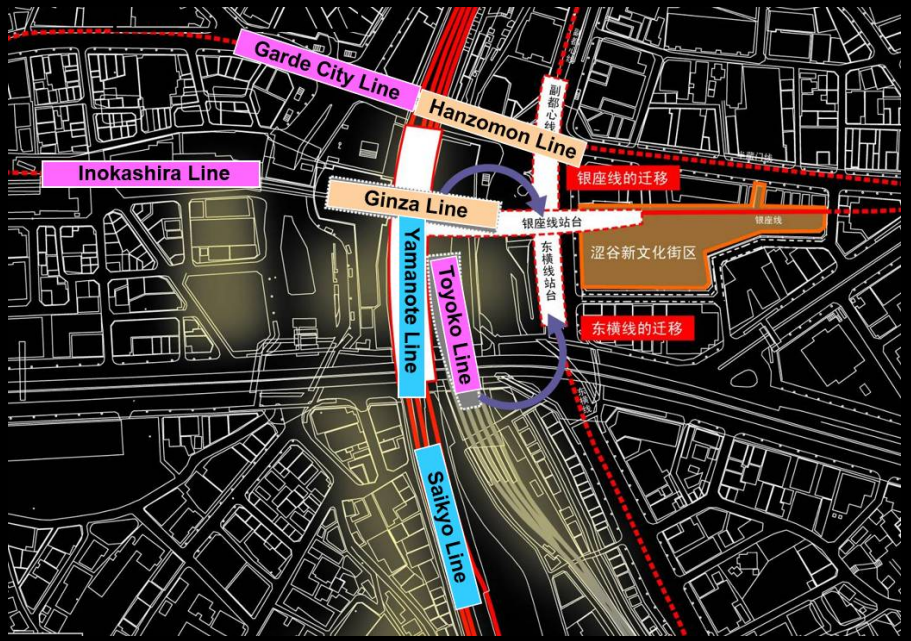


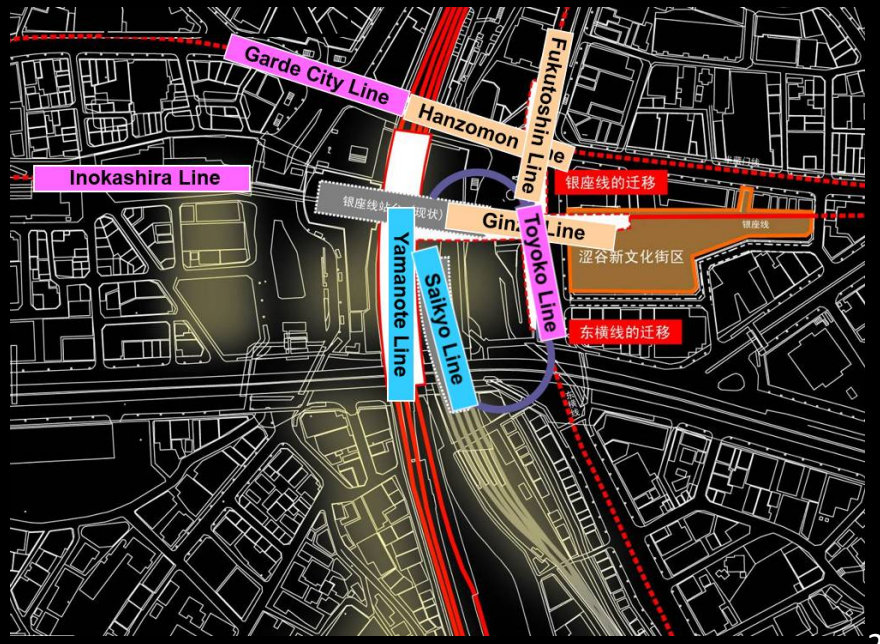
Rail Integrated Urban Development Projects
TOKYU-DENENTOSHI LINE



SHIBUYA: Hub Station Redevelopment

- 9 rail lines, 2.5 million daily ridership
- Urban Redevelopment & Reorganization of Rail/Station Arrangement in progress

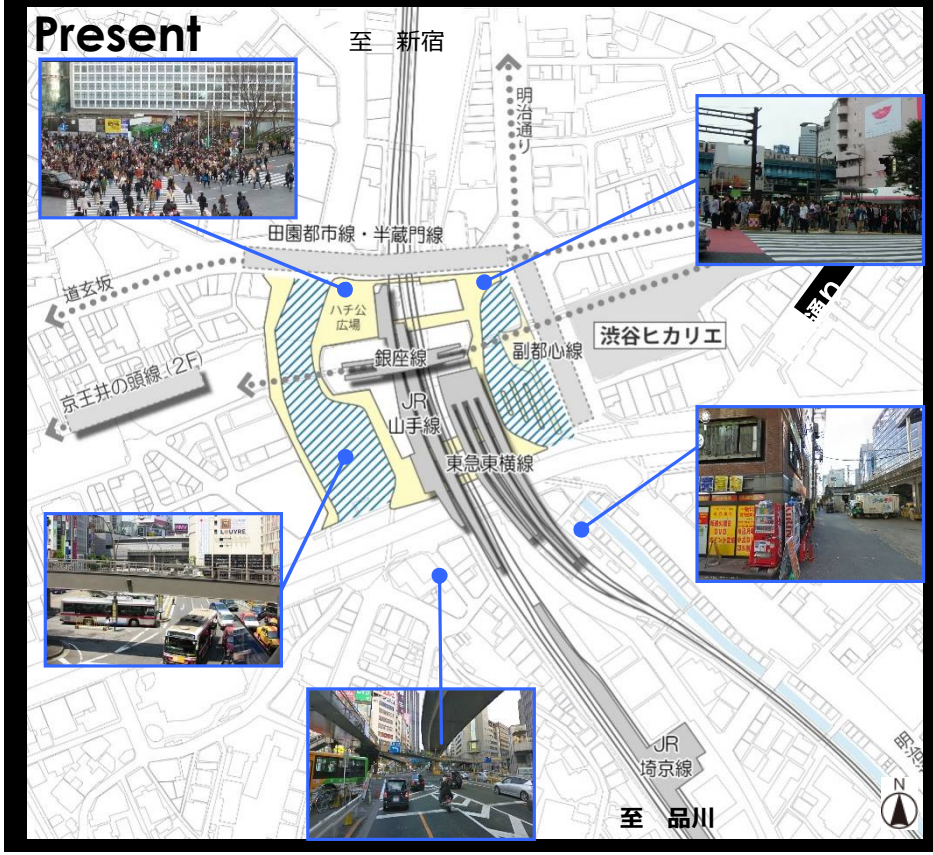


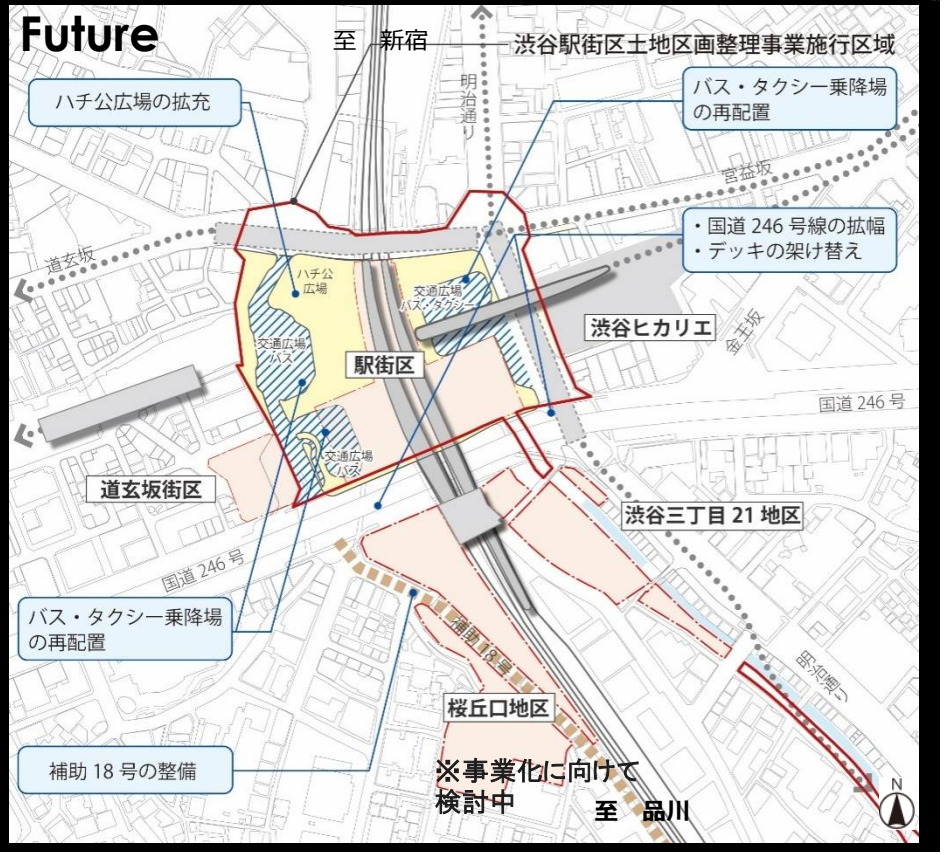


SHIBUYA: Hub Station Redevelopment

Infrastructure Improvement by Urban Redevelopment Projects

- Relocation of Stations for easy Transfer
- Reshaping of Traffic Plazas
- Improvement of Pedestrian Network
- Improvement of Car Access





SHIBUYA: Hub Station Redevelopment

Consecutive Urban Redevelopments Through Restructuring Station-related Infrastructure

HIKARIE: The First Redevelopment Project

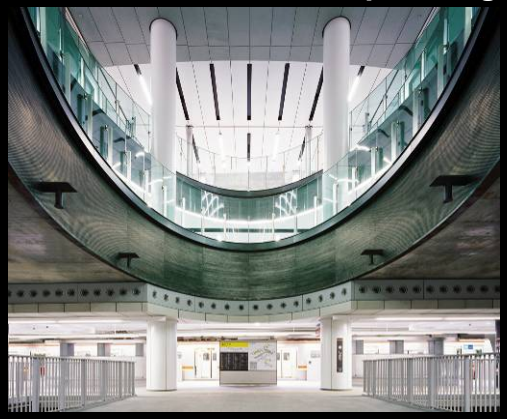
- Completion of construction: 2012
- Owner: Tokyu Corporationet.al
- Total floor area: 144,000㎡ approx.
- Component: Office, Retail, Theater, Exhibition and Urban Core

HIKARIE: The First Redevelopment Project

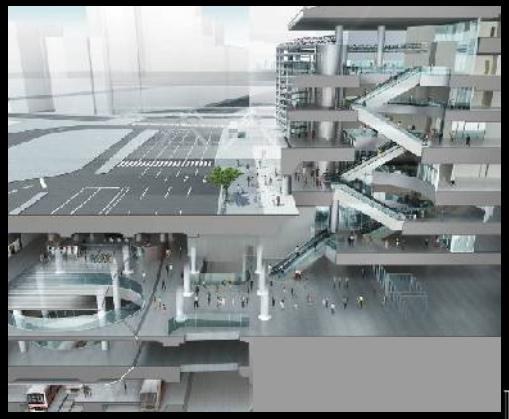
Diversity of Activities brings Cultural Diversity of Areas and Encourages Urban Vitality

Multi-use Theater serves as a cultural information dispatching

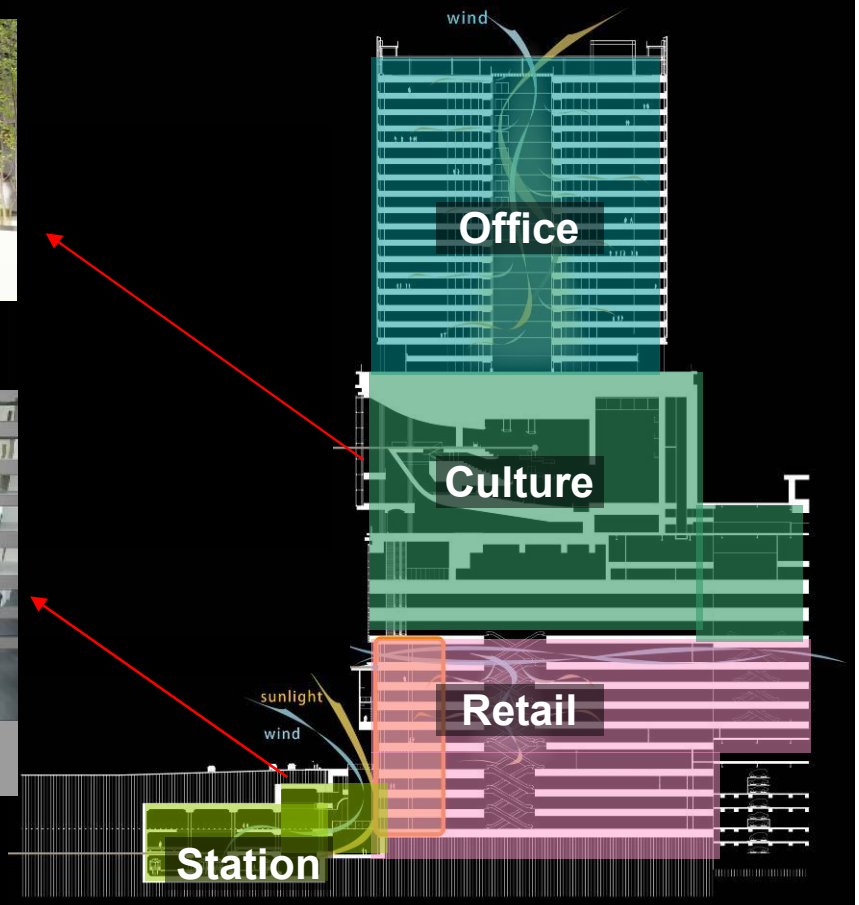
SKY GARDEN serves as a public interactive open space



Metro Interior Design, with the theme of 'Underground Starship'

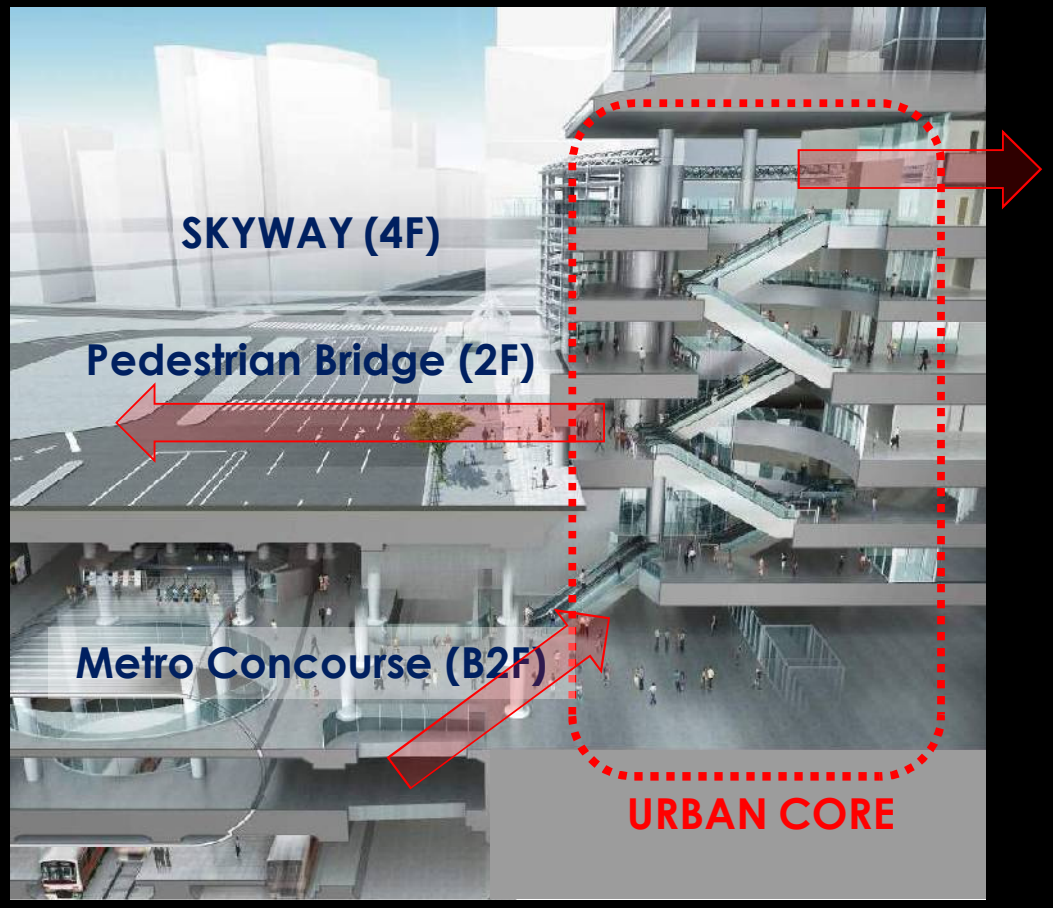


URBAN CORE unites station, development and the area.



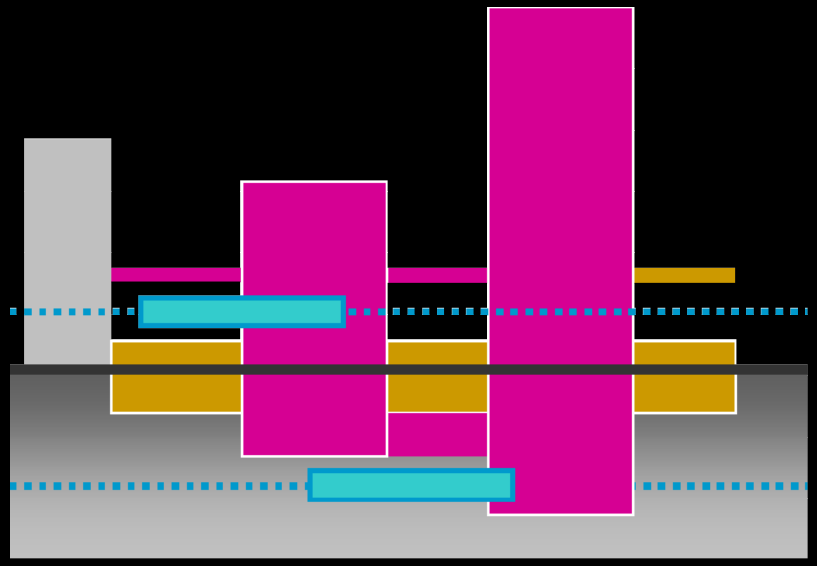
HIKARIE: The First Redevelopment Project

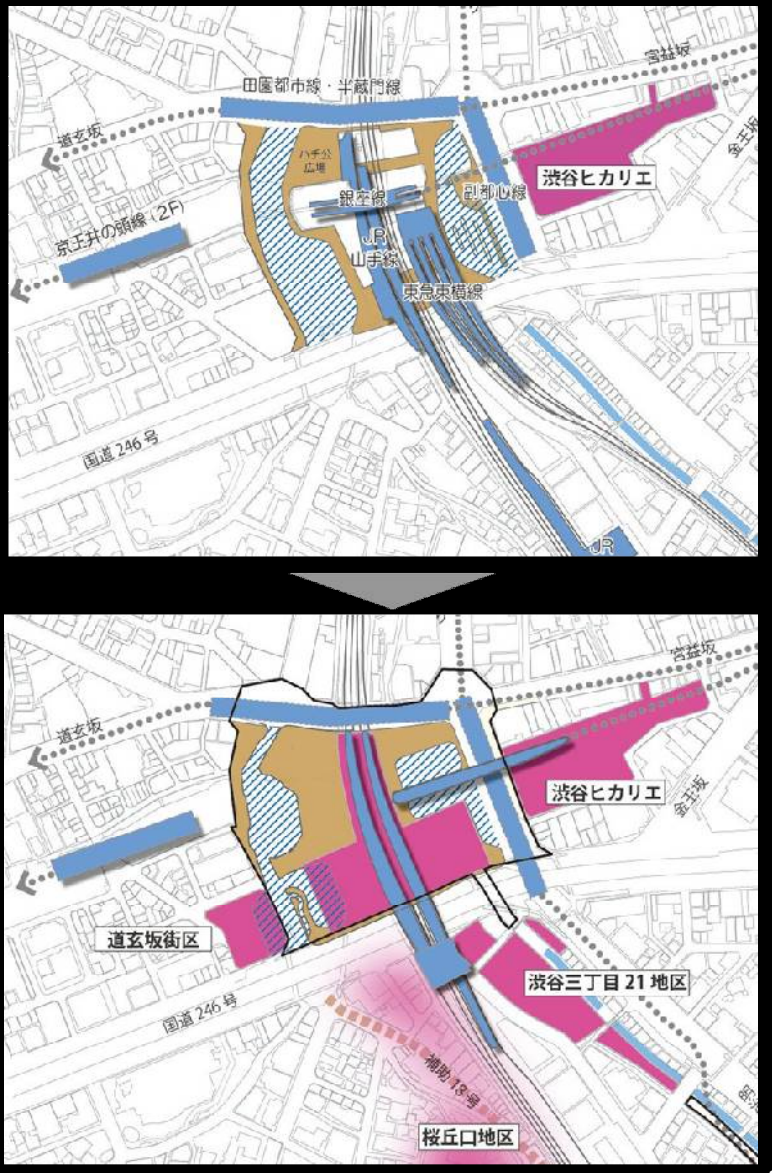
Vertical Pedestrian Connector : “URBAN CORE” completed in HIKARIE project



PPP Project: Integration of 3 Project Types

1. Rail/Station Construction & Improvement
   - JR lines, TOKYU line, Metro lines
2. Infrastructure Improvement
   - Land Rearrangement led by UR
   - Road/Infra Improvement by TMG, NRA
3. Real Estate Development
   - JR, TOKYU, Metro, Private Developers, Other Landowners





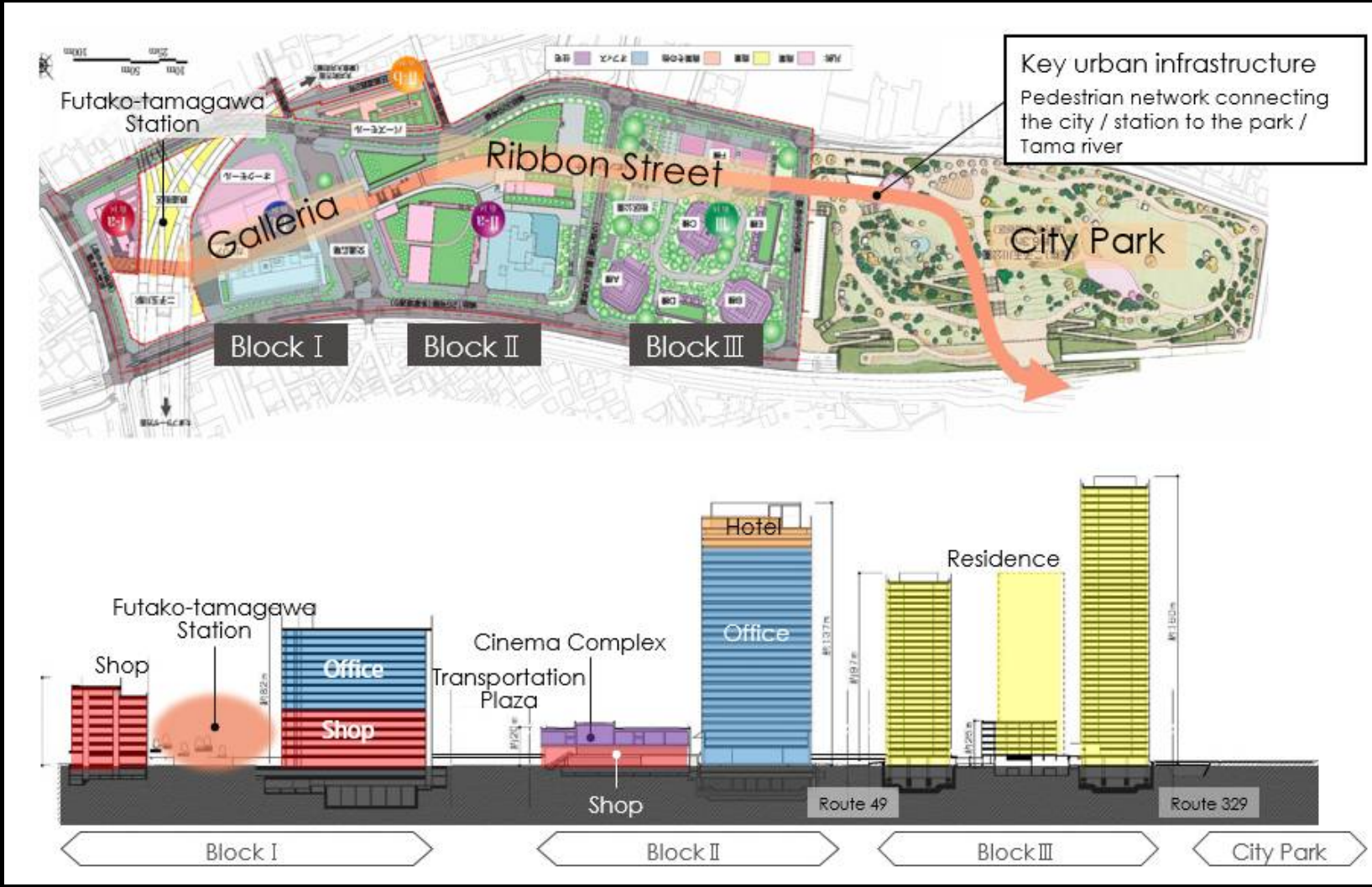
Development project at the Periphery

NIKOTAMA DEVELOPMENT

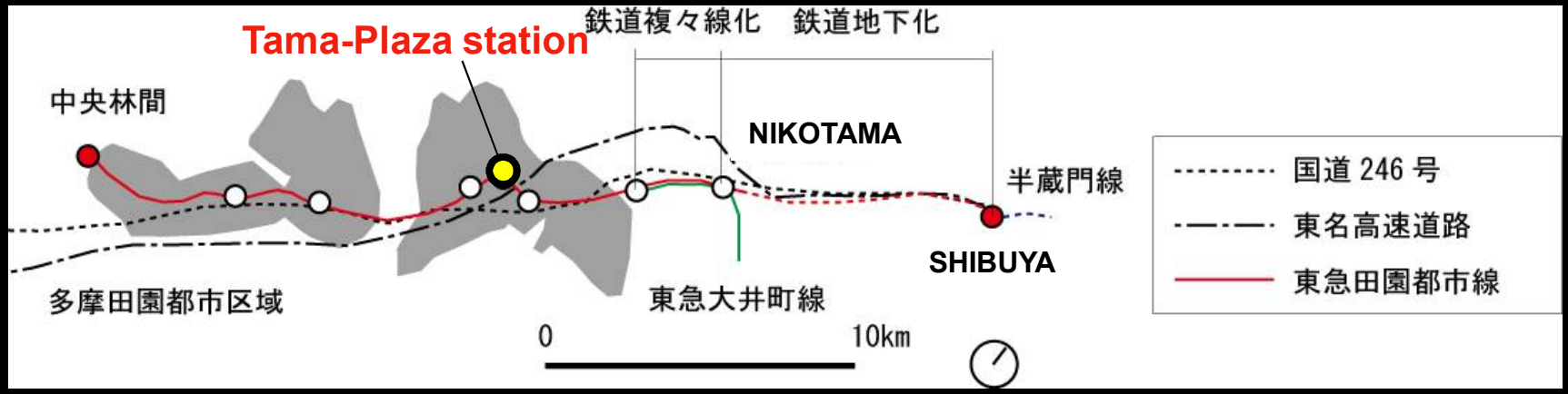
- Mixed-use Development at Urban Edge
- Venture-type Business are becoming established here

Development project at the Periphery

NIKOTAMA DEVELOPMENT



Suburban Development project



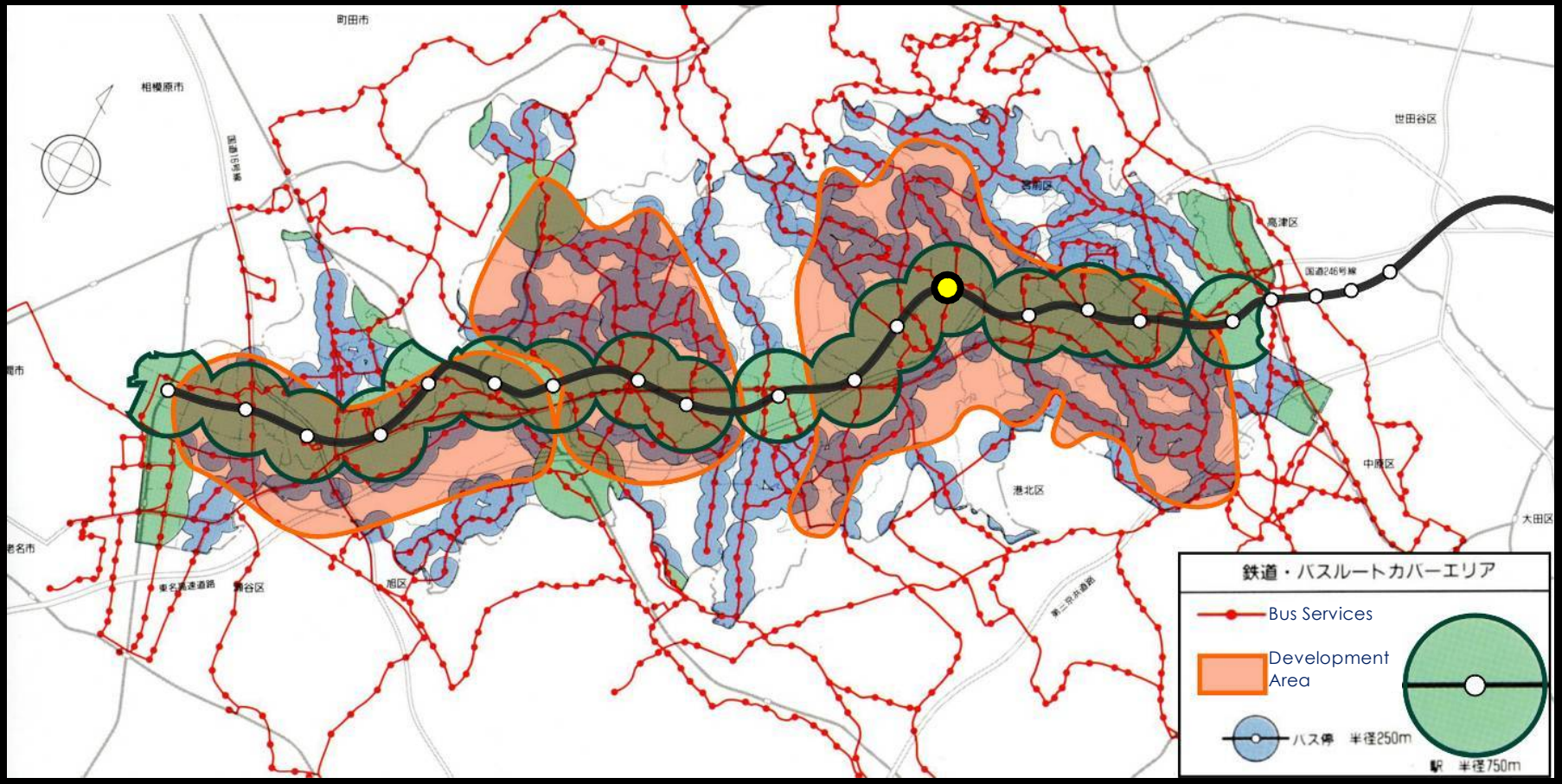
Tama Plaza station is located in the middle of Shibuya and Suburban terminal.
The new town development with the planned population of 0.5million started in the late 60's in this area. Tama Plaza area has been one of the major town centers along this railway corridor.

1968

1974

Suburban Area Development

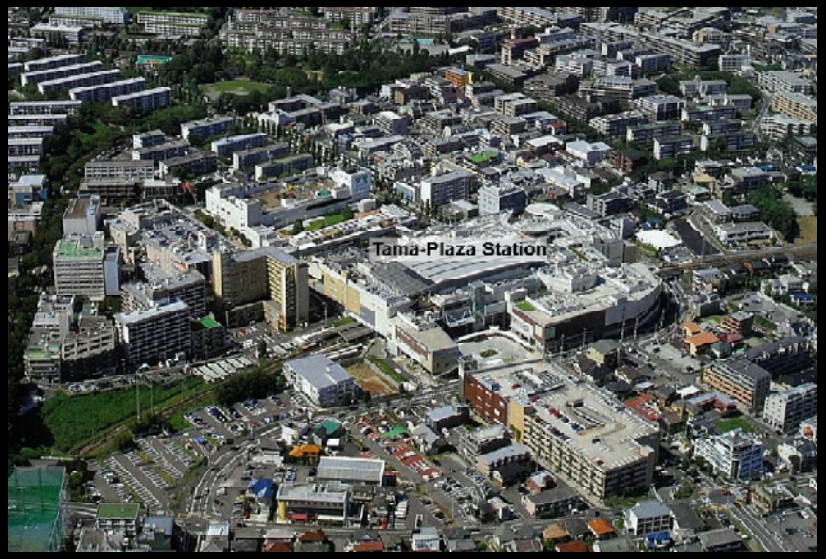
Integrated Rail & Bus Services enhance mobility of residents and enable development areas to be enlarged

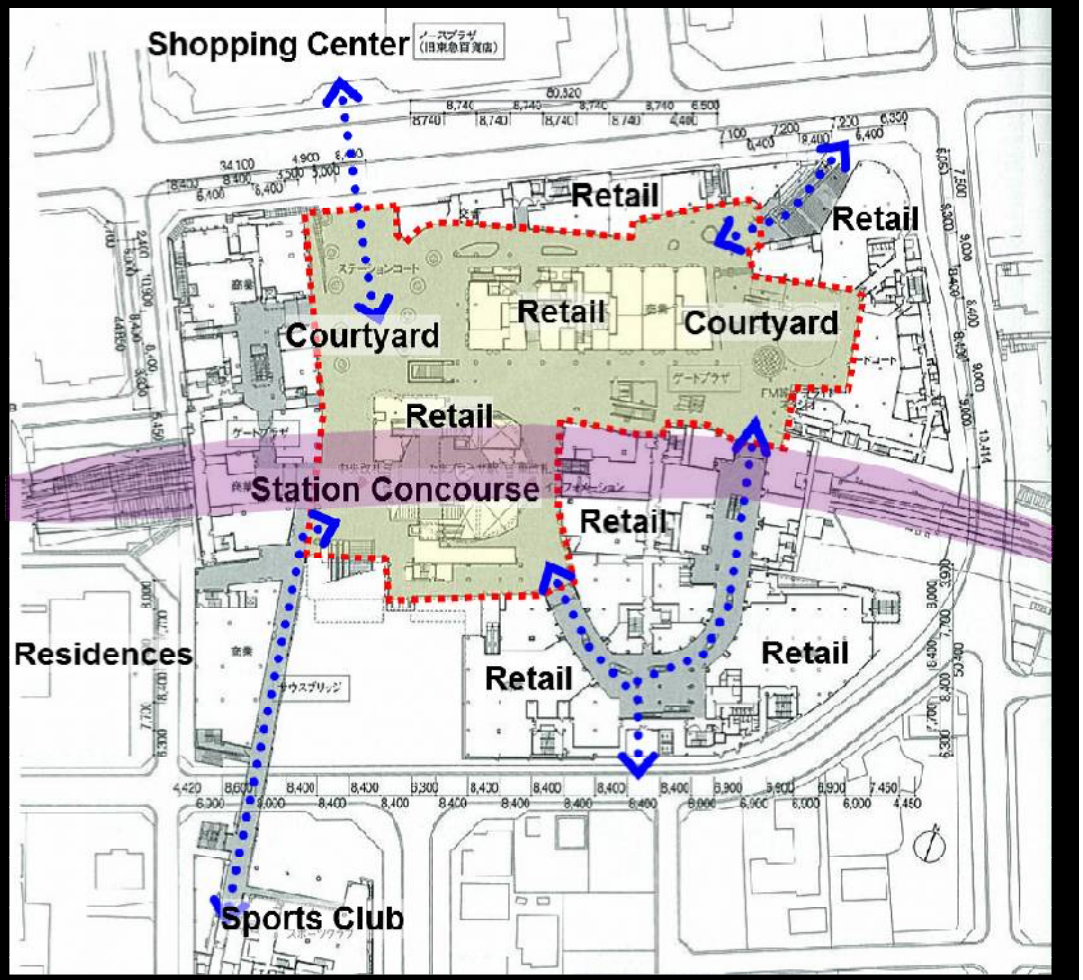


Suburban Area Development

TAMA-PLAZA STATION AREA DEVELOPMENT

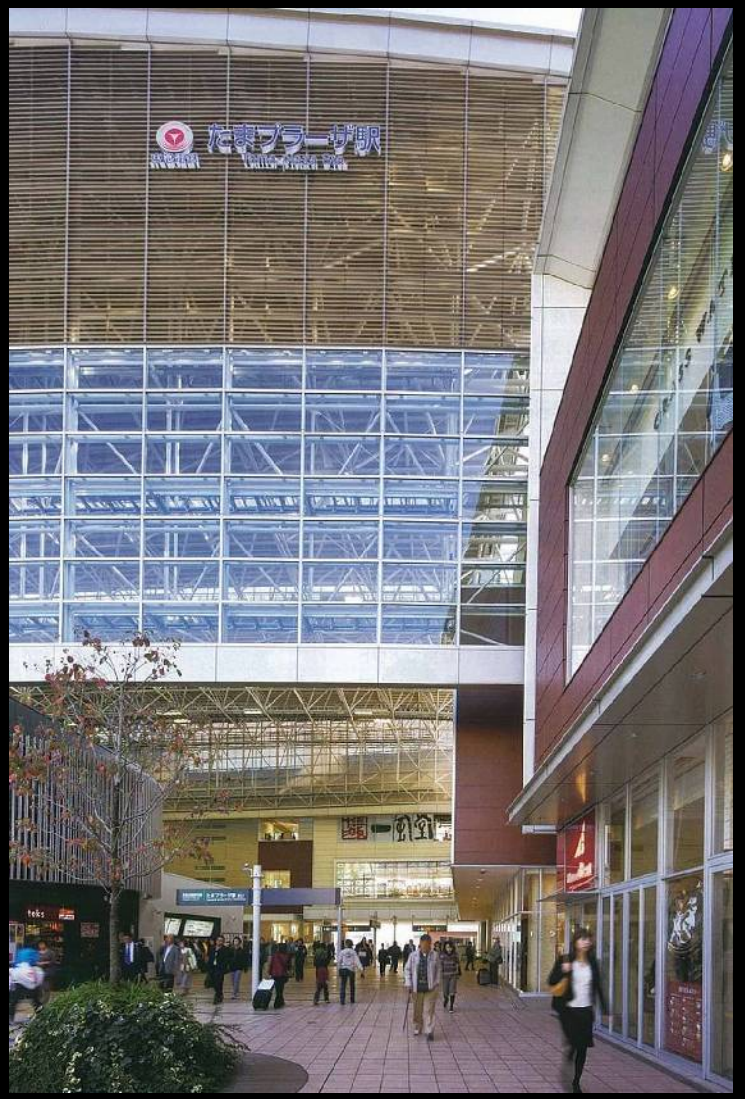
- Construction Completion: 2010
- Owner; Tokyu Corporation et. al
- BUA: about 111,000㎡
- 73,000 persons per day





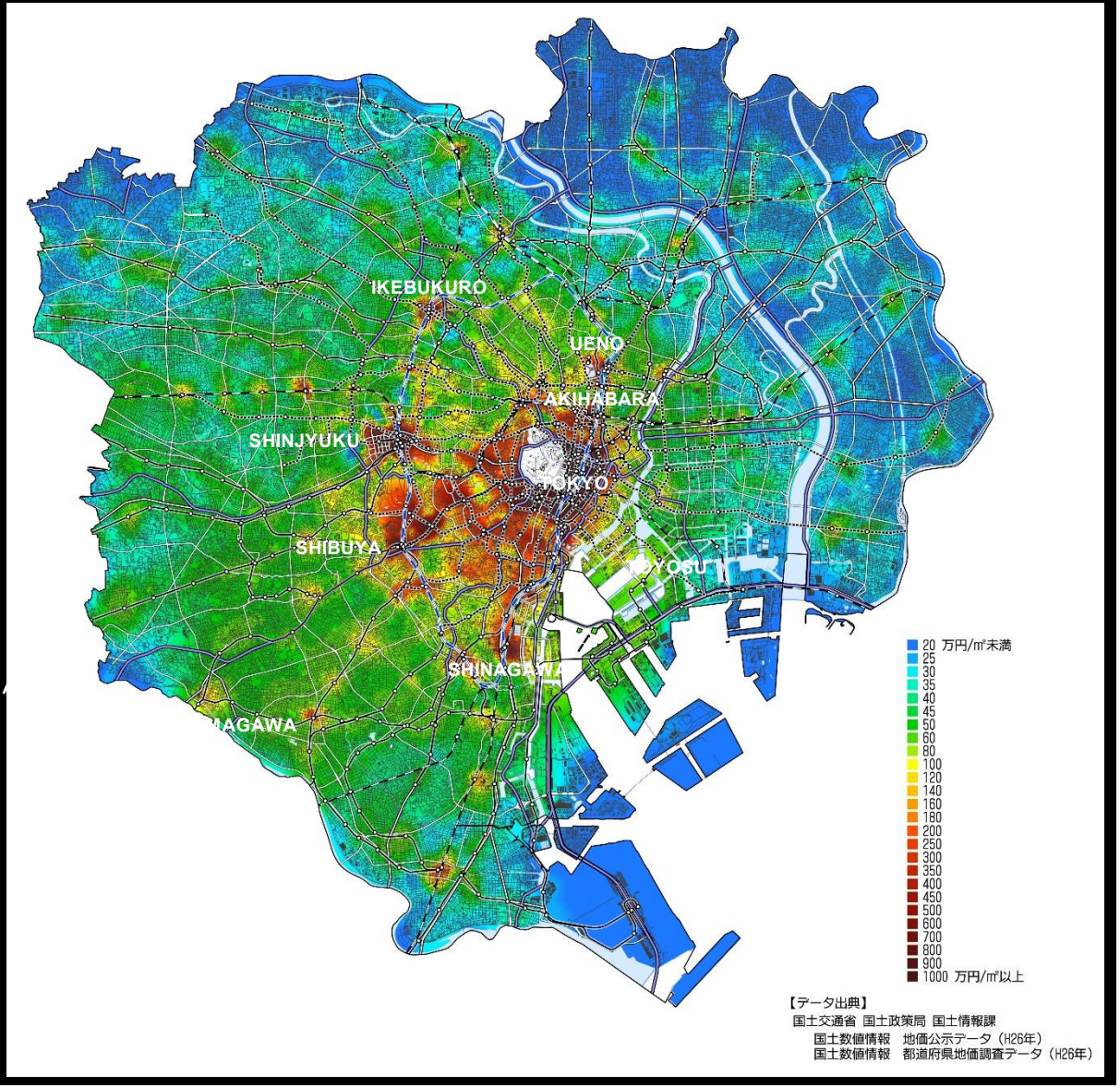
Suburban Area Development

TAMA-PLAZA STATION AREA DEVELOPMENT: Enhancing Connectivity of Districts through Rail Integrated Urban Development



LVC: Land Value Capture Financing

Land Price Map of TOKYO



Warm color means high price, cool color low price.

You can see that land price of train intersections are high and public transit networks are strongly supporting economic activities in Tokyo.

LVC: Land Value Capture Financing

TRANSBAY TRANSIT CENTER, USA

Key Investment in San Francisco's Future

Expected Property Value Enhancement

Lower Left

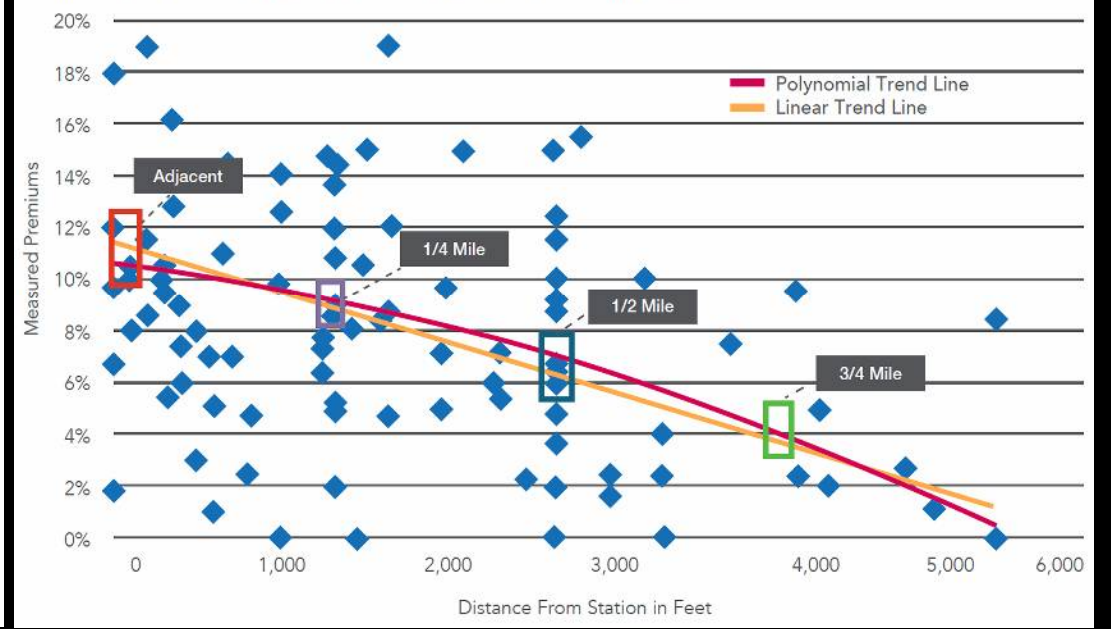
TRANSBAY PROJECT VALUE PREMIUM AREAS

Lower Right

APPLICABLE TRANSIT LITERATURE VALUE PREMIUM RESULTS

FIGURE 3: TRANSBAY PROJECT VALUE PREMIUM AREAS

FIGURE 4: APPLICABLE TRANSIT LITERATURE VALUE PREMIUM RESULTS



LVC: Land Value Capture Financing

Property Value Enhancement in HONG KONG MRT TOD

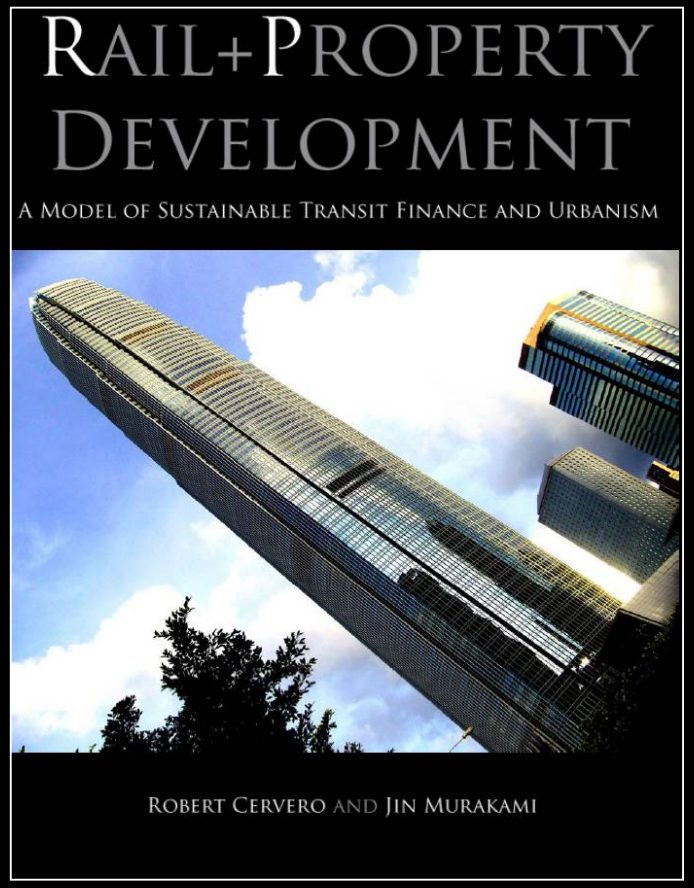
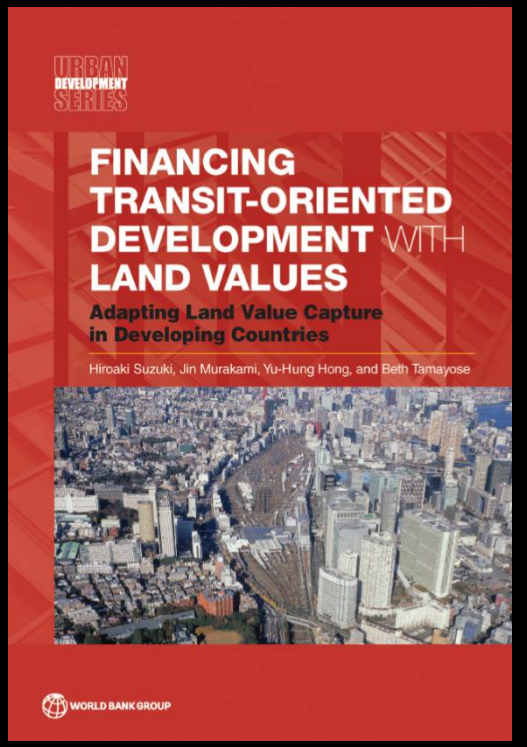


Table 6.12. Summary of Housing Price Effects Associated with R+P and TOD

Station	Urban Line Tin Hau	TKO Line Hang Hau	Airport Line Tsing Yi
Sales Price Means (HK$)			
R+P	8,465	5,395	5,648
TOD	--	4,277	5,606
Non R+P	4,722	--	--
Non TOD	--	2,589	3,343
R+P Premium *from Matched Pairs* (HK$)			
TOD	--	$1,118 (26.1%)	42 (0.8%)
Non R+P	3,743 (79.0%)	--	--
Non TOD	--	2,806 (110.8%)	2,305 (70.0%)
R+P Premium *from Hedonic Models* (HK$)	1,330.8 (15.7%)	290.5 to 939.1 (5.3% to 17.4%)	263.1 (4.7%)
TOD Premium *from Hedonic Models* (HK$)	--	1,637 (38.3%)	1,933 (34.2%)

Rail + Property Development（A Model of Sustainable Transit Finance and Urbanism）, Robert Cervero and Jin Murakami, 2008, P91～101

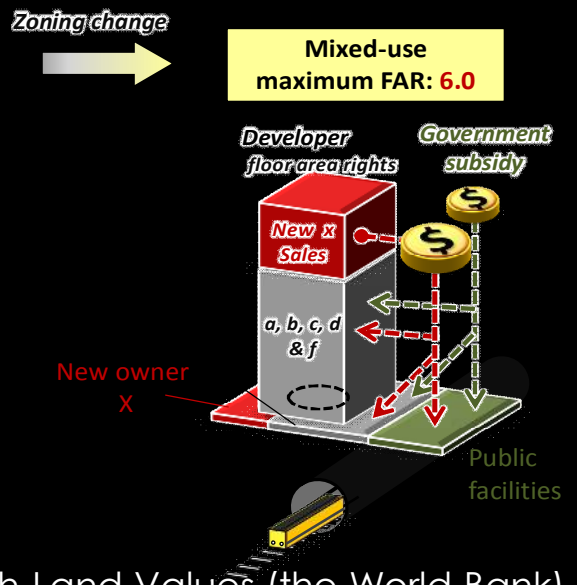
LVC: Land Value Capture Financing



LVC INSTRUMENTS

■Tax- or Fee-based
- Property and Land Tax
- Betterment Levies and Social Assessments
- TIF: Tax Increment Financing
- Exactions/Impact Fees

■Development-Based
- Land Sale or Land Lease
- Air Right Sale
- Land Readjustment
- Urban Redevelopment Financing



Source: Financing Transit With Land Values (the World Bank)

CONCLUSIONS 01
Advantages of Rail Integrated Urban Development

1. Maximum utilization of economic potential
2. Capture economic profit from increased land value
3. Integration of a station and neighboring districts
4. Smooth modal transfer
5. Comfortable, safe and convenient pedestrian circulation
6. Attractive places to motivate train-use in off-peak
7. Contributions to rail-business
8. Less car traffic

Triple Win Structure for Citizens, Environment and Business

CONCLUSIONS 02
Toward a COLOMO-style TOD

Strategically Integrated Plan of Transportation & Urban Development

Pilot Projects

- Projects Consist of Infrastructure Development and Real Estate Development
- Develop an Integrated Railway Corridor Master Plan
- Timeline planning that incorporates the development timeline into the plan
- Development of Frameworks for Public-Private-Partnerships including LVC
- Institutional Approaches Covering Regulations and Incentives to Encourage Green Developments
- Feasibility Studies Covering both Economic and Technical Matters

From "Terminal" to "City"

Thank you