Planning and Implementing TOD with the 3V approach

MODULE 2

ASIAN CASE STUDIES IN TOKYO, SEOUL, SINGAPORE, HONG KONG

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Urban Morphology &
Complex Systems Institute

2nd Transit-oriented Development (TOD) Technical Deep Dive (TDD)
Planning and Implementing TOD at City, Corridor and Station Scale
Planning with the 3V Approach
Asian Case Studies

• Objectives

• Understanding the link between the 3V Approach and Integrated land use and transportation planning in the Asian context
• Understanding how to plan TOD and polycentric urban growth at city scale with the 3V Approach
• Learning by observation
• Case Studies in Tokyo (including Shibuya Redevelopment), Seoul, Singapore, Hong Kong
Learning by observation: 3V Approach In Asian Cities

Tokyo

Singapore

Seoul

Hong Kong

Source: Eric Fischer
Flows of people: Paths through Tokyo — Source: Eric Fischer
Routing 30,000 randomly-chosen trips through the paths suggested by 10,000 randomly-chosen geotags.
Data from the Twitter streaming API, August, 2011. Base map from OpenStreetMap, CC-BY-SA

Node and place value in a polycentric city
Red pictures by tourists; blue pictures by locals
Source: Eric Fischer

Source: Chorus and Bertolini 2011.
Tokyo is clearly one of the world’s most public transportation oriented megacity

Railway construction was one of the national modernization policies in Japan, and the national railway network connecting central Tokyo and other cities in Japan was established by the end of the nineteenth century. Beginning in the 1920s, private railway companies purchased huge areas of land in the suburbs of Tokyo and developed housing estates or garden suburbs. Private railway companies were able to pay for the railway constructions by the profits they made from selling or leasing the developed housing estates and commercial areas around the stations. Public corporations also developed large-scale housing estates along railway lines in the suburbs starting in the 1960s such as Tama New Town and Chiba New Town. On the other hand in central Tokyo, the subway network has been developed continuously since 1927. As a result, nearly 73% of morning commuters to Tokyo 23 Wards used railway lines while only 9% of them used private automobiles in 1998 (Nakamura et al. 2004). Others used bus, bicycle or foot.

Node Value
Today the Tokyo Metropolitan Area has an extensive railway network, totaling more than 2,500 km in length of which over half is privately owned and operated. As in other major world cities, the period in which the railway network expanded the most was between 1915 and 1935, when almost 600 km of tracks were built. But after the Second World War, Tokyo’s railway network kept growing steadily due to the rapid industrialization in combination with the prevailing land scarcity in Japan. A strong urbanizing movement led to the development of new towns along railway corridors, where railway was the only means of reaching Tokyo’s Central Business District.
Encircling Tokyo’s core area is the Yamanote line, with major terminals and high rise office developments at or near the Tokyo Marunouchi, Shibuya, Shinjuku, Shinagawa, Ikebukuro, and Ueno stations. Within the Yamanote loop is a dense network of both the now privatized Tokyo Metro and publicly owned Eidan Subway services. Also crisscrossing central Tokyo are several lines of the privatized Japan Railway (JR) East (formerly the publicly owned Japan National Railway). Radiating outward from JR East’s Yamanote loop is a thicket of privately built rail lines, plus JR East’s heavy rail lines. Tokyo’s private rail lines serve suburban areas and connect to major terminuses on the Yamanote loop, allowing passengers to Tokyo’s radial railway system supports and reinforces the region’s monocentric structure.
Tokyo subway
217 stations out of an urban rail network of about 2000

Degree centrality  Closeness centrality  Betweenness centrality
Betweenness centrality in Tokyo subway network

Tokyo subway network is a hierarchical system containing hierarchical subsystems.

Betweenness centrality in Tokyo subway network

Structure of Tokyo’s Railway Network. Source: Chorus, Bertolini 2011.

Degree centrality along the Yamanote line

Source: Urban Morphology and Complex Systems Institute

The structure of the private railway network in Tokyo has supported the formation of sub-centers. The network consists of several radial lines running from the suburbs to the center of Tokyo. With the exception of the Chuo line, all these lines terminate on the Yamanote loop, a circular line that connects most of Tokyo’s urban centers.
High diversity in Tokyo can be attributed to the flexible planning style used by government planning agencies. The “loose” character of government planning efforts is perhaps best illustrated by the way the land use zoning system is used in combination with volume controls. The land use zoning system in Japan specifies 12 basic zone types, which can be roughly divided into three categories: residential, commercial, and industrial. Neither zone type is limited to only residential or industrial usages. For example, even in the most strictly zoned residential area it is possible for residents to dedicate a part of the house to small-scale commercial activities such as a store. Commercial zones have the fewest use restrictions. Virtually every kind of land use is allowed here, and controls on building activities are the weakest. In Tokyo, a commercial zoning designation is traditional in the areas around stations, along major roads, and in the central business district.
Dense and connected street patterns

Biking heating map, Tokyo
High intensity and hierarchy of sub-centers can be attributed to the use by the government of the instrument of Floor Area Ratio (FAR) to further encourage the growth of the sub-centers and regional centers in Tokyo by assigning these areas higher FAR values than their surroundings. The central business district has been assigned the highest FAR values, followed by the sub-centers around the Yamanote loop. In Japan, FAR values are designated by law but not fixed. Several instruments exist that allow for a relaxation of existing FAR values. Exemptions to existing FAR values, referred to as the “FAR bonus”, are granted when a private developer meets certain conditions such as investing in public infrastructure and/or open space. This practice benefits both the government and the private sector; the government receives public infrastructure for which it does not have to pay, while the private sector receives an additional building volume, which enables them to make a greater profit. Such planning incentives have greatly influenced development around rail stations.
1. High values of betweenness centrality in Tokyo
2. Zoning map shows the Setagaya-ku which mainly is filled with dense and low buildings (coloured blue). The red/pink shows commercial developments, around railway stations or along roads.
3. Tokyo zoning map with high FARs along the Yamanote line
4. The commercial districts, above Shibuya, big red blob to the left, and Ebisu, the outgrowth to the right, in Shibuya-ku.
Chorus and Bertolini (2011) have found in Tokyo a positive relationship between the network position of a station and workforce concentration, but a negative relationship when population concentration is considered. Densification occurs at the main nodes of transit systems but it is not a residential concentration; it is an economic concentration fostered by the agglomeration forces of higher connectivity and accessibility that also push up land values making these highly accessible areas more profitable to be used for businesses than for residential developments. Conversely population concentrations occur at less connected and less accessible areas in the network.

Node-place model ‘Proximity to CBD and Number of Train Connections versus Workforce’ (p < 0.001). Distances in standard deviation units. Source: Chorus, Bertolini 2011.
The synchronization of high accessibility and connectivity (node-value) and of high place-value, creates high level of economic concentration and peaks of market value. Tokyo station, the major hub in the transit network, is situated in the heart of the historic central business district. More than 4000 companies, including the head offices of many national and international firms, are located in the surrounding area, contributing to approximately 20 percent of Japan’s gross domestic product. Approximately 240,000 people work in the area (Okada 2006). The CBD is the site of the highest concentration of jobs and workers within the Tokyo metropolitan area (Kawabata 2003). This concentration of economic activity is reflected in the high density of energy consumption: 25 km² (4 % out of 600 km² in Tokyo 23 wards totaling 9 million inhabitants) use 18 % of the total urban energy (GEA 2011).
“It may sound presumptuous, but I want people to think of Shibuya in the same way they do London, Paris and New York.”
Shibuya Ward Mayor Ken Hasebe
Tokyo Shibuya

Shibuya is a special ward in Tokyo. As of May 1, 2016, it has an estimated population of 221,801 and a population density of 14,679.09 people per km² (that is the average density of Tokyo 23 wards 618 km²). The total area is 15.11 km². Shibuya ward is thus an unbalanced node with a very high node value and an unrealized market potential value, while having a strong place value due to its image as one of the fashion centers of Japan, particularly for young people, and as a major nightlife area.

According to the 3V Framework, the high connectivity of Shibuya would call for an increase in people and jobs density accompanied by an enhancement of public realm to make higher density livable and to enhance connectivity at local level and interchange between lines. This is the strategy that has been followed by Tokyu.
Place Value
Increasing the urban quality and attractiveness of a location

Market Potential Value
Increasing market demand and supply

Node Value
Increasing the connectivity and accessibility of a location by investing in transit

Tokyo
Shibuya
High values of degree, closeness, and betweenness centrality along the Yamanote line in Tokyo

Private railway lines are prohibited by law from passing through central Tokyo, therefore all terminate at Yamanote loop that circles central Tokyo. Only the publicly owned subways and the, until the 1980’s publicly owned JR East lines operate within the Yamanote loop.

Nine rail lines and three underground lines converge at Shibuya, one of the most important stations in Central Tokyo. It is a case of urban centrality linked to transit that have given Tokyo its present shape.

Originally built in 1885, Shibuya Station has continued to change with the times, adding or moving platforms at various points in history in order to accommodate the eight lines it now services. As a result, the connections between many of the lines are poor, making it difficult to navigate the station efficiently. Once complete, the two Yamanote Line platforms will be consolidated into a solitary “island” platform, the Saikyo Line will be moved and positioned alongside the Yamanote Line, and the Ginza Line platform will be moved about 130 meters toward the Hikarie building.
**High ridership:** On average, nearly 3 million passengers use the station on weekdays. Shibuya Station is the fourth-busiest commuter rail station in Japan and the world (after Shinjuku, Ikebukuro, and Ōsaka / Umeda) handling a large amount of commuter traffic between the center city and suburbs to the south and west.
Development of Shibuya Station district

Redevelopment in the area around Shibuya Station is gaining momentum due to the designation of the area as a Priority Development Area for Urban Renaissance, the launching of the Fukutoshin Subway Line, and the line’s mutual direct services with the Tokyu Toyoko Line. Urban infrastructure in the area, including the station, however, still face problems such as aging facilities, complicated passenger flow in transferring train lines, and the jumbled confusion of pedestrians and vehicular traffic in front of the station.

In June 2009, the TMG decided on urban planning for the area that included the station square, roads and railroads; and in cooperation with the central government, Shibuya ward, and railway companies, is proceeding with initiatives aiming to reorganize and develop features such as railroad facilities, station squares, and station buildings in an integrated manner.

Furthermore, this area will also be turned into one that befits its position as a hub for new culture – bustling but pleasant to stroll around in – by properly guiding developments by the private sector.
Shibuya Hikarie: a mixed-use program enhancing local connectivity and creating place value

Tokyu Corporation has positioned the Shibuya Hikarie (hikari means light in Japanese) building near the site of the former Tokyu Bunka Kaikan building as a leading development project in Shibuya, and is promoting the plan as a core stakeholder. The building name is meant to express the idea of a light shining from Shibuya that changes the world. Shibuya Hikarie is a 182.5-m skyscraper with a feeling of transparency expressed mainly by glass. It aims to be a platform for creating new value and projecting that value as a symbol of the ever-changing town of Shibuya.

**Mixed use.** The lower levels will house a new Tokyu Department Store, the higher levels will house offices, and the middle levels will house three cultural facilities: the Tokyu Theater Orb, a 2000-seat theatre for performances centring on musicals; an exhibition hall that will be a new information hub for the town; and an academy for fostering creative human resources.

**A connective building which forms a pedestrian network.** The structure will make use of the surrounding sloped terrain, forming a pedestrian network that connects characteristic zones of Shibuya such as Shibuya Station, Meiji Dori, Miyamasu-zaka, and Aoyama, via five floors of the building. Furthermore, the aim is to enhance the convenience of Shibuya as a mobility hub and to revitalize the area by creating movement and bustle in the surrounding streets. This will be achieved by a vaulted structure from the third floor underground to the fourth floor above ground to enable easy movement between floors, and by providing direct access to the Tokyu Toyoko and Tokyo Metro Fukutoshin lines from the third floor underground. Advanced environmental functions will also be provided, such as exploiting the natural ventilation function of neighboring Shibuya Station and planting about 30% of the floor area with vegetation (Tokyu Corporation).

**Urban cores: 3D connecting public space.** Various spots around Shibuya Station and buildings that are currently under construction will have vertical structures called “urban cores,” which will help funnel pedestrians from the subway station to their desired destination. An example of such a core is the cylinder-shaped heart of the Hikarie building, where long escalators inside an atrium-like space guide pedestrians from the basement to the street and other rail connections. The design does not only want to attract people to the station, but help them effortlessly explore the outer neighborhoods of Shibuya. The urban core will connect people from the buildings to the street.
Enhancing place value: Shibuya River

Now little more than a concrete chute, the Shibuya River will be redirected and opened up

Developer Tokyu also aims to revitalize the little-known Shibuya River, currently a narrow chute behind buildings that’s lined with concrete and devoid of any greenery. The river has been diverted and a large catchment tank has been constructed for heavy rain. In an unusual move for Tokyo, the space along one part of the river will be opened up into a plaza with trees and a walkway for pedestrians. The skyscraper and surrounding area are slated to be complete in fiscal 2017, which ends in March 2018.
At 3,000 square meters, the rooftop observation deck will be one of Japan’s biggest

Another change will bring people far above the complex terminal. On a multipurpose skyscraper that will be built over the station by 2019 – just in time for the Olympics – Tokyu will open an observation deck at a height of 230 meters.

Visitors will be able to see the bustling intersection below as well as Tokyo Tower, Tokyo Sky Tree, Roppongi Hills and other city landmarks, as well as Mt. Fuji on clear days. At 3,000 square meters, the rooftop observation deck will be one of the largest in the country and will also feature a helipad and interior lounge for enjoying the lights of the city at night.
Though railway was originally the main business of the private railway companies it is not the most profitable. A financial rate of return averaging between 1.1 and 1.2 is not spectacular, but in comparison, other railway companies worldwide very seldom achieved profitability. The most profitable side business for private railway companies is real estate development, making up for over half of the profits of the Tokyu Corporation. Among Tokyo’s private railway companies the ones who ventured into real estate businesses successfully also are the ones with the highest network usage. This gives the impression that the integration of railway- and real estate development is vital in establishing a profitable traffic flow. For the Tokyu Corporation, the railway business is not only about “connecting points” but rather about the real estate opportunities that develop along a railway corridor. Along with railways, the company also operates 400 businesses, including real estate development, hotel management, and retail. The Tokyu Corporation not only paired land development and transit investments, but also applied this to an entire corridor along the Tokyu Den-En-Toshi line originating in Shibuya.

Other profitable businesses of private railway companies are for example warehouse chains, such as Tokyu’s own department stores. It is also common for most private railway companies to venture into bus services, but these have always incurred minor losses. The busses provide feeder services for the stations and land developments owned by the railway corporations, making these more profitable. Bus services are then subsidized with profits from other company ventures. Together all these ventures allow the railway companies to increase profit margins drastically, making them among the most successful businesses in Japan.
Far around Shibuya station, the commercial districts, above Shibuya, big red blob to the left, and Ebisu, the outgrowth to the right, in Shibuya-ku.

Department stores, and many other uses, stack over the site, deemed the fourth busiest commuter station in Japan. It is an aggregative architecture.
Rebranding Shibuya as an international hub

The area around Shibuya Station was designated for urgent urban renewal in December 2005. Since then, considerations of urban infrastructure have been made in earnest by government agencies, railway operators, local parties, and others. On 22 June 2009, a decision was made on urban planning including renovation of the station plaza and a location change for the Tokyo Metro Ginza Line station, gradually bringing the overall vision of development for the area around the station into focus. After the current Toyoko Line station is relocated underground and through service starts, development is scheduled to start on the station block and block previously occupied by the Toyoko Line. Financed by railway operators such as Tokyu Corp., East Japan Railway Co. and Tokyo Metro Co., developers are now working on four large construction sites around Shibuya Station. Work on a fifth site, the Hikarie building, which is owned by the Tokyu Group, was completed in 2012.

Under the aegis of Shibuya Ward, the Tokyu Corp. railway conglomerate, JR East, Tokyo Metro and other entities, four major developments – Hikarie, Shibuya Station South Area, Dogenzaka and Sakuragaoka – are planned for the area surrounding Shibuya Station as well as a rebuild of the terminal itself. The overall development of Shibuya is being managed by the ward office, while each individual construction site has been delegated to private companies. Locals have also been involved in the development process to ensure that Shibuya is not just torn down and turned into something that loses its vibrancy.
Shibuya Station Area

The Shibuya Station skyscraper will be the centerpiece of the new town

The pulsing heart of the neighborhood, Shibuya Station has been under construction for years already. In 2013, the Tokyu Toyoko Line connecting Shibuya with Yokohama was buried underneath Shibuya Station and connected to the Fukutoshin subway line. This allows trains to travel all the way from Yokohama to Ikebukuro, another Tokyo rail hub, and far beyond.

Also on the east side of the JR Yamanote Line railway is the Shibuya Station South Area. This zone will make use of land that was occupied by the Tokyu Toyoko Line railway – which now goes underground between Shibuya and Daikanyama stations. The centerpiece of this zone is another skyscraper – 33 floors above ground and 180 meters tall. While it will mostly be office space, the building will also have a hotel, shops and space for incubating creative content startups. The structure will also serve as a bridge between Shibuya Station and the Shibuya 3-chome area, which is cut off from it by Route 246 and Meiji Dori street.

Shibuya Station South Area: Connecting the neighborhood

This skyscraper in the Shibuya Station South Area will serve as a bridge between the Shibuya 3-chome district and the terminal

This is a new development that is connecting the Shibuya 3-chome district with the terminal. The area is developing into an office, hotel, and retail hub.
Dogenzaka Area

On the southwestern side of Shibuya Station lies hilly Dogenzaka, a large shopping and entertainment district. Tokyu is also planning to breathe new life into the neighborhood with a large-scale development at Dogenzaka 1-chome, located by the existing Shibuya Mark City complex, which houses shops, offices, a hotel and the terminus of the Keio Inokashira Line. A new building facing the Shibuya terminal will be erected in fiscal 2018, which ends in March 2019. It will be a mixture of commercial and office space, with the project being led by Tokyu Fudosan Holdings, Tokyu Group's real-estate arm.

A new building in the Dogenzaka area near the Shibuya Mark City complex will have commercial and office space.

Sakuragaoka Area

The Sakuragaoka condos and offices are targeted at foreign businesses

Located south of the station and on the west side of the Yamanote Line, the Sakuragaoka zone redevelopment will add yet more high-rise buildings to Shibuya. One will be a 180-meter tall, 36-story office tower and the other will be a 150-meter tall, 32-story condominium. Featuring multilingual medical and childcare facilities, as well as serviced apartments and a startup incubator, they will be designed to appeal to foreign companies as part of the move to rebrand Shibuya as an international hub. Construction begins in 2016 and is scheduled to wrap up in fiscal 2020, which ends in March 2021.
Seoul

Source: Eric Fischer
The subway network in Seoul has undergone two expansion phases since the construction of Line One in 1974. The first phase is from the operation of Line One to the complete construction and full operation of Lines Two, Three, and Four. The second phase has begun with the construction of Lines Five, Six, Seven, and Eight, which have been completed in 1998.

Between the 2 phases, intra-urban accessibility has changed in response to the addition of new linkages. Whereas some centers have been advantaged by the expansion of the subway networks, others have been relatively disadvantaged. Changes in the relative node values due to the expansion of the subway network have induced changes of the market potential value, which in turn have affected considerably the land use types and intensity of development.

Spatial patterns of nodal accessibility in the first phase.

Spatial patterns of nodal accessibility in the second phase.

Node values in general tend to decrease as one moves outward from the central business district both in the first phase and in the second phase. In the two phases, high node values are concentrated near the CBD with a significant increase around the CBD in the second phase. The nodal accessibility values increase dramatically in the second phase: the largest accessibility value of a node in the second phase turns out to be about eleven times larger than that in the first phase. However, the spatial distribution patterns look rather different as shown in the 2 figures. The spatial pattern of the accessibility surfaces in the first phase shows an atypical shape with several peaks spreading from the CBD toward the north, southwest, and southeast. Such an atypical pattern is transformed into a nearly concentric pattern in the second phase. Although dominant peaks appear at the CBD in both phases, there exists striking difference in their heights. In the second phase, the scope of the highly accessible area is expanded with several peaks at the transfer nodes connecting different subway lines. High level in the hierarchy of hubs (high degree centrality of a node) increases strongly accessibility value.

**Place Value**

**Town Planning Scheme of Seoul on "Feng-Shui" Principles**

Proper balance among the four mountains and well-shaped forms associated with imaginary animals that ensure harmony mirroring the cosmos and that guarantee prosperity for those who occupy the place. The guardian animals are black tortoise to the north, vermilion bird to the south, blue dragon to the east, and white tiger to the west. Seoul is endowed with all auspicious geometric elements.

The map above shows the correlation between high levels of accessibility and changes in land use. It overlays the accessibility rank map with the land use map. The current land use of the central area in the northern part of the Han River, where nodes of high accessibility concentrate, is mainly commercial.

Dense and connected street patterns
Using zoning to encourage high-density development around major transit nodes in Seoul

Seoul’s zoning regulations set floor area ratios as high as 10 for commercial uses around the most connected and central transit stations, 2–4 for mixed residential and business areas, and 1–2 for residential uses. Uses are defined with fine granularity, depending on proximity to and the importance of transit stations. The result is a varied city in which small residential neighborhoods abut thriving business districts and higher FARs (shown in red in the maps) are allowed near metro stations (indicated by blue circles).
The second phase of Seoul subway construction increases accessibility South of the Han River, in Gangnam district. Until the early 1980s Gangnam and its neighboring areas had remained the least developed in Seoul, but a prodigious development over the last 30 years has earned it a reputation of being one of the most affluent, dynamic, and influential areas in both Seoul and South Korea as a whole. The Gangnam District is one of the 25 gu, which make up the city of Seoul. Gangnam is one of three gu that make up the Greater Gangnam Area along with neighboring Seocho District and Songpa District. Combined, these three gu cover approximately 120 km² of land and had a population of 1,567,881 as of 2010, making up 20% of the area and 15% of the population of Seoul.

Both the Greater Gangnam Area and Gangnam itself are widely known for their heavily concentrated wealth. The most significant indicator is its extremely expensive real estate. Seoul average apartment costs are approximately US$5,500 per m², but the average price in Gangnam is almost twice as high, roughly US$10,000 per m², which is 3.5 times the nationwide average. As for land value, the mere 40 km² land of Gangnam district rivals with the entire land value of the city of Busan, the second largest city in South Korea. Combined with the neighboring districts of Seocho and Songpa, Greater Gangnam Area account for almost 10% of land value of the entire country.
Singapore

Source: Eric Fischer
Achieve 75% Use of Public Transport by 2030

The LTA is going to double the rail network by 2030, by building two completely new MRT lines across the island and lengthening existing lines. By 2030, eight in 10 Singapore households will be within a 10-minute walk of a train station. In wanting to make public transport a choice mode of travel for commuters, the LTA has announced ambitious plans to build new MRT tracks and stations around the island, which will expand the 178km length of Singapore’s rail network today to about 360km in 2030.

Source: Bringing New And Extended Rail Lines To You By 2025/2030, Land Transport Authority, 2013
Build new Integrated Transport Hubs (ITH)

The Light Rail Transit (LRT), also known as the Light Rapid Transit, is a series of localised automated guideway transit systems acting as feeder services to the heavy rail Mass Rapid Transit. 

Bus Service Enhancement Programme (2012) will add 1,000 new buses (25% increase) by 2017.

Source: Land Transport Master Plan 2013, Land Transport Authority, 2013
Singapore polycentric structure

Mass rapid transit links commercial centres
Place Value
Decentralize and bring amenities near homes

New Town Prototype

Source: Liu Tai Ker
Amenities

Bishan
17% of NT Area

- Institutions
- Schools
- Commercial

Source: Liu Tai Ker
### Land use Table – Towards High Self-Sufficiency

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Source: RSP
Encourage Cycling and Walking

- Quadruple sheltered walkway network from the existing 56 km to 200 km by 2018
- Double the total length of its cycling paths from 355km in 2015 to more than 700km by 2030


Ang Mo Kio Model
Walking and Cycling Town

Public sector investment has been key to the development of Marina Bay. This investment has been recouped by returns from the private sector. The Urban Redevelopment Agency has received more than $4.5 billion from the sale of land parcels (excluding proceeds from One Marina Boulevard and the M+5 Marina One development site), according to estimates by CBRE (2012). Public sector investments in infrastructure have attracted local developers as well as developers from Australia; Hong Kong SAR, China; Malaysia; and the United States. U.K. firms reportedly occupy 29 percent of the development’s space, with 19 percent occupied by U.S. firms and 18 percent by Singaporean firms. Most occupants are from multinational companies headquartered in Europe (51 percent), Asia (22 percent), and North America (20 percent). Occupants include law, information technology, commodities, energy, and insurance firms as well as financial service firms.
Hong Kong

Source: Eric Fischer
Node value: Paths through Hong Kong – Source: Eric Fischer
Routing 30,000 randomly-chosen trips through the paths suggested by 10,000 randomly-chosen geotags.
Data from the Twitter streaming API, August, 2011. Base map from OpenStreetMap, CC-BY-SA.

Place value: Red pictures by tourists; blue pictures by locals
Source: Eric Fischer

Market value: Densities (people and jobs) in Hong Kong are aligned with transit accessibility
High density in Hong Kong is aligned with high node values
As a result of Hong Kong’s approach to integrating transport and land-use planning, 43% of the population (3 million people) live within 500m of an MTR station and 75% live within 1 km of a station. Public transport is used for 90% of all motorised journeys and the car ownership rate (56 per 1000 people) is lower than any other city of similar wealth (as a comparison, the average rate in OECD countries is 404 per 1000 people).

The city’s exceptionally high levels of residential density – averaging 21,900 people per km² within the built-up area, 6,300 people per km² across the entire territory and peaking at 123,300 people per km² at North Point – has also created one of the most walkable cities in the world. Not surprisingly, 45% of trips are undertaken by foot.

Source: LSE Cities
Hong Kong Planning Concepts

Being a highly compact city, Hong Kong’s preferred future spatial development pattern is underpinned by the planning concept of clustering the bulk of development around mass transit railway stations to facilitate fast and mass movement of people in an environmentally friendly mode of transport. Better utilisation of development opportunities in the existing built-up areas where infrastructure capacities permit would also be recommended. However, care should be exercised to take into account urban design considerations (such as building mass and height, provision of breezeways etc.) as well as heritage conservation objectives, in the planning of new developments.

In terms of future development directions, the core urban areas will still remain as the focal point of development and urban activities. Further development opportunities will be found along three axes:

1. the first in a north-south direction roughly aligning with the East Rail
2. the second spreading westwards from the core towards Lantau
3. the third alignment in northern New Territories located close to the boundary with Shenzhen. These development area/axes will serve the following functions:

- **Metro Development Core**
  - Intensive commercial/business zones and housing for urban-style living;

- **Central Development Axis**
  - Community-type housing and education/knowledge-building facilities;

- **Southern Development Axis**
  - Logistics and major tourism facilities; and

- **Northern Development Axis**
  - Non-intensive technology and business zones and other uses that capitalise on the strategic advantage of the boundary location.

For the rest of Hong Kong in areas falling outside existing developed areas, we would recommend a lower level of development with conservation being a priority consideration.

Hong Kong Preferred Development Option.
Strategic Concept Plan
Hong Kong compact city model

Locations of Hong Kong R+P projects by built environment types

Listing of MTR stations in each built environment type and statistical mean statistics for key clustering variables.

Admiralty Station: vertical and horizontal integration

Hong Kong Station: connectivity and aesthetics
Over the 2001-2005 period, property development produced over half of MTRC’s revenues. By contrast, railway income, made up mainly of fare box receipts, generated 28 percent of total income. Together, MTRC’s involvement in property-related activities – i.e., development, investment, and management – produced 62 percent of total income, more than twice as much as user fares.

For the 1980 to 2005 period, it is estimated that Hong Kong SAR has received nearly $140 billion (in today’s Hong Kong dollars) in net financial returns. This is based on the difference between earned income ($171.8 billion from land premiums, market capitalization, shareholder cash dividends, and initial public offer proceeds) and the value of injected equity capital ($32.2 billion). Thus the government of Hong Kong has enjoyed tremendous finance returns and seeded the construction of a world-class railway network without having to advance any cash to MTRC. The $140 billion figure, of course, is only the direct financial benefit. The indirect benefits – e.g., higher ridership through increased densities, reduced sprawl, air pollution, and energy consumption, etc. – have increased net societal returns well beyond $140 billion.
Timing and project phasing are critical to the success of R+P given the cyclical nature of Hong Kong’s real-estate market. In recent years, MTRC has relied on property development to generate profits to pay off past debt. This is reflected in this figure, which charts annual profits/losses from property development and other recurring businesses over the 1980-2005 period.

During the 1980s, MTRC mostly incurred net losses (based on differences between revenues and combined operating and depreciated capital cost as well as debt service). Even during this period of operating in the red, property development moderated losses. Beginning in the late 1990s when MTRC began aggressively pursuing R+P along the Airport Railway Line, the net yields provided crucial income that went to finance the more recent Tseung Kwan O extension. It took approximately 10 years (1997 to 2007) to fully pay off capital debt for the Airport Line extension. From 2007 onward, earnings from R+P projects on the Airport Line produce funds that no longer need to go toward paying off this debt, allowing these funds to be used to cover costs of Tseung Kwan O and other planned extensions.

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