

**Transit Transformations**  
**Private Financing and Sustainable Urbanism in**  
**Hong Kong and Tokyo**

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## 1. Transit Value Capture

Few sectors of urban infrastructure have experienced as strong of a push to privatize in recent decades as public transit. In the developed world, spiraling operating deficits and falling ridership prompted many public transit agencies to competitively contract out bus and rail-passenger services to the private sector in the 1980s and 1990s. As protected monopolies, critics charged that public operators failed to reign in escalating costs, innovate in response to changing market preferences, and effectively compete with the increasingly popular private automobile (Estache, 1999). In the U.S. and U.K., privatization of public transit became the centerpiece of urban transportation policy under the Reagan and Thatcher administrations. In less developed countries, international aid agencies openly embraced urban transport privatization, reflected by the following World Bank policy position: “Competition, facilitated by regulatory reform to enable private firms to enter and exit the market more freely, forces transport suppliers to respond to user’s needs at lower costs” (World Bank, 1996, p. 33).

Experiences with competitive tendering of bus services in Delhi, Colombo, and Copenhagen generally yielded favorable outcomes: ridership increased, the amount of services increased, and operating costs were held in check (Estache, 1999). Such results, however, only appeared under “managed competition” – i.e., when a public oversight entity set and enforced service-quality, tariff, and safety standards. Where private operators openly colluded and the enforcement of operating standards was lax, such as was the case with transit deregulation in Santiago, Chile, service reliability and quality plummeted while tariffs increased. Absent managed competition and market contestability, experiences show that deregulating and privatizing public transit in large, congested cities can backfire, forcing authorities to re-regulate and re-install a public operator, as took place in Santiago.

While neoliberal policies of privatizing bus operations remain popular in much of Latin America and Asia, there has been less progress in attracting private capital for the construction of public transit infrastructure, particularly urban passenger rail systems. Privatization of road construction has been far more commonplace. Private concessions for the construction of public-transit systems has had a checkered past – due mainly to higher risks and difficulties in coordinating system designs and services among multiple interests. Private financing of metros in Manila, Bangkok, and Kuala Lumpur won kudos for expediting project implementation and containing construction costs, but was faulted for failing to integrate rail transit not only with other modes but even between metro lines. Ridership suffered as a result, yielding fewer mobility and environmental benefits than expected. Private takeover of existing public transit assets has fared even worse, underscored by the British Railtrack fiasco. While costs fell when British Rail was broken into almost a hundred pieces and sold in the mid 1990s, service quality and public safety quickly plummeted (Shaw, 2000). In 2002, British Railtrack was dissolved and its assets sold to Network Rail, a state-back, not-for-profit corporation whose profits go mainly to rail maintenance and expansion. There have been some successes following private financing of metro systems, notably in Buenos Aires and Rio de Janeiro where ridership increased and costs fell without a noticeable decline in service quality (Estache et al., 1999; Zegras, 2004). These experiences show that privatization of public transit infrastructure works best with the expansion of existing services (versus the construction of new facilities) and in congested corridors with pent-up demand, few mobility options, and an emerging middle class (Rodriguez, 1999). Also important is the setting and enforcement of service-quality and safety standards that protect the broader public interest.

The most notable contemporary examples of private railway construction of the majority of urban rail lines, not just extensions (as has been the case in Latin America), come from two of east Asia's economic juggernauts: Hong Kong and Tokyo. What distinguishes both cases is private railway companies' reliance on property development to generate profits. In Hong Kong, a private corporation has assumed the role of building the city's modern urban rail systems, relying mainly on returns from ancillary land development to cover construction and development costs. Metropolitan Tokyo has an even longer history of private railway construction. Over the past half century, private railway corporations have constructed new towns around railway stations throughout the suburbs of Tokyo, exploiting the land-value gains in and around railway stations conferred by improved accessibility. Called *value capture*, this approach to infrastructure finance is fair and efficient. Why, the reasoning goes, let a handful of fortunate landowners, or worse yet, real estate speculators, reap the windfalls created by public investments in transit? Returning the value-added to retire construction bonds can relieve cash-strapped local governments of fiscal burdens while also reducing land speculation and creating a more compact, transit-oriented urban form. Having the transit entity control the land around stations, moreover, increases the chance that major trip generators and transit-oriented land uses – such as retail plazas, offices, and civic uses – occupy strategically important land parcels, thereby increasing ridership and farebox returns.

Ironically, transit value capture was first practiced in the United States, the world's most automobile-dependent society today. One hundred-plus years ago, private landholders secured exclusive franchises to build inter-urban streetcar lines in dozens of U.S. cities, reaping windfalls from land sales to more than cover investment costs (Bernick and Cervero, 1997). Never in American history has there been a more intimate connection between rail transit services and

urbanization than during this era. Contemporary efforts to build compact, mixed-use, walking-friendly “transit villages” largely seek to recreate a built form that thrived throughout urban America in the early 1900s. The ensuing years of public take-over of transit infrastructure in the United States has been accompanied by a dis-connect between rail investments and land development. Most suburban retail development in the U.S. has turned its back on transit, oriented to freeway interchanges, not transit stations. The dominant land use around most suburban rail stations in even big U.S. cities like Los Angeles and Chicago is surface parking lots.

Today, the historically successful model of bundling urban railway infrastructure and land development is alive and well in both Hong Kong and greater Tokyo, among the few places where transit value capture is still practiced today. These are hardly philanthropic gestures on the part of railway companies. Make no mistake: as private corporations accountable to stockholders, the primary motivation for massing land development around stations in both cities is to secure profits. In traffic-choked cities like Hong Kong and Tokyo, this can mean pushing density envelopes as high as possible around many stations. Critics warn, however, that profiteering by intensifying land development in and around stations can be at the expense of longer-term public objectives, like provision of public open space and functional pedestrian corridors. In this chapter, I argue that private railway companies in both cities are in the midst of a culture change, increasingly realizing that station-area developments that promote broader public interests can also improve their bottom lines. Ensuring that high-rise structures are architecturally integrated with subway stations, provide efficient and attractive pedestrian corridors, allow for a mix of land uses that appeal to transit customers, and place an accent on public amenities can yield huge land market premiums. Thus, real-estate profiteering and urban

place-making can be mutually reinforcing. Private railway companies themselves have institutionally responded by establishing urban planning divisions within their organizations to ensure ancillary real estate development is of a high quality, promotes local development objectives, and is functionally integrated with transit infrastructure.

The principal lesson of this chapter – that private profiteering and smart growth of the public realm can be mutually reinforcing -- is particularly important to rapidly industrializing countries like China that are building metrorail systems at a staggering pace. Adapting Hong Kong's and Tokyo's models of railway investments and urban development to places like China, I conclude, is among the most promising pathway to achieving sustainable urban futures.

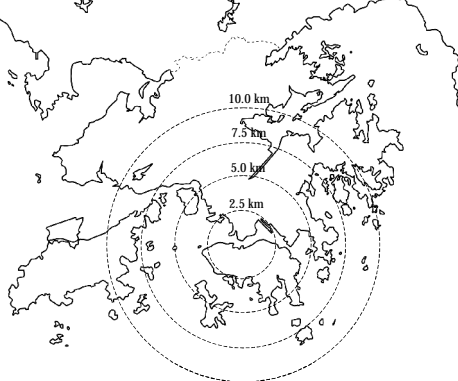
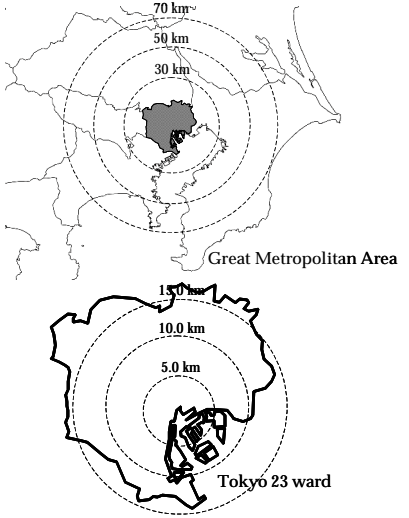
## **2. Transit in Hong Kong and Tokyo**

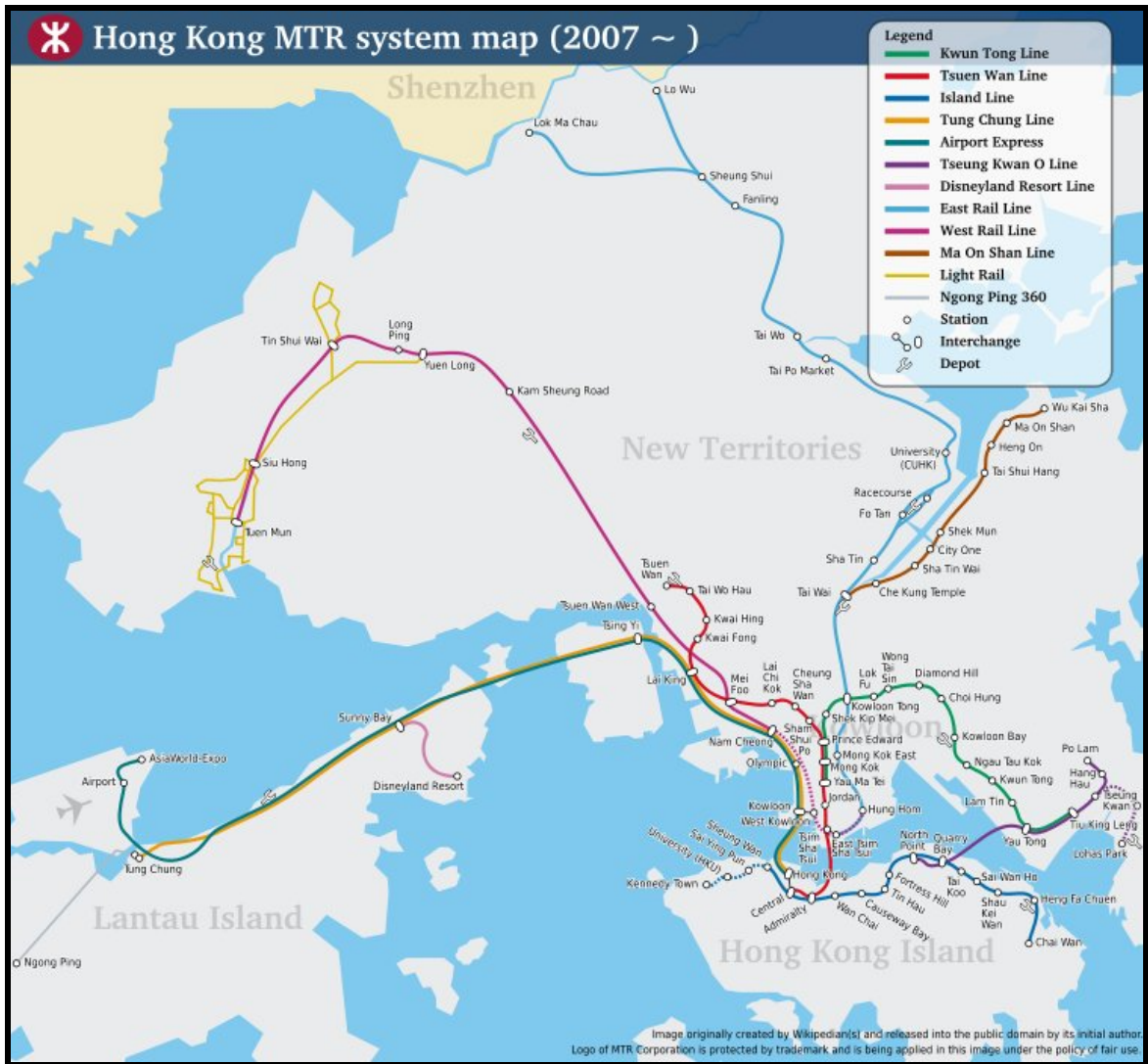
Hong Kong and Tokyo are internationally known for successfully integrating rail transit and urbanization. Indeed, their huge populations and exceptionally high urban densities, and the agglomeration benefits that have resulted, could not be sustained without world-class railway services. Greater Tokyo is much larger than Hong Kong (Table 1). Tokyo's 23 ward area, however, is more comparable to Hong Kong in population size (8.46 million versus 6.94 million inhabitants) although its densities are one-half of Hong Kong's (13,608 versus 26,473 persons per square km).

Any visitor to Hong Kong instantly recognizes that public transit is the lifeblood of the city. Hong Kong boasts a rich offering of transit services, including a high-capacity railway network, surface-street trams, ferries, and an assortment of buses and minibuses. In late-2007, the city's main passenger rail operator, MTR Corporation, merged with the former Kowloon-Canton Railway Corporation, forming a 168 km network of high-capacity, grade-separated

services in Hong Kong island, the Kowloon peninsula, the Northern Territories (to the Chinese border), and through a recent extension, to Hong Kong's new international airport (Figure 1). Today, over 90% of all motorized trips in Hong Kong are by public transit, the highest market share in the world (Lam, 2003).

**Table 1. Population, Area, and Density: Hong Kong and Tokyo, 2005**

	Hong Kong	Tokyo Great Metropolitan Area (upper) & 23 Ward (lower)
		
Population, 2005	6,935,900	34,196,915 8,457,418
Area (sq km)	1,107 (Total) 262 (Urbanized Area)	13,556 621
Density (persons per sq km), 2005	6,266 (Total) 26,473 (Urbanized Area)	2,523 13,608
Population Growth %, 2000-2005	1.02	3.15 3.97



**Figure 1. Hong Kong's MTR System, 2007**



The combination of high urban densities and high-quality public transport services has not only produced the highest level of transit usage in the world (570 annual public transport trips per capita) but has also substantially driven down the cost of motorized travel. In 2002, over half of all motorized trips made by Hong Kong residents were a half hour or less (ARUP, 2003). Motorized travel consumes, on average, around 5 percent of Hong Kong's Gross Domestic Product (GDP). This contrasts sharply with more automobile-oriented global cities like Houston and Melbourne, where upwards of one-seventh of GDP goes to transportation (International Association of Public Transport, 2002). Hong Kong residents enjoy substantial travel cost savings even in comparison to much larger global cities with extensive railway networks, like London and Paris.

Tokyo's railway network – owned and operated by a mix of public, private and quasi-private entities – is, by far, the world's largest (Table 2 and Figure 2). In 2005, 3,216 directional kms of track and 1,501 stations served a commutershed that extended more than 100 km from the central Tokyo station. Encircling Tokyo's core area is the Yamanote line, with major intermodal terminals and high-rise office developments found at key stations like Tokyo-Marunouchi, Shibuya, and Shinjuku. 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). It is beyond the Yamanote loop where one finds purely privately built, owned, and operated private railways. These lines connect numerous suburban new towns to the major terminuses on the Yamanote loop, allowing passengers to switch to the Tokyo Metro or Eidan subway.

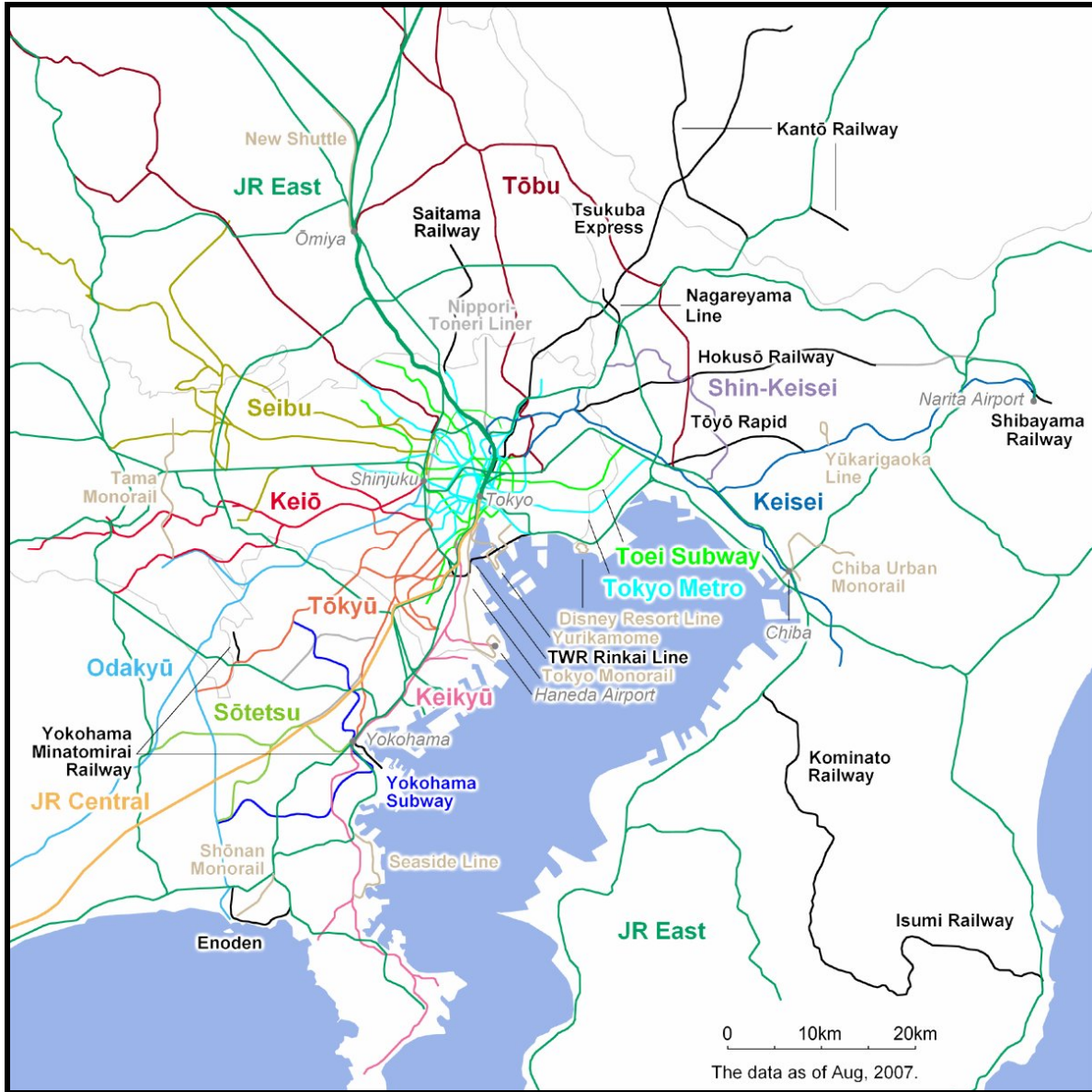
Tokyo's radial railway system supports and reinforces the region's monocentric structure.

The geometry of radial rail lines and roadways that converge on the center have given rise to extreme congestion. Due in part to rising car ownership rates and Japan's aging population structure, public transport ridership has been declining over the past 15 years in greater Tokyo, which has exacerbated central-city congestion to some degree.

**Table 2. Major Railway Operators in the Tokyo Greater Metropolitan Area, 2005**

Company/Agency	Type	Length km	# of Stations	Passenger km million	Year Opened
Tobu	Private	463.3	202	12,667	1897
Seibu	Private	176.6	92	8,669	1912
Keisei	Private	102.4	64	3,508	1909
Keio	Private	84.7	69	7,186	1910
Odakyu	Private	120.5	70	10,528	1923
Tokyu	Private	100.1	98	9,469	1922
Keikyu	Private	87.0	72	6,220	1898
Sotetsu	Private	35.9	25	2,604	1917
JR East	Former Public	1,698.3	516	76,694	1987 (1870) <sup>a</sup>
Tokyo Metro	Former Public	183.2	168	16,356	2004 (1927) <sup>a</sup>
Toei Subway	Public	106.2	105	5,291	1927
TX	Quasi-Private	58.3	20	NA	2005 (1991) <sup>a</sup>
Total		3,216.5	1,501	159,192	

<sup>a</sup> Years in parentheses denote year of opening as a public operator. Years not in parentheses denote year of transformation from a purely public operator.



**Figure 2. Greater Tokyo's Railway Network**

### **3. Rail + Property Development in Hong Kong**

Hong Kong is one of the few places in the world where public transport makes a profit, courtesy of MTRC's "rail+property" program, or R+P for short. R+P is one of the best examples anywhere of transit value capture in action. Given the high premium placed on access to fast, efficient and reliable public-transport services in a dense, congested city like Hong Kong, the price of land near railway stations is generally higher than elsewhere, sometimes by several orders of magnitude. MTRC has used its ability to purchase the development rights for land around stations to recoup the cost of investing in rail transit and turn a profit. The railway has also played a vital city-shaping role. In 2002, around 2.8 million people, or 41 % of Hong Kong's population, lived within 500m of an MTR station (Tang et al., 2004). One in five households lived within 200m of a station.

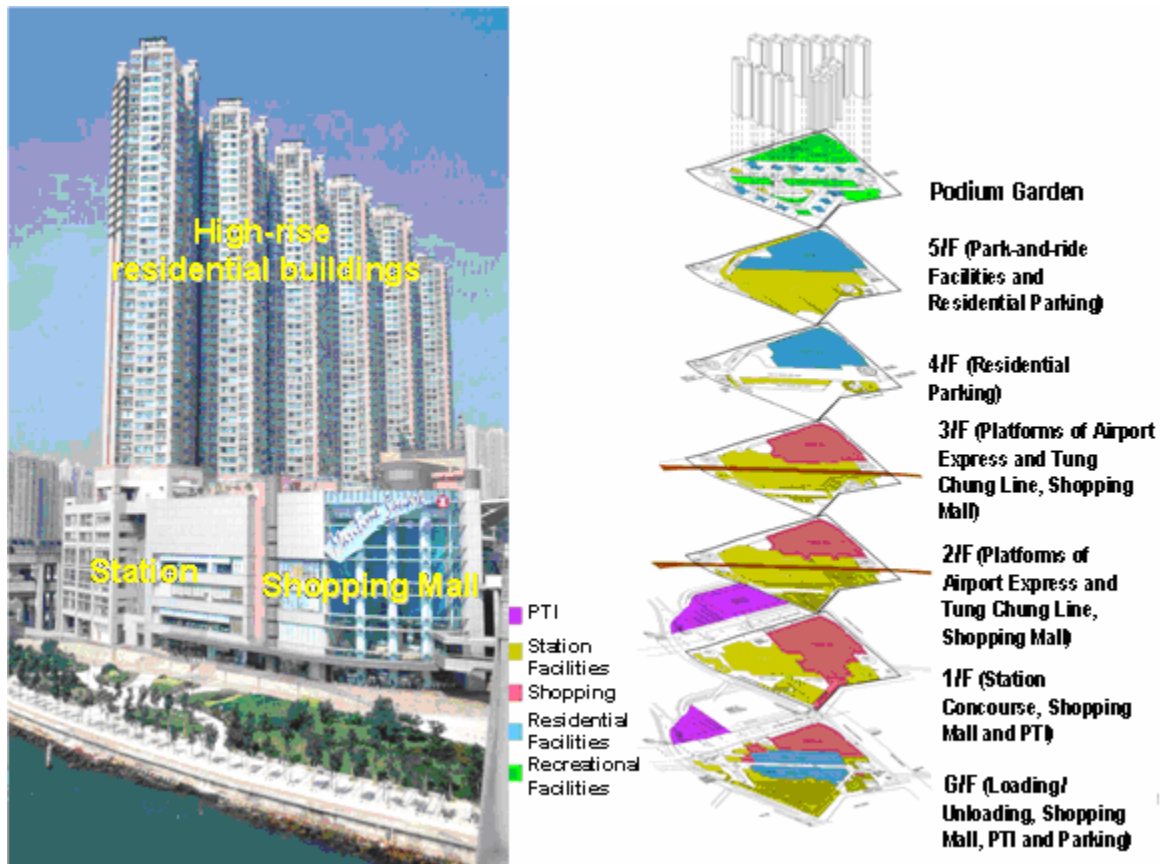
#### **MTRC and R+P**

As a private corporation that sells shares on the Hong Kong stock market, MTRC operates on commercial principles, financing and operating railway services that are not only self-supporting but also that yield a net return on investment. Effectively, the fully-loaded costs of public-transport investments, operations, and maintenance are covered by supplementing fare and other revenues with income from ancillary real estate development – e.g., the sale of development rights, joint venturing with private real-estate developers, and running retail outlets in and around subway stations. Today, Hong Kong MTR is one of the most successful build-operate-maintain transportation systems anywhere, courtesy of R+P.

Throughout the 1980s and 1990s, the Hong Kong Special Administrative Region (HKSAR) government was the sole owner of MTRC. In 2000, 23% of MTRC's shares were

offered to private investors on the stock exchange. The presence of private shareholders exerted a strong market discipline on MTRC, prompting the company managers to become more entrepreneurial and business-minded. However, HKSAR's majority shareholder status ensured that MTRC weighed the broader public interest in its day-to-day decisions, including the promotion of TOD.

A good example of R+P at work is Maritime Square, planned and managed by MTRC as part of the development of Tsing Yi station on the new express Airport Extension Line. MTRC was granted 50-year development rights for the site, selling these rights at a substantial premium to underwrite the costs of building the station and portions of the airport line. The resulting mixed-use Maritime Square R+P project boasts a seamless integration between the railway station and shopping center as well as the above-station residential towers (Figure 3). Residents can experience a 'temperature-controlled' environment – able to go from their luxury apartments to shopping below and then directly into the MTR station without stepping outdoors. Maritime Square came to fruition because the opportunities for physical integration were assessed at the master planning stage (Tang et al., 2004).



**Figure 3. Maritime Square Residential-Retail Development Atop Tsing Yi Station.** Maritime Square features hierarchically integrated uses. Shopping mall extends from the ground floor to the 3<sup>rd</sup> level. Station concourse sits on the 1<sup>st</sup> floor, with rail lines and platforms above and ancillary/logistical functions (like public transport/bus interchange and parking) at or below. Above the 4<sup>th</sup> and 5<sup>th</sup> floor residential parking lies a podium garden and above this, high-rise, luxury residential towers.

### **R+P: How it Works**

The granting of exclusive development rights is what fuels MTRC's R+P program. MTRC does not receive any cash subsidies from the Hong Kong government to build railway infrastructure; instead it receives an in-kind contribution in the form of a land grant that gives the company exclusive development rights for land above and adjacent to its stations. These grants relieve MTRC from purchasing land on the open market.

Timing is crucial in MTRC's recapturing of rail's value-added. MTRC purchases development rights from the Hong Kong government at a "before rail" price and sells these rights to a selected developer (among a list of qualified bidders) at an "after rail" price.<sup>1</sup> The differences between land values with versus without rail services are substantial, easily covering the cost of railway investments.<sup>2</sup> When bargaining with developers, MTRC also negotiates a share of future property-development profits and/or a co-ownership position from the highest bidder. Thus MTRC receives a "front end" payment for land and a "back end" share of revenues and assets in-kind.

Table 3 summarizes MTRC's portfolio of R+P projects in 2006. By design, MTRC has pursued a diverse portfolio of projects to shield the company from swings in Hong Kong's business cycle. In addition to R+P, MTRC has diversified its holdings through equity

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<sup>1</sup> The Hong Kong Special Administrative Region owns all land in the Hong Kong territory. Private individuals and organizations can only purchase 50-year leases that grant exclusive property development rights.

<sup>2</sup> MTRC aims to set rents for its landholdings based on the WACC – the weighted average cost of capital – presently set at 9.5% (reflecting the value of borrowing capital) plus a rent premium of between 1.5% and 3% for equity shareholders, yielding a 11% to 12.5% return. The WACC fluctuates based on loan rates charged by commercial banks. For riskier projects, the WACC might be set at 10% plus a 3% premium, yielding a 13% net return. Thus MTRC's economic rates of return on investments are not determined by the market. Rather, the company sets the desirable rate of return and releases land to achieve this target. This is viewed by the populous as an appropriate strategy for a company whose majority ownership is the Hong Kong government. MTRC will invest in railway projects if these net rates of return (11% to 13%, depending on risks) are attained. This "WACC+premium" formula is used to guide not only railway investment but also MTRC's own real-estate investment, including shopping malls attached to stations.

ownership, cash holdings, property management, consulting, advertising, and ownership of other assets (e.g., telecommunication leases, convenience retail shops). Thus, if Hong Kong's real-estate market softens, MTRC is buffered through other asset holdings; if the land market strengthens, the company participates in this upside through both R+P leases and equity ownership.

R+P's vital income-producing role is revealed by the fact that during the 2001-2005 period, property development produced 52 percent of MTRC's revenues. By contrast, railway income, made up mostly of farebox 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.

Project phasing is 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 by Figure 4, which charts annual profits/losses from property development and other recurring business 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 extensions (as part of a massive brownfield redevelopment of former industrial land). 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 pay off this debt, allowing these funds to be used to cover costs of Tseung Kwan O and other planned



extensions.

Table 3. MTRC's Property Development Overview, 2006

	Type of Land use					No. of Carparks (\$ Spaces)
	Residential	Commercial	Office	Hotel/ Service Apartments	Government & Institutions	
	(# Units)	GFA (m <sup>2</sup> )	GFA (m <sup>2</sup> )	GFA (m <sup>2</sup> )	GFA (m <sup>2</sup> )	
Urban Lines	31,682	314,923	208,866	0	143,034	6,012
Airport Lines	28,650	306,640	611,963	291,722	24,770	14,360
Tweung Kwan O Lines	8,914	55,814	5,000	58,130	0	1,691
Total	69,246	677,377	825,829	349,852	167,804	22,063

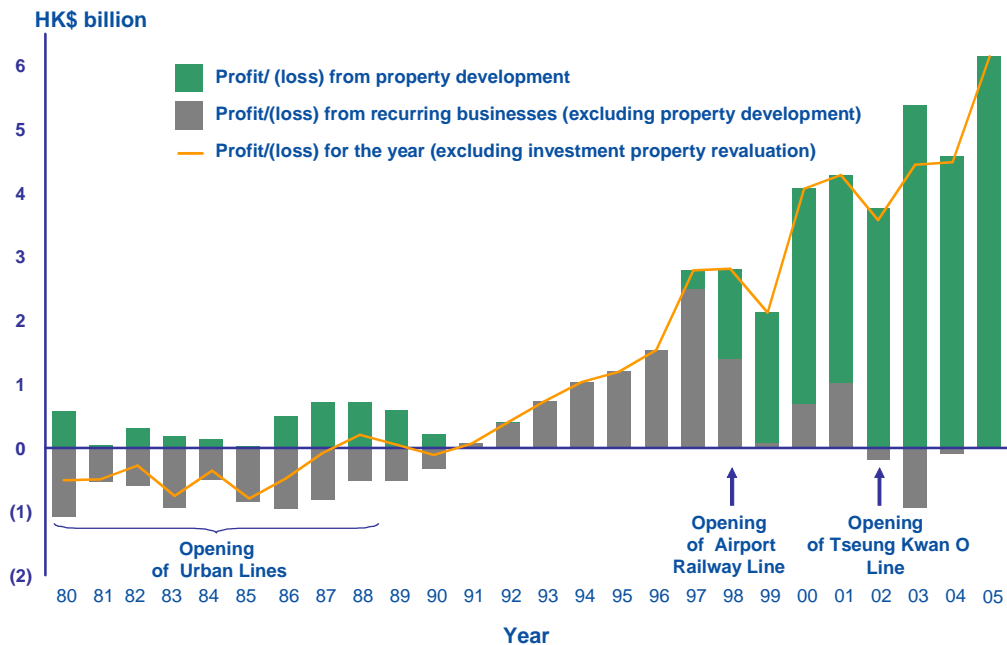


Figure 4. Trends in MTRC's Profits and Losses from Property Development and Recurring Businesses for the 1980 to 2005 Period

MTRC has hardly been the sole financial beneficiary of R+P. Society at large, reflected by Hong Kong SAR's majority ownership of MTRC, has also reaped substantial rewards. 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 from land grants). 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.

### **R+P and Transit-Oriented Development (TOD)**

Growing concerns about quality-of-life and Hong Kong's global competitiveness in an environment of off-shoring manufacturing jobs to mainland China has prompted Hong Kong officials to pursue a policy of integrating high-quality infrastructure investments and land development. Hong Kong has long had tall towers surrounding and above railway stations, however density alone does not make a good transit-oriented development (TOD). Often missing is high-quality urban designs and pleasant yet functional walking environments in and around stations. At its core, TOD is about place-making:

The centerpiece of the transit village is the transit station itself and the civic and public spaces that surround it. The transit station is what connects village residents and workers to the rest of the region, providing convenient and ready access to downtowns, major activity centers like sports stadium, and other popular destinations. The surrounding public spaces or open grounds serve the important function of being a community gathering spot, a site for special events, and a

place for celebrations – a modern-day version of the Greek agora (Bernick and Cervero, p. 5).

The use of the railway station as a focal point for community building is common in Scandinavia. On the outskirts of Stockholm and Copenhagen, most rail stations are physically and symbolically the hub of the community. In master-planned new towns that orbit Stockholm, notably like Vällingby and Skarholmen, the rail stop sits squarely in the town center (Cervero, 1998). Upon exiting the station, one steps into a car-free public square surrounded by shops, restaurants, schools, and community facilities. The civic square, often adorned with benches, water fountains, and greenery, is the community's central gathering spot – a place to relax, socialize, and a setting for special events, whether national holidays, public celebrations, parades, or social demonstrations. Sometimes, the square does double duty as a place for farmers to sell their produce or street artists to perform, changing chameleon-like from an open-air market one day to a concert venue the next. The assortment of flower stalls, sidewalk cafes, newsstands, and outdoor vendors dotting the square, combined with the musings and conversations of residents sitting in the square, retirees playing chess, and everyday encounters among friends, adds color and breathes life into the community. Thus, a community's rail station and its surroundings are more than a jumping off point. As lively urban districts, they should be the kinds of places people are naturally drawn to. If done well, TODs are “places to be”, not “places to pass through” (Bertolini and Spit, 1998).

The first generation of R+P projects built by MTRC were hardly pedestrian-friendly TODs. Most featured indistinguishable apartment towers that dumped pedestrian onto busy streets and left it to their own devices to find a way to a subway entrance. Growing public discontent over sterile station-area environments and sagging real-estate market performance of

older buildings prompted MTRC to pay more attention to principles of good town planning. Perhaps most notable was the establishment of a town-planning division within the corporation, charged with pursuing land-development strategies that met corporate financial objectives while also promoting local land-use objectives and enhanced station-area environments. R+P projects from the early 1980s followed rather than anticipated development (Brownlee, 2001). In keeping with the Hong Kong Government's *Regional Development Strategy* to channel new growth along desired corridors through railway investment and enhance pedestrian environments, more railway investments and their associated R+P projects, such as the extension to the new international airport, have been in advance of market demand.

Recently built MTR stations and their associated R+P projects, notably Kowloon Bay and Tung Chung, embrace the Scandinavian model of TOD design, seeking to impart a sense of place. They do this in large part by creating a significant public space outside the station. Tung Chung station and its adjacent civic square is today the hub of Tung Chung new town and according to Tang et al. (2004) is poised to become Hong Kong's landmark gateway for visitors arriving at the airport. Compared to earlier R+P projects, Tung Chung is designed at a more human scale, featuring bright night lights, openness (much appreciated in a hyper-dense city), vivid and coordinated urban designs, and through active pedestrian movements, the kind of natural surveillance that gives people a sense of comfort (Figure 5). A recent urban design audit found newer R+P projects like Tung Chung scored much higher than early-generation high-rise projects in terms of connectivity, comfort, aesthetics, public amenities, navigability, and natural

surveillance (Cervero and Murakami, 2008).



**Figure 5. Tung Chung Station Environment: Open space and attractive landscaping separates the MTR station from nearby residential towers.** Occupying a 21.7 hectare parcel, Tung Chung was conceptualized and built along the lines of a master-planned new town, comprising predominantly residential housing intermixed with retail shops, offices, and a hotel next to the station. Tung Chung was also designed with TOD principles in mind (Photo 4.4). Several hundred meters from the station lies an arc of 30-plus story residential towers, connected to the town center by a network of covered walkways and footbridges. Upon exiting the station, MTR patrons are greeted by a spacious, attractively landscaped civic square dotted with public art. The “feel” of walking in and around the Tung Chung station is qualitatively different than that found at older MTR stations.

If R+P projects built according to TOD models are beneficial, this should be reflected in ridership statistics and real-estate market performance. A recent statistical analysis found that each additional household built within 500 meters of an MTR station added 1.75 transit trips per weekday (Cervero and Murakami, 2008). If this housing unit part of a master-planned R+P project with a transit-oriented design (e.g., grade-separated pedestrian access; mixed land uses, including retail shops, along pedestrian corridors; architectural integration; and provision of public amenities like pocket parks), each new housing unit added 2.84 daily rail trips. This relationship has not gone unnoticed among MTRC’s management: transit-oriented designs and high-quality pedestrian environments can increase farebox income and generate more walk-on

traffic that purchases the many retail goods and services at MTRC-owned shops in and around railway stations.

Equally important have been the price premiums recorded for R+P housing projects designed according to TOD principles. A notable example is the Hang Hau MTR station, built as a “new town/in town” along the recently opened Tseung Kwan O (TKO) corridor. Hang Hau station marks a strong departure in design practices and the relationship of the R+P project to the surrounding community. Notably, a strong emphasis is given to “place-making”. Owner-occupied apartments are directly tied to a nicely landscape garden and private club house that sits above the station. Residents also have direct elevator connections to the station concourse and lower level shopping mall. A phalanx of second-level footbridges links the shopping mall and station to the surrounding neighborhood. Hang Hau’s R+P project has a comfortable, human-scale feel and a design that not only instills a sense of place but also protects the financial investments of tenants. These benefits have been capitalized into land prices. A recent hedonic price model study that controlled for building types and distance to the subway entrance found that Hang Hau’s condominiums built under the R+P model with transit-oriented designs enjoyed average rent premiums of 22 percent (Cervero and Murakami, 2008). Overall, the analysis found price premiums ranging from US\$12 to US\$36 per square foot of gross floor area for housing estates built atop or adjacent to MTR stations.

While ridership and land-price premiums can be attributed to urban design practices, it is likely that part of the explanation lies in the institutional advantages of the R+P model. Tang et al. (2004) argue that a single entity like MTRC is best suited to manage the complexity of land development and to leverage the opportunities to recapture value created by rail investments. They attribute this to: asset specificity (allowing a professional focus on the intricacies of land

development), accumulated knowledge (among MTRC managers), reduced uncertainty (owing to a disciplined approach to property development and accountability to equity shareholders), internalization of transit's value-added (by maximizing ancillary development potential), and asset protection (through involvement in construction and property management). As the master planner, master designer, and master architect, MTRC aligns the interests of different stakeholders. Importantly, it sets and enforces all development standards. For private developers, the “rules of the game” are clear at the outset. This reduces uncertainties and risks. One-entity oversight also allows strong transit/land-use linkages. In addition, MTRC acts as an intermediary between government and private developers—specifying site requirements, negotiating agreements, and balancing between competing public and private interests.

#### **4. Transit Value Capture in Tokyo**

Japan's form of privatizing railway construction and operations has mainly been in the form of metropolitan governments granting concessions and exclusive rights to companies to design, build, and operate transit services. During Japan's post-WWII era of rapid industrialization and suburbanization, private railway companies took advantage of these entitlements to bundle land development and other commercial enterprises with their transit businesses. In Tokyo and other large Japanese cities, regional governments write design, routing, and service requirements to assure privately built new towns comply with regional growth objectives.

Like Hong Kong's MTRC, Tokyo's railway companies have historically leveraged real-estate development to both pay for infrastructure and produce profits for share-holders. And they have similarly opened convenience stores and shopping malls within and adjacent to

stations. What most distinguishes Tokyo's railway companies, however, is their construction of not just a handful of buildings but also veritable new towns on once virgin lands. West of central Tokyo, where many of the region's most up-market suburbs are located, entire communities are today the domains of powerful conglomerates that are best known for their department store chains – Tokyu, Odakyu, Keio, and Seibu – but which first and foremost are in the business of railway and real-estate development. All started as private railway companies and over time branched into businesses closely related to the railway industry, including real estate, retailing, bus operations, and electric power generation. Such business expansion made perfectly good economic sense. Placing shopping malls, apartments, and entertainment complexes near stations generated rail traffic; in turn, railways brought customers to these establishments. During the 1980s at the height of railway/new-town co-development and a surge in Japanese real-estate prices, railway companies were earning investment returns on ancillary real-estate projects in the range of 50 to 70 per cent (Cervero, 1998).

Tokyu Corporation is greater Tokyo's largest private railway enterprise and was among the first companies to advance the business model of railway/new-town co-development. From 1960 to 1984, Tokyu Corporation's 23-km rail line transformed a vast, hilly, scarcely inhabited area into a planned community of a half million inhabitants, called Tama Denin Toshi (Tama Garden City). Tokyu used land-consolidation techniques to assemble farmland at cheap prices in advance of rail construction and to finance neighborhood infrastructure. Under this approach, landowners formed a cooperative that consolidated (often irregularly shaped) properties and returned smaller but fully serviced (and usually rectangular) parcels to landowners. Roads, drainage, sewerage, parks, and other infrastructure were funded through the sale of the "extra" reserved land contributed by cooperative members. Land consolidation relieved railway



companies like Tokyu from the up-front burden and risks of acquiring land and financing infrastructure.

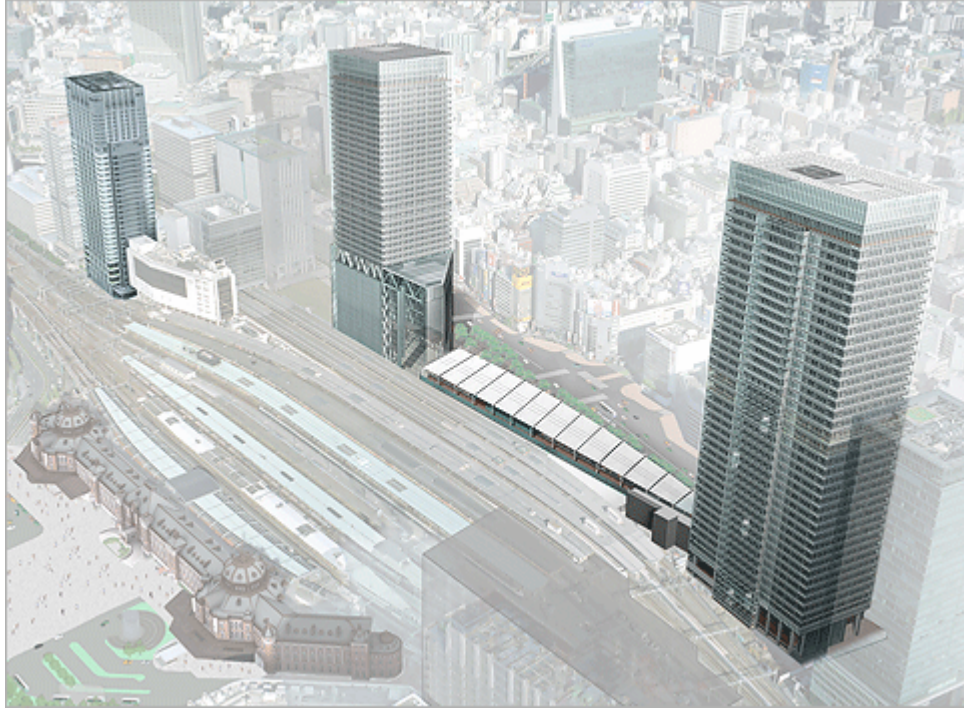
The 1990s and onwards have marked a new era for Tokyo's private railway companies. For one, the bursting of Japan's real-estate price bubble saw the market valuations of rail companies' land-holdings fall. Additionally, powerful demographic trends like declining birth rates and an aging population, combined with a slowing of the economy, reduced the demand for new-town construction. To spread the risks of a shakier real-estate market, private railway companies have in recent years partnered with third parties to pursue large-scale development projects. Recent real-estate projects of Tokyu Corporation, for example, have relied on Real Estate Investment Trust (REIT) funding.

Changing traffic conditions have also had a hand in changing the portfolios of Tokyo's private railways. Greater Tokyo's rail-served new towns and sub-centers consisted mainly of housing and retail services while most white-collar jobs remained in the urban core (Cervero, 1998; Sorensen, 2001). This produced tidal, radial patterns of commuting and thus worsening traffic congestion in the urban core. Lengthening commutes combined with crowded trains and roadways in turn triggered a return-to-the-city movement. Several large-scale redevelopment projects built as joint ventures between private railways and real-estate companies are today underway targeted at the market of young professionals, empty-nesters, and other less-traditional niche markets drawn to central-city living. In a break from tradition, what in the past would have been exclusively office-commercial projects built above major subway stations now features professional-class, high-end housing and consumer services. Residential and commercial districts around several central-city stations, notably Akihabara, Shinjuku, and Shinagawa, are today abuzz with activity, 24-7.

The redevelopment and infilling of strategic central-city land parcels is also being pursued by Tokyo's two former public railways, JR East and Tokyo Metro. In the case of JR East, mounting fiscal losses incurred by the former Japan National Railway (with an accumulated debt of US\$300 billion) led to privatization in 1987. At the time, the national government gave JR East large developable land parcels around terminal stations, prime for commercial redevelopment. Borrowing a chapter from the practices of Tokyo and other long-standing private railway corporations, JR East and Tokyo Metro aggressively transformed these properties to high-rise commercial ventures. In 2006, real-estate yielded more than 40% returns on investment for both former public railways.

JR East's showcase real-estate project is Tokyo Station City, jointly developed by the railway company and other private interests. Tokyo Station City features high-rise, class-A office buildings, retail centers, and hotels (Figure 6). Tokyo Station is well-suited for large-scale redevelopment owing to large amounts of buildable space above depots as well as high pedestrian traffic volumes. On a typical weekday in 2005, around a half-million passengers passed through Tokyo station each day (JR East, 2005).

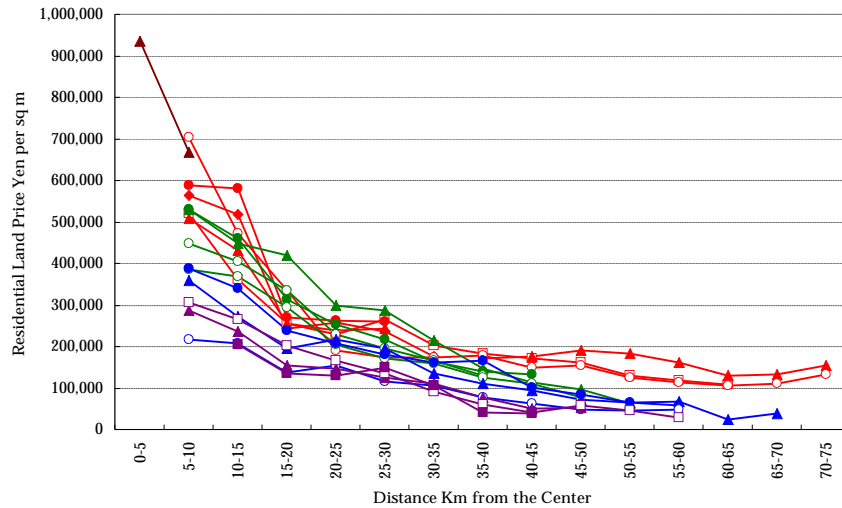
As in Hong Kong, Tokyo's private railways are clearly responding to market price signals. Figure 7 shows 2005 residential land prices along 16 mostly private railway corridors as a function of distance to central Tokyo. Within and along the Yamanote Loop where most large-scale redevelopment projects have been recently built on land owned by private railway companies, residential prices are generally double what they are 15-20 km from the center. Since 2000, the only area where residential land has gained value has been around terminal stations on the Yamanote loop.



**Figure 6. JR East's Tokyo Station City.** Source: JR East Fact Sheet 2007, Mitsui Real Estate Corporation GranTokyo North Tower website, and JR East Building Ltd. website.

### Residential Land Prices in 2006 and Distance from the Center of Tokyo by Major Railway Corridors

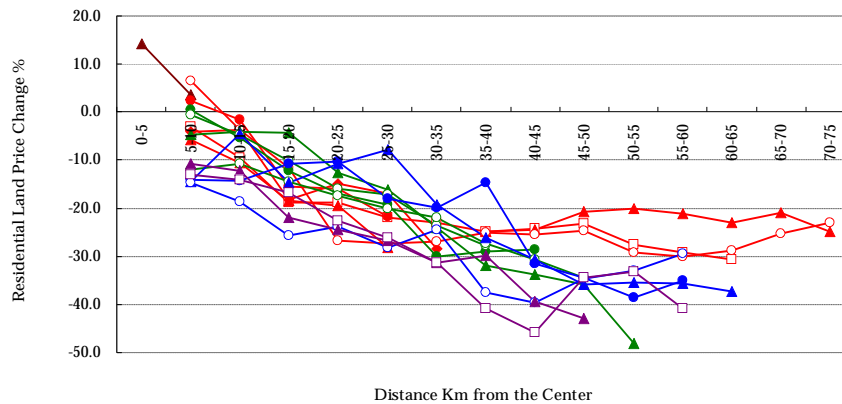
#### Major Railway Corridors



#### Legend:

- Yamanote Loop (Center)
  - Keikyū-Yokosuka (South)
  - Tokaido (South)
  - Tokyu-Toyoko (South)
  - Tokyu-Denentoshi (South)
  - Odakyu (South)
  - Keio (West)
  - Chuoh-Oume (West)
  - Seibu-Shinjyuku (West)
  - Seibu-Ikebukuro (West)
  - Tobu-Tojo (North)
  - Touhoku-Takasaki (North)
  - Tobu-Isesaki (North)
  - Joban (East)
  - Sobu-Keisei (East)
  - TX (East)
- 
- Private (Open Circle)
  - JR (Solid Triangle)
  - Private & JR (Open Square)
  - Quasi-Private (Solid Square)

### Residential Land Price Changes from 2000 to 2006



**Figure 7. Residential Land Price Patterns from the Center of Tokyo by Major Railway Corridors.** Source: Land and Real Property in Japan, Ministry of Land, Infrastructure and Transport

In summary, Tokyo's private railways – both longstanding companies and former public entities only recently privatized – have embraced transit value-capture principles as a means of financing infrastructure, just as in Hong Kong. Importantly, they have responded to changing market and lifestyle preferences, as any successful commercial venture must. In Tokyo's case, the result has been a more sustainable urban form – namely, urban infill on strategically valuable land parcels near major railway stations, a complement to the master-planned, rail-served new towns built decades ago. The emergence of high-rise, mixed-use, and pedestrian-active environments around key central central-city subway stations has produced not only real-estate price premiums but also increased market demand to patronize the companies' railway services.

## **5. Lessons**

Experiences in Hong Kong and Tokyo show that transit value capture, first introduced in the United States over a century ago, is still a viable model – not only for sustainable finance but also for sustainable urbanism. Both cases show it to be particularly suited for financing transit infrastructure in dense, congested settings where a high premium is placed on accessibility and the institutional capacity exists to administer the program. Even in ultra-dense, transit-friendly Hong Kong, the railway investment is not financially viable on its own. Property development has been MTRC's only source of return for meeting investors' equity demands. Through its R+P program, MTRC enjoys significant price premiums for housing built atop or adjacent to metro stations, making it the most profitable public-transit operation worldwide. Greater Tokyo's private railways have historically practiced transit value capture on an even grander scale, building massive new towns along rail-served corridors and cashing in the construction, retail, and household service opportunities created by these investments. In both places, rail and

property development has created a virtuous cycle of viable railway operations and a highly transit-oriented built form.

Important to the success of transit value capture in both cities has been institutional adaptation and change. In Hong Kong, this has taken the form of MTRC's executives gaining an appreciation over time of the importance of urban design, pedestrian circulation, and public amenities, all particularly important in a dense, crowded city like Hong Kong, in creating financially successful R+P projects. Hong Kong's emergence as an international gateway combined with its economic transformation from traditional manufacturing to a service-based economy opened up new possibilities for R+P in both shaping growth and serving new market demands. To MTRC's credit, a conscious decision was made to build high-quality, mixed-use R+P projects both on greenfields en route to the new international airport as well as on brownfields served by central-city railway extensions. These have proven to be wise investments: recent-generation R+P projects that functionally and architecturally blend well with surrounding communities have outperformed earlier projects in terms of both ridership gains and real-estate market returns.

Market adaptation has been just as pronounced in Tokyo in recent times. The region's real-estate market downturn, slowing economic growth, and changing demographic structure has prompted private railway companies – both new and old – to seek new market opportunities, most notably infill housing and mixed-use developments around major central-city railway terminals. Such redevelopment complements the earlier generation new towns built by private companies like Tokyu Corporation. To appeal to professional class workers and a more youthful labor force, as in Hong Kong, a strong accent is being placed on creating high-quality urban spaces in and around joint development projects – a signature feature of Scandinavian-style

TODs (Bernick and Cervero, 1997).

Might these two East Asian models of transit value capture be applied elsewhere, particularly to other fast growing cities in Asia? One might argue that Hong Kong and Tokyo represent extreme cases and that the potential returns from transit joint development elsewhere will be modest. However, many coastal cities of mainland China are beginning to mimic Hong Kong's and Tokyo's development pattern (i.e., the emergence of high-rise, mixed use centers and suburban new towns). Today, urban passenger-rail systems are found in 10 mainland Chinese cities. Plans call for expanding and upgrading these current systems and building new in 15 other Chinese cities. Given the economic and spatial restructuring throughout urban China, there are tremendous opportunities to create sustainable urban forms and reliable funding source by bundling land development and railway investments.

A recent Asian Development Bank report (2005) suggests widespread interest in the People's Republic of China for the adoption of public-private partnerships for urban rail. As rapid urbanization continues to paralyze the streets of many cities in China as well as other parts of Asia with traffic and threatens environmental quality locally and on the global stage, it is imperative that arguably the most sustainable form of urbanism – the linkage of land use and public-transport – be aggressively pursued. Hong Kong's and Tokyo's models of transit value capture are the best template available for sustainably financing transit and building cities.

## **Acknowledgement**

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