a smaller impact than anticipated on land values in suburban station areas. Fewer residents than anticipated shifted from car to transit as the area had been served by a well-developed highway system long before BART’s construction.

• Nuisance from transit: Transit often reduces the value of residential properties very close to transit stations or corridors because of, for example, air and noise pollution, which may override accessibility benefits. Commercial properties are less sensitive, and close proximity to stations or corridors is not a liability.

• Developing countries: Transit investment may have a greater impact on land value than in developed countries with a large stock of transport infrastructure, due to underinvestment in transport infrastructure despite increased congestion and motorization.

Local Socioeconomic and Market Factors

• Socioeconomic disparities: In some U.S. cities, residential land values in wealthy suburban neighborhoods have declined after transit construction. Many high-income residents or shop owners do not want transit-dependent people coming to their neighborhood, as their presence might increase the costs for onsite security or discourage more affluent shoppers.

• Developing countries: Socioeconomic and local market factors are path dependent and context sensitive. Social segregation and spatial divisions of labor markets within cities and regions are often emerging trends or potential concerns, which would shape transit-oriented or car-dependent trajectories at some point.

Nonlisted Factors

There are likely more factors influencing the degree of transit-induced land capitalization than these. For example, Knight and Trygg (1977) presented about 30 factors, including transit, that influence land-use impacts and their complex interactions. However, a similar analysis is beyond this book’s scope.

Little research has been done on transit-induced land capitalization and its empirical findings in developing countries. This may be due to the relatively short history of transit development and paucity of data. Similar to the U.S. empirical findings, the above transit-induced land capitalization theory cannot be applied to all situations in developing countries. In addition, many of these countries have even more difficult conditions, such as inadequate land registration and sizable illegal settlements. More in-depth research is thus needed, which would help developing-country policymakers and practitioners implement better transit and TOD-related investments, in combination with LVC schemes.
Situating LVC in Urban Transport Finance

Elucidating LVC instruments’ similarities and differences may help those actors select the best combination of financial instruments for their situation.

The beneficiary pays principle applies to urban transport finance. Beneficiaries of transport improvements fall into three categories: the public, transport users, and property owners and developers (Lari and others 2009). Governments assign different financial instruments to recover capital investment and service costs according to the characteristic of benefits received by each group and the timing of these benefits (table 2.2). LVC is the financial instrument highlighted to recover costs from property owners or developers by capturing increased land value attributable to transport infrastructure investment (and related efforts). As the land value increase is realized at the end of transport infrastructure construction, LVC is suitable to recover capital investment costs.

To show the roles of LVC instruments for transit and TOD-related investments, we apply the above transport finance framework to transit and TOD-related investment finance (table 2.3).

Based on the beneficiary pays principle, governments and transit agencies should first recover their investment and operation and maintenance costs from transit fares as user fees. However, transit fares are regulated because of their public nature. Fares alone rarely allow transit agencies to fully recover their capital investment and operation and maintenance costs, as fares are usually set at lower than the full cost recovery level to mitigate the externalities created by car users and to keep transit fares affordable.

Table 2.2 Application of the beneficiary pays principle to urban transport finance

<table>
<thead>
<tr>
<th>Beneficiary categories</th>
<th>Benefits of transport improvement</th>
<th>Financial instrument</th>
<th>Rationale for use</th>
<th>Cost recovery areaa</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public</td>
<td>Broad economic and social return, such as economic development and growth</td>
<td>Government’s general fund</td>
<td>Broad economic growth provides the base for general taxation</td>
<td>A</td>
</tr>
<tr>
<td>Transport users</td>
<td>Reduced travel time and costs; improved travel comfort and enhanced safety</td>
<td>Direct or indirect user charges</td>
<td>Benefit attributed to the users of transport facilities</td>
<td>B</td>
</tr>
<tr>
<td>Property owners and developers (restricted nonusers)</td>
<td>Increased property values</td>
<td>Various value capture or development charges</td>
<td>Benefits are land value increase due to public investments for transport</td>
<td>A, B</td>
</tr>
</tbody>
</table>

Source: Adapted from Lari and others (2009).

a. A implies principal, B secondary.
<table>
<thead>
<tr>
<th>Beneficiaries and bearers</th>
<th>Types of instruments</th>
<th>Instruments</th>
<th>Investment to be funded</th>
<th>Delivered typically by</th>
<th>Cases studied</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Transit</td>
<td>TOD Infra.</td>
<td></td>
</tr>
<tr>
<td>Public</td>
<td>Nonuser based general budget</td>
<td>General fund/tax</td>
<td>Y</td>
<td>Y</td>
<td>Government</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Y</td>
<td>Y</td>
<td>Government</td>
</tr>
<tr>
<td>Polluters</td>
<td>Charges</td>
<td>Environmental fees</td>
<td>Y</td>
<td>Y</td>
<td>Government</td>
</tr>
<tr>
<td>Car users</td>
<td>User-based fees</td>
<td>Fuel tax</td>
<td>Y</td>
<td>Y</td>
<td>Government</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Car registration fees</td>
<td>Y</td>
<td>Y</td>
<td>Government</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Parking fees</td>
<td>Y</td>
<td>Y</td>
<td>Government agencies</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Toll</td>
<td>Y</td>
<td>Y</td>
<td>Government agencies</td>
</tr>
<tr>
<td>Transit users</td>
<td></td>
<td>Fare</td>
<td>Y</td>
<td>N</td>
<td>Transit agencies</td>
</tr>
<tr>
<td>Property owners</td>
<td>Tax- and fee-based LVC</td>
<td>Property tax</td>
<td>Y</td>
<td>Y</td>
<td>Government</td>
</tr>
<tr>
<td>Property owners and developers</td>
<td>Betterment charges and special assessment</td>
<td>Y</td>
<td>Y</td>
<td>Government</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tax increment financing</td>
<td>Y</td>
<td>Y</td>
<td>Government</td>
</tr>
<tr>
<td>Property owners and developers</td>
<td>Charges</td>
<td>Exaction/impact fee</td>
<td>Y</td>
<td>Y</td>
<td>Government</td>
</tr>
<tr>
<td>Property owners and developers</td>
<td>Development-based LVC</td>
<td>Air rights sales</td>
<td>Y</td>
<td>Y</td>
<td>Government</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Land sales</td>
<td>Y</td>
<td>Y</td>
<td>Government transit agencies</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Development rights leases</td>
<td>Y</td>
<td>Y</td>
<td>Government transit agencies</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Joint development</td>
<td>Y</td>
<td>Y</td>
<td>Government transit agencies and private sector</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Land readjustment</td>
<td>Y</td>
<td>Y</td>
<td>Government transit agencies and private sector</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Urban redevelopment schemes</td>
<td>Y</td>
<td>Y</td>
<td>Government transit agencies and private sector</td>
</tr>
</tbody>
</table>

Note: LVC = land value capture; N = no; TOD = transit-oriented development; Y = yes. The table includes TOD under “supported investments,” with the idea that governments and their private partners can increase development-based LVC revenues by financing TOD-related investments due to the higher land value appreciation in station areas.
Governments have to fill public transit deficits by providing capital or operational subsidies from their general budget, based on the justification that transit provides broad economic and social benefits.4 Governments also transfer the tax and fee revenues generated from car users or environment fees to mitigate the car-use externalities. But as they find it hard to fill their deficits (given their fiscal constraints), they have looked to alternative sources, including development-based LVC, based on the beneficiary pays principle.

**Types of LVC Instruments**

Techniques similar to LVC have been practiced in many countries for a long time, some dating back to Roman times (Smolka 2013). The two major LVC categories are tax- and fee-based LVC and development-based LVC.

**Tax- and Fee-Based LVC Instruments**

*Land and property tax.* The oldest and most common form of a tax-based LVC instrument is land and property taxation. Most of these taxes are levied on the estimated value of land or of land and buildings combined. The distinction between solely taxing land and levying on land and buildings together has significant efficiency underpinnings. In theory, a land tax encourages high-density development, enhancing land use efficiency. Because urban land supply is relatively inelastic in the short run, taxing land will not alter the amount available for development but will take away the unearned land rent retained by landowners. Hence, many practitioners and analysts view land tax as a fiscal instrument that creates the least amount of distortions (or deadweight losses) to the market. Some have proposed a split-rate property tax that taxes land more heavily than buildings (England 2003). Despite these recommendations, the empirical evidence of the practicality and effectiveness of land or split-rate property tax is mixed (Dye and England 2011).

Most developed countries have property taxes, and their weight in municipal budgets varies greatly. In some Organisation for Economic Co-operation and Development countries like the United States, United Kingdom, and Japan, local governments rely heavily on property taxes to fund public expenditure—16–25 percent of local revenue comes from them. In many continental European cities, however, sales or value-added tax is far more important.

Property taxes in developing countries are not as advanced (Smoke 2008), partly because they require a good cadastral system and huge financial commitments to establish a computer system and training for tax assessment and enforcement. Most important, the notion of paying a property tax when property rights in some countries are not yet well defined presents a major challenge (Hong 2013). It is also because many local governments in developing countries still rely on central transfers to finance local spending,
giving officials little incentive to develop local fiscal bases (Bahl 2008). That said, many decentralization programs have led local governments to search for their own revenue sources.

**Betterment charges and special assessments.** These were introduced in the 1970s as a major LVC instrument in the United States and United Kingdom. For betterment charges, payments could be collected ex post, that is, after the construction of public infrastructure, or ex ante, as with, in Brazil, Certificates of Additional Construction Potential (see chapter 8). Betterment charges and special assessments are basically the same instrument—the term *special assessment* is used in the United States, while *betterment charges* or *levies* are used in other countries like the United Kingdom (or Colombia). By using this kind of surtax, governments attempt to require property owners who benefit directly from public investments to pay for their costs. Misczynski (2012) identifies the Mello-Roos Act in the United States as one such mechanism that has financed parks, open spaces, gymnasiums, swimming pools, landscaping, rail transit, and other public facilities. Special assessments allow tax-exempt status on government bonds to finance public services and infrastructure investments. Initial funding for the Los Angeles subway system came from special assessments on properties within a one-mile radius of downtown stations and a half-mile radius of other stations. This is considered to be LVC because public investment will increase property values.

The largest assessment district in the United States, encompassing nearly all of Los Angeles County and more than 2 million parcels, was created to fund parks and open space. The use of special assessments in California has not been problem-free, however. The rapid expansion of special assessment districts triggered the passage of Proposition 218 in 1996, which added new requirements for special assessments to the state’s constitution. It called for a more rigorous definition of and distinction between special and general benefits generated by projects financed by special assessments.

Owing to the ambiguity of the language in Proposition 218, special assessments are now subject to a wide range of interpretations. In some situations, it is almost impossible for public officials to deploy this instrument because they cannot adequately define and distinguish the special and general benefits of their proposed projects. In other cases, when the distinction can be made explicitly, special assessment projects have renewed legitimacy. Misczynski (2012) predicts that it will take much time and many lawsuits to define the range of permissible uses of special assessments in California.

A similar instrument, betterment levies, has been used in other countries in an attempt to capture as much as 30–60 percent of land value gains attributable to public investment from property owners (Peterson 2009). Public resistance to these extra levies on top of existing property taxes has made implementation difficult. The major challenge is to estimate the land value increments with precision. For instance, estimates of land value created by the extension of the London Underground’s Jubilee Line ranged
from £300 million ($484 million) to £2.7 billion ($4.4 billion), according to the commission report.

Colombia has for a long time had a betterment levy, contribucion de valorizacion (valorization contribution), for infrastructure investment. The levy is usually charged in proportion to the total capital investment and operating costs at the early stages of investment. When construction is completed, the levy rate is reset in proportion to the land value increments. Between 1980 and 1990, public opposition, chronic underestimation of investment costs, and high administrative expenses reduced the share of valorizacion revenue in the local government budget from 15 percent to 5 percent (Peterson 2009, 62). Yet a more recent study by Borrero and others (2011) found that revenues from betterment levies in Bogotá had increased from 7.7 percent of property tax collections in 2003 to 60.3 percent in 2008.

Tax increment financing (TIF). This is another tax-based mechanism that originated in California, in 1951, to encourage redevelopment of blighted areas. It is essentially a surtax on properties within an area to be redeveloped by public investment financed by municipal bonds. After a municipality has declared a qualified area a TIF district, assessment values of all dwellings within the district are frozen. Any future change in the assessed tax base is subject to an extra tax on top of the existing property tax. TIF collections are earmarked for servicing and repaying the municipal bonds issued against such expected increases in tax revenue. In Illinois, more than 500 TIF districts have been created since the inception of the technique.

To the authors’ knowledge, TIF is not widely used in developing countries, or the same name has not been used to describe similar LVC mechanisms outside the United States. This may be because TIF collections piggyback onto a property tax—an instrument not used effectively in developing countries for the reasons mentioned earlier.

A summing up. A general observation from practitioners and analysts of the tax- and fee-based instruments is that they lack a clear link between benefits and costs, which is particularly problematic for property taxation whose revenues are not necessarily tied to investment in infrastructure or social services for specific neighborhoods (or blocks) where the taxes are collected. This is one reason for their unpopularity. Although later instruments such as betterment levies and TIFs have tried to create a stronger cost-benefit link by defining more explicitly where revenues will be applied, there remains the problem of accurately estimating the cost of public goods provision. More important, in some cases, poor neighborhoods have challenged these practices on the grounds that the government provides public services only to areas where residents have the ability to pay taxes and fees. That said, tax- and fee-based LVC can still generate supplementary revenues to fund citywide infrastructure and social services.
Chapter 2: Theory of Land Value Capture and Its Instruments

Development-Based LVC Instruments

Development-based LVC approaches rely on one or more of public or private control over land and increment of land value by infrastructure investment, better site-level plans, and regulatory changes. The government, transit agency, or private investor will then capture the land value increment by either selling the serviced land or leasing the development or land use rights to other parties. They may invest directly in property development solely or in partnership with other parties. Being an investor or co-developer, the government, transit agency, or private investor can recoup some of the future increases in land value for further public infrastructure investment. As discussed in Part Two, Hong Kong SAR, China, and Tokyo have used this approach to finance the construction, operation, and maintenance costs of their urban rail transit systems. Some developing cities in China and India have also started to adapt development-based LVC instruments for their new metro systems, as introduced in Part Three.

Land sale or leasing. Governments can capture the land value increments created by public infrastructure investment or regulatory changes (such as floor area ratio and land use) by selling their public lands or lands acquired from private landowners to developers. The use of public land leasing to finance infrastructure investment has been extensively used in China (Peterson and Kaganova 2010). Rithmire (2013) argues that encouraging local governments to sell development rights to raise investment funds is a deliberate policy of the Chinese central government and an implicit strategy to encourage self-financing of local government expenditures. Unfortunately, the use of land lease revenue by local governments in China is sometimes unrestricted and not tied to any improvements of specific parcels of land (Anderson 2012). In addition, relying on leasing fees to finance municipal spending might create incentives for governments to convert rural land to urban use, thereby promoting sprawl in China. Lessees are required to pay the majority of the leasing fee up-front and sometimes an annual land rent through the term of the lease (Bourassa and Hong 2003).

Peterson (2009) states that lease revenues have been the primary source of highway infrastructure finance in the wealthier coastal provinces in China for the past 15–20 years. Yet this source of revenue has been exhausted, and municipalities must explore other means. Thus, for other municipalities that still depend on lease revenue to pay for local expenditures, governments should auction off land use rights instead of assigning them through negotiated contracts. This will ensure the transparency of the land leasing system and collect the highest possible leasehold charges through competitive bidding. Mandating the establishment of a land fund account in the municipal budget will help cities achieve this goal, with other fiscal reforms.

Land leasing is also practiced in India, as its public sector owns a lot of land. The Bandra-Kurla complex in India is a new business center in Mumbai that was created out of marshland by the Mumbai Metropolitan Development Authority (MMDA) in the 1990s. Covering 553 acres, the
Financing Transit-Oriented Development with Land Values

Site has been enormously successful as a new business location, housing the Bombay Stock Exchange and the majority of bank headquarters. Initially, the MMDA developed the site and collected proceeds from developers in the form of annual rents and development fees. In 2003, it changed the system in response to the added responsibility of building infrastructure. In 2006 and 2007, the MMDA auctioned 80-year leases on 13 hectares of land, raising $1.2 billion (five times the amount of annual infrastructure investment by Mumbai’s municipal authorities). The motivation for the switch to long-term land leasing was to fund ambitious infrastructure projects, including a new metro rail system and a 23-kilometer bridge spanning Mumbai’s harbor (Peterson and Kaganova 2010; Peterson 2009).

Joint development. As the name indicates, this is well-coordinated development of transport facilities (such as a transit station) and adjacent private property between public agencies and developers. Private developers usually contribute to the development by constructing a facility (such as a station) or financing a part or all of the constructions costs. Joint development is a development-based LVC instrument practiced in the United States, Japan, and elsewhere. In the United States, the joint development program of the Washington Area Transit Authority (WMATA) is one of the most successful, even though its contribution to WMATA’s annual operating revenues is small (less than 2 percent). According to WMATA: “Metro defines joint development as a creative program through which property interests owned and/or controlled by Metro are marketed to private developers with the objective of developing transit-oriented projects.”

Air rights sale. Development-based LVC can also be adopted in countries where land is publicly or privately owned. Market freehold lands are normally subjected to land use regulations, such as height and use restrictions. Any development rights beyond these legal limits are sometimes referred to as air rights. By relaxing land use controls, land value will increase, creating opportunities for the government to capture the economic benefit. In principle, exactions and planning gains discussed earlier are also based on a similar principle, but on an ad hoc basis. Thus, the basic idea has been practiced in many countries.

The best known air rights sales are in São Paulo, Brazil. The city government uses them, called Outorga Onerosa de Direito de Construir (Additional Building Charge; OODC) and Certificates of Additional Construction Potential (CEPACs), as LVC instruments to finance local infrastructure investment (see chapter 8). The OODC is applied to all city areas and the revenues go to the city’s Urban Development Fund, which finances urban infrastructure investments across the city. CEPACs are applicable only to designated urban areas (called Urban Operations), and their revenues should be used to finance predetermined urban infrastructure. CEPACs entail hybrid features of development-based LVC and tax- and fee-based LVC, as their selling prices consist of the price for air rights and for benefits to be generated from future infrastructure investments funded by CEPAC revenues.
A key impetus for the innovations in São Paulo was the need to avoid further debt financing. Blanco (2006) states that 70 percent of municipal debt in Brazil was attributed to São Paulo, and its net debt in 2004 was over twice as large as total revenue. The municipality has established three Urban Operations that are empowered with legislation and regulatory tools to enable LVC from private investments (Sandroni 2011; Biderman, Sandroni, and Smolka 2006; Smolka 2013). Density was increased from a floor area ratio of 1.0 to 2.0, and the newly created development rights were auctioned off to private developers, with the proceeds going to public infrastructure investment within the perimeter of the Urban Operation.

In New York City, the government has also tried to apply sales of air rights to direct high-density development and redevelopment, most often around major transit nodes. The approach is based on the city’s transferable development rights program that was originally designed for preserving historic buildings. Owners of such properties were prohibited from redeveloping them, and to compensate them, the government allowed them to transfer their unused development rights to other land parcels for high-density development. Recipients of the transferable development rights then paid owners for these rights at market value (see chapter 5).

A similar approach in the city was proposed (though not passed) to allow property owners to transfer their unused air rights to designated areas surrounding a major regional transit hub. New York City’s stated intent was to incentivize higher density, competitive land development potential to increase land value, thereby allowing the developer to use the financial gains to compensate the original owners of the transferred development rights and to defray a portion of the area’s station maintenance costs and pedestrian space reinvestments.

**Land readjustment.** Land readjustment originated in Germany, where supporting legal structures were enacted in 1902 (Hong and Needham 2007; Lozano-Gracia and others 2013). Since then it has been used extensively across East Asia; land readjustment was adopted by Japan and then the Republic of Korea and Taiwan, China. Typically, landowners pool their land for reconfiguring and upgrading and then receive a directly proportional amount (to their original contribution) of serviced land after the neighborhood is redeveloped (Sorensen 1999; Home 2007; Hong and Needham 2007; Lozano-Gracia and others 2013). During reconfiguring, a portion of land will be reserved for sale to private developers to raise funds to defray a portion of the redevelopment costs, capturing the benefits generated by the project.

In Taiwan, China, landowners contribute land according to a formula based on the expected appreciation in land value (Lozano-Gracia and others 2013). An important variation within that economy involves property owners contributing a combination of land and a share of development costs in return for rezoning their site to higher density (Zhao, Das, and Larson 2012).
Although one of the objectives of land readjustment is to self-finance land redevelopment, some projects still require public subsidies (Hong and Needham 2007). In Japan, for example, the government subsidized land readjustment projects that were related to urban regeneration and peri-urbanization if they could contribute to overall urban and regional development. In Japan land readjustment is also used to assemble lands for right of way for railways along with new town development (see chapter 4). The government of the Republic of Korea demanded land readjustment projects to be self-financing, thus pushing implementing agencies to increase the land contribution from owners. As building costs went up, some landowners who took part in land readjustment in the 1990s had to give up as much as 60 percent of their land, undermining their incentive to participate (Lee 2002).

The Indian Town Planning Schemes mandates landowners to give up as much as 50 percent of their land to the government during redevelopment—40 percent for infrastructure and 10 percent for social housing. The consolidated land is converted into new serviced plots and then returned to the original farmers who can then either sell to developers or retain for their own use. Landowners also pay half the infrastructure costs in the form of a betterment charge (Sanyal and Deuskar 2012).

**Urban redevelopment scheme.** This instrument is primarily used in Japan under the Urban Redevelopment Law (see chapter 4). Multiple property owners typically form an association to consolidate individual land parcels into a single developable site. Proposed redevelopment plans are sent to the local planning department, which then changes zoning codes and increases maximum floor area ratios in the target redevelopment district (typically around rail transit stations where the potential for commercial land use is high). The consolidated land is then used to build one or more high-rise buildings with new access roads and public open spaces. Through this process, the original owners and tenants are entitled to retain rights valued as equal to their original property; or, to speed up the redevelopment project for broader social purposes, a developer can temporarily assume all responsibility on behalf of all owners and tenants. The surplus floor area permitted is then sold to new property owners to partly cover the cost of land assembly and of public facilities within the district. This instrument is often used in redeveloping aging wooden-building districts that are vulnerable to fire hazards caused by earthquakes. The national government financially supports a third of the site survey, land assembly, and open-space-foundation costs using a national general fund and half of public infrastructure costs using a special roadway fund—if the redevelopment project meets the legal requirements.

The majority of literature on LVC concentrates on land value retention by governments; the importance of how to create value and then capture is thus implicit in the discussion. Land value creation is crucial because not only does it give government the legitimacy to recoup the increment, but it also brings the sustainability issues of this public finance approach into the picture (Hong 2013). Yet if the government keeps withdrawing
revenue without simultaneously creating value, the resource will eventually be depleted. Thus, combining TOD with LVC will provide much-needed balance.

**Other Land-Based Revenue-Generation Instruments**

Non-LVC instruments include exaction or impact fees—incremental charges for new entrants to land markets that aim to cover the costs needed to expand infrastructure and services to accommodate new growth so as to maintain some predefined level of services. They focus on cost recovery, not value recoupment.

Such fees require developers to build public infrastructure or facilities (or to set aside land for these purposes) as a condition of getting development approval (Peterson 2009). It is fee-based because developers can also pay the government an equivalent amount of money for fulfilling the requirement (Altshuler, Gómez-Ibáñez, and Howitt 1993). The logic behind this approach is that as new development will increase demand for local infrastructure and social services, it must pay for the added capacity.

Exactions were introduced in the 1920s when suburban development outside U.S. cities resulted in the need for dedicated space for public facilities. Development of agricultural land into urban subdivisions required streets, sewers, water, electricity, schools, and parks. Developers were asked to contribute land to build these facilities inside subdivisions. In Brazil, developers of large-scale housing developments are required to build the corresponding community infrastructure.

In the 1970s, legal limits on property taxation and decreasing support from the U.S. federal government prompted municipalities to seek new tools (Frank and Rhodes 1987). In Portland, Oregon, and Austin and Fort Worth, Texas, developers were required to contribute, for the construction of public facilities, five acres of land per 1,000 additional residents (or pay $200,000–$1 million per 1,000 residents) brought into the city by their development. In Portland, the exaction was also known as a system development charge that allowed the city to issue bonds up front to buy land for parks and then use development fees to repay the debt. Despite their popularity, the main issue with exactions is accurately estimating the land contribution or an equivalent fee that matches infrastructure’s future demands.

**Conclusion**

All LVC instruments share the common goal of capitalizing on land value increments generated by public and community actions to finance public goods. It is an attractive idea because of the perceived efficiency and fairness.

Although tax- and fee-based LVC instruments are common, they lack a clear cost-benefit link, and payers do not always know how their payments are used or whether the money will be spent on the type of public goods they desire. This generates public resistance to them, and realistically the
amount collected is normally insufficient to cover the costs of major infrastructure development such as a metro. That said, these LVC instruments remain important to finance citywide local infrastructure and services such as local streets and roads, water and sewer systems, fire protection and crime prevention, public health, and education.

For financing major urban transit projects, development-based LVC instruments are useful. They rely on the sale of land or leasing of development rights in the hands of the state, including land assembled from that owned by private landholders. Having publicly owned land will not be enough to adopt development-based LVC instruments. The government needs to enhance land value before recapturing the increment for public investment, an approach that will help create public acceptance by establishing a clearer link between value creation and capture. With transit, the government or transit agencies can enhance land value in pursuing TOD principles. They can also capture benefits of the recurrent revenues from the property-related revenues in TOD areas, as well as the increased ridership.

More important, land value creation requires good urban governance and institutional capacities. Cities need open and efficient land management, technical knowledge and expertise, private sector investment, a well-designed master plan, and an effective monitoring mechanism. All are crucial for facilitating LVC through public-private partnerships in integrating transport investments with land development and management.

Opportunities for LVC are market driven. When the real estate market is in a downturn, the required motivation for private property investment may be absent. In the face of rapid urbanization, public infrastructure investment cannot wait for the market to recover. Thus, relying totally on the development-based LVC instruments to generate funds to finance public goods is nonviable. Local governments need to have alternative sources of financing, including other forms of public-private partnerships and transfers or subsidies from higher levels of government.

Local governments may also explore other LVC instruments to recoup part of the future land value increments or may create land value by assembling private lands whose value has not yet been fully explored due to the lack of public investment or outdated land use regulations (or both).

In short, well-designed development-based LVC can be a powerful strategic financing and planning apparatus for transit and TOD-related investments.

Notes
1. In this section, the terms property value and land value are used interchangeably because most empirical studies use property values based on real estate transactions, as it is hard to separate land values and building values.
2. Agglomeration economies, in general, address increases in economic productivity of workers, firms, and/or cities, as a result of higher density of economic and social activities, which can be explained by various locational advantages such as (1) sharing production inputs, (2) sharing infrastructure, (3) sharing consumer services and amenities, (4) matching labor pools to job opportunities, (5) matching firms in production processes, and (6) capturing knowledge spillovers through face-to-face communications (Cervero et al. 1998; Chatman and Noland 2011). Some of these explanations may be strongly related to accessibility benefits, while others may not. Thus the “net” external economic benefit of transportation investment alone is often questionable.

3. A few exceptions focus on middle-income countries, including Gu and Zheng (2008), Yankaya (2004), and Rodríguez and Mojica (2008).

4. To prevent operational inefficiencies among transit agencies, local governments should provide operating subsidies to their transit companies to compensate, primarily, for fiscal losses attributable to regulatory requirements, such as serving remote areas, ensuring late-night and early morning services, and ensuring affordable transit tariffs.


References


PART II
Lessons Learned from Global Development-Based Land Value Capture Practices
CHAPTER 3

Rail Plus Property Program,
Hong Kong SAR, China

Hong Kong SAR, China, is one of the few Asian global cities whose rail transit generates a substantial operating profit. The transit also productively sustains the world’s densest urban form. These successes are due to the Rail Plus Property program run by MTR Corporation Limited. This semiprivate railway entity applies the value capture mechanism to recoup the costs of transit investment, operation, and maintenance, using development rights of publicly owned land and leasing some sites (above/around the stations and depots of new railway lines) granted by the government, working with private developers. Consequently, more than half of all MTR Corporation’s income comes from activities in large property development and long-term asset management. Globally, the story of the city’s Rail Plus Property value capture model seems unique, combining a state leasehold system, extreme urban density, entrepreneurial city authorities and transit agency, a solid legal framework, and well-established operating procedures. Yet other entrepreneurial cities can apply the model, with adjustments, allowing their planning departments and transit agencies to manage land supply and site design—particularly those with a large amount of public land under strong planning controls and legal systems.

Urban Development Context

Hong Kong SAR, China, the “Pearl of Asia,” has been a world-class finance, business services, and tourism hub of East and Southeast Asia since the oil crises of the 1970s. The laissez-faire British colony first developed during the 1950s and 1960s along its waterfronts and later with harbor reclamations and landfills, having extraordinary floor area ratios (FARs) of up to 20:1. The emergence of white-collar jobs and middle-income households called for drastic urban renewal and massive new town development programs during the 1980s (Bristow 1984). Yet the 1984 Joint Declaration between the governments of the United Kingdom and China limited the
supply of new land up to 50 hectares a year, while the city’s urban development in the 1980s and 1990s was subject to the speculative pressures of private developers along with mega-scale infrastructure works, such as rail transit development and international airport relocation projects (Dimitriou and Cook 1998).

Once sovereignty was returned to China in 1997, some socio-spatial integration between Hong Kong SAR, China, and mainland China was likely. Given its unique geographic advantage for increasing cross-border business, the city now has more than 7.1 million residents and continues to attract Chinese and other Asian immigrants to the limited areas of Hong Kong Island, the Kowloon Peninsula, and the New Territories and Islands.

The population is projected to reach 8.6 million by 2026, growing slightly faster than the roughly 0.5 percent a year of the past decade (figure 3.1), though the rising trend in moving to or from the rest of the country will increase uncertainties in projecting population growth and urbanization patterns (HKSAR Census and Statistics Department 2012).

Despite the increased pressures on land development, built-up areas are still less than 25 percent of the entire territory. The “Garden City” concept was introduced by the Abercrombie Report in postwar 1948, which fed into a series of Territorial Development Strategies for using scarce land resources to meet competing demands: housing, commercial, transport, recreation, nature conservation, heritage preservation, and other community needs. Its careful urban planning and land management have allowed the city to be one of the most densely populated in the world, with 16,020

Figure 3.1 Population trends and projections, Hong Kong SAR, China, 1950–2025

Source: Data from UN 2012.
people per square kilometer in Hong Kong Island and 45,730 per square kilometer in Kowloon (HKSAR Census and Statistics Department 2013) (map 3.1). These are extremely favorable conditions in which to profitably run combined railway and property projects.

Hong Kong SAR, China’s, policymakers and town planners have consistently embraced the symbiotic relationship between mass transit railway investments and urban development throughout a series of Territorial Development Strategies (HKSAR Planning Department 2013). Early mass transit railway lines were sited in the dense, built-up parts of the city, since this was where the majority of passengers resided. As residential development spread outwards into the New Territories, mass transit railway investments were viewed as a way of forming a “backbone” of the territorial development that channels key commercial centers, the Hong Kong International Airport, recreational areas, and new towns. In more recent years, railways have also served as critical catalysts for urban regeneration and regional integration, public housing, open spaces, and community facilities on former brownfield and cross-border sites.
About 12 million passenger journeys are made every day on the city’s public transport system, including railways, trams, buses, minibuses, taxis, and ferries. Mass Transit Railway is expected to become the major passenger mode, handling up to 50 percent of total public transport patronage by 2016. In contrast, there are only about 443,000 licensed private cars, or 62 vehicles per 1,000 residents—much fewer than in cities in the developed world, due in large part to the high costs of owning a private car (HKSAR Transport Department 2013; Dimitriou and Cook 1998). The urban geography also makes it increasingly difficult to supply additional road capacity in the built-up areas, whereas demand for cross-harbor and cross-border movements has increased in recent years.

**Regulatory and Institutional Framework**

**Urban Planning System**

The statutory planning system in Hong Kong SAR, China, is mainly concerned with two types of detailed plans: outline zoning plans and development permission area plans, as a temporary measure for certain nonurban areas. Both types are prepared by the Planning Department for the Town Planning Board to decide whether to approve applications. The legal duty of the board and its members is to act in the most beneficial way for the health, safety, convenience, and general welfare of the community by representing diverse professions, expertise, and community interests (Civic Exchange 2006).

There are also special categories. Development scheme plans prepared by the Urban Renewal Authority are for redeveloping old areas. In contrast, comprehensive development area (CDA) zones are introduced by the Town Planning Board when it wants to encourage a comprehensive approach to the urban design and development of an area, typically involving multiple land parcels and property owners, and including public open space and local community facilities. (They are applied, for example, to mixed-use property developments around many Mass Transit Railway stations.)

The Planning Department has created Hong Kong Planning Standards and Guidelines to ensure that land use will facilitate social and economic development and provide public facilities. They stipulate measures relating to, for instance, residential densities, community facilities, recreational facilities, open and green space, industrial land, retail facilities, utility services, internal transport facilities, environmental planning, conservation, and urban design guidelines. A range of FARs guides development density in public and private residential areas (table 3.1). The highest density zone for residential development, “R1,” is designated to key districts well served by high-capacity public transport facilities, such as mass railway transit stations and other major bus interchanges (see map 3.1).
Land Administration System

The city’s land law is unique largely due to its colonial heritage. The leasehold system inherited many aspects of English land law. Technically, the king or queen of England holds all land, and as this philosophy was extended to the colonies, the only tenure in Hong Kong was leasehold, except for the site of St. John’s Cathedral in Central, the only freehold land in Hong Kong (Goo 2009). This land tenure concept continued even after the return of sovereignty to China—which has its own “state leasehold system”—meaning that all lands within the territories of Hong Kong SAR, China, are now state property. The government of Hong Kong SAR, China, is responsible for their management, use, and development and for their lease or grant to individuals, legal persons, or organizations for use or development under the Basic Law passed by China in 1990.

In accord with current land administrative law, land parcels are generally leased for 50 years at a premium and subject to an annual rent payment equivalent to 3 percent of the ratable value of the property starting from the date of the land grant, adjusted in step with any changes in the ratable value. Leases not containing a right of renewal are extended for 50 years without payment of an additional premium, though an annual rent is charged from the date of extension equivalent to 3 percent of the property’s ratable value, adjusted in step with any change in the ratable value thereafter. However, when land that is not efficiently used is needed for public purposes, it is reasonable to expect that the government of Hong Kong SAR, China, will not renew the lease.

Table 3.1 Maximum domestic floor area ratios for Metroplan area and new towns

<table>
<thead>
<tr>
<th>Territorial category</th>
<th>Zone</th>
<th>Area</th>
<th>Location</th>
<th>Maximum FAR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metroplan area</td>
<td>R1</td>
<td>Existing development areas</td>
<td>Hong Kong Island</td>
<td>8.0/9.0/10.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Kowloon and New Kowloon</td>
<td>7.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Tsuen Wan, Kwai Chung, and Tsing Yi</td>
<td>8.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>New development areas and CDAs</td>
<td></td>
<td>6.5</td>
</tr>
<tr>
<td></td>
<td>R2</td>
<td></td>
<td></td>
<td>5.0</td>
</tr>
<tr>
<td></td>
<td>R3</td>
<td></td>
<td></td>
<td>3.0</td>
</tr>
<tr>
<td>New towns</td>
<td>R1</td>
<td></td>
<td></td>
<td>8.0</td>
</tr>
<tr>
<td></td>
<td>R2</td>
<td></td>
<td></td>
<td>5.0</td>
</tr>
<tr>
<td></td>
<td>R3</td>
<td></td>
<td></td>
<td>3.0</td>
</tr>
<tr>
<td></td>
<td>R4</td>
<td></td>
<td></td>
<td>0.4</td>
</tr>
</tbody>
</table>

Source: HKSAR Planning Department 2011.
Note: CDA = comprehensive development area; FAR = floor area ratio.
The Lands Department is in a strong negotiating position in land transactions and related development activities across all territories. The department auctions off or tenders out public land to private developers. Developers, in turn, bid to lease land so as to obtain the right to develop and sell to end-users. However, the highest bidder is not guaranteed the lease; developers must comply with the conditions of sale before acquiring the right to develop. Land leases stipulate the obligations and duties of the owner as well as the requirements related to town planning, civil engineering, and urban development (Nissim 2012; Hui 2004). Lease conditions typically include the following: lease term; permitted uses; maximum building heights; minimum and maximum gross floor area; maximum permitted site coverage; building covenant; deeds of mutual covenant; master layout plan requirements; design, disposition, and height limitations; car parking, loading, and unloading requirements; restrictions on vehicle ingress and egress; landscaping and environmental requirements; recreational facilities; and other site-specific conditions.

Two types of covenant—building covenant and deeds of mutual covenant—are important safeguards against speculative land investment and inappropriate asset management. A building covenant is set up to ensure that the site is developed with an acceptable amount of floor space within a reasonable time. The volume of floor space generally required to fulfill this condition is 60 percent of the maximum floor space permitted to be built; the time frame is usually 48 months. If at the end of the building covenant period there has been no progress, the government can exercise its right to reclaim the site without making any compensation. A deed of mutual covenant is placed to ensure a fair balance between the interests of all public and private parties, including future purchasers, over the responsibilities and costs for the long-term management of properties. This action is most common for complex mixed-use developments with commercial floors in the podium and residential or office floors above.

Funding sources for public infrastructure and services have been revenue from land leasing practices, accounting for nearly 20 percent of the income of the government of Hong Kong SAR, China. The state leasehold system has essentially four value capture mechanisms: initial land auctioning, contract modification, lease renewal, and collection of land rent. The government has relied heavily on initial auctioning to capture increased land value (accounting for about 75 percent of total lease revenues) because the costs of delineating, negotiating, and enforcing the parties’ rights to benefit from land at the auctions (the transaction costs of land leasing expected) are the lowest among the four value capture mechanisms (Hong 1998).

Rapid disposition of low-value land parcels cannot generate strong public revenues, as regulating developable land supply would escalate land prices. When property market prices in the city become too high, the government requires purchasers to pay stamp duty on property transactions to prevent speculation (Hui, Ho, and Ho 2004). The ad valorem stamp duty rates announced on February 22, 2013, range from 1.5 percent to 8.5 percent based on the property value (HKSAR Inland Revenue Department 2013).
MTR Corporation

The Mass Transit Railway (MTR) Corporation was established in 1975 as a government-owned enterprise to build, operate, and maintain a mass transit railway system for Hong Kong SAR, China’s public transport needs and to conduct its business according to prudent commercial principles (Dimitriou and Cook 1998). Through the 1980s and 1990s, the government was its sole owner. In 2000, it was succeeded by the MTR Corporation Limited and about 23 percent of its shares were offered to private investors on the Hong Kong Stock Exchange. The presence of private shareholders has exerted a strong market discipline on MTR Corporation, prompting company managers to become more business-minded (Cervero and Murakami 2009).

MTR Corporation was one of two rail agencies that served the city, the other being the Kowloon-Canton Railway Corporation (KCRC) fully owned by the government of Hong Kong SAR, China. In December 2007, the company began to operate KCRC’s railway system under a concession agreement with the government, generally called the “Rail Merger.” The merged 218.2-kilometer rail network consists of 10 railway lines with 84 stations serving Hong Kong Island, Kowloon, and the New Territories. A light rail network with 68 stops covers the districts of Tuen Mun and Yuen Long in the New Territories. The MTR Corporation network also includes the Airport Express, which runs between the Hong Kong International Airport and AsiaWorld-Expo in Chek Lap Kok Island, the International Commerce Centre in Kowloon, and the International Finance Centre in Central (map 3.2).

MTR Corporation’s chief mission is to construct, operate, and maintain a modern, safe, reliable, and efficient mass transit railway system. Supplemented by a competitive service performance of buses and private vehicles, the integrated network carried about 4.12 million passenger trips a day in 2012 (HKSAR Transport and Housing Bureau 2012b). MTR Corporation’s share of the franchised public transport market in Hong Kong SAR, China, was 46.4 percent that year. Its share of cross-harbor traffic was 66.7 percent and of cross-boundary traffic 54.2 percent. It kept its share to and from the international airport at 21.8 percent. As a result of the high ridership and efficient operations, the company generated a net operating profit of HK$6.694 billion (US$869 million) from its transit operation and achieved farebox recovery of 185.5 percent for 2012 (MTR Corporation 2013). These are outstanding figures when compared to other world-class metro systems’ operating performance.

Relations with the Government of Hong Kong SAR, China

The government is the majority owner of about 77 percent of the issued MTR Corporation shares under the control of the financial secretary, permitting it to pass special resolutions (which require at least 75 percent of the shares) at MTR Corporation’s general meetings, while it can pass ordinary resolutions on its own with a majority (at least 50 percent of the shares) under the law. MTR Corporation has the power to appoint persons to the board by ordinary resolution—in other words, the government can
determine board members on its own. The government can appoint the chairman of MTR Corporation with the majority of the votes, while the chief executive of Hong Kong SAR, China, may appoint and remove additional directors of the company under the MTR Ordinance (MTR Corporation 2007).

Due to the public-private nature of its railway and related businesses, the interests of MTR Corporation and its subsidiaries may conflict with those of the government on, for example, railway construction or public land grants and leases. For this reason, the Hong Kong Stock Exchange granted the company a special waiver not to be strictly in compliance with the rules applicable to commercial entities for those transactions involving the government (MTR Corporation 2007).

Before the Rail Merger of 2007, the Legislative Council Panel on Transport formed a subcommittee to oversee matters on integrated railways. One of the most important issues is whether the proposed funding arrangements
for new railway projects are appropriate and whether passengers can enjoy a reasonably priced and efficient transit service. The subcommittee has examined forms of funding for railway construction projects in detail, as now discussed.

**Land Value Capture (LVC)**

**Funding Arrangements for MTR Corporation**

Just like many other metro projects, MTR line construction in the 1970s and 1980s was capital intensive and required substantial funding. With high-grade ratings in the international capital markets, MTR Corporation attracted private financiers. Yet it was still important for the government to cover and even cut some of the company’s project costs without raising fares by arranging government land grants for rail and property development. The basic rule applied in Hong Kong SAR, China, is that the government grants MTR Corporation a “running line lease” at a nominal charge for use of the land to develop railway infrastructure, such as stations and track. Railway depot sites are granted to the company as a normal land grant, and land premium is charged on the basis of industrial use, as railway maintenance is regarded as an industrial activity. When the railway depot site is also used for property development, an extra land premium is paid for property development rights. Indeed it was the government, with an equity holding of HK$800 million, that granted the assembled rights of way for lines, stations, and depots and sold the development rights of sites above the new stations and depots to MTR Corporation to build the Kwun Tong line within the original financial limit of HK$5 billion (Dimitriou and Cook 1998).

By 1983, however, MTR Corporation’s capital costs had already reached HK$10 billion for 26 kilometers of both the Kwun Tong and Tsuen Wan lines, with 25 stations. Additionally, it had submitted the new Island Line proposals (previously approved in 1980), at an estimated cost of HK$7.1 billion. While the construction was successful, it had accumulated debts of HK$18.7 billion by 1985. Nevertheless, from 1986 it turned back into an efficient borrower in the capital markets due to its low interest rates, increasing fare revenue, and property development earnings (Dimitriou and Cook 1998; Strandberg 1989).

In the early 1990s the Hong Kong Airport Core Program was set out as a series of infrastructure projects (at a total cost of HK$160.2 billion) along with the relocation of the airport from Kai Tak to North Lantau. Beginning in the late 1990s when MTR Corporation began pursuing 15 property development packages along the Airport Express Line, the net yields provided crucial income in achieving commercial returns on this new line and in financing the subsequent Tseung Kwan O extension. It took about 10 years to pay off the debt for the Airport Express project. From 2007, property development earnings have produced capital funds that no longer go
to paying off this debt, allowing them to be used to cover the project costs of Tseung Kwan O and other extensions (Cervero and Murakami 2009).

After the rail merger, new rail construction projects could be categorized into two: natural extension and non-natural extension of mass transit railway. The government of Hong Kong SAR, China, usually arranges new projects for natural extension based on the ownership approach and for non-natural extension on the ownership or the concession approach. Under the ownership approach, MTR Corporation is responsible for design, finance, construction, operation, and maintenance of the rail project and ultimately owns the line. Under the concession approach, the government (or KCRC) is responsible for funding the new railway’s infrastructure while MTR Corporation pays service concession fees for the right to operate the railway (HKSAR Legislative Council 2008).

The government initially discusses the appropriateness of providing capital grants or property development rights to MTR Corporation—a profit-oriented organization undertaking a nongovernment project—on the basis of the ownership approach. The granting of property development rights is a way to fill the funding gap of new rail construction that could not be recovered by future operating revenues. When a new rail project with property development rights is financially nonviable (due in large part to the lack of developable sites along the lines), the government considers providing capital grants to MTR Corporation, given the expected large social and economic benefits (HKSAR Legislative Council 2008).

In 2013, five new railway projects were under construction: South Island Line–East (SIL-E), Kwun Tong Line Extension (KTE), West Island Line (WIL), the Hong Kong Section of Guangzhou-Shenzhen-Hong Kong Express Rail Link (XRL), and the Shatin to Central Link (SCL) (HKSAR Transport and Housing Bureau 2012b). The form of funding for each project is assessed case by case (table 3.2).

A railway project is considered not financially viable if its net present value for a 50-year period falls short of the expected return on capital,
which is the weighted average cost of capital plus 1–3 percent with MTR Corporation. This shortfall is the funding gap. Independent consultants usually review the estimated cost and revenue for new railway projects prepared by MTR Corporation. The company has proposed current project contingencies to be 13 percent of the estimated capital costs based on unforeseen additional expenditures on past railway projects in Hong Kong SAR, China, which ranged from 12 percent to 25 percent of the tendered prices. To safeguard the public interest from project risks, any excessive capital grant will be reimbursed to the government, with interest (the clawback mechanism) (HKSAR Legislative Council 2009).

**Rail Plus Property**

Rail Plus Property (R+P) development is a core part of MTR Corporation’s business model, capturing real estate income to finance the capital and running costs of new railway lines as well as higher rail transit patronage from the high-quality catchment areas created and managed by the company.

The basic mechanism for capturing MTR Corporation’s added (land) value is through public-private transactions and partnerships. Originally, because the government owns all land in the territory, private developers usually bought 50-year leases that granted property development rights through public auctions/tenders. Under the R+P program, however, the government exclusively grants to MTR Corporation development rights over the land above and around new stations and depots at the full market value “without the presence” of the new rail line (the “before-rail” market price). With several land lease conditions, MTR Corporation uses these rights to partner with developers (selected from a list of qualified bidders) based on the full market value “with the presence” of the new rail line (the “after-rail” market price). The difference of MTR Corporation’s share of development profits between the before- and after-rail prices needs to be enough to bridge the funding gaps estimated by the company and by external project assessors (figure 3.2). It does not sell development rights to other private developers but instead partners with property developers. It remains in full control of the land and sells the completed units. This mechanism is fundamentally different from other LVC models, which sell off development rights of public land to private developers and subsequently lose control over the land, as has happened to some rail companies elsewhere in the world.

Although entitled to capture the land value added by R+P, MTR Corporation has never been the sole beneficiary of R+P. Society has also reaped substantial rewards through this financial approach: from 1980 to 2005, the government received an estimated HK$140 billion in net financial returns (nominal value). This is based on the difference between earned income (HK$171.8 billion from land premiums, market capitalization, shareholder cash dividends, and initial public offer proceeds) and the value of injected equity capital (HK$32.2 billion).

From 2000 to 2012, property developments produced more than 38 percent of MTR Corporation’s net income, transit operations 34 percent,
and station commercial and property management businesses about 28 percent (figure 3.3). Property-related recurring income needs to grow to keep up with the increasing costs of long-term rail-related infrastructure maintenance.

MTR Corporation’s formula for property business is based on minimizing direct risks in property development projects, reducing the company’s exposure to the real estate market and its related risks. For their part, developers must cover all development costs (such as land premiums, construction and enabling work costs, marketing and sales expenses, professional fees, finance charges, and others) and cope with all project risks.

MTR Corporation negotiates with developers to derive benefits from the property developments through sharing profits in agreed proportions from the sale or lease of the properties (after deducting development costs), sharing assets in kind, or receiving up-front payments from the developers, taken case by case.

In the R+P model, MTR Corporation is the “master planner and designer” to align the interests of multiple stakeholders in different project phases. It prepares a development layout plan, resolves all interfaces with rail stations, takes care of tendering land parcels, acts as a liaison between the government and developers, monitors development quality and the sale of completed properties, and manages properties after completion. For
private developers, the rules of the game are very clear at the outset, which eases uncertainties.

While many properties are high-rise towers above MTR station podiums, the R+P model is not a “cookie-cutter” approach to making the cityscape transit supportive. Indeed, the development parameters of R+P (such as area size, building densities, floor uses, and site designs) vary from place to place, essentially depending on the city’s urban planning and market demands. FARs of at least 4.0 (as observed in recent MTR Corporation projects) are generally viewed as necessary if R+P is to be financially viable; however, MTR Corporation’s actual site coordination remains flexible by covering large R+P sites with the CDA zone. In addition, the design principle of R+P has changed by generations: newer development packages since the late 1990s have practiced the design concepts of transit-oriented development—high-density, mixed-use, and pedestrian-friendly—in a more physically comprehensive manner than seen in the 1980s (figure 3.4).

The evolution of the physical typology and R+P practices highlights how MTR Corporation’s objective of LVC has shifted from supplemental
finance on small and simple towers in limited land plots toward sustainable finance and urbanism with large and complex packages, as seen in the next section. These later practices have greater synergistic impacts on the transit ridership bonus as well as on property price premiums throughout extensive station catchment areas (Cervero and Murakami 2009).

**Development Cases**

To show the above practices as applied to R+P projects since the 1980s, this section discusses four cases. Each presents its own financial, ownership, and responsibility arrangements between public and private entities.

**Case 1: Tin Hau Station, Island Line**

High-rise residential towers on small sites loom over Island Line, built in the 1980s. The Tin Hau station’s R+P practice is a typical case, producing a FAR above 14:1 on a smaller than 0.6 hectare site in the built-up area (table 3.3). Completed in 1989, this property development is among MTR Corporation’s earliest R+P project portfolios. It has ample provision for car parking and bus connections, though the somewhat imposing scale of these
intermodal facilities detracts from the pedestrian environment. The surrounding neighborhood consists mainly of residential towers and an aging retail district, though the two towers on the top of the Tin Hau Station are a little isolated in the old streetscape (photo 3.1). In sum, Tin Hau’s R+P was designed for a small site, mainly for financial objectives and with modest attention to the station catchment area’s quality.

**Table 3.3 Tin Hau Station’s rail plus property parameters**

<table>
<thead>
<tr>
<th>Completion</th>
<th>1989</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distance to central business district</td>
<td>4.6 km (Hong Kong Island)</td>
</tr>
<tr>
<td>Site area</td>
<td>0.58 ha</td>
</tr>
<tr>
<td>FAR</td>
<td>14.4</td>
</tr>
<tr>
<td>Floor area use</td>
<td>Residential: 61,000 sq. m. (72.9%) Retail: 3,700 sq. m. (4.4%) Other: 19,000 sq. m. (22.7%)</td>
</tr>
<tr>
<td>Car parking</td>
<td>650 spaces</td>
</tr>
<tr>
<td>Cost and profit sharing</td>
<td>Developer paid land premium and development cost; investment return split by end-profit sharing</td>
</tr>
</tbody>
</table>

*Note: FAR = floor area ratio; km = kilometer; ha = hectare; sq. m. = square meter.*

**Photo 3.1 Tin Hau’s rail plus property residential towers in the urban neighborhood of Hong Kong Island**

Case 2: Tung Chung Station, Tung Chung Line

This station, a core part of Tung Chung New Town, is the gateway community to nearby Hong Kong International Airport, constructed with the rail lines in the 1990s. The station’s R+P project was arranged at a fundamentally different scale than most of its predecessors designed in the 1980s. Occupying a 21.7-hectare parcel, Tung Chung was conceptualized around the design principles of transit-oriented development 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. Several hundred meters from the station is an arc of residential towers with 30-plus stories, connected to the town center and amenity podiums by a network of elevated walkways and footbridges separated from car traffic. On exiting the station, MTR users are greeted by a spacious civic square dotted with public amenities (table 3.4, map 3.3, and photo 3.2), rather than being overwhelmed by high-rise towers, as so often happens in the denser parts of Hong Kong Island and Kowloon. Due to its site scale, the project was divided into three packages among 11 developers.

Case 3: Kowloon Station, Airport Express

Opened as a key intermediate terminus of the Airport Express in 1998, the Kowloon Station case shows that R+P with the principles of transit-oriented development need not be limited to greenfield projects. On reclaimed land in West Kowloon, the distinctive R+P packages that integrate the 118-story International Commerce Centre with residential and retail complexes on the

<table>
<thead>
<tr>
<th>Table 3.4 Tung Chung Station’s rail plus property parameters</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Completion</strong></td>
</tr>
<tr>
<td>Distance to central business district</td>
</tr>
<tr>
<td>Site area</td>
</tr>
<tr>
<td>FAR</td>
</tr>
</tbody>
</table>
| Floor area use | Residential: 935,910 sq. m. (90.8%)  
Office: 14,999 sq. m. (1.5%)  
Retail: 55,862 sq. m. (5.4%)  
Hotel: 22,000 sq. m. (2.1%)  
Other: 2,063 sq. m. (0.2%) |
| Car parking | 3,869 spaces |
| Project phase | 3 packages |
| Developers | 11 developers |
| Cost and profit sharing | Developers paid land premium and development cost; investment return split by both up-front profit and end-profit sharing |

*Note: FAR = floor area ratio; ha = hectares; km = kilometers; sq. m. = square meter.*
Map 3.3 Tung Chung’s master layout plan: Integrating MTR station, properties, pedestrian network, and amenity podiums in the comprehensive development area

Source: Data from Cervero and Murakami 2009. 
Note: MTR = Mass Transit Railway.

Photo 3.2 Pleasant public place of Tung Chung Station

Kowloon Station net out at a moderate FAR of 8.1 within a 13.5-hectare CDA zone (table 3.5). Built as part of a city-led waterfront redevelopment initiative, the station area plan contains a generous amount of public open space and cultural and entertainment facilities, coordinated with the government and private developers. The intermodal vehicle facilities and pedestrian circulation systems are well integrated within the podium development, offering seamless travel services (figure 3.5). However, this podium design has disengaged station area activities from the surrounding context with a high blank-wall ratio (about 89 percent) and has limited ground-level integration and interaction with neighboring districts in West Kowloon. Due to its vertical multiplicity, engineering complexity, and market conditions, this R+P project was divided into seven components and completed with 13 developers phase by phase from 1998 to 2010.

Case 4: Wong Chuk Hang Station, South Island Line–East (SIL-E)

The latest R+P concept can be seen at the ongoing SIL-E project, a new rail corridor running from north to south of Hong Kong Island through the Wong Chuk Hang area. Under the ownership approach, MTR Corporation is responsible for the finance, design, construction, operation, and maintenance of the new line, though a development right grant was required to bridge the funding gap of HK$9.9 billion. In May 2011, the Chief Executive of Hong Kong SAR, China, ordered that approval should be given to

Table 3.5 Kowloon Station’s rail plus property station parameters

<table>
<thead>
<tr>
<th>Completion</th>
<th>1998–2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distance to central business district</td>
<td>2.6 km (Kowloon Peninsula)</td>
</tr>
<tr>
<td>Site area</td>
<td>13.5 ha</td>
</tr>
<tr>
<td>FAR</td>
<td>8.1</td>
</tr>
<tr>
<td>Floor area use</td>
<td></td>
</tr>
<tr>
<td>Residential: 608,026 sq. m. (55.5%)</td>
<td></td>
</tr>
<tr>
<td>Hotel/serviced apartments: 231,778 sq. m. (21.1%)</td>
<td></td>
</tr>
<tr>
<td>Retail: 82,750 sq. m. (7.5%)</td>
<td></td>
</tr>
<tr>
<td>Hotel: 167,472 sq. m. (15.3%)</td>
<td></td>
</tr>
<tr>
<td>Other: 6,163 sq. m. (0.6%)</td>
<td></td>
</tr>
<tr>
<td>Car parking</td>
<td>5,621 spaces</td>
</tr>
<tr>
<td>Project phase</td>
<td>7 packages</td>
</tr>
<tr>
<td>Developers</td>
<td>13</td>
</tr>
<tr>
<td>Cost and profit sharing</td>
<td>• Developers paid land premium and development cost</td>
</tr>
<tr>
<td></td>
<td>• Investment return split by both upfront profit and end-profit sharing</td>
</tr>
<tr>
<td></td>
<td>• In-kind profit sharing (MTR owns 81% of the shopping mall)</td>
</tr>
</tbody>
</table>

Note: FAR = floor area ratio; ha = hectares; km = kilometers; sq. m. = square meter.
grant MTR Corporation development rights to the ex-Wong Chuk Hang Estate site (HKSAR Transport and Housing Bureau 2011).

Figure 3.5 Rail plus property development layers atop Kowloon

Source: Al (forthcoming).
That site has been reserved for the new rail line’s depot plus joint property development, which had become technically feasible through past development experiences in Hong Kong SAR, China, such as the residential towers constructed above MTR Corporation’s depot at Fo Tan Station (photo 3.3). Having directly worked with the district council and local community in the past few years, MTR Corporation has responded to requests raised by affected owners and residents for the design and provision of facilities. This has, in turn, raised the project cost. Yet generally the local community

**Photo 3.3 Residential towers developed above MTR Corporation’s depot at Fo Tan Station**

*Source: © Jin Murakami, 2014. Used with permission. Further permission required for reuse.*
and other stakeholders who strongly wanted a new public transport interchange, retail services, and social welfare facilities have welcomed redevelopment of the Southern District. MTR Corporation has proposed developing the roughly 7.2-hectare site with 14 towers of over 350,000 square meters of residential floor area (table 3.6). In particular, this R+P plan includes a specified amount of floor space for social enterprises and social welfare entities in the CDA depot site, which is predominantly surrounded by government, institutional, or community zones (map 3.4).

While three independent consultants have estimated that the profit generated from the depot site alone might not be enough to fully bridge the funding gap of SIL-E under a range of optimistic and pessimistic scenarios, the R+P plan is expected to act as a key catalyst to rejuvenate the Southern District’s industrial area, increasing economic growth and employment opportunities and providing a labor force. MTR Corporation plans to complete this R+P project in three phases over about nine years, depending on Hong Kong SAR, China’s, market conditions (HKSAR Transport and Housing Bureau 2011).

### Debate over Land Value Capture and Housing Affordability

There has long been public concern about housing affordability in Hong Kong SAR, China, due to the government’s limited land supply through the R+P development or other land lease schemes. Certainly, land scarcity could increase the financial viability of property development in general, yet the relationship between public land supply and property prices is unclear in the city (Tse 1998; Peng and Wheaton 1994).

<table>
<thead>
<tr>
<th><strong>Completion</strong></th>
<th><strong>2024 (tendering: 2015–20)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Distance to central business district</td>
<td>7.9 km (Hong Kong Island)</td>
</tr>
<tr>
<td>Site area</td>
<td>7.2 ha</td>
</tr>
<tr>
<td>FAR</td>
<td>6.5</td>
</tr>
</tbody>
</table>
| Floor area use | Residential: 357,500 sq. m. (76.9%)  
Retail: 47,000 sq. m. (10.1%)  
Social welfare: 2,615 sq. m. (0.6%)  
Transport: 58,000 (12.5%) |
| Car parking | 931 spaces |
| Project phase | 3–6 packages |

*Note: FAR = floor area ratio; ha = hectare; km = kilometer; sq. m. = square meter.*
Several macroeconomic and institutional factors influence private property investment and rents in Hong Kong SAR, China, complicating matters. Indeed, adequate housing supply can be achieved by increasing the density of development in target areas along with adequate transit infrastructure and services. Whereas the R+P practices in recent years (such as Wong Chuk Hang Station) have become increasingly attuned to striking a balance between financial and social welfare objectives, the provision of affordable dwelling units for all residents is beyond the scope of MTR Corporation’s property business. Hong Kong SAR, China, has a Housing Authority, another statutory body, which is responsible for implementing most public housing programs, and more than 2 million people (or about 30 percent of the population) are living in public rental housing flats (HKSAR Transport and Housing Bureau 2012a).

Some may argue that the R+P approach has exacerbated the issue of housing unaffordability and socioeconomic segregation in the past few decades, but in fact the high-end development concept of R+P does not apply to all MTR stations, and a number of public housing and subsidized flats are within 500 meters of many MTR stations. While inefficiency in providing social housing units has long been an issue, sales of development rights under carefully limited land supply, instead of charging a high income tax and other tax rates to all residents, have enabled the government of Hong Kong SAR, China, to fund a wide range of high-quality local infrastructure and social welfare programs without accumulating too much public debt.
Conclusion

The R+P development run by MTR Corporation in Hong Kong SAR, China, is internationally recognized as an innovative model of transit finance and urban development for the 21st century. Yet despite its great potential for emerging economies, it seems that policymakers and practitioners in other cities in the developing world do not yet fully understand its possibilities. Key mechanisms and steps to implement the R+P program are summarized below, from upstream visionary planning to downstream project management:

- Master plans and policy documents consistently state the importance of a mass transit railway network and stations as a “backbone” of urban and regional development, particularly during rapid growth period.
- A public leasehold system is prudently designed and applied to control urban land supply, attract private resources, and ensure public interest in new rail corridors.
- Zoning plans, through CDA zoning, set up special FARs around key stations to incentivize private investment in strategic locations, while maintaining comprehensiveness and providing flexibility for private developers to negotiate and design.
- Property development rights are exclusively granted at a pre-rail market price for a business-oriented rail corporation to cover the capital and running costs of a rail project and to master multiple functions and phases of rail and property development at lower transaction costs.
- The grant of development rights starts with small parcels above stations/depots primarily for generating project revenue and later evolves into large, high-quality new towns, iconic business centers, and local community hubs to benefit society more widely.
- Private developers cover land premiums and bear project risks for higher financial returns, whereas the government and MTR Corporation (to some degree) are protected from market and development risks.
- The rule of cost and profit sharing between public agencies, MTR Corporation, and private developers is clear and sound, which can ease project uncertainties and public opposition.
- Development parameters around rail stations vary by location in a city and do not always strictly follow on urban design principles and standards but work flexibly reflecting market demands and socio-economic conditions.
- After project completion, MTR Corporation stays on as an asset manager not only to capture up-front profits of property development but also to maximize management-related recurrent revenues in the long-term business portfolio.
Note

1. Which could be accessibility and agglomeration benefits plus amenity benefits of pedestrian circulation design and “synergetic” effects of transit-built environment coordination.

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———. 2012a. Hong Kong The Facts: Housing. Hong Kong SAR, China: HKSAR Information Services Department, September.

———. 2012b. Hong Kong The Facts: Railway Network. Hong Kong SAR, China: HKSAR Information Services Department, September.

HKSAR Transport Department. 2013. Hong Kong The Facts: Transport. Hong Kong SAR, China: HKSAR Information Services Department, June.


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Tokyo is well served by the world’s most extensive railway network. Yet no single entity could have developed and managed such a huge, “seamless” structure without a clear national capital region plan and strong partnerships. Its rail transit system consists of multiple public, semiprivate, and private passenger lines, along with large real estate developments around key stations and former rail yards. The land value capture (LVC) models vary by development generation, location, and stakeholder, but usually call for moves to incentivize land readjustment and to maximize rail’s value added. These efforts are under the market freehold system, coordinating zoning codes, floor area ratios (FARs), local infrastructure and social facilities, feeder service plans, urban design, and asset management guidelines between public and private entities. Techniques and lessons drawn from Tokyo’s rich rail-oriented culture over the last five decades apply to both traditional capital cities and newly emerging megacities of the developing world, where policymakers need to overcome institutional barriers and integrate multiple policy objectives and urban functions of station area development.

Urban Development Context

Tokyo is the world’s largest metropolis; Asia’s global business, entertainment, and cultural center; and Japan’s capital city. Its roughly 14,000 square kilometers of conurbation added more than 21 million people from 1950 to 2010, accounting for more than those living in most megacities in the world today. And despite slowing population growth, Tokyo will stay the planet’s largest metropolis with a population projected to exceed 38.6 million in 2025 (figure 4.1).
The metropolitan area stretches over multiple jurisdictions, including the Tokyo metropolitan government; 23 wards; Kanagawa, Chiba, and Saitama prefectures; and numerous cities, towns, and villages. Each entity draws up its own master plan, taking into account both upper-level strategies and local specifics, while the national government presents a regional development vision as well as transport infrastructure development strategies that guide the local master plans (Sorensen, Okata, and Fujii 2009). The first National Capital Region Master Plan (NCRMP) was written in 1958, addressing the target population, green belt, and satellite cities to manage urban growth. While the green belt setup was not effectively working due to strong housing demand and opposition from farmers in the surrounding areas, satellite cities were successively adopted in the NCRMPs of the 1960s, 1970s, and 1980s to overcome excessive commuting and congestion caused by Tokyo’s monocentrism. By the 5th NCRMP of 1999, about nine satellite business centers had been identified. Connecting them by intercity transport networks, the NCRMP attempts to form both highly self-contained but also mutually supportive subregions to accommodate a diverse range of residents in the suburbs (map 4.1).

A series of the NCRMPs’ spatial strategies tried to guide long-term regional development in a polycentric direction by encouraging public and private investments in new town line extensions given the strong economy, but Tokyo’s real estate markets were too “hot” for local governments to control rapid growth and motorization. Property prices peaked between the mid-1980s and early 1990s due to inflated demand for developable sites and speculative investments in Tokyo’s suburban and extra-urban areas.
Rapid price increases were the driving force for the original owners to trade land at inflated prices and for public agencies and private developers to assemble small lots to generate capital gains. With accelerating money supply and inadequate credit assessment, the land price bubble crashed in 1991, leading to Japan’s decade-long economic stagnation (Saxonhouse and Stern 2003; Oizumi 1994).

Over the last decade or so, Tokyo’s spatial transformation has largely reflected urban revitalization, a shrinking and aging society, inflated public debts, municipal budget constraints, and sustainable energy uses (Ministry of Land, Infrastructure, and Transport 2006; Sorensen 2006). Its urban regeneration projects were initiated chiefly by the national government’s land liberalization policy, which aimed to enhance Tokyo’s global competitiveness and its quality of urban living in the central areas, offering greater location advantages with high accessibility and agglomeration economies.

In accord with the Urban Regeneration Special Act of 2001, eight districts and 2,514 hectares were designated in the central area of Tokyo, especially
where publicly owned land and former rail yards were available for large redevelopment projects (map 4.2). In these special districts, Japanese City Planning Law permits exceptionally relaxed site use, FARs, building height and area, and wall clearance while taking into account the redevelopment impact on local infrastructure and services, built environments, and social activities. Such land deregulation makes it possible for transit agencies and private developers to propose design parameters case by case and for governments to concentrate public-private investments around key railway stations (Ministry of Land, Infrastructure, Transport, and Tourism 2013a).

**Regulatory and Institutional Framework**

**Development Instruments**

Under Japan’s market freehold system, the philosophy of urban planning is minimum intervention. Yet local governments, public housing and redevelopment agencies, private developers, property and business owners, and railway corporations can all access key land development instruments to apply LVC to transit investment and to promote transit-oriented development.

Among these instruments, land readjustment has been the most important in preventing urban sprawl and forming rail-supportive landscapes.
over the past few decades (Sorensen 1999, 2000; Cervero 1998). Traditionally, development entities—including public housing agencies, local planning and road departments, and private railway corporations—acquired low-priced agricultural land for real estate development with full public services before new rail lines came to suburban areas. But based on the land readjustment approach, multiple landowners can organize a cooperative body that consolidates irregularly shaped agricultural parcels, returning smaller but fully serviced and regularly shaped residential and commercial parcels with higher property value to the original landowners. Roads, utilities, parks, sidewalk networks, station plazas, open spaces, and other infrastructure are funded partly by the sale of the land reserved from the original owners for new private development and public services. Land readjustment is often administered alongside the national government’s Road Program or Urban Street Program. These programs essentially subsidize transit-oriented infrastructure and facilities, such as bus lanes, station plazas and transport terminuses, pedestrian access and circulation systems, bicycle parking, urban green space, and street amenities on the basis of the former Roadway Special Fund.1

Land readjustment is harder to carry out in already built-up areas, as development regulations there are inadequate for landowners to reassemble their properties and regenerate large capital gains from their land parcels. Thus, a stronger incentive mechanism is needed to endorse the profitability of second- or third-generation development activities and to ensure another development project is available for local governments and private stakeholders. Under the Urban Redevelopment Law, the national government pays for a third of the costs of site survey, land assembly, and open space foundation using the national general fund, and half of public infrastructure costs using the (former) Roadway Special Fund. Districts with aging wooden buildings are particularly targeted, in view of earthquake and fire hazards (Ministry of Land, Infrastructure, Transport, and Tourism 2013b).

Multiple property owners usually establish one cooperative entity to receive government subsidies, consolidate separate land parcels into one developable site, and build one or more high-rise buildings with new access roads and public open spaces. The local planning department then reviews the proposed plan for redevelopment, changes zoning codes, and increases maximum FARs in the target redevelopment district (typically around rail transit stations where the potential of commercial land use is high). Through this process, the original owners and tenants are entitled to keep the property rights of floor spaces in the new building(s), which are valued as equal to their original property, or one developer can take up all property rights to speed the redevelopment project for broader social purposes. The “surplus” floor area permitted by the local government is sold to new property owners to partly cover the costs of land assembly and public facilities within the district (figure 4.2).

The instruments used for land development in Japan are mainly inclusive through stakeholders’ consensus building. However, government
authorities under the Eminent Domain Law can compulsorily take over private property for public projects, with compensation but without landowners’ consent, and this power is sometimes controversial, as with the Narita International Airport dispute (Tokyo Metropolitan Government Expropriation Commission 2013; Bowen 1975). In recent years, the more inclusive strategic planning approach—“Public Involvement”—has been progressively adopted to keep government policymaking and development criteria more accountable; discourage individual landholders’ selfish, short-sighted, and speculative actions; and deliver public-private partnership projects smoothly for long-run individual and societal interests (Ministry of Land, Infrastructure, Transport, and Tourism 2008).

**Multiple Railway Agencies**

The metropolitan area is covered by the world’s largest urban railway network, with many public, semiprivate, private, and privatized passenger lines. Over the past century policymakers have nationalized, corporatized, and then privatized railway agencies repeatedly as they and markets react
to changes in public and private entities’ finances, and to social demands for regional and local transport services.

The railway agencies fall into three categories (table 4.1). The metropolitan area has about 48 rail transit operators, including monorail, new fixed-guideway transit, classic mountain-ride, and ocean-side tram lines. Encircling Tokyo’s core area is the Yamanote line of the East Japan Railway Company (JR East), which was privatized from the former Japanese National Railways (JNR), with major terminal stations and high-rise office developments at or near the Tokyo, Shibuya, Shinjuku, Shinagawa, Ikebukuro, and Ueno stations. Within the Yamanote loop is a dense underground network of both the publicly owned Tokyo Metro and Toei Subway lines. Also crisscrossing central Tokyo are JR East’s multiple services. Radiating outward from the Yamanote loop are major private commuter lines, plus the JR group’s intercity and high-speed rail lines. The private suburban lines stop at major terminuses on the Yamanote loop, allowing passengers to directly switch onto the Tokyo Metro and other municipal subway lines without transfers by integrating terminal functions and sharing train services across multiple lines (map 4.3).

Railway agencies are licensed to develop and operate new lines listed in the national government’s regional network plan. Under the general development model, public and private sector agencies built, owned, and operated rail lines over the past few decades. The Railway Business Law, along with the privatization of JNR in 1987 (box 4.1), allows railway agencies to separate ownership and operation in order to cope with the growing costs and risks of new projects; settle a financial balance over multiple rail lines; and improve passenger services through open access to multiple operating

<table>
<thead>
<tr>
<th>Category</th>
<th>Agency</th>
<th>Ownership</th>
</tr>
</thead>
<tbody>
<tr>
<td>Special-purpose enterprise</td>
<td>Japan Railway Construction, Transport, and Technology Agency (former Japan Railway Construction Agency and former JNR Settlement Corporation)</td>
<td>National government</td>
</tr>
<tr>
<td></td>
<td>Tokyo Metro (former Teito Rapid Transit Authority)</td>
<td>National and metropolitan governments</td>
</tr>
<tr>
<td></td>
<td>Seven Japan Railway Companies (former Japanese National Railways)</td>
<td>Fully or partially privatized</td>
</tr>
<tr>
<td>Private corporation</td>
<td>Private railway corporations</td>
<td>Private</td>
</tr>
<tr>
<td></td>
<td>Third sector</td>
<td>Private, national, metropolitan, and municipal governments</td>
</tr>
<tr>
<td>Metropolitan/municipal government</td>
<td>Public transport bureaus</td>
<td>Metropolitan/municipal government</td>
</tr>
</tbody>
</table>

Source: Adapted and updated from Japan Society of Civil Engineering 1991.

Note: JNR = Japanese National Railways.
businesses on the same track, which enables multiple transit agencies to provide “seamless” passenger services over the metropolitan area.

**Relations with the National Government**

The long-term development of Tokyo’s railway network is discussed at the national government level. The Ministry of Land, Infrastructure, Transport, and Tourism of Japan periodically holds external committee meetings

**Box 4.1 JNR privatized**

In 1987, Japanese National Railways (JNR) was privatized in one of the biggest institutional reforms in decades—not only because it changed ownership, management, and operations of railway systems, but also because it influenced the geographic division of regional rail services and disposed of large areas of public land (often former rail yards) for private redevelopment near terminal stations.

Based on the JNR Reform Law of 1986, JNR was divided into private railway companies by regions and into public agencies for other special purposes. This move was the cumulative result of huge financial debts of about ¥37 trillion ($256 billion) due to inefficient fare price and real estate business regulations, rapid motorization in Japan’s suburban and rural areas, very expensive capital investments in *Shinkansen* (“high-speed rail” in Japanese), and growing labor costs by the mid-1980s. In particular, the new JNR Settlement Corporation took over many of the former JNR’s assets (such as rail yards) and prepared developable land parcels with local governments for auction from 1987 to 1998, which led to the recent regeneration boom in Tokyo’s central areas.
where rail experts recommend extension projects for the next decade, based on changing economic and social needs. The latest Railway Network Master Plan of 2000 stresses five strategies: responses to urban restructuring; corridor capacity increases; terminal and transfer improvements; high speed rail and airport access investments; and seamless feeder bus and nonmotorized travel services (Transport Policy Committee 2000).

To start a new railway business, agencies go through a series of legal procedures, such as license application, approval of construction plan, inspection of completed infrastructure and rolling stock, approval of facility transfer and use, approval of fare proposals, submission of operational plans, and agreements. The national government, in comparison, issues a railway business license based on certain criteria, such as travel demand, supplied capacity, master plan, ability of applicants, and the public interest gained by the railway project. Generally, Tokyo’s railway business is presumed to recover the operation and maintenance costs of railways from fare revenue, so the tariff across the entire railway network needs to be appropriate for protecting railway users and stabilizing railway business. Thus, the Ministry of Land, Infrastructure, Transport, and Tourism gives approval to fare proposals submitted by agencies based on four criteria: business efficiency, public equity, travel affordability, and fairness in market competition.

The government has long selected new projects proposed by railway agencies based on their business profitability, and self-evidently the profitability of railway investment is heavily affected by land development around stations. Historically, railway businesses in Tokyo were attractive enough for entrepreneurs to generate large capital gains during the rapid growth period. In recent years, however, this has become harder to do, largely due to escalating construction costs; lengthening construction periods; increasing market competition among multiple rail lines, private automobiles, and air services; and weakening real estate markets along new town corridors. All these factors require innovative financing, including development-based LVC.

**LVC**

**Funding Arrangements**

New railway projects require Tokyo’s public and private agencies to raise huge capital funds from various sources including fare revenues, public investments, bonds, subsidies, zero-interest loans, long-term debt, and LVC.

Funds for such projects come principally from users. Most railway agencies reserve a portion of their fare revenues to finance future extensions. The Special Urban Railway Reserve Fund, based on the Urban Rail Development Promotion Special Measure Act of 1986, also makes it possible for railway agencies to collect extra money from their current services to support future improvement projects that may be necessary but may not
generate much additional demand or revenue (such as quadruple-track line and station-function upgrade programs). This approach has certain advantages for private railway agencies—including tax-exempted resources, lower interest rates, moderate fare increases, and user-linked or corridor-specific funds—yet it is applied mainly to relatively short-term capital improvement projects that do not call for too much land acquisition or assembling (within 10 years).

Private railway corporations generally fund about 10–20 percent of urban lines’ construction costs by selling equity in the stock market, but national and local governments invest in the essential urban lines that do not fit private projects through the Japan Development Bank, the public subway agency, and joint public-private companies. In addition, publicly owned subway and new town railway lines are eligible for a range of local bond issues (for instance, the Subway Project Special Bond, Capital Cost Relief Bond, Transport Bond, Corporate Debt Payment Bond, and Japan Railway Construction Agency Bond), though growing metropolitan and municipal debts for large infrastructure projects have become more contentious for taxpayers.

As profits from railway development have fallen since the 1960s and 1970s, the national government has steadily raised its financial assistance to cover railway agencies’ construction costs by setting up project-based subsidy programs. More recently, its funding arrangements have shifted toward existing stock improvement and airport access development in response to sweeping changes in Tokyo’s demographic patterns, travel demands, and economic development strategies. Private railway corporations with local governments have adopted other funding mechanisms as well, such as quadruple- and elevated-track project subsidies using the Roadway Special Fund (which usually accounts for a third of bridge or underpass construction costs) and land readjustment projects that save land acquisition costs and promote real estate developments simultaneously.

**Types of LVC**

Japan’s transit agencies have long applied an LVC mechanism to finance their railway development, alongside other funding arrangements. LVC techniques vary by location and stakeholder. The metropolitan area has six main LVC types (strictly speaking, not limited to development-based LVC), as listed under “Mechanism” in table 4.2.

One of the most popular mechanisms in Tokyo is to internalize accessibility and agglomeration benefits from private railway investment. Typically, private railway agencies collectively carry out land readjustment projects around stations by receiving the land reserved for new town development and internalizing the capital gains from real estate businesses (for example, the Tokyu Corporation Tama Denentoshi Line).

The national government’s new town development program, along with other subsidy mechanisms, can require developers to pay half of the construction costs of new town lines (connecting sub-business centers and new
towns) and provide the rights of way for new town lines to metropolitan, municipal, and private railway bodies at a base land price. Yet such schemes made land acquisition pricey and increased the new town line’s fare levels (Hokusou Line).

The latest suburban extension model in the metropolitan area is integrating housing development and railway investment. In accord with the Housing-Railway Integration Law of 1989, several local governments with public housing agencies can designate station districts and catchment areas in their master and district plans and simultaneously assemble the developable land parcels for new housing units as well as the rights of way for new railway lines through land readjustment projects. With the Tsukuba Express, the Railway Construction Agency incrementally purchased rights-of-way segments from local governments and housing agencies at an assessment price and then built or transferred infrastructure (including land) to the new railway corporation jointly owned by the multiple local governments at a “with-rail” price. But local governments and housing agencies could only make a capital gain from selling land parcels reserved for housing development around new stations if demand for suburban housing was very strong.

Local towns and rural villages that the national railway line passes can submit a petition to the Japan Railway Companies (the former JNR) to add a full-service station to the line by paying the full construction costs of new station facilities, providing the rights of way for free, and creating station plazas and local access roads through land readjustment projects. Local stakeholders—residents, landholders, business owners—usually need to demonstrate enough ridership to justify the extra station, especially when the Japan Railway Companies are hesitant to increase service frequency and coverage as the stop would reduce trains’ operating speeds.

Railway agencies (or local governments) sometimes attempt to make an agreement case by case with private developers and building owners in order to share construction costs or development benefits (for example, Yokohama MM21 Line). With the Tokyo Metro, building owners near new subway stations usually pay the construction costs of pedestrian access pathways to and from their properties (which may be called “building connection fees” in other countries).

Another significant practice is the sale of former rail yard sites in Tokyo’s central areas. The JNR Settlement Corporation took over much of JNR’s real estate to reduce the debt accumulated by the mid-1980s and sold it via public auction of large land parcels around the Japan Railway Companies’ terminal stations for private redevelopment (which can be seen as one type of LVC). This LVC model usually involves local planning departments, developers, and future building owners in public-private infrastructure and service provision, land readjustment projects, and inclusive urban redevelopment schemes, but they have extraordinary FAR bonuses for profitable regeneration (such as Tokyo-Marunouchi, Shinagawa, and Shiodome).
Private Business Practices

For major railway corporations, development-based LVC is an important business practice not only to fund capital-intensive railway projects but also to offer value-added lifestyles along railway corridors through their real estate and other service businesses (Murakami 2012). The private
railway corporations in Tokyo have played multiple roles, such as transport engineers, land brokers, and town planners in broader urban contexts. To explain their actual practices, the revenue proportions of seven major private railway corporations in the metropolitan area are presented (figure 4.3). Annual revenue from real estate and other businesses ranged between 18.2 percent and 40.5 percent in fiscal year (FY) 2011, which was much lower than in the 1980s and 1990s (Association of Japanese Private Railways 2013; Cervero 1998). The largest is Tokyu Corporation, with annual revenue of about ¥96 billion ($1.2 billion) from real estate and non-railway business.

Among many railway agencies, Tokyu Corporation is internationally well known for its development-based LVC practices over past decades. Nonetheless, its development strategy in recent years has evolved to tackle the huge demographic and business changes along railway corridors (Murakami 2012). Its net income shares from multiple business practices for FY2003–12 are shown in figure 4.4. Real estate accounted for about 34 percent of net income, and transport—railway and feeder bus services—about 41 percent. It raises about 25 percent of total income from residential, business, and leisure services, which indicates the growing importance of providing multiple services with railway investment and real estate development, helping support the railway’s long-term operation and maintenance costs.

In addition, the Japan Railway Companies have also acquired real estate and retail service expertise since the 1987 privatization and have seized LVC opportunities in their own properties in and around stations. In particular,
JR East’s station space utilization and shopping center and office building business practices have become substantial revenue sources, accounting for about 23 percent of corporate income over the last decade (figure 4.5). The concentrations of retail service and property business activities are observed within JR East’s terminal buildings and station concourses, where the railway company enjoys the government’s large property tax reduction that aims to support railway operations and public space uses. While JR East’s “in-station” business model (Ekinaka in Japanese) has gained wider commercial popularity across other private railway corporations, there was public criticism that such in-station business practices with the government’s tax reduction redistributed sales transactions from other retailers and undermined the viability of traditional street-level businesses outside railway stations. In 2007, the Tokyo Metropolitan Government responded by levying a surcharge of ¥2.2 billion ($21 million) on the private railway companies’ properties across 83 stations (Tokyo Metropolitan Government 2007).
Four Development Cases

Four development cases stand out among those in the metropolitan area, selected from different LVC types, stakeholders, locations, and periods. Each case attempts to provide detail on local contexts and needs, innovative LVC mechanisms, key instruments, development parameters, stakeholder relationships, successful implementation, and challenges.

Case 1: Futakotamagawa Station, Tokyu Denentoshi Line—Internalization by Private Railway Corporations

Tokyu Corporation practiced the garden city concept along its Denentoshi Line extensions between 1966 and 1984. The business territories defined by the corporation are about 490 square kilometers across the 17 jurisdictions, with some 5 million residents in 2.5 million households whose income is 50 percent higher than the national average. Of all the territories, the garden city districts account for about 50 square kilometers with 600,000 residents along the Denentoshi Line (Tokyu Corporation 2013).
The garden city development is high-quality and self-sufficient and supports a well-mixed variety of businesses within a suburban setting: offices, banks, universities and private schools, medical and community centers, public service branches, department stores and supermarkets, hotels, and recreational facilities (Cervero 1998).

With a shrinking and aging society, demography is a critical factor for the corporation to update and sustain its development model in the coming decades. Over the last decade, for example, its business territories have gained about 400,000 residents, and the proportion of adults older than 65 has increased from 15 to 19 percent—an aging trend set to continue for the next two decades, reaching 29 percent by 2035. Such changes have called for a range of large-scale redevelopment projects and unconventional service facilities in recent years (Tokyu Corporation 2013).

The redevelopment around Futakotamagawa Station reflects the corporation’s new strategy and key approaches to recent and projected market trends (table 4.3). About 19 kilometers southwest from the central business district (Tokyo Station), the five redevelopment packages attempt to form a new center for commercial, residential, and leisure activities, with urban accessibility around Tokyu’s railway station and suburban amenities by the Tama River (figure 4.6).

The inner-city office spaces included in this mixed-use development target innovative industries and creative workers, distinguishing itself from other office buildings for conventional white-collar businesses in Tokyo’s central areas. The corporation has also differentiated the new shopping facilities for younger consumers from existing retail stores for elderly residents around the station, intending to generate commercial synergies rather than redistributive effects in the same station area.

The project has provided a generous amount of new public facilities, such as a transit plaza, local roads, and parks, through an urban redevelopment scheme that has raised public subsidies (¥36.6 billion/$355 million) and substantial floor area sales (¥100.1 billion/$971 million). Nonetheless, the redevelopment has taken nearly 15 years, involving more than 200 landowners and tenants in inclusive and complex floor area reallocation procedures (figure 4.7). Owning more than 95 percent of the property rights around the station, the corporation has made a real effort to integrate multiple objectives and functions into one redevelopment, so as to generate recurrent benefits through synergistic area management activities rather than temporary profits from speculation (Murakami 2012).

Case 2: Kashiwanoha Campus Station, Tsukuba Express—Integration of Housing Development and Railway Investment
Tsukuba Express is the latest large-scale suburban railway development in the metropolitan area, opening with 20 stations in 2005. The 58.4-kilometer
Chapter 4: Inclusive Land Value Capture Schemes: Tokyo, Japan

Table 4.3 Futakotamagawa Station redevelopment project

<table>
<thead>
<tr>
<th>Project period</th>
<th>2000–15 (15 years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distance to central business district</td>
<td>18.8 km</td>
</tr>
<tr>
<td>Daily ridership</td>
<td>77,422 passengers (2011)</td>
</tr>
<tr>
<td>Site area</td>
<td>11.2 ha</td>
</tr>
<tr>
<td>FAR</td>
<td>3.8 (2.1–6.5)</td>
</tr>
<tr>
<td>Floor area use</td>
<td></td>
</tr>
<tr>
<td>District I-a:</td>
<td>17,200 sq. m. (retail)</td>
</tr>
<tr>
<td>District I-b:</td>
<td>106,700 sq. m. (retail and office)</td>
</tr>
<tr>
<td>District II-a:</td>
<td>156,400 sq. m. (retail, office, and hotel)</td>
</tr>
<tr>
<td>District II-b:</td>
<td>9,400 sq. m. (retail and residential)</td>
</tr>
<tr>
<td>District III:</td>
<td>133,300 sq. m. (residential and retail)</td>
</tr>
<tr>
<td>Public facilities</td>
<td></td>
</tr>
<tr>
<td>Trunk road:</td>
<td>1,820 meters</td>
</tr>
<tr>
<td>District road:</td>
<td>260 meters</td>
</tr>
<tr>
<td>Transit plaza:</td>
<td>5,800 sq. m.</td>
</tr>
<tr>
<td>Park:</td>
<td>2,520 sq. m.</td>
</tr>
<tr>
<td>Car parking</td>
<td>2,258 spaces</td>
</tr>
<tr>
<td>Project phase</td>
<td>2 phases (5 packages)</td>
</tr>
<tr>
<td>Instrument</td>
<td>Urban redevelopment scheme</td>
</tr>
<tr>
<td>Key stakeholders</td>
<td>Tokyu Corporation (owning over 95% of total area); 211 local landholders and tenants</td>
</tr>
<tr>
<td>Project costs</td>
<td>Phase I: ¥102.9 billion ($999 million)</td>
</tr>
<tr>
<td></td>
<td>Phase II: ¥39.1 billion ($379 million)</td>
</tr>
<tr>
<td>Funding arrangements</td>
<td>Subsidies: ¥36.6 billion ($355 million)</td>
</tr>
<tr>
<td></td>
<td>Floor area sales: ¥100.1 billion ($971 million)</td>
</tr>
<tr>
<td></td>
<td>Others: ¥5.4 billion ($52 million)</td>
</tr>
</tbody>
</table>

Source: Adapted from Futakotamagawa East District II Urban Redevelopment Association 2013a.

Note: FAR = floor area ratio; ha = hectare; km = kilometer; sq. m. = square meter.

line, which offers 130 kilometer an hour passenger services between the central areas of Tokyo (Akihabara) and multiple satellite towns (like Kashiwanoha Campus Town and Tsukuba Science City), is the only case implemented in accord with the Housing-Railway Integration Law of 1989. The Metropolitan Intercity Railway Company was established in 1991 jointly by the multiple local governments along the railway corridor with private shareholders. While other new town line projects in the 1980s and 1990s suffered from high land acquisition costs and interest payments (such as the Hokuso Line), Tsukuba Express in recent years has more innovatively adapted land readjustment projects with zero-interest loans, as well as public assistance programs to finance the roughly ¥808 billion ($7.5 billion) cost of construction.
There were 18 land readjustment districts, accounting for about 2,903 hectares around 13 stations. Across the 18 districts, the prefectural government, Urban Renaissance Agency (former Housing and Urban Development Public Corporation), and municipal governments reserved rights of way for development through their land readjustment practices. They then transferred the assembled land parcels to the Railway Construction Agency at an assessment price, significantly economizing on painstaking land acquisition tasks (figure 4.8). The local governments and public housing agency simultaneously promoted transit-oriented townships with original landholders and new residents by coordinating land parcels reserved for sale or public facilities around the new stations.

Kashiwanoha Campus Station, 32 kilometers northeast from Tokyo center, presents further information for practitioners considering future suburban developments (table 4.4). The Chiba prefectural government’s land readjustment project began in 2000 when it designated a 272.9-hectare district occupied mainly by a golf course, fields, forested hills, and small factories. Through readjustment, the large area has been converted into developable land parcels for residential, commercial, industrial, educational,
and social service uses served by roads, utilities, parks, green spaces, and a new railway station. With the provision of full-service public facilities and changes in maximum FARs (2.0–4.0), the total asset price is estimated to increase from ¥232.6 billion ($2.2 billion) to ¥330.1 billion ($3.1 billion), or 41.9 percent before and after land readjustment. The project costs of ¥96.3 billion ($891 million) have largely been recovered from sales of reserved land parcels—about ¥60.9 billion ($563 million, 63.2 percent)—and other sources, though Tokyo’s demand for suburban housing has been unfavorable in the last decade.

Local efforts in the new suburban township development involved key landholders and research institutes around the railway station. Mitsui Fudosan Corporation, an original owner of the former golf course, is of particular importance as the largest landholder and developer in the district. With its real estate expertise and resources to maximize the value of its assets, the corporation has invested in a new shopping mall and residential tower package under the Smart City concept (information technology applications, electric vehicle stations, and renewable energy systems) that target young households with children (photo 4.1). Having large satellite campuses near the new station, two universities have together held urban design workshops with the developer, city government, railway company,
commercial associations, and nonprofit organizations, which may add further value to the district in the long run.

**Case 3: Yokohama MM21 Line—Agreement with Land Developers and Building Owners**

For several decades, the city of Yokohama has been recognized internationally as a pioneering developer. Notably, the MM21 district, about 30 kilometers southwest of Tokyo center, is an icon of modern waterfront development, and one that aimed to form a regional business cluster of about 160,000 workers. The city’s project team, with the Urban Renaissance Agency, set up a land readjustment district over the 100-hectare way front area, including the Mitsubishi group’s large shipyard, in the early
Table 4.4 Land readjustment project around Kashiwanoha Campus Station on Tsukuba Express

<table>
<thead>
<tr>
<th>Project period</th>
<th>2000–23 (23 years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distance to central business district</td>
<td>32.0 km</td>
</tr>
<tr>
<td>Daily ridership</td>
<td>12,744 passengers (2012)</td>
</tr>
<tr>
<td>Population</td>
<td>26,000 (projection)</td>
</tr>
<tr>
<td>Site area</td>
<td>272.9 ha</td>
</tr>
<tr>
<td>FAR</td>
<td>2.0–4.0</td>
</tr>
<tr>
<td>Land use</td>
<td>Residential: 110.5 ha (40.5%)</td>
</tr>
<tr>
<td></td>
<td>Commercial: 20.9 ha (7.7%)</td>
</tr>
<tr>
<td></td>
<td>Industrial: 31.6 ha (11.6%)</td>
</tr>
<tr>
<td></td>
<td>Educational: 7.7 ha (2.8%)</td>
</tr>
<tr>
<td></td>
<td>Social service: 12.4 ha (4.5%)</td>
</tr>
<tr>
<td></td>
<td>Railway: 2.3 ha (0.8%)</td>
</tr>
<tr>
<td>Public facilities</td>
<td>Road: 66.6 ha (24.4%)</td>
</tr>
<tr>
<td></td>
<td>Park and green space: 10.3 ha (3.8%)</td>
</tr>
<tr>
<td></td>
<td>Water: 10.6 ha (3.9%)</td>
</tr>
<tr>
<td>Project</td>
<td>1 district</td>
</tr>
<tr>
<td>Instrument</td>
<td>Land readjustment project</td>
</tr>
<tr>
<td></td>
<td>(Reduction rate: 40%: 13.55% for reserved land and 26.45% for public use)</td>
</tr>
<tr>
<td>Key stakeholders</td>
<td>Chiba prefectural government; Mitsui Fudosan Corporation; universities; 900 landholders and tenants</td>
</tr>
<tr>
<td>Project costs</td>
<td>¥96.3 billion ($891 million)</td>
</tr>
<tr>
<td>Funding arrangements</td>
<td>Subsidies: ¥32.5 billion ($301 million)</td>
</tr>
<tr>
<td></td>
<td>Land Sales: ¥60.9 billion ($564 million)</td>
</tr>
<tr>
<td></td>
<td>Others: ¥2.9 billion ($27 million)</td>
</tr>
</tbody>
</table>

Sources: Chiba Prefectural Government 2013; Tsukuba Express 2013.
Note: FAR = floor area ratio; ha = hectare; km = kilometer.

In the 1980s (table 4.5). In this development, the high-rise commercial towers, given the maximum FAR of 8.0, are directly served by the new MM21 subway line, connecting the existing Yokohama Station and 4.1 kilometers of the Bay Shore commercial and recreational districts, with five distinctively designed stations (map 4.4). Acquisition of the 1.3-hectare rights of way for the MM21 line was incorporated into the land readjustment scheme.
Photo 4.1 Shopping mall and residential tower package under the Smart City concept around Kashiwanoha Campus Station

Table 4.5 MM21 waterfront development project

<table>
<thead>
<tr>
<th>Project period</th>
<th>1983–2006 (23 years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distance to central business district</td>
<td>30.5 km</td>
</tr>
<tr>
<td>Daily ridership</td>
<td>33,067 passengers (2012)</td>
</tr>
<tr>
<td>Employment</td>
<td>160,000 (projection)</td>
</tr>
<tr>
<td>Site area</td>
<td>101.8 ha</td>
</tr>
<tr>
<td>FAR</td>
<td>4.0–8.0</td>
</tr>
<tr>
<td>Land use</td>
<td>Commercial: 66.1 ha (64.9%)</td>
</tr>
<tr>
<td>Public facilities</td>
<td>Road: 24.4 ha (24.0%)</td>
</tr>
<tr>
<td></td>
<td>Highway: 1.5 ha (1.5%)</td>
</tr>
<tr>
<td></td>
<td>Park and green space: 5.0 ha (4.9%)</td>
</tr>
<tr>
<td></td>
<td>Water: 2.4 ha (2.3%)</td>
</tr>
<tr>
<td></td>
<td>Station plaza: 1.1 ha (1.1%)</td>
</tr>
<tr>
<td></td>
<td>Railway: 1.3 ha (1.3%)</td>
</tr>
<tr>
<td>Project</td>
<td>1 district</td>
</tr>
<tr>
<td>Instrument</td>
<td>Land readjustment project</td>
</tr>
<tr>
<td></td>
<td>(Reduction rate: 36.5%)</td>
</tr>
<tr>
<td>Key stakeholders</td>
<td>Mitsubishi Real Estate; City of Yokohama; Urban Renaissance Agency; Yokohama MM Railway Company</td>
</tr>
</tbody>
</table>

Source: © Mitsui Fudosan Corporation. Used with permission. Further permission required for reuse.
The Yokohama MM Railway Company, which operates the MM21 line, is the third sector body, jointly owned by the city of Yokohama, prefectural government, private railway corporations, Mitsubishi Real Estate, and bankers. Subway line development cost about ¥257 billion ($2 billion), due in large part to the difficulty of underground construction in reclamation districts. To finance such a megaproject, the city made negotiation-based agreements with major developers and landowners, including Mitsubishi Real Estate, which was an original landholder of the former shipyard and an owner of the new commercial towers, for sharing accessibility benefits from the MM21 line investment. The land premiums to be shared were estimated at ¥74 billion ($578 million), accounting for nearly 29 percent of project costs (City of Yokohama 2009).

Although Yokohama’s benefit-sharing arrangement worked in practice, similar projects often raise the question of how to decide on the allocation of vertical space between underground structure constraints and FAR bonuses. The following case finds some possible solutions.

**Case 4: Shinagawa Station, JR Yamanote Line—Settlement of Former JNR Debt**

The former JNR’s yard site sales for debt settlement has had major impacts on Tokyo’s landscape over the past few decades, as had the recent urban regeneration boom. The high-rise commercial tower redevelopment around JR Shinagawa Station illustrates how the JNR Settlement Corporation arranged large sales of former yard sites in Tokyo’s central area, and during the “post-bubble” period of Japan created highly value-added business environments with multiple developers, property owners, and local governments (photo 4.2). Through the 1987 privatization, about 10 hectares of the Shinagawa rail yard was transferred to the JNR Settlement Corporation not only to pay off the huge debt but also to increase asset values by

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**Table 4.5 MM21 waterfront development project (continued)**

<table>
<thead>
<tr>
<th>Project period</th>
<th>1992–2004 (12 years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length</td>
<td>4.1 km (6 stations)</td>
</tr>
<tr>
<td>Project costs</td>
<td>¥257 billion ($2 billion)</td>
</tr>
<tr>
<td>Funding arrangements</td>
<td>Benefit sharing: ¥74.0 billion ($578 million)</td>
</tr>
<tr>
<td></td>
<td>Contribution: ¥27.0 billion ($211 million)</td>
</tr>
<tr>
<td></td>
<td>Public loan: ¥129.0 billion ($1 billion)</td>
</tr>
<tr>
<td></td>
<td>Bank loan: ¥27.0 billion ($211 million)</td>
</tr>
</tbody>
</table>

Note: FAR = floor area ratio; ha = hectare; km = kilometer.*
promoting more comprehensive area planning and development around the station. The initial yard’s function was gradually relocated to another site in Tokyo, costing about ¥42 billion ($382 million) over 18 years.

The redevelopment methods for this site were rather advanced in several respects (table 4.6). The JNR Settlement Corporation, bringing in JR East, private developers, new property owners, and local governments, designated the land readjustment district over the 13.7 hectares that encompassed the 10-hectare yard site, as well as surrounding public-private blocks. This extensive approach generated greater road access to the station and a better connected pedestrian network in and around the project district without much public assistance. This urban regeneration package was comprehensively adapted to convert both the land readjustment and private property redevelopment districts (totaling 16.2 hectares) into six hyper-blocks that incorporated “human-scale” circulation systems within the six large parcels (map 4.5).
Photo 4.2 Before and after rail yard redevelopment around JR Shinagawa Station, 1981 and 2008

1. Before

2. After

Table 4.6 Former rail yard redevelopment project around JR Shinagawa Station

<table>
<thead>
<tr>
<th>Project period</th>
<th>1992–2006 (14 years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distance to central business district</td>
<td>6.8 km</td>
</tr>
<tr>
<td>Daily ridership</td>
<td>329,679 passengers (2012)</td>
</tr>
<tr>
<td>Employment</td>
<td>40,000 (projection)</td>
</tr>
<tr>
<td>Site area</td>
<td>16.2 ha</td>
</tr>
<tr>
<td>FAR</td>
<td>6.8–9.5</td>
</tr>
<tr>
<td>Floor area use</td>
<td>A-1: 337,119 sq. m. (commercial)</td>
</tr>
<tr>
<td></td>
<td>A-2: 7,381 sq. m. (commercial)</td>
</tr>
<tr>
<td></td>
<td>B-1: 469,770 sq. m. (commercial)</td>
</tr>
<tr>
<td></td>
<td>B-1: 114,586 sq. m. (residential)</td>
</tr>
<tr>
<td></td>
<td>B-2: 62,740 ha (commercial)</td>
</tr>
<tr>
<td></td>
<td>B-3: 70,307 ha (commercial)</td>
</tr>
<tr>
<td></td>
<td>B-4: 39,961 ha (commercial)</td>
</tr>
<tr>
<td>Public facilities</td>
<td>Road: 3.9 ha (28.2%)</td>
</tr>
<tr>
<td></td>
<td>Park: 0.5 ha (3.4%)</td>
</tr>
<tr>
<td></td>
<td>Transit plaza: 1.0 ha (7.0%)</td>
</tr>
<tr>
<td>Car parking</td>
<td>3,188 spaces</td>
</tr>
<tr>
<td>Project</td>
<td>1 district (6 superblocks)</td>
</tr>
<tr>
<td>Instrument</td>
<td>Government land sales</td>
</tr>
<tr>
<td></td>
<td>Land readjustment project</td>
</tr>
<tr>
<td></td>
<td>(Reduction rate: 40.78%)</td>
</tr>
<tr>
<td></td>
<td>Urban redevelopment scheme</td>
</tr>
<tr>
<td>Key stakeholders</td>
<td>JNR Settlement Corporation; JR East; Central Japan Railway Company; Tokyo Metropolitan Government; two ward governments; 20 private corporations; nine individual landholders</td>
</tr>
<tr>
<td>Project costs</td>
<td>Yard relocation: ¥42 billion (US$382 million)</td>
</tr>
<tr>
<td></td>
<td>Land readjustment: ¥33 billion (US$300 million)</td>
</tr>
<tr>
<td></td>
<td>Roads, bridges, and so on: ¥50 billion (US$455 million)</td>
</tr>
<tr>
<td></td>
<td>Private buildings: ¥360 billion (est.) (US$3.3 billion)</td>
</tr>
<tr>
<td>Land valuation</td>
<td>Land sales: ¥30 billion (US$272 million)</td>
</tr>
<tr>
<td></td>
<td>Before: ¥1.9 million per sq. m. (1996) (US$17,000/sq. m.)</td>
</tr>
<tr>
<td></td>
<td>After: ¥3.3 million per sq. m. (2007) (US$30,000/sq. m.)</td>
</tr>
</tbody>
</table>

Note: FAR = floor area ratio; ha = hectare; JNR = Japanese National Railways; JR = Japan Railway Company; km = kilometer; sq. m. = square meter.

To incentivize the provision of residential, pedestrian, and public amenity spaces within the private commercial redevelopments, substantial FAR bonuses were given to the new property owners. For instance, the B-1 commercial district (base FAR 7.0) achieved the maximum FAR of 9.5 by including 35,433 square meters of collective housing floor area for a bonus FAR of 0.6 and by creating public open and green spaces as well
as a pedestrian skyway network for a bonus FAR of 1.9. This attracted amenity-conscious business entities and increased property prices. Land values of the station area soared by over 73.6 percent, but such a jump was also likely due to intercity accessibility benefits produced by JR Central’s new Shinkansen stop, which opened in 2003. The construction costs of the wide bridge with the new Shinkansen terminus were paid for from the developer-building owner side through a petition process, largely because JR Central had taken a passive position since the early stages of the regeneration plan.

Map 4.5 Access roads, pedestrian facilities, and green spaces provided by private property owners within the superblocks for floor area ratio bonuses

Conclusion

Tokyo metropolitan area has adopted a draft of LVC railway practices related to stakeholders, location, period, and scale. Key procedures may be analyzed and lessons drawn from its transit-oriented experiences for traditional capital city-regions and newly emerging megacities of developing countries:

- The national-, provincial-, or metropolitan-scale government’s master plan principally leads to polycentric regional development and railway extension strategies, though multiple public, private, and semi-private entities use different development approaches and LVC techniques in the same metropolitan area. All stakeholders need to share a clear vision and take collective actions, so as to face the macroeconomic and demographic trends of the future.

- Under market freehold systems, the land readjustment and urban redevelopment schemes are two main instruments to apply LVC to transit finance and develop transit-oriented systems in built-up areas and urban fringes. Both instruments, however, essentially require inclusive decision making, which is often time-consuming, and smooth implementation relies on traditional social ties or economic incentives. Eminent domain may help practitioners speed up land assembly; however, careless application is likely to generate long-lasting social tensions and mistrust.

- Some degree of railway privatization is necessary to progressively apply the development-based LVC concept through property developments and related transactions around stations. Entrepreneurial railway agencies should acquire expertise not only in conventional system engineering but also in real estate investment, town planning, and marketing to set up appropriate development parameters, analyze market profiles, offer multiple services, and maximize value increments in their station properties and wider catchment areas. Essentially, railway agencies need to be entitled to keep the long-term ownership and stewardship of properties to generate recurrent revenues from both development and service activities around stations.

- A variety of LVC techniques can be adapted by stakeholder, location, period, and scale across a single city-region. Policymakers have to understand the characteristics of each approach and design combinations of techniques in their local context. There is no single development-based LVC model that can solve all financial and spatial concerns.

- The rights of way for a new railway line can be assembled cost-effectively by transit agencies and local governments through land readjustment projects, especially where local residents are waiting for railway access. This can promote property development along the
new line at the same time, which would achieve target ridership and fare revenues in the following years.

- Major landholders/developers in a designated district can help in land readjustment. With enough real estate knowledge and resources, they are more likely to invest in local infrastructure, take initiatives in planning, and maximize the value of their land around a new station.

- To create high-quality built environments around a station, substantial density bonuses should be provided. This incentivizes private transit agencies and developers to supply social infrastructure and services, maximize synergistic effects, and mitigate redistributive impacts through inclusiveness. This technique can also be used to provide human-scale built environments within the superblocks already constructed in many developing countries.

Note

1. A fuel tax and vehicle registration fee earmarked for road-related projects.

References


Financing Transit-Oriented Development with Land Values


Some cities in North America and Europe have also used development-based land value capture (LVC). Urban railways have helped improve urban dwellers’ mobility and accessibility and develop world-class service- and knowledge-based business clusters by enhancing economic competitiveness, environmental sustainability, and social equity.

Three cities in particular have intensified property development and the financing of local infrastructure and services around their key terminals. New York City has a long history of programs with transferable development rights (TDRs) for preserving landmarks and densifying commercial activity on and around Grand Central Terminal. The Washington Metropolitan Area Transit Authority (WMATA) has extensively used joint development (JD) programs to achieve transit-oriented development (TOD) by sharing the benefits and costs of planning and development with local governments and private developers. In London, local governments and private developers, redeveloping the King’s Cross rail yard, stress the importance of sharing the benefits conferred mainly around the newly integrated transit terminus. The three cases—though less so than Hong Kong SAR, China, and Tokyo—provide analogies and lessons for practitioners in developing countries.

Context: The United States

The funding sources for fixed-guideway transit projects in the United States can be roughly categorized into four types: funds directly generated by transit agencies, federal government financial assistance, local government financial assistance, and state government financial assistance. In 2011,
directly generated funds accounted for 44.0 percent of all operating expenditure and 24.4 percent of all capital expenditure, and federal funds 9.8 percent of operating expenditure and 44.0 percent of capital expenditure. Local government funds are usually generated from taxes or fees assessed within a jurisdiction and in 2011 covered roughly 22.0 percent of operating expenditure and 18.5 percent of capital expenditure. The capital funds for transit “directly generated by transit agencies and local government sources” jumped from 1995 to 2011 by about 160 percent (APTA 2013).

Despite increasing dependency on transit agent and local government sources, these financial figures indicate that fixed-guideway transit ridership has not been high enough to recover capital costs and operation and maintenance costs. Indeed, farebox recovery from all such transit systems in U.S. transit metropolises was far below 100 percent, though the numbers of transit passengers grew by 36 percent from 1995 to 2012. Certainly, high project costs and low passenger volumes contribute to the low-cost-recovery rate of these transit projects in the country. Realistically, their financial viability depends on the degree of transit-supportive urban development patterns in each project. Higher density areas tend to have higher transit capital expenses as well as higher transit passenger volumes, based on data from 59 transit projects in 19 U.S. metropolitan areas (Guerra and Cervero 2011).

Given severe municipal fiscal constraints, increased market demand for new and existing fixed-guideway transit projects with TOD infrastructure that could support cost-effective operation requires innovative approaches. A report from the U.S. Environmental Protection Agency on how to fund TOD infrastructure highlights a range of financing options and cases that fall into six broad categories: direct fees, debt, credit assistance, equity, grants and other philanthropic sources, and LVC (U.S. EPA 2013). The report expands on the sixth category, indicating that LVC typically takes the form of one or more of the following: creation of a new assessment, tax, or fee (a special tax or development impact fee); diversion of new revenue generated by an existing tax (tax-increment financing); or a revenue-sharing agreement that allows a government agency to share some of the revenue generated by developing publicly owned land (through the JD programs).

Here we attempt to analyze the use of development-based LVC in the United States—specifically TDRs and JD programs—as financing and planning tools to promote TOD in global financial and business centers like New York City and Washington, DC.

**New York City: Evolution of Transfer of Development Rights in Manhattan**

The TDR concept was initially adopted by New York City along with the first American Zoning Ordinance of 1916, in response to urban neighborhood opposition to skyscrapers. It allowed landholders to sell their unused
densities or “air rights” to adjacent land parcels, and developers to realize further densification in already well-developed Manhattan by exceeding New York City’s existing zoning code, such as floor area ratio (FAR), building height and setback limits, with the air rights transferred. The modern application of TDR as a land use (regulation) technique to preserve historically important buildings, public open spaces, and valuable natural resources began from the enactment of the New York City Landmarks Preservation Law in 1968. The U.S. Supreme Court case—Penn Central Transportation Co. v. New York City, in 1978—further acknowledged the TDR concept to mitigate the economic impact of the city’s land use regulation on and around historic landmarks (New York State 2011).

Theoretically, TDR could achieve local planning goals without causing an economic disbenefit to private landowners or spending a lot of municipal funds to acquire land, yet court cases long ago raised the question of the uncertain demand for development rights mandatorily transferred within the designated marketplace. Generally, a TDR program fails if market demand for air rights does not exist, development opportunities are already oversupplied in target districts, or market values of TDRs are insufficient with high transaction costs between districts. Thus, TDR programs should be accompanied by an amendment to city- or regionwide comprehensive zoning plans that designates sending districts and receiving districts in a strategic way (Nelson, Pruetz, and Woodruff 2012; New York State 2011).¹

Yet how and where New York City’s TDR programs are best suited in modern property markets are still research issues. The Furman Center for Real Estate and Urban Policy at New York University (2013) sheds light on the TDR market in New York City using data on actual transactions between 2003 and 2011. New York City’s zoning code, or the Zoning Resolution, allows landholders to transfer unused development rights, mainly in three ways: the Landmark Program helps compensate owners of designated landmarks for the (financial) burden of preserving old buildings by allowing them to transfer unused development rights not only to adjacent lots, but also across streets; the Zoning Lot Merger groups properties into one large lot, allowing transfer of development rights through contiguous lots; and the Special Purpose District allows zoning codes to be customized so as to promote densification in very specific areas, which include redevelopment districts around Grand Central Terminal and Hudson Yards. The study found that 385 of all 421 TDR transactions (91.4 percent) occurred through the Zoning Lot Merger, of which 328 were arm’s-length transactions between unaffiliated parties. The vast majority of the TDR deals were in Manhattan, especially Midtown, where generous zoning codes allow for further densification of developable parcels, and there is strong market demand for commercial redevelopment around Grand Central, with an average transaction price of $203 per square foot during 2003–11 (map 5.1).
Reinvestment in and around Grand Central

Grand Central Terminal is at 42nd Street and Park Avenue in Midtown Manhattan, covering 48 acres. Built by the New York Central Railroad in the heyday of American long-distance passenger railway markets in the early 20th century, it was the largest and busiest station in the world, with 44 platforms serving 67 tracks. Among its many firsts, Grand Central Station electrified its tracks, eliminating dangers from steam-powered trains and allowing the entire train system to develop underground. This
subterranean system also allowed for expansion above and around the station. In 1913, the New York Times reported that the “new” land created above the tracks was worth $2 million–$3 million per block. That land was among the most valuable on the continent, where the area taken up by one Pullman car was valued at $30,000. The newspaper called the development of real estate and the use of air rights as an “adequate return on the entire investment” (New York Times 1913). Park Avenue’s transformation into one of the most iconic areas in Manhattan was largely due to the sale of air rights once the rail yards were moved underground (Morris 1969).

In 2013, Grand Central celebrated its 100th birthday and has been on the National Register of Historic Places since the mid-1970s. It now contains retail and office functions and is served by both multiple subway and commuter rail lines. Much of the area surrounding the terminal is built above the rail shed; the track network extends between Madison and Lexington Avenues but then narrows to about the width of Park Avenue going north. The area immediately surrounding it is one of the most densely developed areas in New York City. Many of the avenues and cross streets surrounding Grand Central are dominated by restaurants and other retail uses, some of which are built on large lots or take over entire blocks. The Park Avenue area north of Grand Central is marked by high-rise corporate headquarters, whereas the mixed-commercial/residential areas lie to the east of Lexington Avenue (Parsons Brinckerhoff 2013).

The area around the station allows for a FAR up to 21.6 through a special permit established in 1992. This was created to facilitate the transfer of development rights from landmarks—mainly from Grand Central—to new developments, while providing for improvements to the existing (mostly below-grade) pedestrian network surrounding them. However, due to the full public review required, as well as myriad other requirements, only one project (completed in 2001) has used this permit. Grand Central Terminal still has more than 1 million square feet of unused development rights.

There are four other ways to increase the FAR. A 1.0 FAR transfer is permitted through a certification process in the core area, which includes the western side of Madison Avenue and the eastern side of Lexington Avenue; it has only been used three times. Sites directly adjacent to subway entrances are eligible for subway station improvement bonuses of up to 20 percent more than the permitted base via a City Planning Commission special permit. Extensive development rights are available via transfer from the New York City Landmarks Preservation Committee—Designated Landmarks, but receiving properties must be adjacent or across the street and must get a City Planning Commission special permit. Finally, a 1.0 FAR bonus is permitted in areas outside the Grand Central subdistrict if a public plaza is provided (Parsons Brinckerhoff 2013).

Surrounded by Manhattan’s major commercial activities, Grand Central Terminal is the second busiest subway station as a transfer point for the S, 4, 5, 6, and 7 lines, carrying almost 43 million passengers in 2012. East Side Access (ESA)—Long Island Rail Road (LIRR)’s new connection
to Grand Central and scheduled to open in 2019—aims to provide direct access to East Midtown for LIRR commuters and to reduce train congestion, especially at Penn Station (map 5.2). A study by the Regional Plan Association (2013) shows that most time-saving benefits from the ESA project will accrue to the East Side nearest Grand Central in Manhattan, where 560,000 jobs are predicted to locate closer to the new ESA terminal (under Grand Central) than to Penn Station, since travel times could drop by 18 minutes a day on average and up to 42 minutes a day at best (map 5.3). These estimates may well understate as the study does not consider pedestrian access, egress, and amenity improvements around the new LIRR terminal promoted by New York City.

The ESA project has required capital improvement plans in and around Grand Central. As of December 19, 2012, the Capital Program budget of the Metropolitan Transportation Authority (MTA) totaled more than $29 billion for 2010–14 (including some amendments in the last few years), of which all LIRR capital projects account for about $2.3 billion. In particular, the ESA terminal at Grand Central costs $16.5 million under the Station and Buildings budget category, while the existing Grand Central elements require $93.8 million for tunnel constructions and facility renewals under the Metro-North Railroad budget category (MTA 2013).

Partly to finance the MTA’s capital reinvestments in Grand Central, the New York City administration intended to adapt a TDR-based District Improvement Fund mechanism as part of the proposed East Midtown Rezoning project (box 5.1). However, the former Bloomberg administration had to withdraw the proposal as the City Council failed to support it. City Council members opposing it recognized the need for rezoning but had
several concerns including “the price, methodology and timing of the air rights to be sold by the City for the District Improvement Bonus as well as the certainty and funding level of the needed infrastructure improvements” (Council of the City of New York 2013). These issues would be revisited under the administration of Mayor Bill de Blasio.
Conclusion

TDR was introduced to promote efficient land use without much public spending in land acquisition, typically when the municipal tax or fee base is weak. TDR has good potential to achieve multiple objectives with TOD, including financial viability of transit, economic competitiveness, environmental sustainability, and social equity. But although TDR has a long history of market transactions—from many court cases across U.S. cities—it is still hard to see how TDR can contribute to urban densification in an efficient way while protecting the public interest. Notably, use of TDR programs in assuring TOD is limited to a few commercial redevelopment cases in New York City, specifically Manhattan, accompanied by heavy capital reinvestment and rehabilitation in existing subway stations and pedestrian networks. In other words, from the case of New York City, we cannot conclude that TDR programs will lead extensively to pedestrian-friendly, high-density, mixed-income residences or mixed-use development along new transit extensions in suburban property markets.

Box 5.1 Proposed East Midtown rezoning and transferable development rights scheme

The zoning code of East Midtown’s subdistrict (a 73-block area surrounding Grand Central) is a key deterrent to reinvestment in the area. Commercial zoning is typically 15 floor area ratio (FAR) along the avenues and 12 on some mid-blocks. This area contains about 400 buildings, with the average age over 70 years. In April 2013, the city’s Planning Commissioner announced the beginning of a review on rezoning, provision of higher FAR, and projected revenue of up to $750 million for improving pedestrian access to transit and for maintaining the transit infrastructure.

The purpose of the rezoning is to ensure the economic competitiveness of East Midtown as a world-class business center and job generator for New York City. The plan provides zoning incentives to promote development of a handful of new, state-of-the-art commercial buildings so that East Midtown’s premium office stocks remain attractive to a broad range of high-profile business entities. The rezoning redefines the Grand Central Subdistrict as a Grand Central Subarea. It would allow the owners of lots in the designated subarea that meet certain site criteria to add further densities above the maximum FAR 15 or 12, through the following three mechanisms (figure B5.1.1):

- **District Improvement Fund.** Owners of qualifying sites can obtain an additionally permitted FAR of 1.2–3.0 in exchange for making contributions to this fund, which will finance transit and pedestrian network improvements in the subarea.
- **Landmark Transfer.** After contributing to the District Improvement Fund, owners of qualifying sites in the new subarea can gain a further FAR of 1.2–6.6 by making further contributions to the fund, purchasing unused development rights from Grand Central Terminal, or directly improving transit infrastructure and pedestrian environments without special permit review. (Grand Central Core would be allowed up to 24.0 FAR under this zoning.)
- **Superior Development Special Permit.** Owners of qualifying sites in the new subarea will be permitted to build skyline-piercing towers by offering the “Superior Development” that provides substantial public benefits to the city through a special permission review process. (Grand Central Core would be allowed up to 30.0 FAR under this framework.)

(continued next page)
Obviously, Manhattan is the world’s most recognized agglomeration of finance and business activities. This reputation has attracted many domestic and international workers to seek creative jobs and open-minded lifestyles, which has required further commercial floor area along with social space—also supported by Manhattan’s geographic and building constraints. Thus, in Manhattan, TDR programs could be lucrative for developers, as they clearly cannot build outward but can build upward within well-configured central business districts. Additionally, New York City’s urban mobility options are critical. The transport component of the draft Environmental Impact Statement prepared for the proposed rezoning identified several areas
where vehicular and pedestrian traffic would be adversely affected by such commercial densification. Certainly, the TDR-based District Improvement Fund seems rational as it incorporates private developers’ financial contribution and density allocation mechanisms into funding TOD infrastructure.

On the contribution rates for bonus FAR in the proposed East Midtown Rezoning, the Furman Center’s study (2013) points out that the uniformly designated contribution rates (at $250 per square foot for commercial use and $360 per square foot for residential use) would mitigate administrative costs and market unpredictability, but any single rate is very unlikely to reflect the actual market value of the bonus FAR granted to many of the respective development sites within the rezoned districts. This pricing inflexibility might diminish the funding capability to support public capital improvements and lead to unintended spatial consequences in East Midtown, especially if the District Improvement Fund’s contribution rates for East Midtown are inconsistent with the redevelopment costs of competing office space being built in other parts of Manhattan. One alternative entails auctions to better reflect the market value of additional FAR based on site conditions, which have recently been introduced and implemented as the Certificate of Additional Construction Potential, sold within the Urban Operations of São Paulo, Brazil (see chapter 8).

To mitigate issues of pricing inflexibility, it is essential for New York City to establish information systems to make the TDR market more transparent on the attributes of market transactions. By doing so for landowners, private developers, local stakeholders, and transit agencies, the resultant transparency could improve the efficiency and fairness of TDR programs. More specifically, a “Development Rights Bank,” founded by multiple municipalities beyond their jurisdictional boundaries, could play a pivotal role in consolidating unused or floating air rights around stations and along corridors. Such a system could acquire and retain development certificates as marketable products to ensure accurate pricing and promote TDR transactions dynamically and flexibly.

The local affordability gap is another major concern with TDRs in New York City. Raising public capital funding for improving local infrastructure out of TDR-transaction and FAR-distribution mechanisms should free municipal resources for other welfare purposes. However, this type of commercial densification has historically paid little attention to ensuring the interest of local communities, which would suffer from rising costs, and increasingly unaffordable living options. Additionally, rents for such areas would become further and further out of the grasp of small business owners, which would in turn dramatically alter the business and social landscape inside and outside designated areas.

**Washington, DC: WMATA’s Entrepreneurial Joint Development Program**

Development-based LVC programs have increasingly been adopted by local governments for fixed-guideway transit projects in the United States, most
of them in New York City and Washington, DC (Landis, Cervero, and Hall 1991), in the form of JD programs between transit companies and private landholders or developers. Most JD programs around New York City’s subway stations are small and do not directly finance railway infrastructure via incentive agreements or cost sharing. In contrast, those undertaken by WMATA (Washington, DC) have been relatively capital intensive and large. WMATA has adopted development-based LVC instruments with developers, project by project. WMATA’s JD program is the most advanced development-based LVC model in the United States for financial impact and project scale.

The concept of modern JD was introduced by federal agencies to financially support their highway and airport projects during the 1950s. The application of JD projects for fixed-guideway transit investment came later, recognized in the Urban Mass Transportation Act (UMTA) of 1964. Locally, WMATA also embarked on its own railway-related real estate business in the early 1960s. Its 1969 guideline, “Commercial Tie-Ins with Metro Stations,” stipulated a partnership model between WMATA and landholders who would realize capital gains on property through tie-ins with Metro investments. A major amendment to UMTA in 1974 and the Surface Transportation Act of 1978 further made discretionary funds available for JD projects, including land acquisition. More critically, President Reagan’s administration in the 1980s deeply cut federal financial assistance to local governments as part of the Republican Party’s move toward privatization. Accordingly, local transit agencies needed to increase revenues from JD projects. Since the early 1990s, the focus of JD projects has moved toward the incorporation of public-private initiatives in developing and operating fixed-guideway transit systems by making efforts to eliminate legal and regulatory barriers against transit-supportive development activities in real estate markets (Landis, Cervero, and Hall 1991). Such public-private initiatives have prevailed in WMATA’s JD program.

Construction of WMATA’s first Metro line began in 1969, took in four regional bus services in 1973, and opened the first phase of Metrorail in 1976. The system now serves 86 stations over 106 miles (170 kilometers) of track in the metropolitan area (map 5.4). Both Metrorail and Metro bus systems serve about 5 million within a 1,500–square mile (3,885–square kilometer) jurisdiction across the District of Columbia, Maryland, and Virginia. This means that WMATA is an interstate transit company undertaking a tri-jurisdictional operation collectively funded and managed by three states and governed by a board of directors. Specific oversight is through three entities: a Tri-State Oversight Committee, the Office of the Inspector General, and the Federal Transit Administration. Multiple jurisdictions with joint development interests in WMATA transit zones include the District of Columbia; the counties of Arlington, Fairfax, Montgomery, and Prince George’s; and the cities of Alexandria, Falls Church, Fairfax, and Rockville. In its 30-plus year history, WMATA has participated in more than 65 JD projects within its service territories (WMATA Office of Property Development and Management 2008) and
has spurred more than $235 billion in economic development at or next to Metro property (WMATA 2012).

Such economic development benefits around Metro stations can be translated into local tax revenues. According to a 2011 WMATA report, proximity within a half mile of the station adds 6.8 percent property tax revenues to single-family houses, 8.9 percent to commercial office properties, and 9.4 percent to multifamily buildings. Development within a half mile of Metro stations generated around $3.1 billion and within a quarter mile generated $1.8 billion in property tax revenues in 2010 across multiple jurisdictions (figure 5.1). A total of 27.9 percent of the tax base of the area served by WMATA is from the value of real estate within a half mile of Metro stations. And of the more than 800 million in assessed property values in the area served by WMATA, about 15 percent is within a quarter-mile buffer of Metro stations and 28 percent within a half-mile buffer (AECOM 2011). In the same year, commercial properties within a half mile of Metro stations generated $189 million in property tax, of which $115 million came from commercial properties within a quarter mile.

Special assessment taxes (surtaxes levied on real estate in the designated area that benefits from public investment) have been applied around
WMATA’s Red Line. The New York Avenue–Florida Avenue–Gallaudet University station is the first Metro infill project. The District of Columbia, the federal government, and area businesses funded the more than $100 million construction project. As the first public-private partnership (PPP) Metro project, a 30-year special assessment was placed on commercial properties within 2,500 feet (762 meters) of station entrances (Parsons Brinckerhoff 2010). In 2001, the assessed value of the 35-block area was about $535 million and in 2007 roughly $2.3 billion.

Local governments have seen steep hikes in revenue from property taxes and special assessment taxes around Metro stations; WMATA has also raised property-related revenues by adapting four development-based LVC instruments: air rights sale, site leasing, long-term development agreements of WMATA-owned land on and around Metro stations, and connection payments from private developers on non-WMATA-owned sites (McNeal and Doggett 1999). Yet the revenues generated from JD businesses contributed only a trivial amount of WMATA’s annual operating revenues—0.74–1.33 percent—in FY2004–12 (figure 5.2). Revenues from parking—4.66–6.38 percent over the same period—were larger. WMATA receives sizable operating subsidies from its owners, the local governments, in that it indirectly receives benefits from property taxes or special assessment taxes collected by local governments. In addition, both joint development and parking businesses may have contributed to the increase in

![Figure 5.1 Property tax revenue collected within a half and a quarter mile of Washington Metro stations, multiple jurisdictions, 2010](source: Data from AECOM 2011. Note: Values located within a quarter mile of stations are also included in the half mile figures and thus are not additive.)
WMATA’s transit passenger revenues from $419.6 million in FY2004 to $752.6 million in FY2012 by enhancing built environments and access functions around Metro stations, based on TOD principles.

**JD Programs and TOD Policies**

The majority of projects under WMATA’s JD program involve converting surface parking lots to structures, freeing adjacent land for private residential, commercial, or office development (Goldin 2010; McNeal and Doggett 1999). As defined by WMATA’s guideline on JD projects, the property business attempts to promote TOD principles, providing affordable housing, improving access to stations, attracting new transit riders, and increasing transit fare revenue to support WMATA’s operation and maintenance expenses. WMATA’s JD program must also meet the following Federal Transit Agency’s requirements: enhance economic development or incorporate private investment; enhance the effectiveness of a public transport project and relate physically or functionally to that project, or establish new or enhanced coordination between public transport and other transport; and provide a fair share of revenue for public transport. Private investment need not be monetary and can take the form of properties or other user or social benefits to be generated either initially or over the development lifecycle (WMATA Office of Property Development and Management 2008).
As WMATA’s passenger service coverage is so extensive, JD projects must cooperate with local zoning codes and other planning and design regulations of each jurisdiction. Local jurisdictions in turn review proposals and evaluate them against local policies, land use plans, zoning, and other development-related capital-improvement proposals (WMATA Office of Property Development and Management 2008). In this way, proposals can be evaluated both on their local and regional impact.

Arlington County, as one progressive example, adopted a corridor-wide General Land Use Plan (GLUP) in accord with agreed-on development goals. The GLUP allows for flexibility to rezone areas for higher densities than originally specified. Project review involves revised zoning as allowed by the GLUP, a special exception, a full site plan, and county board approval. In planning for the Metro projects, 11 percent of the county was rezoned to encourage mixed-use, high-density development. This is in contrast to the remaining 89 percent of the county area that is generally low density (Arlington County Department of Community Planning, Housing and Development, Planning Division 2012). The targeted spatial layout was based on the bull’s eye concept—concentrating high- and mid-density redevelopment around transit stations and tapering density toward existing neighborhoods. Each of the sector plans sought to create urban villages, spanning around a quarter to a half mile from the Metro station (map 5.5).

The required site plan allows flexibility by allowing up to six times the allowable FAR and height, while reducing parking requirements. However, it is still ultimately tied to the GLUP and sector plans on uses, including specified mixes, density, height, design, and public improvements. In contrast, in 2008 Maryland incorporated the term TOD into its state laws and funding mechanisms, which has allowed the state department of transportation to use departmental resources—including land, funds, and personnel—to support the public-private TOD projects “designated” for economic development, housing, and environmental improvement. The 2008 TOD law also helps offset some of the political and up-front costs generated by local infrastructure as well as land acquisition by allowing the state to be a major player in prioritizing TOD projects for government support, by promoting greater ability to apply tax incremental financing and special assessment districts, and by making local funding programs more flexible for revitalization activities and small businesses around Metro stations (Maryland Department of Transportation 2012).

**Conclusion**

WMATA’s JD program is generally seen as one of the better development-based LVC successes that is entrepreneurial in raising local transit funds. Still, WMATA’s annual reports in recent years explicitly state that the financial contributions from JD projects have not been significant. As in other U.S. cities, parking fees around WMATA Metro stations generate larger receipts. Recent figures on WMATA’s annual revenue structure may discourage other transit agencies from converting parking lots into
commercial and residential use properties on the basis of TOD principles as practiced in the United States. However, WMATA’s annual reports also imply that its JD projects have indirectly led to steady increases in transit ridership and fare revenue, accompanied by state and local TOD initiatives.
In fact, however, the multibillion-dollar development benefits generated by the transit-supportive land policies near Metro stations have been generated largely by related local jurisdictions through property taxation and special assessment levies, which are more popular LVC techniques than JD programs throughout the United States. Thus, WMATA indirectly benefits from the tax revenue increase of the real estate precinct of its Metro stations, as it receives sizable operating subsidies from the local governments, which are also its owners. This benefit distribution pattern also explains why so many JD projects in the United States have applied cost sharing with private developers rather than benefit sharing.

State and local governments play critical roles in promoting the transit businesses themselves and TOD. Although WMATA cannot generate large revenues from joint development, local governments annually provide an operating subsidy, indirectly using property tax revenues, but because these go to the general treasury, local governments need to establish clear policies to allocate a portion of the tax revenues to support transit and TOD, given the positive economic, environmental, and social externalities.

For example, through its 2008 TOD law the Maryland state government has prioritized several development projects, making transport-related resources more flexible and helping set up small business activities around Metro stations. In recent years, WMATA’s JD program has also been expected not only to increase financial returns on commercial property investments but also to promote cultural activities and community services by enhancing pedestrian-friendly built environments around Metro stations. Ideally, local governments will play a fundamental role in removing legal and regulatory impediments to TOD projects running smoothly, offer economic incentives to landowners and private developers, create a collaborative business climate, and establish fair rules to share long-term mutual development benefits beyond immediate capital costs around transit stations.

Both the financial contribution and physical scale of WMATA’s JD projects are much smaller than those of the global best development-based LVC practices in Hong Kong SAR, China, and Tokyo. This is due to the differences in roles of local governments, degree of railway privatization, experience with private developers, and maturity of transit-supportive property markets. However, installing strong entrepreneurialism into transit agencies is key to successful adaptation of any development-based LVC scheme.

**Context: Europe**

In Europe, private investors in unregulated business conditions built rail transit in the early 19th century. When competition from road transport increased, private transit operations became financially less viable with most taking on different forms of public ownership. The recessions triggered by the oil shocks of the 1970s, however, greatly eroded governments’ fiscal capacity to make railway investments and to provide
operating subsidies. Yet politicians and others with vested interests lobbied to preserve or extend systems without adequately addressing the structural financial problem—the need to increase fares or taxes. Due to such soft budget constraints, most European railways had accumulated large deficits by the 1990s in proportions unsustainable to gross domestic product, forcing the major countries to take often unique approaches. In the United Kingdom, for example, the government attempted to offset some of its debt with receipts from privatizing the railways. Germany opted to pay it off directly. The overall policies of the European Union have emphasized the importance of making government contributions to railway activities more transparent on the basis of corporate accounting standards (Perkins 2005).

PPPs still account for a small share of railway investment in Europe, except in the United Kingdom, where the London Underground’s tracks were privatized by the government to two private consortia for £15.7 billion ($26.1 billion) under 30-year concessions in 2003. Another large PPP (also known as a private finance initiative, or PFI) was applied to the High Speed Channel Tunnel Rail Link between London and the Channel Tunnel. In 1996, the winning consortium—the London and Continental Railways (LCR)—estimated the total costs of the project at about £6 billion ($10 billion), including £1.8 billion ($3.0 billion) of government subsidies. Since LCR failed to raise enough revenue to cover operating expenses, direct subsidies increased to £2 billion ($3.3 billion). The government agreed to underwrite a £3.8 billion ($6.3 billion) bond issue to reduce LCR’s debt service, and LCR agreed to pay back 35 percent of any profits after 2020 to the government. Further, the concession period was heavily cut from 999 to 99 years, with the line reverting to public ownership in 2086 at the same time as the Channel Tunnel (Perkins 2005). This suggests that while PPP/PFI schemes may be adopted to finance mega railway projects, European governments have sought more innovative and competitive ways to ensure sufficient revenue with private partners as well as local entities.

The redevelopment of railway station areas has become a major economic catalyst for many European cities since the early and mid-1990s (Bertolini and Split 1998). Entrepreneurial cities in Europe have embarked on urban regeneration projects around major intercity and intracity railway interchanges, promoting local economic development and environmentally sustainable transport and land use integration by restructuring the cities’ economic geography and social relations. In particular, recent expansions of high-speed rail (HSR) links across Europe have provided opportunities for global-center or regional capital cities to make their central business districts internationally accessible and economically competitive. Essentially, they have been able to recapture substantial accessibility and agglomeration benefits through development-based LVC schemes. For example, railway interchange reinvestments were financed with revenues from redeveloping former train yards and adjacent brownfield sites. However, such urban redevelopment or “gentrification” highlights important socioeconomic
issues of spatial division of classes, income disparities, and housing unaffordability alongside low population growth, international migration, and real estate booms. Most of these aspects are seen in the case of King’s Cross land redevelopment in London.

London: Regeneration of King’s Cross Lands

King’s Cross Terminus—with the stations of St. Pancras and Euston—is expected to function as the principal transit center for London. The 2004 London Plan anticipated King’s Cross to become the best accessibility location in Greater London with the completion of the Channel Tunnel Rail Link - High-Speed 1 (HS1), Thameslink 2000, and the Cross River Tram. King’s Cross is also the biggest inner-city transit interchange in London, linking six metro lines at one venue (map 5.6).

In the Victorian era King’s Cross was part of a large industrial area of the city, but by the late 20th century it had deteriorated into disused buildings, railway sidings, warehouses, and contaminated land. Regeneration
had been debated since the mid-1980s, but due to weak market conditions and the uncertainty of delivering the HS1 and related development projects at the time, private developers could not embark on it. It was not until the site became an integral part of HS1 development that plans went ahead in the late 1990s.

Construction of the Channel Tunnel Rail Link made about 20 hectares of the underused land available for high-density commercial development as well as housing provision around King’s Cross–St. Pancras (Mayor of London 2004). “Opportunity areas” were identified, and regeneration proceeded after the local authority approved the plans in 2006, with a target completion date of 2016. The first phase of the regeneration project, the University of the Arts London, opened its new campus in autumn 2011. About 27 hectares of the land is planned to contain more than 1,900 homes, 23 new and refurbished office buildings, 500,000 square feet (about 47,000 square meters) of shops and restaurants, 20 new streets, and 10 major new public spaces for a projected 45,000 people (figure 5.3). While the majority of private floor space will be allocated to produce business profits, more than 40 percent of the redeveloped former brownfield site will be used for public purposes, and across from the redevelopment site 20 historic buildings will be restored for modern use (King’s Cross 2014). According to an assessment by LCR in 2009, the incremental economic impacts of HS1 through the King’s Cross regeneration are estimated to be steep, with about 22,100 permanent jobs and 2,000 dwellings in the area (LCR 2009).

LVC Scheme and Section 106 Agreements around King’s Cross

The construction cost of the HS1 project was £5.7 billion ($8.82 billion), of which Section 1 between the Channel Tunnel and North Kent cost £1.92 billion ($2.96 billion) and Section 2 between North Kent and St. Pancras cost £3.78 billion ($5.86 billion). The Department for Transport’s (DfT) financial assistance of £8.16 billion ($13.5 billion) covers construction costs, the project’s debts, and the operations of LCR and its subsidiaries. Originally, HS1 was planned to be privately financed, owned, and operated, yet there was significant doubt about the project’s financial viability. Consequently, besides the additional cash grant of about £2 billion ($3.3 billion), LCR was also granted property development rights around King’s Cross and Stratford Stations. This arrangement was to continue until the concession contract expired in 2086, at which point the assets would return to the government (Omega Centre 2008; Butcher 2011; U.K. Parliament n.d.). Accordingly, LCR was restructured into a property development entity in 2011. Based on the 1996 arrangement between the government and LCR, DfT will receive a 50 percent share of LCR’s net profit after deducting the costs for the King’s Cross development scheme (Comptroller and Auditor General 2005). As the King’s Cross project is in progress, LCR expects to start earning new income from its core property holdings at King’s Cross and Stratford between 2015 and 2020 (Comptroller and Auditor General 2012).
Figure 5.3 Redevelopment schemes of the King’s Cross opportunity area

Outline planning permission approximate use allocation

- Principal open space: 40% of 67 acres
- Built space*: 60%

Culture: 9%
Education: 11%
Hotel: 11%
Leisure: 24%
Retail: 9%
Residential: 24%
Offices: 56%

Eight million square feet

Source: © 2014 Argent (Property Development) Services LLP. Used with permission; further permission required for reuse.

a. Built space includes associated public spaces such as court yards and gardens.
Although the United Kingdom’s properties are largely transacted under a market freehold system, many development-based LVC cases are on publicly owned sites, including DfT’s. DfT-related agencies hold 87,944 assets across the United Kingdom. In addition, the local governments of Greater London, LCR, and other related agencies manage their own properties next to railway facilities. Under the supervision of DfT, LCR has been mandated to maximize its long-term asset value, and its development strategy has been to use its major sites as equity to participate in joint-venture development companies that can make long-term profits through urban regeneration around HS1 stations—chiefly King’s Cross and Stratford. For King’s Cross, the developer—Argent—was selected as a private partner in 2001. The London Borough of Camden granted outline planning permission for regeneration in 2006, and LCR, Argent, and another landholder—DHL—jointly formed the King’s Cross Central Limited Partnership in 2008. And so LCR owns a 73 percent share of the 27-hectare land parcel and a 36 percent share of the new entity, though the partnership officially became the single landowner around King’s Cross. Since 2008, the Partnership has invested more than £300 million ($498 million), and core sitewide infrastructure is in place.

One key LVC technique adopted by local governments in England and Wales is their use of Section 106 of the Town and Country Planning Act of 1990. This section provides a means for local authorities to negotiate agreements or planning obligations with a landowner or developer in association with the granting of planning permissions. Section 106 agreements can be financial in that landowners or developers are required to make some sort of financial commitment (lump sum or recurring) in exchange for development permission; or can be in kind that assure local interest, such as affordable housing or community facilities (figure 5.4). Once a Section 106 agreement is signed and planning permission is granted, developers have three years to exercise their property development rights, or the permission lapses (London Borough of Newham Strategic Development Committee

Figure 5.4 Stakeholders in the land value capture scheme and Section 106 agreements around King’s Cross

Note: HS1 = High-Speed 1; LCR = London and Continental Railways.
The annual benefits to Londoners, through the financial contributions from developers who attain planning permissions, are estimated to be worth £100 million–£200 million ($155 million–$309 million) a year (London Assembly Planning and Special Development Committee 2008).

Section 106 Agreements and Spatial Coordination around King’s Cross

The mixed-use redevelopment of the King’s Cross site has involved a long process of spatial coordination with three local authorities: Camden Council, adjoining Islington Council, and the Greater London Authority. There has also been close consultation with related statutory bodies (such as English Heritage over buildings to be preserved) and with local community groups through the King’s Cross Development Forum (Gossop 2007; King’s Cross Railway Lands Group n.d.). In 2006 the Camden Borough Development Control Committee gave planning permission for redeveloping the King’s Cross brownfield site via a Section 106 agreement, reflecting the consultation process of spatial coordination with local stakeholders (Camden Council 2006). The agreement contains the broad principles of the redevelopment scheme with “floor space maxima” to guarantee diverse site use (table 5.1). Yet these allocation figures allow for some flexibility as redevelopment is likely to take 10–15 years to complete. Thus, floor space of one use could, to a limited extent, be traded against another, depending on market conditions (Gossop 2007).

The Section 106 agreement package around King’s Cross includes cash and in-kind contributions to the provision of local infrastructure and community services by the joint developer for the Camden council, including £2.1 million to create 24,000–27,000 local jobs through a Construction Training Centre and Skills and Recruitment Centre; 1,900 homes, more than 40 percent of which will be affordable housing; cash and in-kind contributions for community, sports, and leisure facilities; new green

<table>
<thead>
<tr>
<th>Use</th>
<th>Floor space (sq. m.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mixed-use development—total permissible</td>
<td>739,690</td>
</tr>
<tr>
<td>Offices</td>
<td>Up to 455,510</td>
</tr>
<tr>
<td>Retail</td>
<td>Up to 45,925</td>
</tr>
<tr>
<td>Hotels/served apartments</td>
<td>Up to 47,225</td>
</tr>
<tr>
<td>D1 (nonresidential institutions)</td>
<td>Up to 74,830</td>
</tr>
<tr>
<td>D2 (assembly and leisure)</td>
<td>Up to 31,730</td>
</tr>
<tr>
<td>1,900 homes</td>
<td>Up to 194,575</td>
</tr>
</tbody>
</table>

Source: Gossop 2007.
Note: sq. m. = square meter.
public spaces, plus new landscaped squares and well-designed and accessible streets, accounting for about 40 percent of the entire site; a new visitor center, education facilities, and a bridge across the canal to link streets; and cash contributions to improve adjacent streets, transit stops, and bus services (Camden Council 2006).

Conclusion

A series of HSR network expansions across Europe since the 1990s has provided opportunities for entrepreneurial governments to promote regeneration projects along with intercity and intracity transit terminus investments through various PPP/PFI schemes, including development-based LVC instruments. In recent years, this HSR investment–economic development scenario has been commonly adopted in Japan, the United States, China, India, and Brazil, for example. But in the United Kingdom PPP/PFI schemes to finance HSR projects have not always been successful, relying heavily on government contributions or resulting in (re-)nationalization of railway ownership and management. To ease the public-private debts accumulated by the HSR-related projects, the sales of development rights on former railway yards and train depots have been used in major global cities’ financial and business locations, where regional accessibility and urban development potential is extremely high. King’s Cross is a typical case. Essentially, as the HS1 project moved forward and opened new development opportunities in London, LCR was restructured from a mere railway construction company into an entrepreneurial property development and asset management agency.

To fully capture potential economic benefits, entrepreneurial railway agencies should pursue development opportunities on their lands and create capital gains with other private developers. Ideally, corporate profits will attract other multinational headquarters and business services to these locations with new interregional passenger services. However, the sizable intercity accessibility and development benefits conferred by HSR-related megaprojects should not be dominated by global corporate entities at the expense of local public interest around regional transit centers. Development-based LVC should not be merely adopted as a money-making tool. In the case of King’s Cross, Section 106 agreements have been crucial in incorporating desirable planning principles into public-private funding and property development. Joint public-private developers are required to sustain multiple interaction and consultation opportunities with local authorities and residents to gain planning permission, yet such local interventions should not weaken the developers’ market competitiveness and financial viability. As a case in point, the Section 106 agreements for King’s Cross set out very flexible allocations of property floor uses, allowing the joint developers to respond to changes in market and other conditions.

In summary, the use of Section 106 agreements around King’s Cross underlines the importance of balancing interregional business marketability
and local community livability with PPP-based infrastructure funding and property development. This is especially important to be borne in mind when development-based LVC schemes are used in very expensive HSR projects during redevelopment of former railway yards in global or regional capital cities of the developing world.
Notes

1. “Sending districts” can be defined as the areas from which development rights are transferred along with zoning regulations to address natural, scenic, recreational, architectural, or open land, or sites of historical, cultural, aesthetic, or economic values to be protected. “Receiving districts can be designated as the areas to which development rights are transferred mainly for desirable densification, including TOD. This means that the designation of receiving districts also call for careful analysis and planning on the availability and provision of public infrastructure and services in the areas influenced by new densification activities, such as transport, parking, water and energy supply, sewage, and fire protection” (Nelson, Pruetz, and Woodruff 2012; New York State 2011).


3. A special taxing district is “an area defined by the local government where a new tax is assessed to businesses and perhaps other properties and the revenue generated by the new tax is dedicated to a particular use within the district. Special taxing districts can be used in several ways: to fund directly capital construction of public infrastructure at a TOD; to provide revenue or security for the repayment of a bond; or fund operating and maintenance costs such as management contract costs, utilities, cleaning, snow removal, and security services within the defined district” (Maryland Department of Transportation 2012).

References


Financing Transit-Oriented Development with Land Values


PART III

Emerging Development-Based Land Value Capture Practices in Developing Countries
CHAPTER 6

Financing a Metro with Development Rights of Public Land, Nanchang, China

China’s public sales of development rights are a major funding source for local governments in delivering infrastructure projects. These sales have often led to the rapid conversion of rural agriculture land into urban land for industrial and residential uses but without an adequate economic rationale or planning. With increased concern over the negative impacts of such rural–urban land conversion, policymakers in reform-oriented cities have already started taking longer-term approaches in public sales of development rights, focusing on sustainable finances and urban development.

Nanchang is one of these cities. Its public land leasing scheme attempts to incorporate the principles of transit-oriented development (TOD) into new metro finance. As this scheme has not yet been fully implemented, it is too early to assess whether it will generate the desired outcomes. If successfully executed, however, Nanchang’s development-based land value capture (LVC) schemes could provide a good model for other Chinese cities.

Urban Development Context

Population and Urbanization Trends

Nanchang’s central location in southeastern China relative to the Pearl River and Yangtze Delta regions, and to the junctions of major highways, makes it a major transport hub (map 6.1). The provincial capital, Nanchang is also a regional center for agricultural production in Jiangxi province. The city has many manufacturing firms including those producing cotton textiles and yarn, paper products, processed food, agricultural chemicals and insecticides, and Chinese medicine and other pharmaceuticals. Annual gross domestic product (GDP) growth in 2007–11 was a very robust 16–22 percent.
Map 6.1 Location of Nanchang
The strong growth triggered rapid urbanization. According to the United Nations Department of Economic and Social Affairs, Population Division (2012), the population in Nanchang’s core city areas (330 square kilometers) increased from 1.6 million to 2.3 million from 2000 to 2010, or by 44 percent. It also projects that the population in the core areas will continue to grow, to 2.8 million by 2015 and 3.5 million by 2025 (figure 6.1). Due to rapid population growth in the city center, proper land use and transport planning is becoming crucial.

As in many rapidly urbanizing Chinese cities, traffic congestion in Nanchang is one of the major downsides of urbanization. Car ownership (at 120 per 1,000 people in 2012, according to ChinaAutoweb, June 25, 2013) is lower than most provincial capitals, but the share of motorized road trips (including those on public buses) grew from 22 percent in 2002 to 30.5 percent in 2010, according to traffic surveys (World Bank 2013). Public transport accounted for only 13.5 percent of total daily trips, which is lower than in cities of similar size and GDP such as Changsha (24.5 percent) or Wuhan (23.4 percent) (World Bank 2013). Roads in southern Nanchang and the four bridges across the river routinely see congestion with average driving speeds down to 11 kilometers an hour during rush hour. Roads built in the newly developed part of northern Nanchang are wide, favoring car use.

**Urban Planning**

Nanchang has a tradition of good urban planning. Its 1985 Strategic Plan aimed to develop the historic city center on the right bend of the Gan River.
(map 6.2); the left bend saw very little development at that time. As the city’s industries continued growing, more space was needed.

In 1995, a new strategic plan was written to extend city development to the left bend. Industrial and residential development started on the northern part of Nanchang’s city center. The goal then was to balance urban development on both sides of the river and to extend residential areas to the surrounding seven districts. This 1995 strategy is unchanged.

According to the 2005 Urban Comprehensive Development Plan, northern and southern Nanchang will form the city’s future urban core, with new developments radiating out to surrounding districts and towns (see map 6.2). In southern Nanchang, the Nanchang municipal government (NMG) plans to decrease the population in the historic core, lower its development densities, lessen traffic congestion, and preserve historic buildings.

**Metro Project**

To achieve these goals and resolve the growing congestion, NMG has designed an extensive public transport system with fully integrated bus services and metro railway networks to facilitate travel between the newly planned areas and between the left and right bends of the Gan River. NMG plans to build five metro lines; two are under construction. Once complete, the metro railway network will be about 160–170 kilometers long with 128 stations (map 6.3). With a target completion date of 2020, lines 1, 2, and 3—60–70 kilometers in all—will form the basic structure of the metro railway network, connecting major business centers, the financial district, recreational areas, sport facilities, two industrial parks, and three universities.

Construction of Line 1 began in 2012 and will be completed in December 2015. This will connect the old city center to the new development areas on the left bend, helping redirect economic and residential investments from

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**Map 6.2 Urban development strategies in Nanchang**

southern to northern Nanchang. On completion, Line 1 will be 28.7 kilometers long with 24 stations, one depot, and one parking yard. The average distance between stations will be about 1.2 kilometers.

Line 2’s construction started in July 2013 and is partly financed by the World Bank. It goes from Zhan Qian Nan Da Dao Station to Xin Jia An Station and will be 23.8 kilometers long with 21 stations and one depot. NMG expects construction of Line 2 to be completed by 2016. Plans to build lines 3, 4, and 5, and Phase II of lines 1 and 2, are awaiting approval from the National Development and Reform Commission.

To feed the metro railway system, bus services will be reorganized. Several interchange locations between the bus and metro railway networks have already been designed for lines 1 and 2. More important, these interchanges are coordinated with better land use planning than in the past to allow retail stores and supermarkets to be built there.

**Regulatory and Institutional Frameworks**

In China, responsibility for city-level land use planning and investments in local infrastructure and services is delegated to municipalities. Strong leadership in Nanchang by the mayor and vice mayors ensures interdepartmental coordination and cooperation. NMG established the Nanchang Railway Transit Group Co. Ltd. (NRTG), wholly city owned, to build and operate the metro system. To better leverage the private sector’s expertise, NRTG
set up a special property management division with key staff recruited from the private sector to manage all real estate assets owned by the company. It also acts as a key liaison between government agencies to coordinate their planning and reviewing of metro railway investments and projects.

**Nanchang Municipal Finance**

In 2011, the budget of NMG was RMB49.7 billion ($8.1 billion). Land revenue was the major revenue source at RMB18.9 billion ($3 billion, 38 percent) (figure 6.2). The estimated cost for Line 2 is RMB1.48 billion ($2.42 billion), excluding interest charges, or equivalent to about 30 percent of the 2011 budget. During the construction phase, NMG will pay 37.3 percent of construction costs and interest each year. The largest expenses, about RMB1.4 billion ($230 million), will incur in 2017. On the revenue side, operating revenues in the fifth year are estimated to be RMB342 million ($56 million), resulting in a recovery ratio of 0.63. NRTG is expected to achieve breakeven in the 15th year. The debt service repayment and operational deficit will be filled by real estate development revenue (expected net profit of $166 million) and other land transfer fees. For land transfer fees, 25 parcels of 10,878 mu (7.2 square kilometers) out of an envisaged 50,000

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**Figure 6.2 Municipal revenues of Nanchang, 2011**

![Pie chart showing the breakdown of municipal revenues in 2011 in Nanchang.](image)

- **Tax revenue**: 38%
- **Nontax revenue**: 32%
- **Intergovernmental transfers**: 23%
- **Land revenue**: 6%
- **Extra-budgetary funds**: 1%

*Source: Nanchang Railway Transit Group.*
mu (33.3 kilometers) have been allocated to the metro system, representing a potential net contribution of RMB21.6 billion ($3.54 billion) to the metro railway construction program. Given that NMG needs to finance the five subway lines, NMG has to maximize revenues from real estate development or land transfer by adopting development-based LVC approaches.

Real Estate Market

Before discussing the LVC scheme designed by NMG, we examine the real estate market in Nanchang. The national government established a leasehold system in 1978 to enable public and private exchanges of leasehold rights. Leases are long—residential land 70 years and commercial and industrial land 40 years. According to the Constitution, buildings on leasehold land are private property. Under this legal framework, functioning real estate markets have appeared in many Chinese cities.

In 2008–09, the global economic downturn affected Chinese exporters and manufacturers, hurting land prices for commercial, commercial/services (mixed-use), and industrial land, which dropped back to 2006 levels (figure 6.3). Yet prices for other land types continued to rise, especially residential and commercial/residential mixed-use land. Hence, overall land prices declined by only 2 percent (table 6.1).

In 2009–10, prices soared in response to the central government’s economic stimulus, which included a loosening of monetary policy and a lowering of mortgage rates. Prices for all land types increased by more than 50 percent, except industrial land. Commercial/residential mixed-use land prices more than doubled, and commercial land prices more than tripled (see table 6.1).

![Figure 6.3 Land prices, Nanchang](source: Nanchang Railway Transit Group.)
Concerned that real estate markets might be overheated, in 2010 NMG adopted certain measures: it passed a regulation allowing each family to purchase only one new housing unit—and prices for land designated for residential and commercial development dropped in 2011–12. Yet because the new law applied only to residential property, the price for commercial/service land kept rising. From 2011–12, although residential land prices continued to drop, prices for other land types saw an upward trend, with the performance of land for mixed use such as commercial/services and commercial/residential land the strongest. On average, the aggregate land price climbed by 24 percent.

These are interesting outcomes because TOD is a strategy that promotes mixed land use. A typical TOD scheme will have office buildings clustered with residential properties and retail stores around a transit station. This design can both increase ridership and cross-subsidize transit development costs by capturing the increased land value generated by commercial and residential development. Rising land prices for mixed use is a favorable condition for adopting development-based LVC in Nanchang.

### LVC

Nanchang’s metro railway construction (60–70 km in length by 2020) will require large capital investment. Aside from transfers from the national government, local tax revenues, fares, and loans from international development agencies like the World Bank or domestic banks, NMG is also adapting the development-based LVC financing method to recoup land value increments generated by its metro railway investment to pay for some of the construction and operating costs. NRTG plans to fully use land value increments to partly fund metro railway investment via three procedures.

First, after the Urban Planning Bureau announces the City Master Plan and Land Use Plan, the Land Resource Center will acquire land for NRTG from landowners, with compensation, exercising eminent domain (compulsory purchase). NRTG will pay for all acquisition costs.

Second, NMG will increase the floor area ratio (FAR) limit at the acquired sites and allow NRTG to either invest directly in land redevelopment or

<table>
<thead>
<tr>
<th>Year</th>
<th>Commercial/residential</th>
<th>Commercial/services</th>
<th>Industrial</th>
<th>Commercial</th>
<th>Residential</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008–09</td>
<td>50%</td>
<td>−61%</td>
<td>−38%</td>
<td>−1%</td>
<td>52%</td>
<td>−2%</td>
</tr>
<tr>
<td>2009–10</td>
<td>134%</td>
<td>88%</td>
<td>24%</td>
<td>226%</td>
<td>67%</td>
<td>77%</td>
</tr>
<tr>
<td>2010–11</td>
<td>−4%</td>
<td>109%</td>
<td>−12%</td>
<td>−63%</td>
<td>−4%</td>
<td>−5%</td>
</tr>
<tr>
<td>2011–12</td>
<td>39%</td>
<td>22%</td>
<td>28%</td>
<td>−4%</td>
<td>−34%</td>
<td>24%</td>
</tr>
</tbody>
</table>

Source: Nanchang Railway Transit Group.
transfer the development rights to private investors to raise funds to finance metro railway construction. All land parcels within a 500–meter radius from a subway station will be qualified for upzoning with higher FARs. While the 500–meter criterion is uniformly applied to all station areas, some flexibility should be incorporated to accommodate varying market conditions. More important, the Urban Planning Bureau will also convert land use at these sites to mixed use to allow NRTG to promote TOD and to maximize land-related revenues.

Third, with the land resources in hand, NRTG will generate land revenue to defray metro railway development costs. For this, NRTG, through the Land Resource Center, will re-auction the land sites to developers at market value that reflects the increase in the development density and land use change and the improvement in accessibility due to the metro railway. The successful bidder will pay the bidding price (called a transfer fee) to the Municipal Finance Bureau, which will in turn deduct fees for six development funds related to education, agriculture, and other public services. These charges together are about 20 percent of the transfer fee. NRTG will receive the balance from the Finance Bureau and use the funds to finance construction of subway lines and stations.

NRTG can also develop the space above and below the metro railway stations, whether offices, recreational facilities, retail spaces, or residential units, all within the physical space of a metro railway station. Revenue from renting or selling residential and commercial properties will be used to partly finance metro railway investment or operating costs.

To illustrate these procedures in detail, we present the entire LVC financial arrangement of lines 1 and 2. Again, because these projects are in progress, we can only show how use of the LVC mechanism has been planned but cannot tell how much land value NRTG has actually captured.

**LVC Financing of Lines 1 and 2**

These lines’ LVC financing will follow two methods: sale of development rights, and direct property development and management above or below the metro railway stations.

*Sale of development rights.* Line 1 (see map 6.3) is under construction and is planned to begin operating in 2015. The construction of Line 2 started in July 2013, and operations are expected to start in 2016.

NRTG has, through negotiated land sales, gained control over the development rights of 46 land sites with an area of 15,200 mu (10 square kilometers). About 2,600 mu (1.7 square kilometers) of the acquired land is close to the planned metro railway stations. NRTG also took part in public tenders of land and obtained the leasehold rights to 147 mu (0.1 square kilometers) of land for real estate development.

The total cost of developing the land resource was about RMB9 billion ($1.5 billion), including acquisition costs of RMB4.2 billion ($688 million) and demolition costs of RMB4.8 billion ($787 million). For the entire investment period (2012–20), estimated financial benefits derived
from NRTG’s planned real estate investment for own use and rental, or subleasing of land use rights to third parties, are about RMB22 billion ($3.6 billion). For 2012–16, these land benefits are estimated at around RMB14 billion ($2.2 billion).

Balancing the estimated costs and benefits of accumulating land resource, by 2016 NRTG will be able to generate a surplus of RMB5 billion ($820 million), equivalent to 15.1 percent of total construction costs of Line 1 (RMB18.1 billion, $3 billion) and Line 2 (RMB15 billion, $2.5 billion).

To assure projected land profits, NRTG has followed TOD principles. It combines development of the metro stations with improvements to surrounding neighborhoods. It has also designed the stations using one-stop-shop ideas and is financing their construction with revenue from mixed development above all subway stations. NRTG’s strategy is to develop areas that are close to the city center first and then extend toward the suburbs (figure 6.4).

**Direct property development:** In 2012–15, NRTG plans to build 28 stations along lines 1 and 2 of two types. The first is mixed development on the ground above the metro stations; there will be 23 projects of this type. NRTG will invest directly in five of them and develop the other 18 stations with private investors. The second type is underground development at selected metro railway stations. There will be five projects of this type. NRTG will be the sole investor in three, with two co-financed and developed by other private investors.

These projects will cover 1,700 mu (1.1 square kilometers), with an estimated capital investment of RMB8.3 billion ($1.4 billion). NRTG is
expected to raise RMB6.8 billion ($1.1 billion) of the capital requirements between 2013 and 2015, mainly from commercial loans and bonds or the sale of leasehold rights.

Expected income generated from the investment includes: RMB3.5 billion ($574 million) from the sale of development rights; an estimated revenue of RMB8.9 billion ($1.5 billion) from selling 500,000 square meters of commercial property; and an average annual rental income of RMB400 million ($65.6 million), totaling RMB1.2 billion ($198 million) for three years. If these projections are fulfilled, property investments above or below the stations will bring a net profit of RMB6.8 billion ($1.1 billion) to the company by end-2015, equivalent to 20.5 percent of the construction cost of lines 1 and 2.

Development Cases

This section presents two metro railway property projects at station areas that follow development-based LVC in different floor uses and development parameters.

NRTG’s Metro Mansion Station

NRTG is constructing a 45-story, 193-meter office tower with a FAR of 7.04 above the Metro Mansion Station on Line 1 in Nanchang’s financial center. There will be underground parking on three levels. NRTG’s headquarters and control center will occupy the first five floors of the tower, with the remaining office space rented to other tenants (figure 6.5).

Investment in land and construction comes to RMB1.3 billion ($213 million), financed in two ways. NRTG’s real estate subsidiary will develop and sell some of its development rights, of which NRTG will get 80 percent of the revenue, or about RMB160 million ($25.8 million), to finance
metro construction. The real estate subsidiary will also build 100,000 square meters of office space, of which 40 percent will be sold to NRTG on preferential terms. The subsidiary, under this scheme, will only earn a net profit of RMB5.6 million ($918,000), renting the remaining 60,000 square meters and earning an annual rental income of about RMB39 million ($6.5 million). It has an option to sell the rental units for some RMB1.1 billion ($180 million), valued at project completion. This financial arrangement appears to generate enough income to cover the project’s property investment cost.

**Metro Time Square**

Metro Time Square at Bayi Bridge West Station of Line 1 has a development area of 125.8 mu (83,867 square meters) with a built-up area of 388,827 square meters and a FAR of 3.5 (figure 6.6).

Construction began in 2012, with an expected date of completion of December 2016. The investment cost is RMB2.8 billion ($459 million). Project financing is through a joint venture between the real estate subsidiary of NRTG and a developer. The venture financed land acquisition costs and will develop the land with high-end residential apartments, retail stores, recreational facilities, and offices and then sell some of the properties. NRTG will receive profits in proportion to its shareholding. Eighty percent of the land use rights sales revenue of RMB880 million ($144 million) has already been allocated to NRTG to finance metro railway construction. In addition, 40,000 square meters of commercial space will be available for lease to private companies, and some of the rental income will go to NRTG, again in proportion to its shareholding.

**Figure 6.6 Architectural design and site plan for Time Square Station**

Conclusion

The following are major enablers for Nanchang’s development-based LVC schemes and the associated risks. If implemented well, Nanchang’s development-based LVC schemes could provide a good LVC model for other Chinese cities.

- Under a state leasehold system similar to Hong Kong SAR, China’s, overall economic and urban environments are conducive to the development-based LVC approach. The city has experienced rapid economic and population growth coupled with fast urbanization. Not only will increases in income and population generate sufficient ridership for the metro railway, they can also help develop a buoyant real estate market, which is essential for LVC.

- Good urban planning helps, and Nanchang has played its part well. Land markets will behave erratically if land use regulations and planning are unpredictable. Public and private investors need to know with some degree of certainty when and where urban expansion will take place in order to invest. A well-designed master plan that allows for development flexibility serves this purpose.

- Nanchang’s Urban Planning Bureau reviews its master plan every 10 years and makes additions and modifications as urban conditions change. Through this iterative process, NMG has established a vision for the future development of Nanchang that guides public and private investments.

- Well-integrated urban planning and public transport investments are other advantages. NMG has established a directive to use the metro railway as the backbone of its urban transport. The design of the system is based on facilitating the master plan. The number of metro lines and stations, with their locations and surrounding land uses, are specified for short- and long-term development.

- NMG and private investors understand the importance of mixed land use to make the idea of TOD and LVC work. NRTG’s station designs provide strong evidence of this underlying principle. This is also reflected by sustained increases in prices for land designated for mixed use, showing that the market has caught on to the idea.

- NMG collects about 20 percent of the transfer fees of land use rights for the use of six development funds. This will allow NMG to use the revenues from development-based LVC for prioritized public investments other than metro investment.

- Key government agencies under the leadership of the mayor and the vice mayors fully support NRTG in reaching its financial goals under the LVC approach. This type of institutional backing is crucial for lowering transaction costs of land acquisition and regulatory changes.

- Cooperation from all government agencies can help engender synergies between public and private sectors to undertake the technically and financially complicated metro railway investments.
Although Nanchang seems to possess the preconditions for applying development-based LVC, potential risks include overreliance on land financing that exposes NMG to overheated real estate markets; unaffordable housing due to gentrification of transit station areas; and lack of public-private experience in jointly delivering property development projects alongside complex TOD/LVC procedures in fast-moving real estate markets.

Challenges Faced by Other Chinese Cities with Development-Based LVC

Integrating metro investment with land management and incorporating development-based LVC in infrastructure finance and urban planning with cities’ policies will be crucial for urbanization success, as metros offer another attractive mode of transport. If done well, Nanchang’s approach combining TOD and LVC will increase the vibrancy and livability of the city, making it a model for other Chinese cities. Yet many barriers remain throughout China.

- Strict development parameters and site control plans are not conducive to maximize urban land values via TOD around stations and along corridors. They include excessive building setbacks; excessive road width; limited emphasis on mixed land uses; low differentiation in FAR, not reflecting accessibility of mass transit systems; limits to building height; and fire regulations limiting allowable FAR.
- Public land leasing programs are not designed in transit-supportive ways. Land development rights around stations cannot be formally transferred to mass transit agencies at the start of a project in a way that enables those companies to coordinate integration of mass transit investment with land management through public-private partnerships or to secure the sustainability of revenue streams from properties on and around stations. In Chinese practice, once land has been attributed to a developer, the developer cannot subdivide the land or transfer rights to subdevelopers. Additionally, the varying authorized land use periods for residential and commercial buildings make the combination of both in a single development difficult.
- Location priority is given to greenfield development rather than redevelopment of built-up areas, including brownfield. While most metro alignments go through existing city centers, fragmented property rights and complexities over the redevelopment of already built-up areas lead developers to favor greenfield development, limiting the application of TOD and LVC in potentially high-access and high-density districts. The lack of urban redevelopment schemes is a critical constraint for implementing TOD and LVC in mass transit investment at city- and regionwide level.
- Transit investment in China often lacks long-term financing. Revenues from the sale of development rights are the major funding source
for local infrastructure, yet they are only a one-time revenue source for cities, and they fail to (1) capture the long-term increase in value brought by mass transit, and (2) meet the need for recurrent financial support for operation, maintenance, and renewal. There needs to be a mechanism for mass transit agencies to share recurrent revenues fairly with developers, through development-rights arrangements or other financial instruments, to capture increases in land values over the long run, such as property taxes, impact fees, and betterment taxes.

- The scale of TOD in Chinese cities is small, while the superblock design for car traffic creates urban islands disconnected from other streets within cities. Transit agencies have difficulty in finding experienced developers who can design and develop well-integrated spaces at the neighborhood level, even though the development rights of public land have been secured.

Notes

1. If other needed land sites are still under NMG’s control, NRTG can obtain these parcels via public auction. The Land Resource Center is in charge of leasing public land in Nanchang and usually leases development rights to investors through public auction or tender. NRTG can also take part in these auctions. Less than 1 percent of total land resources (16,426 mu) obtained by NRTG was secured through public auction.

2. RMB3,600 per square meter, while the actual construction cost is RMB13,000 per square meter.

References


CHAPTER 7

A Tale of Two Metro Cities: Delhi and Hyderabad, India

Two cities in India exemplify contrasting institutional approaches to land value capture (LVC) in delivering new metro projects: a conventional government-led approach in Delhi and an innovative public-private partnership (PPP) in Hyderabad. As the National Capital Region, Delhi faces the complexity of policymaking and interest sharing among multi-layered governments and their agencies within its wide territory. Despite the national government’s strong support and operational success of the extensive metro system, the Delhi regional government and its transit agency have been unable to fully use development-based LVC schemes as a strategic apparatus of infrastructure financing and urban development. This underutilization of land around metro stations is largely due to an inconsistent policy and regulatory framework and lack of coordination among stakeholders. In contrast, Hyderabad, the multinational corporate hub of South Asia, has advanced the world’s largest PPP metro project, integrating development-based LVC scheme as its financing and urban development instrument. Under a clear and transparent institutional and regulatory framework, the new private rail lines attempt to reconfigure the city’s business districts and streetscapes, spurring real-estate development along metro corridors and station precincts for commercial properties or offices connected to the stations through skywalk pedestrian bridges. These two cases highlight constraints and opportunities in applying development-based LVC in the fast-growing cities of the developing world, given the institutional and regulatory frameworks, many informal settlements, private expertise and resources available, and the market potential.
Urban Development Context, Delhi

Population and Urbanization Trends

The Delhi Metropolitan Area consists of the National Capital Territory of Delhi (NCTD) and the first ring of towns around the capital, including Ghaziabad, Loni, Noida, Faridabad, Gurgaon, and Bahadurgarh (map 7.1). It was home to more than 22 million inhabitants within 1,483 square kilometers in 2010 and is projected to increase to 33 million inhabitants by 2025 (figure 7.1). The NCTD’s per capita income is 2.4 times higher than the national average (Rs 70,238/$1,545 versus Rs 29,524/$650 in 2006–07), so its population ratio below the poverty line is also around half the national figure (14.7 percent versus 27.8 percent in 2004–05) (Gladstone and Kolapalli 2007).

Delhi’s economic supremacy comes mainly from trade, commerce, banking, finance, manufacturing, and tourism, which, however, accounted for only 15 percent of jobs in 2006, whereas government is the largest employer. Development policies, such as transport network extensions, large-scale slum redevelopment, and special economic zones, have gradually diminished the cohesiveness of traditional business activities around the city center. Delhi’s regional territory already expands beyond the NCTD’s original boundary (1,483 square kilometers) and has gradually engulfed the surrounding cities, towns, villages, and rural hinterlands. This has been spurred on by recent rapid motorization (the number of registered motor vehicles in Delhi climbed from 6.0 million in 2008–09 to 7.4 million in 2011–12), further complicating interjurisdictional coordination.

Regulatory and Institutional Framework, Delhi

Master Plans

Delhi’s strategic planning exercise began with the Delhi Development Act of 1957, which was followed by the Master Plan of Delhi, 1962 (MPD-62). MPD-62 first formulated the government’s land acquisition, development, and disposal scheme to extend the urbanized areas of Delhi from 172.9 to 447.8 square kilometers by 1981. It also promoted the first ring of towns within a radius of 35 kilometers of the capital, along with provision of public infrastructure and services. Between 1961 and 1981, 155.4 square kilometers was identified for public land acquisition. The initial procedure was highly government led with limited private participation in housing development (shelter provision) and infrastructure investment until the early 1990s. Thereafter, the Master Plan of Delhi, 2001 (MPD-2001), elaborated land use characteristics with a hierarchical planning system: master, zonal, and layout plans for specific development schemes within each zone. Nevertheless, the government has acquired only 39 percent of the land proposed for development in MPD-2001 (Delhi Development Authority 2013).
Map 7.1 Delhi Metropolitan Area

Source: GISAT for European Space Agency/World Bank.
The latest version, the draft Master Plan of Delhi, 2021 (MPD-2021), takes into account the achievements and shortfalls of MPD-62 and MPD-2001. Several studies made for preparing MPD-2021 reveal that there had been substantial gaps between the land areas targeted, acquired, and developed due to the limitations of financial, physical, and human resources and various difficulties encountered in the course of land assembly.

The draft MPD-2021 thus stresses the importance of four approaches: improving the scheme of large-scale land acquisition and development, involving the private sector in the assembly and development of land and the provision of infrastructure and services, integrating land use planning and infrastructure investment, and promoting redevelopment and densification with more flexible land use and development codes (Delhi Development Authority 2013). MPD-2021 also envisages an integrated multimodal transport network for the overall structure of the city, including various guided transit systems, such as Metro Rail, ring rail, dedicated rail corridors for daily commuters, bus rapid transit corridors, and regional rapid transit system corridors.

The Mass Rapid Transport System (MRTS) is the most important transport mode, forming a roughly 250-kilometer network of underground, elevated, and surface lines across the territory by 2021. It is expected that after the full network is developed, about 60 percent of the urbanized area of Delhi will be no more than a 15-minute walk from MRTS stations. Such investments are also expected to generate greater opportunities for economic growth and employment by calling for selective redevelopment and densification of the existing built-up areas given local conditions and informal settlement patterns such as land pockets of slum and Jhuggi Jhoppadi (a cluster of slum colonies). In the MPD-2021 framework, therefore, it is
recommended that a comprehensive redevelopment scheme of the catchment areas of MRTS stations be made with multiple land use categories and floor area ratios (FARs) (map 7.2).

**Zoning and Land Administration**

Delhi’s zonal plans aim to detail the policies of the master plan and lead to the practices of the layout plan. Between the master plan and layout plan, Delhi’s urban area is divided up into planning zones A through P, whose population and housing capacities are to be enhanced with target densities for redevelopment projects, especially along some sections of the rail corridors. Like many other large cities in India, the FAR of Delhi’s central business district has been kept much lower than those of global megacities in developed countries (1.12–3.5 versus 12.0 in Hong Kong SAR, China, 15.0 in New York City, and 20.0 in Tokyo) (World Bank 2013b). In addition, the FAR for the properties of the Delhi Metro Rail Corporation Limited (DMRC) at its station sites has been capped at 1.0, which does not allow DMRC to maximize revenues from property development.

**Map 7.2 Land use plan of the draft Master Plan for Delhi-2021**

*Source: Delhi Development Authority 2013.*
The Delhi Development Authority (DDA), set up in 1957 and in charge of the master plans, proposes to greatly raise FARs in Delhi under MPD-2021. A 500-meter wide transit-oriented development (TOD)/multi-use zone would be overlaid on both sides of the metro corridor to encourage a mix of commercial and employment-generating activities along with residential developments. Higher FARs would be permitted subject to certain setback and height restrictions. One redevelopment package will be included in the influence zone if more than 70 percent of the site area falls inside the 500-meter buffer. Property developments around the MRTS stations, up to a maximum area of 3.0 hectares, will be allowed in all use (mixed land use) zones, with some exceptions. This flexible land use coordination could lead to a mix of residential and commercial uses as well as densely built-up areas, but whether this actually triggers redevelopment along the corridor remains to be seen.

In practice, other regulatory impairments have impeded property development in the influence zones besides a low FAR limit. For example, the delivery of property development projects around the MRTS stations is subject to the approval of multiple statutory bodies as well as statutory clearance from local municipalities and related agencies, a process that can take several years. In addition, approvals of any development activities in the influence zones are granted only after the start of the MRTS extension projects, which blocks planners, developers, and operators from coordination and physical integration between public spaces, private properties, and station facilities (Delhi Development Authority 2013).

The private sector is expected to mobilize financial resources for land acquisition of slum areas, resettlement, and redevelopment through capital markets, while the government agency (DDA) enforces development controls, such as higher FARs and targeted land use planning, to achieve broader social objectives. In Delhi, the local government has set up mandatory provision of housing units for “economically weaker sections” (EWS) by exercising slum redevelopment to the extent of 15 percent of the permissible FAR, or 35 percent of the dwelling units on the plot. After private developers complete construction, EWS housing units are handed over to the government agency and are allotted to beneficiaries. Slum rehabilitation requires a minimum lot size of 2,000 square meters and an FAR of 4.0 for residential use. The FAR for remunerative use (mixed and commercial use) is up to 10 percent of the permissible FAR for residential areas. A minimum proportion of squatter resettlement area is 60 percent of the total areas for the residential use, while a maximum proportion of area for the remunerative use has to be up to 40 percent of the total area.

The practice of land banking in Delhi started in 1961, allowing DDA to take control of land designated for urban development and management. However, despite its financial success, fundamental issues remain with implementation. First, land acquisition is often difficult due to an outdated land valuation system. Second, land disposal has reallocated a high share of land resources to a small number of wealthy groups rather than a large number of low-income people. Third, DDA has been unable to provide
affordable housing units to low-income people and new immigrants, which has generated yet more informal settlements beyond the city boundaries. Fourth, land values have escalated as DDA has deliberately limited the release of DDA-owned sites to land markets (Nallathiga 2009; Gladstone and Kolapalli 2007).

**MPD-2021: Guidelines for TOD**

The term TOD has become increasingly popular across Indian cities, yet even as TOD standards for Indian cities are still being set up and executed, they face new challenges in urban land markets. In response, the current draft MPD-2021 attempts to provide guidelines for TOD practices that aim to reduce private automobile dependency through urban design and policies and to maximize public transport access through enhancing connectivity and densifying. It states that “the MRTS influence zone may catalyze the private sector into cross subsidizing and providing the various public amenities, greater affordable housing stock and high-quality public transport” (UTTIPEC 2012).

The draft MPD-2021 proposes that the influence zones of MRTS stations be further classified into three zone categories with certain location thresholds (table 7.1 and map 7.3). The total area covered by these TOD zones will be around 44.1 percent of Delhi, or 665.1 square kilometers. Applying the principles of TOD to Delhi would probably require more diversified approaches (including redevelopment, infill, and greenfield development) and using incentives and restrictions within the intense and standard zones.

<table>
<thead>
<tr>
<th>Zone categories</th>
<th>Location thresholds</th>
</tr>
</thead>
</table>
| Zone 1: Intense TOD | 300 m influence zone of all metro stations  
800 m (10 minutes’ walking) influence zone of regional interchange station (that is, interchange between rail and metro or two different metro lines) |
| Zone 2: Standard TOD | 800 m (10 minutes’ walking) influence zone of all metro stations |
| Zone 3: Nonmotorized transport | 2,000 m (10 minutes’ cycling) influence zone of all regional interchange stations and metro stations  
300 m influence zone of all bus rapid transit corridors  
Zones within intense or standard TOD influence zones, which are not permitted for redevelopment but need enhancements in public realm |

*Source: Adapted from Delhi Development Authority 2013.*

*Note: TOD = transit-oriented development.*
Any development practices in the zones are intended to be flexible, subject to development parameters and land use criteria: minimum site area of 6 hectare or 5,000 residents, minimum gross density permissible for TOD of 250 dwelling units per hectare, no universal cap on the FAR, minimum 30 percent residential and 30 percent commercial/institutional use of the FAR, and minimum 15 percent of the FAR to be allocated to rental or for-sale housing with unit sizes no larger than 25 square meters (table 7.2). However, the TOD zones and criteria listed are still inconsistent with the land use map shown in the MPD-2021 (map 7.4). MPD-2021 implies that DDA will continue to restrict the FAR for DMRC’s properties at its station sites up to 1.0.

The guidelines also encourage integration of multimodal public transport at key interchanges, with a checklist of interchanges, public facilities and open spaces, urban designs, and parking locations/policies over the 300-meter influence zone of MRTS stations. Similarly they target pedestrian and cyclist access to public transport systems, with street connectivity, housing density, and job-home accessibility standards (Delhi Development Authority 2013). The guidelines present a range of opportunities to tap developable sites around target interchanges and create greater benefits to
Chapter 7: A Tale of Two Metro Cities: Delhi and Hyderabad, India

Table 7.2 Proposed permissible floor area ratios and density for transit-oriented development

<table>
<thead>
<tr>
<th>Gross FAR (site)</th>
<th>Net FAR (block)</th>
<th>Minimum permissible density (with ±10% variation)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Residential-dominated (FAR ≥ 50%), dwelling units per hectare</td>
</tr>
<tr>
<td>Below 1.0</td>
<td>Below 2.0</td>
<td>Underutilization of FAR not permitted</td>
</tr>
<tr>
<td>1.1–1.5</td>
<td>2.1–3.0</td>
<td>300</td>
</tr>
<tr>
<td>1.6–2.0</td>
<td>3.1–4.0</td>
<td>400</td>
</tr>
<tr>
<td>2.1–2.5</td>
<td>4.1–5.0</td>
<td>500</td>
</tr>
<tr>
<td>2.6–3.0</td>
<td>5.1–6.0</td>
<td>600</td>
</tr>
<tr>
<td>3.1–3.5</td>
<td>6.1–7.0</td>
<td>700</td>
</tr>
<tr>
<td>3.6–4.0</td>
<td>7.1–8.0</td>
<td>800</td>
</tr>
</tbody>
</table>

Source: Adapted from Delhi Development Authority 2013.
Note: FAR = floor area ratio.

Map 7.4 Inconsistencies between Master Plan for Delhi-2021 and proposed transit-oriented development zones

Source: Adapted from Delhi Development Authority 2013.

several transport bodies, but the plethora of development-related bureaus in Delhi’s multilayered government rather inhibits seamless decision making and joint development.
A Complicated Government Structure

Delhi is statutorily distinct from other Indian cities. It is the seat of the national government, which heavily involves itself in managing urban affairs. Multiple government bodies over multiple jurisdictions often overlap territorially and functionally (figure 7.2). Unlike other Indian city-states, Delhi has no metropolitan planning committee—the NCTD has no control over its urban development. Instead, DDA administers land acquisition, disposal, and development within the NCTD. It started institutionalizing the TOD concept in 2007 for MPD-2021, while the Unified Traffic and Transportation Infrastructure Planning and Engineering Centre (UTTIPEC), established as one branch of DDA in 2008, is responsible for TOD policies and projects.

Transport, nationwide, is the domain of multiple government agencies. For example, since 1986 the Ministry of Urban Development has been the nodal body for planning and coordinating urban transport. Major transport projects in 65 Indian cities are sanctioned under the Urban Infrastructure and Governance component of the Jawaharlal Nehru National Urban Renewal Mission (JnNURM), launched in 2005 and administered by the Ministry of Urban Development. The writ of the Unified Metropolitan Transport Authority runs in all municipalities with more than
1 million people, such as Hyderabad, Bangalore, Chennai, Mumbai, and Jaipur. Beyond that, with the Dedicated Urban Transport Fund (funded by a green surcharge on petrol, “a green tax” on registered personalized vehicles, and an urban transport tax on purchase of new cars at national government level), state- and city-level transport agencies attempted to raise their own capital funds from revenues from the increased FAR, enhancement of property tax, and parking charges.

In Delhi, matters are even more complicated. Three major bodies—DDA, National Capital Region Board, and DMRC (see just below)—are under the national Ministry of Urban Development, whereas several transport-related branches, such as the Delhi Transport Corporation, Delhi Integrated Multi-Modal Transit Systems, and IFDC Foundation, are also involved in coordinating fares and services, operating bus transit, integrating multimodal activities, and funding infrastructure under the government of Delhi.

Still, India may be one of the few developing countries to have adopted a national urban transport policy. Its objective is “to ensure safe, affordable, quick, comfortable, reliable and sustainable access for the growing number of city residents to jobs, education, recreation and such other needs within our cities” (Ministry of Urban Development 2006). The policy thus encourages municipal governments and transit agencies to “raise funds, through an innovative mechanism that taps land as a resource, for investments in urban transport infrastructure” (Ministry of Urban Development, Government of India 2006).

**DMRC**

DMRC was established as a state-owned company in 1995 through an equal partnership between the national and Delhi governments, specifically for building and operating MRTS in the National Capital Region and beyond. It has powers of decision in railway business practices, while the exercise of land development rights remains with government authorities—the Ministry of Urban Development often intervenes in DMRC’s station plans with property development projects.

Since its beginning, DMRC has held a strong position in public infrastructure and urban mobility services. Due in large part to the financial difficulty faced by its initial operations, it was allowed to carry out property development projects and generate real estate revenues from the sites granted by the national government in and around its station facilities (map 7.5). The DDA and other municipal authorities agreed on such development practices to support the implementation of the DMRC’s railway projects in the early years. However, the DMRC was also exempted from paying most taxes levied by the national and Delhi governments—a source of conflict between the Municipality of Delhi and DMRC. The municipal agencies eventually refused to sanction some plans for commercial development on land granted because the DMRC was exempted from property taxes on some projects that were not directly related to MRTS operations.
DMRC has to get statutory clearance from multiple government stakeholders at NCTD level: for architectural and conceptual plans, from the Delhi Urban Arts Commission; land use changes—DDA; building plans—municipal authorities; no objection certificates—the Land and Development Office and DDA; archaeological surveys—the Archaeological Survey of India; fire-fighting clearance—Delhi Fire Service; and environmental clearance—the Ministry of Environment.

This slow and convoluted process (requiring two or three years a project) is often held up by DMRC and by private developers as the main barrier to delivering property development projects on MRTS station sites (see the second bullet in the Delhi “Conclusion”). Nevertheless, the process of generating revenues from property development in Delhi has been generally recognized as a metro finance model for other Indian cities.


Note: DMRC = Delhi Metro Rail Corporation Limited; NCTD = National Capital Territory of Delhi.
Land Value Capture, Delhi

Funding Arrangements

The current and proposed Delhi MRTS network combined is about 293 kilometers long and has three project phases (table 7.3). The national government’s direct participation in project funding in the three phases was required to secure concessional Japanese yen loans (30 years, including a 10-year grace period, with an interest rate of about 1.8 percent) from the Japan International Cooperation Agency (JICA).

The land parcels belonging to the various bureaus, agencies, and municipalities were transferred to DMRC at intergovernmental transfer rates decided by the Ministry of Urban Development for a 99-year lease. The

<table>
<thead>
<tr>
<th>Table 7.3 Mass Rapid Transport System financing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project completion cost (in crores Rs): 10,891 ($3,472 million)</td>
</tr>
<tr>
<td>• Government of India equity: 14%</td>
</tr>
<tr>
<td>• Government of Delhi equity: 14%</td>
</tr>
<tr>
<td>• Subordinate debt of government of India: 2.5%</td>
</tr>
<tr>
<td>• Subordinate debt of government of Delhi: 2.5%</td>
</tr>
<tr>
<td>• Interest free subordinate debt representing land cost: 7%</td>
</tr>
<tr>
<td>• JICA loan: 60%</td>
</tr>
<tr>
<td><strong>Phase II (2006–11)</strong></td>
</tr>
<tr>
<td>Project completion cost (in crores Rs): 19,390 ($4,304 million)</td>
</tr>
<tr>
<td>• Government of India equity: 17%</td>
</tr>
<tr>
<td>• Government of Delhi equity: 17%</td>
</tr>
<tr>
<td>• Subordinate debt of government of India: 3.26%</td>
</tr>
<tr>
<td>• Subordinate debt of government of Delhi: 3.26%</td>
</tr>
<tr>
<td>• Interest free subordinate debt representing land cost: 4.35%</td>
</tr>
<tr>
<td>• JICA loan: 55.13%</td>
</tr>
<tr>
<td><strong>Phase III (2011–16)</strong></td>
</tr>
<tr>
<td>Project completion cost (in crores Rs): 35,242 ($7,889 million)</td>
</tr>
<tr>
<td>• Government of India equity: 10.6%</td>
</tr>
<tr>
<td>• Government of Delhi equity: 10.6%</td>
</tr>
<tr>
<td>• Subordinate debt of government of India: 7.2%</td>
</tr>
<tr>
<td>• Subordinate debt of government of Delhi: 7.2%</td>
</tr>
<tr>
<td>• Interest free subordinate debt representing land cost: 4.50%</td>
</tr>
<tr>
<td>• JICA loan: 40%</td>
</tr>
<tr>
<td>• Others: 19.9%</td>
</tr>
</tbody>
</table>


Note: JICA = Japan International Cooperation Agency.
Delhi government is essentially in charge of acquiring private lands for public projects and then transferring them to DMRC. In some locations, DDA also provides the land for free to DMRC. The cost of land acquisition is treated as a premium to be recovered as an interest-free subordinate debt over a 25-year period in the fund allocation schemes.

From 2006 to 2012, DMRC gained more passengers (about a 285 percent increase in daily ridership), leading to operational cost recovery of about 247 percent in fiscal year 2011–12 (DMRC 2013a). However, this exceptional outcome can be explained by tax exemptions (see above), preferential power tariffs, and low-cost labor. The recurrent income from traffic operations, which accounts for 57 percent of total corporate revenue in fiscal year 2011–12, is a primary source for DMRC to pay back the low-interest foreign loans.

Property Development

In 1996 during phase I, DMRC was granted a mandate from the union cabinet to raise 7 percent of the total cost of the first phase of the metro project through property development. Its property division, set up in July 1999, deals with smaller commercial properties inside the MRTS, reserved developable land parcels close to stations, and larger residential and commercial property projects on the sites initially acquired for constructing depots and maintenance buildings. This funding approach—development-based LVC, in other words—was followed by phases II and III, but the capital proportion from property development fell (table 7.4).

Most residential development projects on depot and standalone plots with 90-year leases generate substantial upfront payments, whereas commercial properties within station buildings with short (6–12-year) leases and on large plots outside stations with medium-term (20-year) leases produce more recurrent revenue streams. DMRC’s recurrent income from real estate accounted for about 30 percent of the total over seven recent years (figure 7.3). Yet the financial contribution from the real estate practice has been minor for the last few years (such as only 6 percent in 2011–12).

<table>
<thead>
<tr>
<th>Phase</th>
<th>Metro Rail Project cost (crores Rs)</th>
<th>Funded by property (crores Rs)</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>10,891</td>
<td>762.37</td>
<td>7.00</td>
</tr>
<tr>
<td>II</td>
<td>19,390</td>
<td>843.46</td>
<td>4.35</td>
</tr>
<tr>
<td>Subtotal</td>
<td>30,291</td>
<td>1,605.83</td>
<td>5.30</td>
</tr>
<tr>
<td>III</td>
<td>35,242</td>
<td>1,586.00</td>
<td>4.50</td>
</tr>
<tr>
<td>Total</td>
<td>65,523 ($12,049 mn)</td>
<td>3,191.83 ($587 mn)</td>
<td>4.87</td>
</tr>
</tbody>
</table>

Sales of development rights are in two steps. After it gets the land transfers from multiple government agencies, DMRC usually invites shortlisted bidders to make concession agreements with successful tenders for the development rights. Only DMRC selects the developer and sets the lease terms. Yet inefficiencies in implementation remain at the site level. An audit report of the Comptroller and Auditor General of India (2008) highlighted weak responses and poor performance on the amount of development realized at a reasonable price. From a private developer’s standpoint, two impediments stand out: restrictive clauses for land use in the allotment letter and stringent technical criteria fixed through the bidding process; and inadequate FAR and plot size to generate a profit.

**Development Cases, Delhi**

To illustrate Delhi’s TOD and LVC practices at the site level, this short section presents two current Delhi cases. Both sites are being mainly developed
with large-scale properties: one by UTTIPEC based on the TOD principle, the other by a private developer without a TOD-planning framework and control. Their experiences reveal some of the potentials and barriers to these practices.

Case 1: TOD Pilot Project, Karkardooma Metro Station

In 2010, the DDA decided that UTTIPEC would conduct a TOD pilot project at MRTS stations. The UTTIPEC team drafted a project for a group housing complex around Karkardooma Metro Station (photo 7.1). The area has more than 30 hectares of developable land connected to Vikas Marg Station and the new MRTS Line III that stretches from Yamuna Bank to Anand Vihar Terminal and points to huge accessibility benefits from the multiple metro lines, commuter rail, and feeder services.

UTTIPEC is attempting to demonstrate TOD principles, which aim to improve neighborhood connectivity and reduce automobile trips. It proposes mixed-use developments with a variety of housing types (including EWS units) and civic amenities, all intended to encourage affordable and walkable communities around a multimodal transport node. The area is surrounded by informal housing clusters. Yet the implementation of such an ideal TOD proposal would require drastic changes and several modifications to the strict FAR and coverage regulations, zoning and design codes, and painstaking clearance procedures (table 7.5). Worse, there has been no coordination between UTTIPEC and DMRC on the metro station area’s

Photo 7.1 Group housing site and Mass Rapid Transport System extension around Karkardooma Metro Station

Source: © Jin Murakami. Used with permission. Further permission required for reuse.
land use and layout plans, design parameters, multimodal facilities, feeder services, and travel and property demand estimates, even though these conditions will determine the financial feasibility of the project and the metro line extension.

**Case 2: Sales of Development Rights for High-End Residential Complex, Khyber Pass Metro Depot**

The Khyber Pass Metro Depot is located 9 kilometers north of the city center near the Yamuna River and a series of major roads that were originally selected by the Delhi government for building a new bridge. In 1999, more than 37 hectares of land were transferred from the Land and Development Office to DMRC for more than Rs 210 million ($4.9 million) with an annuity of 2 percent of this amount. In 2003, DMRC invited tenders for much of the depot site. It received six bids for a residential condominium package and two for a shopping mall. The developer Parsvnath won the bid for residential development at about Rs 194 crores ($40 million) for a long-term leasehold of 99 years (property development rights); the up-front payment was 94 percent higher than the reserve price set by the DMRC. Parsvnath then sold the leasehold rights to high-end housing units to private buyers. To finance the project, the developer raised Rs 115 crores ($24 million) from a private investment company for a 22 percent stake in the property package.

Parsvnath’s residential condominiums are mainly three- to five-bedroom units with about four parking spaces per household along the depot (figure

<table>
<thead>
<tr>
<th>Table 7.5 Proposed transit-oriented development project around Karkardooma Metro Station</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project period</td>
</tr>
<tr>
<td>Distance to central business district</td>
</tr>
<tr>
<td>Population</td>
</tr>
<tr>
<td>Site area</td>
</tr>
<tr>
<td>FAR</td>
</tr>
<tr>
<td>Floor area use</td>
</tr>
<tr>
<td>Parking requirement</td>
</tr>
<tr>
<td>Key stakeholders</td>
</tr>
<tr>
<td>Financial figures</td>
</tr>
</tbody>
</table>


*Note:* DDA = Delhi Development Authority; FAR = floor area ratio; UTTIPEC = Unified Traffic and Transportation Infrastructure Planning and Engineering Centre.

^a. Because the project is a pilot, financial figures have not been published, and official financing data was not available as of May 2013.
7.4). But the layout is not connected to the nearest MRTS station—making it a typical transit-adjacent development (TAD) for DMRC’s financial gain rather than a TOD. Still, a social component of the project is housing

**Figure 7.4 Layout of residential complex property development around Khyber Pass Metro Depot**

*Source (top): Map data © OpenStreetMap contributors.*

*Note: EWS = economically weaker section.*
Chapter 7: A Tale of Two Metro Cities: Delhi and Hyderabad, India

reserved for economically weaker sections (EWS) of society: the MPD-2021 stipulates that large housing projects must reserve 35 percent of their units for EWS residents (table 7.6). This development includes 273 such units. Yet the physical configuration between the condominium and EWS units raises questions whether this public requirement will promote social inclusiveness.

Urban Development Context, Hyderabad

Population and Urbanization Trends

Hyderabad, the capital of Andhra Pradesh, has long been the international corporate hub for India’s driving businesses since the arrival of modern infrastructure—railway and education—in the late 19th century. Hyderabad’s economy is once more restructuring, transitioning from low-cost manufacturing to services- and knowledge-based activities. Information technology (IT) and IT-related services, with the biotech industry, have formed new business clusters largely in the northern part of the Hyderabad Metropolitan Development Area (HMDA), helping make it the fourth-largest exporter of software in the country (GHMC 2013).

More than 7.5 million people live within the 7,257 square kilometers of the HMDA, which includes the Greater Hyderabad Municipal Corporation (GHMC). Hyderabad’s metropolitan population is projected to grow to more than 11.6 million by 2025 (figure 7.5), of which the major development and population growth are likely to occur in the surrounding municipalities. Hence, there is a need to think long term about public infrastructure investments and land use regulations, reflecting population growth patterns and the emerging industrial clusters across the whole metropolitan area (GHMC 2013).

| Table 7.6 Residential property around Khyber Pass Metro Depot |
|-----------------|-----------------|
| Period          | 2003–present (99-year lease) |
| Distance to central business district | 9 km |
| Population      | 2,000 |
| Site area       | 16.8 acres |
| Total units     | 507 excluding EWS units |
| EWS units       | 273 (35% of total units) |
| Car parking     | 1,500 spaces |
| Key stakeholders| Land and Development Office; DMRC; Parsvnath (developer); Private Investment Company |
| Financial figures| Rs 210 million (DMRC to Land and Development Office); Rs 194 crores (Parsvnath to DMRC); Rs 115 crores (investment company to Parsvnath) |

Note: DMRC = Delhi Metro Rail Corporation; EWS = economically weak sections.
Hyderabad’s master plans have been updated to address emerging population growth patterns and business location shifts for the long term. The latest Metropolitan Plan-2031 for the outer areas (that is, outside the outer ring road) encourages the clustering of economic and social activities within built-up areas and along target transport corridors for more compact development (map 7.6). The metro rail has never been integrated into any of the master plans, and so there were no studies on the impact of the new metro system on adjacent areas. The metro network development in the central area was in fact a standalone project in the broader metropolitan development strategy. Once the metro development plan was complete, the master plan of the GHMC was amended by the state government to introduce a 300-meter wide “multi use zone (mixed land use)” on both sides of the metro corridor to promote commercial and office use, which can also benefit from transit services.

Government Structure

Hyderabad used to have many municipalities and administrative organizations, though it has recently consolidated them. The overarching spatial unit is the HMDA, which was set up in 2008 as an umbrella authority after five authorities were merged (map 7.7). This unit is in charge of planning,
coordinating, supervising, promoting, and securing the development of the HMDA by allocating development funds for amenities and infrastructure.

Within the outer ring road growth corridor is the Greater Hyderabad Municipal Corporation (GHMC), with an area of about 650 square kilometers, formed by the merger of the Municipal Corporation of Hyderabad with 12 municipalities and eight gram panchayat of two neighboring districts in 2007 (except Secunderabad Cantonment Board, which has camps of the Indian Army and Indian Air Force). The GHMC is divided into five zones (north, south, central, east, and west) and 18 circles that contain 150 municipal wards. Each ward is headed by an elected “corporator.” The corporators elect the city mayor, the titular head of GHMC, though its executive powers lie with the municipal commissioner, appointed by the state government.
Public-Private Partnership

Hyderabad runs the world’s largest metro PPP project, in an entrepreneurial model established after reviews of worldwide best practices, as for example, Bangkok; Hong Kong SAR, China; London; Singapore; and Tokyo (Hyderabad Metro Rail Limited, 2010 information). The state government is attempting to provide a rail system for 71.16 kilometers on elevated structures in Hyderabad via design-build-finance-operate-transfer. In 2009, it invited proposals from eight consortium bidders shortlisted for undertaking the project with a maximum 10 percent viability gap fund (a subsidy from the national government to fill a PPP’s financing gap).

Among the three finalists, Larsen & Toubro Limited (L&T) won the bid as it asked for the lowest viability gap funding (VGF) (Rs 1,458 crores/$230 million) and signed the concession agreement with the state government for the project over 35 years, of which 5 years are for construction. Hyderabad Metro Rail Limited (HMR) was set up as a special-purpose vehicle. In this framework, HMR is an intermediary ensuring that
L&T gets the right of way for the metro construction, coordinating with the GHMC, traffic and police departments, and utility agencies for multiple clearances. Essentially, all heads of major departments are on the board of the HMR, and the core members of the HMR were selected from the state government, which tries to make the painstaking task of obtaining various clearances easier. The HMR has acquired about 269 acres (108.8 hectares) of land for property development. Where road widening in certain sections was required, the land parcels were acquired at market rates.

The L&T Hyderabad Metro Rail Private Limited (L&T Metro Rail)—the concessionaire of the Metro Rail Project—assisted by international consulting firms has been entitled to undertake development, operation, and maintenance of real estate along corridors, with the right to sublicense any or all parts of those properties. Two important obligations of the concessionaire are to achieve integration with the surrounding landscape by engaging architects and town planners and to design the metro system to accommodate interchange facilities with other transport modes and new corridors.

**Land Value Capture, Hyderabad**

**Funding Arrangements**

The first phase of the Metro Rail System is still under construction (photo 7.2 and map 7.8). The length of the three metro rail lines will reach 71.16 kilometers with 66 stations roughly 1 kilometer apart. Most of the area of the former Municipal Corporation of Hyderabad will be covered by the

**Photo 7.2 Metro construction in progress: Cutting across the built-up areas of Hyderabad**

The entire system is elevated and positioned in the center of the right of way of the roads because the underground basements are too rock-strewn to construct subway structures.

In accord with one of the bid conditions, the government meets 40 percent of the project costs—half from the national government and half from the state government. The balance of 60 percent has to be provided by L&T Metro Rail. A consortium of 10 banks led by the State Bank of India provided financing. The debt to equity ratio set out for this rail project was 2:1. L&T Metro Rail foresees around 50 percent of corporate revenue coming from fares, about 45 percent from real estate development, and 5 percent from adverts and parking fees.

The proportion of L&T Metro Rail’s real estate revenues is therefore much higher than DMRC’s (see table 7.4 for DMRC’s real estate values).
contribution rate). The total project costs are $3.07 billion, which include $0.41 billion for real estate development along the metro rail corridors (L&T Metro Rail, 2013 information).

Property Development
Based on Hyderabad’s PPP scheme, L&T Metro Rail is pushing through with several real estate development projects at depots and stations. The three depots’ area of development is nearly 86 hectares, with a maximum floor area of about 1,161,000 square meters, which would be structured at and above first floor level by earmarking 70–80 percent of the ground floor for maintenance and stabling of trains and other depot facilities. Also, some 20 percent of the floor area of each station will be used for real estate. (The sites under tracks are not considered for computing the floor area.) L&T Metro Rail is entitled to use the stations’ parking and circulation spaces for real estate development on the 25 sites, accounting for 23 hectares, and with a maximum floor area of 557,000 square meters. Many of the developable sites are former government facilities for nonresidential use near future metro stations and include government quarters, hospitals, and colleges. If any of the land parcels earmarked are not made available, the government will provide alternate sites on a comparable scale.

L&T Metro Rail is expected to provide public amenities, specifically where a 300-meter wide band from the metro corridor is envisaged for TOD at higher densities. In the TOD scheme, it is also essential to provide good feeder bus services and build well-connected foot and bike pathway networks around the new metro stations. However, the costs of such infrastructure and services are not included in the original concession agreement. For the intermodal integration objective, additional project funds need to be arranged from other transport sources such as JnNURM.

Conclusion
Delhi and Hyderabad are two Indian cities that have applied the value capture concept and schemes, having learned from other cities’ experiences, to finance their new metro rail projects and to transform their urban structure with transit. The two cities have adapted different institutional and regulatory frameworks. Based on their experiences, they are adjusting these frameworks to overcome existing barriers, as seen in the proposed new TOD guidelines in Delhi. Even though it is early, some constraints and opportunities are now summarized.

Delhi’s Experience

• DMRC began its first property development in 1999, though the contemporary MPD-2001 did not consider MRTS stations in its zoning systems, partly as Delhi’s planning concept had, since World War II,
been automobile oriented. Political and financial support from the national government could only start bearing fruit after a series of master plans was launched, which integrated the key position of new metro stations in the long-term development strategies and zoning systems.

- The FARs for DMRC’s first property development were kept very low because DDA was initially concerned about the extra commercial activities inside metro stations generating serious congestion there. DMRC tried hard to get DDA to allow higher FARs by referring to Hong Kong SAR, China’s, successful practice. But DDA did not relent because it recognized that DMRC properties would attract more people than the properties outside—controlled by DDA. For this reason, any proposals made by the DMRC for changes in land uses, approvals of building controls, and other clearances have been often held up for a long period. While DDA has proposed to significantly increase FARs in the metro influence zone in the draft MPD-2021, it seems that DDA will continue to limit FARs for DMRC’s properties at station sites to 1.0. Beyond congestion, it seems that DDA’s obstruction originates from a fundamental disagreement on how to share the development benefits generated by multiple property developments in metro impact areas among itself, DMRC, and other stakeholders.

- To increase broader public interest in India’s first metro project, land parcels along the routes were transferred from various national government departments, agencies, and municipalities to the DMRC at far less than market prices. However, DMRC began using part of the land for real estate businesses without paying property taxes. The profits of development should have been shared with the land contributors and other benefit generators, including DDA. And so the regulatory tools have been used by DDA, not to support DMRC’s property development projects, but to resist DMRC’s monopolistic position.

- To solve the conflict of interest, the property development programs around metro stations should be conducted jointly by the DDA and DMRC. Yet they also have big differences in working cultures and methods. DMRC as a transport agency gives more attention to the efficiency of the metro system with certain privileges provided under the Indian Railways Act, which cannot legally be shared with DDA and other municipal agencies. Unlike the MTR of Hong Kong SAR, China, and several railway companies in Tokyo, DMRC’s property division has not yet been given a strong business mandate because the major funds for its metro projects have been raised by the national government, including yen loans. While passenger services have increasingly generated substantial corporate profits in recent years, the lack of adequate expertise in real estate and town planning has diminished DMRC’s motivation
to explore joint development opportunities and create greater profits with DDA and other stakeholders.

- The TOD parameters set out by the UTTIPEC seem extremely similar to those introduced from U.S. urban planning and design schools but realistically they would not be able to perform well for residents and passengers in the real estate and transport markets unless DDA and DMRC work together on the master layout plan. The world’s best LVC practices suggest that the parameters be determined not based on fixed standards but on local site conditions, networkwide node characteristics, and market-based demands. Despite the importance of private entities’ participation in implementing large TOD projects, the opportunities have been limited thus far for developers to put greater knowledge and resources into a variety of housing properties around metro station areas.

Hyderabad’s Experience

- In the innovative business climate of Hyderabad, the world’s largest metro PPP scheme has involved several municipal agencies and multinational corporate parties. The procedure has been very smooth because of the clear-cut concession agreement that spells out public-private obligations and provides a list of the land parcels for real estate development with specifications of public facilities. In accord with the obligations, the government has hastily acquired land parcels along the city’s main corridors, and the private partner has been building bridge pillars, railway segments, and depots.

- The latest master plan for the Hyderabad Metropolitan Area includes neither specific development strategies nor strict land use restrictions along the new metro lines that will serve the central area of Hyderabad. Instead, 300-meter buffer areas from the target corridors have been set up as TOD zones at the municipal government level to work with PPP-based metro projects. Such relaxed and localized policies raise the question of how the short- and mid-term project outcomes in the PPP framework will meet the long-term urban development goals at the metropolitan scale.

- A list of the real estate development packages being proposed by L&T Metro Rail contains mainly commercial properties within the small plots awarded for financial gain. Associated with rash land acquisition and clearance processes, TOD principles have not yet been incorporated in the PPP-based development practice. Additional time, knowledge, and experience are needed for the Metro Corporation to embark on larger mixed-use development projects with elevated pedestrian networks and to gradually harmonize metro facilities into the surrounding districts for wider social interest. Such a scenario may not be too optimistic, as Hong Kong SAR, China’s, MTR Corporation took a similar approach after the initial stage of R+P implementation in the 1980s.
References


São Paulo is Brazil’s land value capture (LVC) pioneer, as without large fiscal resources it has explored LVC instruments to raise funds for urban infrastructure investment. Yet having urbanized heavily and owning few developable lands—and so, unlike Chinese or Indian cities, unable to sell or lease public lands—the local government has explored air rights sales as an integral part of urban redevelopment. It has attracted private real estate investments into its designated urban redevelopment areas, called “Urban Operations” (UOs), and raised funds for urban infrastructure by auctioning out tradable air rights—Certificados de Potencial Adicional de Construção (Certificates of Additional Construction Potential, or CEPACs). CEPACs have rarely financed transit or transit-oriented development (TOD)–related investments in São Paulo but could be used more to finance this type of project elsewhere in Brazil, as Curitiba has done. CEPACs are not without problems, however, due to downzoning, which seems to have unintended negative impacts on urban development patterns.

Urban Development Context: Population and Urbanization Trends

São Paulo is pivotal for the development of the Southeast and Midwest Regions of Brazil. Many of the municipalities in its metropolitan area have evolved from small villages along the major rivers that were used as regional transport corridors during the colonial era. The first period of intensive growth was in the 19th century when the region’s coffee production and trading businesses extended with the construction of railroads from the Port of Santos to the City of São Paulo and its hinterlands. The second phase was during industrialization in 1940–80. While the city’s gross domestic product increased 10 times, the population quintupled, up to about 12.1 million. But since the 1990s, São Paulo’s economy has heavily deindustrialized.
The high pace of income and population growth linked to unstable political and financial conditions, as well as inadequate implementation of a spatial development vision and strategy in past years, have led to urban expansion (map 8.1), including massive informal settlements on the periphery. Currently, 86.5 percent of São Paulo is urbanized (World Bank n.d.). The urban agglomeration is projected to have around 23.1 million inhabitants by 2025 (figure 8.1), even though developable land is in short supply.

While the city-region boundaries persistently drive outwards, the central area presents a high concentration of job openings, educational activities, public services, businesses, and entertainment activities. These have generated excessive commuting patterns between the city center and surrounding municipalities, where the majority of people live. Lately, however, central urban areas have once more seen the return of residential populations, similar to other global cities like Tokyo, New York, and London. Such urban regeneration trends could have been used better to provide opportunities to adapt value capture instruments in association with rail transit investments over the last decade.

Map 8.1 São Paulo’s metropolitan region

Several laws and master plans guide São Paulo’s urban development and transit investment across federal, state, and municipal governments. At the federal level, the City Statute (Federal Law 10.257/2001) defines the legislative principles to guide governmental actions for controlling the processes of urban land development and management, complemented with municipal by-laws (Fernandes 2010). The City Statute also defines the obligations of municipalities with more than 20,000 inhabitants and the functions of UOs to be implemented through partnerships between municipal governments and private developers, among other instruments. The City Statute also underlines the social function of property by distinguishing between the ownership of land and the right of use. This means that land ownership does not immediately promise complete freedom of site use, as landholders have to obtain development permits with conditions from their local government. In accord with the City Statute, municipal governments in Brazil ensure the public interest of property through land development approvals as well as air rights sales. This provides the legal background for air rights sales by municipal governments.

The National Plan of Logistics and Transport was prepared by the Ministry of Transport to guide public-private transport infrastructure investments and integrate multiple transport modes over the medium and long term. The Urban Mobility Program was developed by the Ministry of Cities, with action plans for policymakers and practitioners to promote urban
transport projects in their own cities, such as bus rapid transit (BRT) and urban improvements along commuter and metro rail lines. The Ministry of Cities has also published guidelines for urban mobility projects and related programs.

At the state level, PITU 2025 (Integrated Urban Transport Plan 2025) (STM 2006) proposed a well-integrated transport development strategy that aims to balance the supply of and demand for urban mobility. The latest revision in 2006 stressed the integration of land use policies with transit infrastructure investments, aiming to promote the relocation of business activities and lessen excessive commuting trips to and from the central business district. Some of the railway projects proposed in PITU 2025 have already been delivered, such as the construction of the new Marginal Pinheiros station, the modernization of rail line 9, the extension of metro lines 4 and 5, and the installation of new BRT lanes. By 2025, the entire network is expected to comprise 110 kilometers of commuter rail and metro systems, including express services to Guarulhos International Airport (map 8.2).

At the city level, the latest Strategic Master Plan of 2002—Plano Diretor Estratégico (PDE)—incorporated the urbanization instruments defined by the City Statute in its spatial development strategy. The PDE also emphasized the integration of transit and land development that could be achieved through market incentives for high-density and mixed-land use development, creation of new business clusters along metro lines, redevelopment
of built-up areas, and use of existing transport infrastructure. Many of the
directions in the PDE are consistent with those in PITU 2025. Since 2013, the
PDE has been undergoing revision through civic consultation, after which
the strategic development districts in São Paulo will be redefined, based on
future urban transit investments and current land market conditions.

A document, São Paulo 2040, was prepared by City Hall in 2012 to
share a longer-term vision of the city. A notable outcome was the “30 Min-
utes City” (Cidade de 30 Minutos), to get urban residents closer to their
daily activities, in time and space, by improving urban transit quality and
extending the metro network to 264 kilometers by 2040.

**UOs**

“An urban operation (Operacion Urbanisica/UO) is defined by the City
Statute as a tool to promote the restructuring of large areas of the city
through land-based incentives offered to public-private partnership (PPP),
including local public authorities, developers, landowners, and other stake-
holders as independent investors” (Montandon and de Souza 2007). UOs
are implemented through instruments called Operações Urbanas Consorti-
adas (Consortia Urban Operations). The urban infrastructure investments
in UOs will be financed by the incremental value created by public invest-
ment, land use, and zoning change (Sandroni 2010), as recouped through
air rights sales (described below).

The first UO in São Paulo was Anhangabaú in 1991, later expanded
under the new name of Centro. Two other UOs were Faria Lima around
a business district, and Água Branca on a former industrial site (map 8.3).
Only a few months after the City Statute was approved, Água Espraiada was designated a UO, based on the new 2001 standards. The 2002 PDE recognized the four current UOs and proposed 11 new UOs. The city-level plan also reiterated the need to update existing UOs to meet the requirements of the City Statute, as the four initial UOs did not have CEPACs. The amount to be paid for additional air rights used to be assessed based on the valuation report prepared by professional auditors for each real estate project. The new system was applied to update Faria Lima in 2004. A study to update Água Branca began in 2008, and its revision was sent to the City Council in 2012, though it is still waiting for official approval.

**Government Structure and Roles**

Federal, state, and municipal governments all have a hand in executing the PDEs and transport master plans for São Paulo. The federal government is responsible for formulating normative criteria on urban planning and TOD projects belonging to the city and surrounding municipalities. It is also in charge of managing the federal road, rail, and waterway systems more broadly. The federal Ministry of Cities is given an instructive role to guide urban development processes, taking into account the benefits of integrating multitransport systems across cities. Its recommendations cover multiple states and municipalities to consolidate their own ideas.

The state government is accountable for the metro rail and integrated transport network across the metropolitan area, while the municipal agencies control parts of the urban transport systems within their jurisdictions, as well as land use planning.

State and municipal governments have formed multiple departments and agencies for regional and local transport systems. The state Secretariat of Metropolitan Transport (STM) has three operating companies: São Paulo Company of the Metropolitan (METRO), São Paulo Metropolitan Trains Company (CPTM), and Metropolitan Urban Transportation Company (EMTU). Within the STM, the tasks for public transport and traffic management are split between SPTrans (São Paulo Transporte S.A.) and CET (Traffic Engineering Company). As a primary transit agency, SPTrans coordinates all municipal bus services, which are operated by eight private companies within the city of São Paulo. Important transit projects are being undertaken by two units: STM and the Municipal Secretariat of Urban Development. The latter works mostly on urban planning and design around new transit corridors and terminuses, controls land regulations, and oversees the municipal urban development company (São Paulo Urbanismo).

State and municipal governments and agencies face onerous financial requirements for the transit investments proposed in recent master plans (table 8.1). According to the latest report of the São Paulo state government, total public expenditure for FY2013 was R$173 billion (US$88.7 billion), of which about R$24 billion (US$12.3 billion) was for transport investments. New investments in the São Paulo metro accounted for R$4.8 billion (US$2.5 billion), of which R$3.5 billion (US$1.8 billion)
was financed by the State Treasury and R$1.3 billion (US$0.7 billion) by METRO. The São Paulo municipal government had a total budget of R$42 billion (US$21.5 billion) of statutory spending by Brazilian municipalities on health, education, debt servicing, and operations for FY2013, of which R$2.6 billion (US$1.3 billion) was allocated to transport projects and related urban programs.

Land Value Capture

Funding Arrangements for Transit Investments

The funding for most transit projects in the city of São Paulo and surrounding municipalities relies heavily on local government resources, especially São Paulo state government’s general budget for metro, commuter rail, and intercity bus transit investments. The federal government provides financial support to some projects (such as the construction of 150 kilometers of new bus corridor projects in the city since April 2013). According to a study on the financial feasibility of public investments (called SP 2040), São Paulo’s

<table>
<thead>
<tr>
<th>Project</th>
<th>Agencies</th>
<th>Objective</th>
</tr>
</thead>
<tbody>
<tr>
<td>BRT</td>
<td>Prefeitura Municipal de São Paulo (PMSP)</td>
<td>Implementation of new bus corridors (150 km)</td>
</tr>
<tr>
<td>Intercity Bus Corridors--Itapevi--São Paulo</td>
<td>STM/EMTU</td>
<td>30.4 km of bus corridor and integration with metro line 4</td>
</tr>
<tr>
<td>Intercity Bus Corridors--Guarulhos--São Paulo</td>
<td>STM/EMTU</td>
<td>24.8 km of bus corridor</td>
</tr>
<tr>
<td>New lines for the Railway System</td>
<td>STM/CPTM</td>
<td>Line ABC Express (will run parallel to line 10) and Line 13 Jade/Airport express</td>
</tr>
<tr>
<td>Extension of Railway System</td>
<td>STM/CPTM</td>
<td>Extension of line 8 (Diamond) and 9 (Emerald)</td>
</tr>
<tr>
<td>Metro Line 4 Yellow</td>
<td>STM/METRO</td>
<td>Extension of 12.8 km, with 6 new stations</td>
</tr>
<tr>
<td>Metro Line 6 Orange</td>
<td>STM/METRO</td>
<td>New line with 15.3 km and 15 stations</td>
</tr>
<tr>
<td>Metro Line 18 Bronze VLT São Paulo SBC</td>
<td>STM/METRO</td>
<td>14.2 km of monorail line with 12 stations</td>
</tr>
<tr>
<td>Metro Line 20 Pink</td>
<td>STM/METRO</td>
<td>New line with 12.3 km and 14 stations</td>
</tr>
<tr>
<td>Metro Line 5 Lilac</td>
<td>STM/METRO</td>
<td>Extension between Largo Treze and line 2 Green—19.9 km</td>
</tr>
<tr>
<td>Metro Line 15 Silver</td>
<td>STM/METRO</td>
<td>25.8 km of monorail line and 18 stations</td>
</tr>
<tr>
<td>Metro Line 17 Gold</td>
<td>STM/METRO</td>
<td>7.7 km of monorail line connecting Congonhas Airport to the CPTM—line 9</td>
</tr>
</tbody>
</table>


Note: BRT = bus rapid transit; CPTM = São Paulo Metropolitan Trains Company; EMTU = Metropolitan Urban Transportation Company; km = kilometer; METRO = São Paulo Company of the Metropolitan; SBC = São Bernardo do Campo (municipality); STM = State Ministry of Transportation, São Paulo; VLT = light rail.
municipal government does not have enough fiscal resources to deliver and maintain the capital-intensive transit systems enumerated in several master plans.

To raise the capital funds required in the coming decades, PITU 2025 examined financing scenarios for transit investments based on conventional tax resources and innovative financing schemes, including value capture. According to the funding arrangement models analyzed in the master plan, substantial development benefits could be captured by air rights sales in “urban intervention areas” and in “urban operations or consortia urban operations,” accompanied by PPP initiatives and congestion charges (pedágio urbano) (table 8.2).

Value Capture Instruments

The city of São Paulo has played a pioneering role in value capture instruments since the early 1990s, including CEPACs adapted under UOs. Many municipalities’ LVC regulatory frameworks and schemes have been derived from São Paulo’s experience. The key features of the main LVC instruments in Brazil are now discussed and are summarized in table 8.3.

Additional building charge (Outorga Onerosa do Direito de Construir/OODC) is the sale of floor areas that enable landholders to make use of their own sites up to the maximum floor area ratio (FAR) defined by law. Under OODC, the landowner’s property right is limited to a basic FAR that is different from “the maximum FAR the area could support” (Smolka 2013). In São Paulo, the city planning department sets the “basic” FAR for the city at 1.0–2.0, though specific FARs within this range depend on

<table>
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<tr>
<th>Funding scheme</th>
<th>2007–12</th>
<th>2013–25</th>
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<tr>
<td>State government—treasury contribution</td>
<td>7,700</td>
<td>13,200</td>
</tr>
<tr>
<td>State government—financing</td>
<td>600</td>
<td>2,800</td>
</tr>
<tr>
<td>Federal government—federal tax return</td>
<td>1,000</td>
<td>2,000</td>
</tr>
<tr>
<td>Federal government—Contribution of Intervention in the Economic Domain</td>
<td>600</td>
<td>1,200</td>
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<tr>
<td>Municipal government—property tax</td>
<td>300</td>
<td>1,000</td>
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<tr>
<td>Municipal government—financing</td>
<td>300</td>
<td>0</td>
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<tr>
<td>Municipal government—urban tolls</td>
<td>0</td>
<td>3,000</td>
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<tr>
<td>Private (PMSP and others)—urban concessions</td>
<td>500</td>
<td>4,500</td>
</tr>
<tr>
<td>Private—PPPs with state and municipal governments</td>
<td>5,400</td>
<td>4,000</td>
</tr>
<tr>
<td>Private—operators’ operating margin</td>
<td>200</td>
<td>400</td>
</tr>
<tr>
<td>Total</td>
<td>16,600</td>
<td>32,100</td>
</tr>
</tbody>
</table>

Source: STM 2006.
Note: PMSP = Prefeitrua Municipal de São Paulo; PPP = public-private partnership.
### Table 8.3 Land value capture instruments in Brazil

<table>
<thead>
<tr>
<th>Instrument</th>
<th>Mechanism</th>
<th>Paid by</th>
<th>Delivered by</th>
<th>Applications</th>
</tr>
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<tbody>
<tr>
<td>Property tax</td>
<td>Property taxation</td>
<td>Property owners</td>
<td>Municipal government</td>
<td>General budget use</td>
</tr>
<tr>
<td>Betterment levy</td>
<td>Charge on public improvement</td>
<td>Property owners getting benefit from public investments</td>
<td>All government levels</td>
<td>Public investments</td>
</tr>
<tr>
<td>OODC</td>
<td>Air rights sale</td>
<td>Property owners</td>
<td>Municipal government</td>
<td>Urban Development Fund (finances prioritized public urban investments including slum upgrading within city boundary)</td>
</tr>
<tr>
<td>CEPAC as an integral part of UOs</td>
<td>Air rights sale</td>
<td>Property developers and owners</td>
<td>Municipal government</td>
<td>Predetermined public urban investments including slum upgrading within UO</td>
</tr>
<tr>
<td>Urban intervention area</td>
<td>Air rights sale</td>
<td>Property developers and owners</td>
<td>Municipal government</td>
<td>Not implemented</td>
</tr>
<tr>
<td>Urban concession</td>
<td>Development rights sale and power of eminent domain</td>
<td>Property developers and owners</td>
<td>Municipal government</td>
<td>Infrastructure investment</td>
</tr>
</tbody>
</table>

**Source:** Maleronka and Pires 2013.

**Note:** CEPAC = Certificate of Additional Construction Potential; OODC = Outorga Onerosa do Direito de Construir; UO = urban operation.

location and land use (table 8.4). If landowners want to build above the free basic FAR up to the maximum allowable FAR (1.0–4.0, also depending on location and land use), they have to buy additional FARs. The free basic FAR in certain areas has become lower than the preexisting basic FAR. The revenues generated from the sales of OODC are deposited in the Urban Development Fund (Fundo de Desenvolvimento Urbano), which finances public urban investments including slum upgrading within the city boundary. The PDE 2002 established an inventory of all air rights in the municipality, except those tradable within the UO that are subject to federal law.

CEPACs are a market-based instrument to finance public urban investments through air rights transactions within designated UOs. Through CEPACs, municipalities can raise infrastructure investment funds by selling the bearer additional building rights, such as a higher FAR and possible land use changes, that should induce private investments in the transformations wanted by urban development policy. One advantage is that municipalities can obtain revenue before the project starts and can finance
infrastructure construction without creating a deficit or public debt or using budget resources (Sandroni 2010). Another is that market forces determine the price of undeveloped air rights, though the municipality can reject prices offered below its minimum prices. (The CEPAC mechanism is detailed in the next section.)

Although unused because application laws are still pending, urban intervention areas in the PDE are areas where the city intends to promote urban development. In the designated areas, landholders can develop their own sites beyond the basic FAR in accord with their master plans. The revenues gained from air rights sales go into the Urban Development Fund to finance public works throughout the city.

Urban concessions (UCs)—not yet implemented—are another public-private development mechanism, under which a municipal government

<table>
<thead>
<tr>
<th>Land Use Zones Established by the Strategic Development Plan in 2002</th>
<th>Land Use Zones before 2002</th>
<th>FAR up to 2002</th>
<th>In 2003</th>
<th>From 2004 on</th>
<th>Maximum FAR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exclusive Residential Zones (ZER)</td>
<td>Strict horizontal single-family residential zone (Z1)</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Mixed Use Zones (ZM)</td>
<td>Predominant horizontal residences zone (Z9)</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td></td>
<td>Predominant low demographic density residential zone (Z11, Z13, Z17, Z18)</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
<td>2.5</td>
</tr>
<tr>
<td></td>
<td>Predominant medium demographic density residential zone (Z3, Z10, Z12)</td>
<td>2.5</td>
<td>2.0</td>
<td>2.0</td>
<td>4.0</td>
</tr>
<tr>
<td></td>
<td>Mixed use zones and medium high demographic density zone (Z4)</td>
<td>3.0</td>
<td>2.5</td>
<td>2.0</td>
<td>4.0</td>
</tr>
<tr>
<td></td>
<td>Mixed use zones and high demographic density zone (Z5)</td>
<td>3.5</td>
<td>3.0</td>
<td>2.0</td>
<td>4.0</td>
</tr>
<tr>
<td></td>
<td>Special use zones (Z8 007-02, -04, -05, -08, -11, -12)</td>
<td>3.0</td>
<td>2.5</td>
<td>2.0</td>
<td>4.0</td>
</tr>
<tr>
<td></td>
<td>Special use zones (Z8 007-10, -13)</td>
<td>2.0</td>
<td>2.0</td>
<td>2.0</td>
<td>4.0</td>
</tr>
<tr>
<td></td>
<td>Special use zones (Z8 060-01, -03)</td>
<td>1.5</td>
<td>1.0</td>
<td>1.0</td>
<td>2.5</td>
</tr>
<tr>
<td></td>
<td>Mixed use with predominance of commerce and services zone (Z19)</td>
<td>2.5</td>
<td>1.5</td>
<td>1.0</td>
<td>4.0</td>
</tr>
<tr>
<td>Industrial Zones under Restructuring (ZIR)</td>
<td>Predominant industrial zone (Z6)</td>
<td>1.5</td>
<td>1.0</td>
<td>1.0</td>
<td>2.5</td>
</tr>
<tr>
<td></td>
<td>Strict industrial zone (Z7)</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
<td>2.5</td>
</tr>
</tbody>
</table>

Source: Smolka 2013.
Note: FAR = floor area ratio.
delegates site-specific master plan implementation to a private developer. Whereas the master plan needs to be developed by the municipal government through consultation with the public, one private entity, selected through the bidding process, becomes the concessionary of real estate development in a UC area. The concessionary is entitled to expropriate land required for the master plan and to generate revenues from the associated real estate development. In this framework, the municipal government requires the concessionary to provide public facilities, green spaces, and social housing units, which are funded by the revenues generated from real estate development in the UC area.

**CEPAC Mechanism**

CEPACs—tradable air rights—created by municipal governments are auctioned on the Brazilian stock exchange, which means that they are regulated not only by the City Statute but also the Securities and Exchange Commission of Brazil (CVM), under CVM Instruction 401, published two years after the City Statute. CVM Instruction 401 requires municipal governments to set the minimum price of the CEPAC to keep the city’s real estate business competitive. For price valuation of CEPACs in São Paulo, the virtual land method was applied. It assumes that the private revenue gained from a property project must comprise development costs, land acquisition costs, real estate margin, and the added land value premium. The CEPAC price can be estimated as the residual land value between two

---

**Figure 8.2 Price valuation of the CEPAC based on the virtual land method**


Note: CEPAC = Certificates of Additional Construction Potential.
different situations: the actual plot with the full benefits of additional air rights and the plot without any additional air rights (figure 8.2).

The municipal government is required to update the minimum price as well as the amount of CEPACs offered for each public auction. The final sale price is determined at auction. In theory, CEPACs can be traded in the securities market, though a secondary market has not yet developed. The amount of the CEPAC to be issued corresponds to the additional square meters that the present and future urban infrastructure in the designated UO can support. That quantity is based on program feasibility analysis that takes into account existing infrastructure and all additional construction work foreseen in the UO. The CEPAC can be used only at construction sites within UOs that exceed the standard FAR set by land development legislation, up to the maximum fixed by the UO law (figure 8.3).

Revenues from CEPAC auctions are deposited in a special escrow account because they are earmarked for improving the UOs as defined by the prospectus of each UO. This means that each of the CEPAC auctions is intended to finance predetermined public works projects. In São Paulo, the priority of public works for each CEPAC public offering is decided by the UO’s administration committee, composed of municipal government officers and civic representatives.

Although air rights sale instruments are available in major Brazilian cities with fiscal constraints and limited land, the CEPAC instrument has been rarely used to finance transit projects to pursue TOD.

**CEPAC-Funded UO Case: Água Espraiada, São Paulo**

Água Espraiada occupies about 1,425 hectares of the UO, approved in 2001. Although it looks like an expansion of Faria Lima’s business district, Água Espraiada contains many slum housing units between high-rise office
buildings, two highways, and one metro line. The initial number of CEPAC units authorized was 3.75 million, of which 2.39 million units had been sold on the stock exchange as of February 2013. The air rights sold were used for 136 property developments in 2004–12. The revenue generated by the Água Espraiada through January 2013 was R$3,282 million (US$1,683 million) with expenditures of R$978 million (US$502 million), accounting for net public income of R$2,303 million (US$1,181 million).

The list of major projects to be funded by that net income included high-amenity public open spaces, 8,000 social housing units for families affected by the UO, construction of viaducts, and a bridge over the Pinheiros River. While the UO’s prospectus lists up to an R$82 million investment in the metro and monorail line projects (according to the Memorandum of Understanding between São Paulo’s state government and city hall), CEPAC transactions in the real estate market have not yet generated TOD.

In the UOs, air rights are not distributed freely or evenly. To attain desirable spatial development targets (such as articulated densities and mixed uses), a sector map and corresponding equivalence table have been prepared for each UO (table 8.5 and map 8.4). In accord with the unique zoning system and specific floor area conversion ratios, the CEPAC should have been allocated strategically through transaction processes. However, CEPAC operations have not always resulted in desirable spatial development in all parts of the UOs (photo 8.1). The market responses to UO designation remains to be seen, as CEPACs are relatively new.

**Photo 8.1 Undesirable built environment predominantly filled with car parking around the train station in Faria Lima Urban Operation**

Source: © Jin Murakami. Used with permission. Further permission required for reuse.
Table 8.5 Example of CEPAC coefficient table

<table>
<thead>
<tr>
<th>Sector</th>
<th>CEPAC coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jabaquara</td>
<td>3 m²</td>
</tr>
<tr>
<td>Brooklin</td>
<td>1 m²</td>
</tr>
<tr>
<td>Berrini</td>
<td>1 m²</td>
</tr>
<tr>
<td>Marginal Pinheiros</td>
<td>1 m²</td>
</tr>
<tr>
<td>Chri Zaidan</td>
<td>2 m²</td>
</tr>
</tbody>
</table>

Note: m² = meters squared. The table shows the amounts of floor space that can be purchased by one Certificate of Additional Construction Potential (CEPAC) in different sectors.

Map 8.4 Sector map of Água Espraiada


Unintended Negative Impacts of OODC and CEPAC on Urban Development Pattern

To create higher demand for air rights to be sold through OODC or CEPAC, São Paulo initially reduced the basic (free) FAR of the entire city area to the range of 1.0 to 2.0. Under the new FAR scheme, current owners who want to rebuild their old buildings have to pay OODC or CEPAC for additional FAR exceeding the free FAR limit, on top of demolition and construction costs. Aside from the difficulty in achieving consensus on reconstruction, the newly imposed free FAR limitation may discourage current owners from rebuilding older properties built under
the previously higher FAR allowance. Seeking a high return on investment, developers intending to build high-rises via an OODC or CEPAC generally focus on high-end properties such as offices, shopping malls, and luxury residential buildings in the city center. This results in a limited supply of affordable housing in the city center where most jobs are found, in spite of the municipal government’s efforts to construct social housing in the center using the revenues from OODCs, CEPACs, and the general budget, as well as incentivize the construction of residential buildings by allocating FAR higher than regulations typically permit. Thus low- and lower-middle-income people, who account for the majority of the city’s population, live in the suburbs far from the city center and deal with long commutes in crowded trains or buses.

The maximum FAR that can be bought through an OODC or CEPAC in São Paulo is limited to 4.0, even in the central business district. Other megacities allocate much higher FARs: in Tokyo, for example, from 1 to 20; in Hong Kong SAR, China, from 1 to 12; and in Seoul, from 8 to 10 (Suzuki, Cervero, and Iuchi 2013). São Paulo would seem to share characteristics with many metropolitan areas in developing countries—namely high population densities and low FARs, which usually leads to urban sprawl (photo 8.2).

**Photo 8.2 Low- or lower-middle-income household areas, São Paulo**

![Photo 8.2 Low- or lower-middle-income household areas, São Paulo](image)

*Source: © Hiroaki Suzuki. Used with permission. Further permission required for reuse.*
Institutional Barriers

In São Paulo, rail transit (metro and suburban rail) and bus services are under the responsibility of the state government and the municipal government, respectively. Except for a few minor investments, CEPAC revenues have not been used for metro construction. In addition, CEPACs within UOs have often not been allocated to the precinct of the railway or bus station areas to promote TOD. CEPACs have not therefore always captured the increments of land value attributed to transit investments.

Further, political factors (such as control of the state and municipal governments being under different political parties) make coordination difficult between transit agencies and the urban planning department (which allocates CEPACs). Even in the same transport sector, railway transit companies owned by the state government and bus companies owned by the municipality seem to be competing rather than collaborating. Due to lack of coordination between transit agencies and the city planning bureau, as well as transit agencies’ railway-centered engineering approaches, transit agencies often miss out on opportunities to explore the use of air rights above stations to generate revenues. For instance, given the tight budget situation and legal restrictions, metro company engineers tend to design metro stations according to minimum structural specifications requiring the least investment—yet these cannot support the type of multipurpose terminal building that can generate sizable lease revenues and increase transit ridership.

Opportunities for Adapting Development-Based LVC for Transit-Oriented Development

Despite the above challenges, São Paulo has great potential to adapt development-based LVC for transit investment and to develop articulated densities suitable for TOD. CEPAC revenues partly financed the investment costs of the Linha Verde (Green Line) UO in Curitiba, where a major national highway was converted into an urban avenue along with the extension of a bus rapid transit green line and promotion of higher-density land uses (Smolka 2013).

São Paulo’s city planners are considering reducing overcrowded commuting between suburbs and city centers by developing subcenters to balance business and residential densities across the city (such as Região da Jacu-Pêssego as a new commercial center and Região da Cupecê for commercial and residential use), based on the TOD concept where developable lands are still available. Demand for good housing in the mid-market segment is very high because of fast-rising household incomes, and so land prices close to transit stations could climb.

If the municipal government and transit agencies collaborated with investors and developers, as their counterparts in Hong Kong SAR, China, and Tokyo, Japan, do, they could raise revenues to recoup a portion of the transit and other TOD-related investment costs. The municipal government can redevelop these areas by directly selling land or selling CEPACs. Even if these lands are occupied, developers would likely be interested in rebuilding
high-density properties by purchasing land together with CEPACs, because of their low land costs relative to the city center.

To maximize revenues and at the same time promote TOD, the municipal government would need to allocate many CEPACs to station areas, if possible with much higher FARs, designating these areas as urban intervention areas. It could also encourage residents to live and work in TOD areas by changing zoning from single to mixed land use. Finally, by using development-based LVC-generated revenues, it could finance the construction of much needed social housing as a part of its development programs.

**Conclusion**

Air rights sales may be innovative development-based LVC, but few Brazilian cities have used them to finance transit investment projects and promote TOD, missing an opportunity to move their cities’ transit development to the forefront of global practice.

A summary of São Paulo’s experience is as follows:

- The greatest advantage of tradable air right sales is that local governments in developing countries with limited developable lands can produce substantial upfront cash flows for capital intensive urban infrastructure projects without increasing their public debt.
- In São Paulo, limiting the basic free FAR to 1.0–2.0 over the city artificially raised demand for tradable air rights, thus increasing revenues from sales. However, this downzoning seems to have led to unintended negative urban development impacts.
- São Paulo’s spatial development pattern has progressed as high urban densification in a relatively unarticulated manner, partly because the city government has not established a strong land assemblage system for infill development with air rights sales schemes inside UOs. Additionally, government officials lack experience with the new LVC mechanisms and air rights market. It is hard for financial and planning practitioners to estimate an appropriate value of tradable air rights and designate effective zoning codes that lead to TOD. In São Paulo, the designations of UOs with the CEPAC auctions have not resulted in transit-supportive urban forms, though the master plans may have benefited from innovative value capture schemes for new metro projects.
- The lack of integration between metro rail investments and value capture applications is due in large part to institutional barriers between state and municipal agencies for intergovernment funding allocations. For multiple government entities working together using revenues from air rights sales, the world’s best value capture practices suggest that they need to develop a transparent project finance scheme with clear rules and mechanisms to share profits and risks among multiple agencies, local government, transit agencies, landholders, residents,
developers, and investors, as well as coordination mechanisms between them in planning, financing, and implementing transit and urban development. These moves also require strong political leadership at the highest level.

Annex table 8A.1 Data on case study cities in developing countries

<table>
<thead>
<tr>
<th>City</th>
<th>Nanchang</th>
<th>Delhi</th>
<th>Hyderabad</th>
<th>São Paulo</th>
</tr>
</thead>
<tbody>
<tr>
<td>Country</td>
<td>China</td>
<td>India</td>
<td>India</td>
<td>Brazil</td>
</tr>
<tr>
<td>Landholding system</td>
<td>State leasehold</td>
<td>Market freehold</td>
<td>Market freehold</td>
<td>Market freehold</td>
</tr>
<tr>
<td>Metropolitan population (thousand), 2010</td>
<td>2,331</td>
<td>21,935</td>
<td>7,578</td>
<td>19,649</td>
</tr>
<tr>
<td>Metropolitan area (km²)</td>
<td>617</td>
<td>1,943</td>
<td>881</td>
<td>7,947</td>
</tr>
<tr>
<td>Population density (metropolitan) (1,000/km²)</td>
<td>3.8</td>
<td>11.3</td>
<td>8.6</td>
<td>2.5</td>
</tr>
<tr>
<td>Population growth in metropolitan areas, 2000–10 (% annual)</td>
<td>41.5% (3.5%)</td>
<td>39.4% (3.4%)</td>
<td>39.2% (3.4%)</td>
<td>14.9% (1.4%)</td>
</tr>
<tr>
<td>GDP per capita growth, 2007–2011 (% annual)</td>
<td>12.4%</td>
<td>8.7%</td>
<td>5.2%</td>
<td>-2.8%</td>
</tr>
<tr>
<td>GDP growth rate projection, 2008–25 (% annual)</td>
<td>13% (2011–15)</td>
<td>189% (6.4%)</td>
<td>193% (6.5%)</td>
<td>102% (4.2%)</td>
</tr>
<tr>
<td>Real estate price growth (% annual)</td>
<td>19.5% (2008–12, land)</td>
<td>14.3% (2007–12, housing)</td>
<td>-2.1% (2007–12, housing)</td>
<td>18.7% (2008–12, housing)</td>
</tr>
<tr>
<td>Number of private cars registered (of 1,000 population)</td>
<td>57 (2010)</td>
<td>143 (2011)</td>
<td>13 (for Andhra Pradesh)</td>
<td>410</td>
</tr>
<tr>
<td>Private car registration growth rate (% annual)</td>
<td>24.9% (2007–)</td>
<td>8.3% (2006–11)</td>
<td>10%</td>
<td>5% (2005–10)</td>
</tr>
<tr>
<td>Public transport use (%)</td>
<td>13.5%</td>
<td>42%</td>
<td>44%</td>
<td>36.8%</td>
</tr>
<tr>
<td>Metro lines (existing) km</td>
<td>—</td>
<td>190</td>
<td>—</td>
<td>74.2</td>
</tr>
<tr>
<td>Number of stations (existing)</td>
<td>—</td>
<td>144</td>
<td>—</td>
<td>64</td>
</tr>
<tr>
<td>Metro lines to be constructed (km)</td>
<td>168</td>
<td>120</td>
<td>72</td>
<td>205 (by 2030)</td>
</tr>
<tr>
<td>Number of stations (to be constructed)</td>
<td>128</td>
<td>81</td>
<td>66</td>
<td>94 (by 2016)</td>
</tr>
<tr>
<td>Estimated metro construction cost (US$ million)</td>
<td>2,421 (line 2)</td>
<td>11,701 (Phases I–III)</td>
<td>3,440 (Phase I)</td>
<td>14,000 (for extension)</td>
</tr>
<tr>
<td>Contribution of land value capture financing (US$ million and %)</td>
<td>168 (7%) (line 2)</td>
<td>570 (5%) (Phases I–III)</td>
<td>Modeled as 45% of revenue</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Source: World Bank databases; UN Statistics; websites of transit agencies; and others.

Note: GDP = gross domestic product; N/A = Not available.
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ECO-AUDIT

Environmental Benefits Statement

The World Bank is committed to preserving endangered forests and natural resources. *Financing Transit-Oriented Development with Land Values* was printed on recycled paper with 50 percent postconsumer fiber in accordance with the recommended standards for paper usage set by the Green Press Initiative, a nonprofit program supporting publishers in using fiber that is not sourced from endangered forests. For more information, visit www.greenpressinitiative.org.

Saved:
- 24 trees
- 11 million British thermal units of total energy
- 2,032 pounds of net greenhouse gases (CO2 equivalent)
- 11,023 gallons of waste water
- 738 pounds of solid waste
What the literature has long been missing is a thorough, thoughtful book that translates how to move land value capture from the ivory towers of theory to real-world implementation. This book comes as close to any in achieving this. It shows that land value capture holds tremendous untapped potential as a viable and sustainable funding source for public transit improvements and leveraging transit-supportive growth, particularly in developing cities.

— Robert Cervero, Friesen Chair of Urban Studies and Professor of City and Regional Planning, University of California, Berkeley

This book will help cities in emerging economies, and those of us working with them, to tap into the increases in land value resulting from the economic development stirred by public investments in infrastructure, providing opportunities to finance further public investment in infrastructure in a virtuous cycle. This provides finance but also helps structure more sustainable cities through complementary land use regulations, furthering the virtuous cycle of financial, environmental, and social sustainability.

— Holger Dalkmann, Acting Global Director, Transport and Cities, and Director, EMBARQ, World Resources Institute

What a timely and important book! It makes an impressive contribution to urban planning literature, bridging theory and practice in transit-oriented development and offering much needed practical advice on how to structure and execute land value capture mechanisms to finance infrastructure investment. It is invaluable for all city planners and public investors, providing pragmatic guidance based on thorough analysis of successful efforts in Hong Kong [SAR, China] and Tokyo and emerging efforts in places like São Paulo, Nanchang, and Hyderabed. Bravo!

— George W. McCarthy, President and CEO, Lincoln Institute of Land Policy

This book identifies enabling factors from the experiences of Tokyo and other cities in promoting private sector railway construction and operation with revenues from development rights sales or leases around transit stations, so-called “land value capture” (LVC). Also addressed are the risks and challenges in applying the LVC apparatus to other cities. This book provides rich experiences of many cities and deserves to be an essential reference for development agencies, including the Japan International Cooperation Agency (JICA), to address transportation in megacities in developing countries where public transit is needed as the backbone of urban development.

— Junichi Yamada, PhD, Senior Special Advisor, Japan International Cooperation Agency (JICA)
10 Topics to Know about City Planning in Japan

Tokyo Development Learning Center, The World Bank Group
OVERALL FLOW OF CITY PLANNING PROCESS IN JAPAN AND OVERLAY OF PLANS

Designation of areas which will be subject to city planning: City Planning Area (CPA)

Formulation of 1) CPA Master Plan (prefectures) + 2) Municipal Master Plan (municipalities)

City Planning Instruments and Tools

- Land use regulations
  - Area division (UPA/ UCA)
  - Land use zones
  - Special districts

- Urban facilities (infrastructure)

- Urban development projects
  - Land readjustment projects
  - Urban redevelopment projects
  - Special districts

Mechanisms to Ensure Realization

Basic mechanisms
- Land development permissions
- Building confirmation
- Notification through District Plans

Additional measures for Urban Facilities/ Urban Development Project
- Development restrictions within the designated area
- Eminent domain and tax incentives for land acquisition
- Technical and financial assistance to the implementing body

City Planning Area

UPA and UCA

Land Use Zones

Urban Facilities

Urban Development Projects

Special Districts

District Plans
The 1968 New City Planning Law is the current active city planning law in Japan, the first major revision of the law since first passed in 1919. The objective of the Law is to promote the sound development and orderly improvement of cities by stipulating the details of city planning and decision procedures. As urban sprawl became prevalent in the suburbs after the first stipulation of the Law, it was revised in 1968 to deal with issues in urban fringe areas and suburbanization and to primarily focus on controlling excess land conversion from rural to urban. While under the 1919 Law the ministry at the national level held all planning powers, the 1968 Law enabled considerate delegation of planning powers to prefectural and municipal governments. The following are key items covered in the City Planning Law:

- City Planning Area, Urbanization Promotion Area and Urbanization Control Area (see p.3)
- CPA Master Plan (Policies on Improvement, Development and Conservation) (see p.4)
- Land Use Zones and Special Districts (Chiiki Chiku) (see p.5)
- Urban Development Project (see p.6)
- Land Development Permission (Kaihatsu Kyoka) System (see p.9)
- Urban Facilities and City Planning Decision Procedure (Toshi Keikaku Kettei) (see p.7 and p.10)

Since 1968, the City Planning Law has evolved over the years, accommodating emerging needs by introducing new schemes.

- **District Plan (Chiku Keikaku)** is one of the most major additions introduced in 1980 to address the accelerating problems of urban sprawl, designed to allow more detailed planning control over urban areas, empowering local governments to impose detailed restrictions on development activities than allowed by the zoning and building standard systems.

- **Special District Plan for Redevelopment (Saikaihatsu Chiku Keikaku)** was stipulated in 1988 against a backdrop of an era of real estate boom, and large scale redevelopment projects were planned to convert former industrial land. This particular scheme was created to provide incentives and tools for developers to promote such redevelopment that have sufficient land for roads, parks and other urban facilities.

- **Productive Greenery District (Seisan Ryokuchi)** was introduced in 1992 to designate and preserve certain agricultural land when tax rate for agricultural land inside urban areas was raised to be equivalent to that of urban land.

- **Quasi City Planning Area** was introduced in 2000 aiming to strengthen development restrictions outside of City Planning Area, and **Public Participation** was also introduced in the same year to move away from the rather statutory requirement to “inform” towards inviting public participation in planning decisions.

- Other changes include the stipulation of **Landscape District in 2004**, and the **Strengthening Regulations on Large-Scale Visitor-Attracting Facilities in 2006** to regulate development of large facilities particularly in urban fringe and suburban areas.
2. **City Planning Area, Urbanization Promotion Area and Urbanization Control Area**

**City Planning Area (CPA):** CPA can be designated for land that meets conditions for population, number of employees, etc. that require integrated urban improvement, development and preservation in due consideration of both current and future natural and social conditions. CPA is composed of Urban Promotion Area (UPA) and Urbanization Control Area (UCA).

**Urbanization Promotion Area (UPA):** UPA can be designated for land which will be urbanized within a designated period (approximately 10 years). UPA and UCA classification is primarily based on the following criteria: potential for future urban growth and expansion, urban service coverage, and natural preservation considerations.

**Urbanization Control Area (UCA):** UCA can be designated for forest area, natural conservation area, agricultural and rural village area, disaster and flood-prone area, and other preservation area. Any construction and urban development activities without permission are restricted within UCA. Land conversion from agricultural to urban is not permitted within UCA under Agricultural Land Law.

![Figure 1 Areas for Urban Development and Control Stipulated by Law](source_url)

**Source:** The Urban Planning Formulation and Management Capacity Development Project (CupCup), JICA
A Master Plan is a document/map which embodies the future development vision in urban planning. In Japan, there are two levels of legislated master plans under the City Planning Law:

- City Planning Area Master Plan (prepared by prefectural government)
- Municipal Master Plan (prepared by the municipal government)

These Master Plans provide the overall direction of the development of the area, and principles that specific city planning instruments to follow, including urban facilities and development projects. These Master Plans do not have direct control over land use restriction, but provides guidelines for urban planning to set forth concrete land use restrictions.

Figure 2 Conceptual Diagram on Land Use of Gifu City as part of the Municipal Master Plan

Source: Gifu City, Gifu Prefecture, Japan
4. Land Use Zones

Land use zones is an instrument which regulates the use, density and form of buildings in guiding land use, and must be designated in the entire Urbanization Promotion Area (UPA). Based on designated use zone by block, other indicators such as Floor Area Ratio (FAR), Building Coverage Ratio (BCR)\(^1\), and maximum building height are designated for each use zone to control volume of buildings of each block. It is pro-development in nature, that is, development which conforms to these land use zones are in principle permitted by default.

**Figure 3  Land Use Zone Development Image by Category**

Source: “Introduction of Urban Land Use Planning in Japan” (MLIT, 2007)

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\(^1\) FAR is the ratio of a building's total floor area (zoning floor area) to the size of the land (site) area upon which it is built. BCR is the ratio of the building area divided by the land (site) area. Building area means the floor space of a building when looking down at it from the sky.
Urban Development Project schemes enable the public and private sector to carry out necessary development projects to serve public interests through the provision of infrastructure and service delivery. The objectives of having these schemes are to: enhance land use efficiency, consolidate fractioned land ownership and ensure efficient development of roads etc. There are various schemes\(^2\) in place to enable such actions, such as using exchange and conversion of land rights, or acquiring the entire land within the project area. Some projects involve elements such as: development of business, construction of commercial and residential facilities, development of new towns, establishing industrial zones in suburban areas and thereby dispersing population and industries, reinforcing buildings to be resilient, and securing roads and parks for evacuation purposes.

### Table 2  Comparison of Main Urban Development Projects Schemes

<table>
<thead>
<tr>
<th>Schemes</th>
<th>Land Readjustment Project</th>
<th>Urban Redevelopment Project</th>
<th>New Residential Area Development Project</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measure</td>
<td>Replotting: exchanging rights from one land to another.</td>
<td>Right conversion: exchanging rights from land to building floor and joint ownership of land. Right of compulsory expropriation.</td>
<td>Whole purchase including the right of compulsory expropriation</td>
</tr>
<tr>
<td>Objective</td>
<td>Development of Urban Facilities Higher added value to land</td>
<td>Development of fire-resistant building Development of Urban Facilities Rational and sound high utilization of land</td>
<td>Large-scale development of housing with livable environments to ensure provision of housing for all, particularly in high density built-up areas</td>
</tr>
<tr>
<td>Target Areas</td>
<td>Applied broadly from urbanized area to new town</td>
<td>Urbanized area</td>
<td>New town</td>
</tr>
<tr>
<td>Project Size</td>
<td>Usually more than a few hectares (&gt; 100 hectares)</td>
<td>Several hectares (mainly 1-3 hectares)</td>
<td>More than 100 hectares</td>
</tr>
<tr>
<td>Implementing Bodies</td>
<td>Individuals, cooperatives, local governments, public corporations, private sector</td>
<td>Individuals, cooperatives, local governments, public corporations, private sector</td>
<td>Local governments, public corporations</td>
</tr>
<tr>
<td>Achievement</td>
<td>395,206 ha</td>
<td>1,193 ha</td>
<td>17,943 ha</td>
</tr>
</tbody>
</table>

Source: “Urban Planning System in Japan” (JICA in cooperation with MLIT, 2007)

**See also: Case Study on “Land Readjustment in Japan” (World Bank TDLC, 2016)**

\(^2\) The former includes: land readjustment project, urban redevelopment project, while the latter includes: new residential development project, residential district development project, industrial zone development project, and new urban infrastructure development project.
One of the most fundamental provisions of Japanese City Planning Law is that the location and area of Urban Facilities are stipulated in advance to 1) tightly regulate the building and land development activities of the land plots included in the area of Urban Facilities, so that the construction of such facilities in the future can be; 2) ensure the consistency across land use, projects and facilities, ensuring the effective consultation with relevant agencies and general public. The first objective is due to the country’s experience during the rapid growth period that urbanization happened very quickly and hence became very costly to secure land in a built-up area for urban facilities.

This is done through a “City Planning Decision” otherwise known as TOSHI KEIKAKU KETTEI. Effects include, among others:
- Building activities will be restricted in areas where Urban Facilities have been stipulated;
- Once the location of facilities is determined, landowners/leaseholders can prepare an appropriate development plan in accordance with the facility plan.

Urban Facilities subject to the above are the following:
- Transport facilities such as roads, urban rail transit systems, car parks, automobile terminals, etc.
- Public space such as parks, open spaces, plazas, etc.
- Utilities such as water, sewerage, electricity/gas, etc.
- Waterways such as rivers, canals, etc.
- Education and cultural facilities such as schools, libraries, research facilities, etc.
- Medical and social welfare facilities such as hospitals, day care centers, etc.

Figure 4 Urban Road Plan in Kawasaki City, Japan

Source: Kawasaki City, Japan
District Planning was added as a new instrument in the city planning system in 1980 as a detailed land use planning system applying to areas with several hectares, often with theme-specific development purposes. It is decided by the municipality and **must be drafted through consultation with land owners**. Moreover, additional efforts are often made to consult the residents as well. It is an *overlay regulation* over primary regulations (Urbanization Promotion Area/ Urbanization Control Area, Land Use Zones) to provide more detailed regulation on land use and building activities to cater to the specific needs of the area.

Regulations under the District Plan include the following:

- Location of urban facilities (local roads, small parks, open spaces, footpaths, etc.)
- Building control and regulations (land use, floor-area ratio, building coverage ratio, scale of building lot, set back of building from the boundaries, design, hedge, green space ratio, etc.)
- Preservation of green and open space

*Figure 5   Image of District Plan*

Source: “Introduction of Urban Land Use Planning in Japan” (MLIT, 2007)
All entities seeking to develop land both inside and outside City Planning Areas (CPAs) are required to obtain land development permission from prefectural governors. There are two criteria for permission. In an Urbanization Promotion Area (UPA), if the development plan satisfies the permission standard (technical), then the project is permitted. However, in the Urbanization Control Area (UCA), the development plan should be consistent with the criteria for the project location in addition to the technical standard (local impact criteria).

### Table 3  Scale of Land Development requiring Permission

<table>
<thead>
<tr>
<th>Area</th>
<th>UPA</th>
<th>UCA</th>
</tr>
</thead>
<tbody>
<tr>
<td>City Planning Area</td>
<td>1,000 m² or more</td>
<td>All projects</td>
</tr>
<tr>
<td>Urbanization Control Area</td>
<td></td>
<td>3,000 m² or more</td>
</tr>
<tr>
<td>Area without Division</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quasi City Planning Area</td>
<td>3,000 m² or more</td>
<td></td>
</tr>
<tr>
<td>Other Area</td>
<td>10,000 m² or more</td>
<td></td>
</tr>
</tbody>
</table>

Source: “Urban Planning System in Japan” (JICA in cooperation with MLIT, 2007)

Technical Standards provide for the following:
- Proper location, scale and function of urban facilities such as roads, parks and schools, water, sewer systems, etc. provided;
- Safely designed structures such as foundations and retaining walls; and
- Environmentally sound development.

Land Development Permission in UCA is allowed in principle either when the development is consistent to the District Plans, or when it is required for agriculture, fishery and forestry activities which are industrial activities often conducted in UCAs.

The following table shows the cost sharing between the public and private sectors in UPA and UCA. While the public sector takes on a substantial part of the public facility development in UPA, this is rather limited for UCA where the private sector has a higher burden of public facility development.

### Table 4  Principles of Cost Sharing of Public Facility Development

<table>
<thead>
<tr>
<th>Area</th>
<th>Public Sector</th>
</tr>
</thead>
<tbody>
<tr>
<td>UPA</td>
<td>Urban facilities such as arterial roads, sewerage and large-scale parks (approved in the City Planning Law process)</td>
</tr>
<tr>
<td>Private Sector</td>
<td>Access roads, drainage systems, small parks designed for residents within the project area</td>
</tr>
<tr>
<td>UCA and other areas</td>
<td>Public Sector</td>
</tr>
<tr>
<td></td>
<td>Arterial roads</td>
</tr>
<tr>
<td></td>
<td>Private Sector</td>
</tr>
<tr>
<td></td>
<td>All urban facilities</td>
</tr>
</tbody>
</table>

Source: “Urban Planning System in Japan” (JICA in cooperation with MLIT, 2007)
9. Development Restrictions

都市計画決定および事業認可時にかかる権利制限

The Land Development Permission system (see p.9) was the first mechanism that granted city planners legal authority to withhold permission for land development projects. While this applies to all development proposals, there are additional restrictions and permission processes required for areas within Urban Facilities and Urban Development Projects, in order to prevent development activities that may make the future implementation of projects difficult and/or costly. The additional restrictions become effective through 1) City Planning Decision (Toshi Keikaku Kettei) on Urban Facilities and Projects, and 2) Project Approval (Jigyo Ninka)\(^3\).

1. Development Restrictions based on City Planning Decision (Toshi Keikaku Kettei)

The legal effects of City Planning Decision are:

- Building activities can be restricted in areas where urban facilities have been decided. However, those that can be easily removed or transferred, such as below, can be constructed under the permission of the prefectural governor (*):
  - The building is no more than 2 stories high without basement.
  - The main structures are simple such as wood, iron frames, concrete blocks, etc.
- The implementing body is empowered to execute projects

Non-legal effects of City Planning Decision include:

- Once the future location of facilities is determined, landowners/ leaseholders can adjust the use of land in accordance with the facility plan

2. Development Restrictions based on Project Approval (Jigyo Ninka)

Project Approval comes after the planning decision has been made, and after this step actual land purchase and construction takes place. Upon Project Approval, the implementing body has the following powers:

- Compulsory Land Expropriation
- In the area of Urban Facility and Development Project that has been given Project Approval, all building and land development activities are prohibited in principle, even if they satisfy conditions of the City Planning Decision stage noted above (see asterisk).

*If it is the implementing body of an approved City Planning Project, a private enterprise is also vested to exercise the powers described above.*

---

\(^3\) Both summarized based on “Urban Planning System in Japan” (JICA in cooperation with MLIT, 2007)
Floor Area Ratio (FAR) with the combination with Building Coverage Ratio (BCR) help maintain livable environments through height and volume control of buildings. FAR/ BCR also helps estimate the future population and the scale of activities for non-residential areas upon formulating urban development plans, and infrastructure development is planned in line with this estimated population; lack of control of the FAR/ BCR would imply various issues such as deprivation of the right to sunlight, lack of sufficient infrastructure provision and other challenges associated with overconcentration.

However, City Planning Law and other relevant laws have provisions to relax the base FAR (stipulated through Land Use Zones) under certain circumstances. An example is when there is contribution to public plazas and open space, and pedestrian walkways. Moreover, unused FAR (difference of maximum permitted FAR of the area to the building’s actual FAR) can be transferred to another building in the vicinity as air rights transfer. However this is possible only in certain District Planning areas.

The underlying principle of this deregulation is the optimal distribution of costs and benefits based on local conditions. From the Government’s perspective, FAR bonuses are given to realize public goods with no cost for the Government. The “Special District Plan for Redevelopment” for major urban redevelopment projects is a common scheme where bonus FARs are given. Significantly higher FARs allowances than specified in the land use zones are granted as a “bonus” in return for private investment in compensating public facilities. Another common example is how the District Plans in the 1990s used FAR bonuses to ensure the provision of wider roads. More recently, the Government modified the guidelines so that FARs can be relaxed up to 1.5 folds for hotels to address the lack of room supply.
Japan consists of 8 regional blocks under the National Government and 47 prefectures, each overseen by an elected governor. Each prefecture is further divided into municipalities (cities, towns and villages).

---

**Table 1  Overview of Inter-Jurisdictional Role-Sharing**

<table>
<thead>
<tr>
<th>Sector</th>
<th>National</th>
<th>Prefectural</th>
<th>Municipal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spatial plans</td>
<td>• National Spatial Plans</td>
<td>• Regional Spatial Plans</td>
<td>• Municipal Master Plans</td>
</tr>
<tr>
<td></td>
<td>• Master Plans for City Planning Area</td>
<td>• Master Plans for City Planning Area</td>
<td>• District Plans</td>
</tr>
<tr>
<td>Infrastructure development</td>
<td>Transport</td>
<td>Transport</td>
<td>Transport</td>
</tr>
<tr>
<td></td>
<td>• National expressways</td>
<td>• National roads</td>
<td>• Municipal roads</td>
</tr>
<tr>
<td></td>
<td>• National roads</td>
<td>• Prefectural roads</td>
<td>• Agricultural roads</td>
</tr>
<tr>
<td></td>
<td>• High-speed railway</td>
<td>• Inter-city railway</td>
<td>• Fishing ports</td>
</tr>
<tr>
<td></td>
<td>• Hub airports</td>
<td>• Regional airports</td>
<td>• Other key infrastructure</td>
</tr>
<tr>
<td></td>
<td>Other key infrastructure</td>
<td>• Industrial ports</td>
<td>• Water supply, drainage</td>
</tr>
<tr>
<td></td>
<td>• Energy infrastructure</td>
<td>Other key infrastructure</td>
<td>• Solid waste management</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Telecom infrastructure</td>
<td>• Public housing</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Public housing</td>
<td>• Parks</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Parks</td>
<td>• Cultural facilities</td>
</tr>
<tr>
<td>Land use</td>
<td>• Area division (UPA/UCA)</td>
<td>• Land use zones and special districts</td>
<td></td>
</tr>
<tr>
<td>Economy and industry</td>
<td>• Currency, finance</td>
<td>• Promotion of primary economic sector</td>
<td>• Promotion of primary economic sector</td>
</tr>
<tr>
<td></td>
<td>• Economic policy</td>
<td>• Tourism, SME promotion</td>
<td>• Promotion of local commercial facilities</td>
</tr>
<tr>
<td></td>
<td>• Stock exchange</td>
<td>• Tourism facilities</td>
<td>• Tourism, SME promotion</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Landscape preservation</td>
<td>• Tourism facilities</td>
</tr>
<tr>
<td>Employment</td>
<td>• Labor standards</td>
<td>• Human resource development training</td>
<td>• Human resource development training</td>
</tr>
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<td>• Human resource development policies</td>
<td>• Job placement</td>
<td>• Job placement</td>
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<tr>
<td>Health and welfare</td>
<td>• Public pension</td>
<td>• Regional health services</td>
<td>• Welfare services</td>
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<td>• Public insurance</td>
<td>• Infections</td>
<td>• Livelihood protection</td>
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<td>• Medical care</td>
<td>• Hospitals</td>
<td>• Nurseries</td>
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<tr>
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<td></td>
<td></td>
<td>• Hospitals</td>
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<tr>
<td>Education, culture and</td>
<td>• Aerospace development</td>
<td>• University, high school</td>
<td>• Middle school, elementary</td>
</tr>
<tr>
<td>science</td>
<td>• Nuclear power</td>
<td>• Important heritage</td>
<td>school, etc.</td>
</tr>
<tr>
<td></td>
<td>• National heritage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Environment</td>
<td>• National parks</td>
<td>• Industrial solid waste management</td>
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Source: National Governor’s Association (translated and modified from original source)
CASE STUDY
LAND READJUSTMENT IN JAPAN

Source: City of Yokohama.
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INTRODUCTION

HISTORY

The origin of Land Readjustment (LR) in Japan dates back more than 100 years. The modern land management system and Agricultural Land Consolidation (ALC) were established in the late 19th century. ALC was an agricultural land development tool to reorganize agricultural lands and develop passage and irrigation channels to improve agricultural productivity. In the early 20th century, ALC was applied to residential area developments in large cities facing rapid population growth. Because ALC required land owners to pay cash for construction, it was difficult to involve poor land owners in the target area. To recover part of the project cost, “surplus lands”—which can be created from private lands under the provision of ALC law—were sold on the market. The idea of surplus lands gave way to the “reserve lands” of the LR Law, which was established in 1954.

The Urban Planning Law established in 1919 was incorporated with provisions of LR, establishing the legal basis of LR. Provisions of the ALC Law were applied as the implementing procedures of LR.

During the period of the 1920s to 1950s, LR—implemented mostly by the central and local government—was applied to several objectives such as post-earthquake reconstruction in the Tokyo region, urban renovation in large cities, industrial city construction nationwide, and post-war reconstruction after World War II. Through those experiences, LR techniques were improved and refined. Also, the Agrarian Reform of 1947 to 1950 had increased the number of landowners, which increased the necessity of LR.

In 1949, the ALC Law was repealed and the Land Improvement Law, focused on agricultural land development, was established. This resulted in the conflicting situation that LR followed the repealed ALC Law, even though the Land Improvement Law also covered LR. To resolve the situation, the LR Law was established in 1954. It aimed to foster completion of the post-war LR projects as well as implementation of large-scale LR projects for new town development in response to socio-economic recovery and increased housing demand.

In the period including rapid economic growth during the 1950s to 1990s, large-scale LR projects had been implemented in the major metropolitan areas. Through the experiences of a large number of LR projects, the LR system improved in terms of the approval process, land repploting techniques, and financing; this contributed to quicker and smoother implementation.

After the collapse of the bubble economy in the early 1990s, decreased housing demand contributed to financial issues in private LR projects that depended on sales of reserve lands. At the same time, the

---

1 There were also cases of LR projects by cooperatives. However, it seems that under the ALC Law, it was popular to undertake land consolidation projects for projects in peri-urban areas even after establishment of LR by the Urban Planning (UP) Law, due to the availability of financial support from government for land consolidation.
government changed its policy to promote LR for urban renovation in city centers, areas around transit stations, and other urban areas.

Although the number of on-going LR projects has decreased nowadays, LR has been playing very important role in urban development in Japan through supporting various development purposes. The detailed history of LR in Japan is shown in Annex 1.

**KEY ACHIEVEMENTS**

LR is one of the popular urban development methods in Japan. It has been used for various development purposes around the whole country. The development purposes include not only residential area development in peri-urban areas, but also urban renewal in urbanized areas, and post-disaster reconstruction and integrated urban development with urban transport facilities. To date, LR has created and redeveloped urban areas with a total area of approximately 3,700 km², occupying 30 percent of the total urban area in the whole country.

Furthermore, LR has developed urban public facilities such as roads, green parks, and station plazas, with achievements including the following:

- city planning roads with a total length of approximately 11,500 km (accounting for one-quarter of the total length of all city roads designated on urban plans);
- green parks with a total area of 150 km² (comprising one half of the total area of community parks, neighborhood parks and district parks across the entire country); and
- station plazas with a total number of 950 facilities (one third of station plazas at stations with more than 3,000 passengers per day).

**OTHER RELATED URBAN DEVELOPMENT TOOLS: URBAN REDEVELOPMENT (UR)**

In this paper, a broad definition of LR is taken. In this context, urban redevelopment (UR) is considered to be an application of LR. UR in Japan converts land rights in a project site to a part of building rights by using land right conversion. For approval of the project and to apply for the national subsidy, the project area must be designated as an urban

---

2 Currently there are about 900 projects covering a total area of 363 km².
3 The Urban Redevelopment Law in Japan was established in 1969. UR aims to promote high-intensity land use under the UR Law.
4 In the urban planning context, “designation” means decision and public notification by local government.
redevelopment promotion area in urban planning or must satisfy several other conditions such as: designation as a high-intensity land use area, vulnerability to fire hazards, and improving the efficiency of land use. These conditions focus utilization of UR on urban redevelopment in urbanized areas—distinguishing the UR objectives from those of LR. The conceptual model of UR is illustrated in Figure 1.1.

In the case of LR projects for city center redevelopment and station area reconstruction, integrating LR with UR can be applied for the purpose of building development for high-intensity land use. Land rights which participate to UR are replotted into specialized urban redevelopment blocks within the LR project site. After reploting, the land rights are converted to UR building rights and a share of the joint ownership of the plot of the UR building.

The conceptual models of LR as well as integrating LR with UR are illustrated in Figure 1.2.
LEGAL AND INSTITUTIONAL FRAMEWORK

OVERALL LEGAL FRAMEWORK

LR in Japan is an urban development tool with legal basis in the LR Law. The legal framework for LR consists of the LR Law, other related laws such as the Urban Planning Law and the Urban Redevelopment Law, and the related regulations and guidelines. Figure 2.1 illustrates the overall legal framework of LR and UR in Japan.

The LR Law is a procedural law mainly stipulating the rights and obligations of LR implementers and stakeholders in the approval and implementation processes. Annex 2 shows the approval process for two categories of implementers: (a) LR cooperatives and (b) local governments. Other related laws function as the legal basis for specific activities in the

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Figure 2.1: Legal Framework of LR and UR in Japan

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<tr>
<th>National Constitution</th>
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<td>Basic Laws for Land and National Land Use</td>
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<td>• Basic Act for Land</td>
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<td>• Law on National Spatial Plan</td>
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<td>• Law on National Land Use Plan, etc.</td>
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<td>• Objectives of LR</td>
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<td>• Approval procedures by types of implementers</td>
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<td>• Implementation procedure and replotting</td>
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<th>Related Laws</th>
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<td>• New Housing and Urban Development Act</td>
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<td>• Environmental Impact Assessment Act</td>
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<td>• Land Expropriation Law</td>
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<tr>
<td>• Real Estate Registration Law</td>
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<td>• Law concerning the Sectional Ownership of Buildings, etc.</td>
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<th>Related Ordinance and Regulations</th>
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<td>• Ministerial ordinances</td>
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<td>• Guidelines</td>
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Source: Author.

5 Law No.119 of 1954.
In the case of LR projects integrated with UR, the UR Law functions as the legal basis for the urban development project in the designated block within the LR project area.

**URBAN PLANNING SYSTEM**

The urban planning system in Japan (illustrated in Figure 2.2) consists of three levels: (a) national level, (b) prefecture level, and (c) city level. The prefecture- and city-level urban planning play a main role in urban management.

The urban planning area designated by the prefecture government is divided into two zones: (a) urbanization promotion area and (b) urbanization control area, based on development policy in the prefecture-wide plan. The urbanization *promotion* area aims to strategically promote urbanization as a priority. It covers existing urbanized areas and future urban areas to be urbanized within about 10 years. On the other hand, in the urbanization *control* area, development and building activities are basically prohibited based on the policy to preserve agricultural areas and natural resources.

City master plans are intended to decide the fundamental policy for urban development of the city area. They usually provide vision, development goals, urban structure, a conceptual land use plan, and development policies of each sector (e.g., transportation, center area, housing, cityscape control, and disaster management). Remarkably, city master plans in Japan do not show detailed land use plans. Zoning plans, urban public facilities plans, and urban development projects designated in the urban planning process are based on the city master plan, control building and development activities.

The zoning plan in Japan (see Figure 2.3 for an example) consists of 12 zone categories, and nine policy zones and districts. The zoning plan divides

---

**Figure 2.2: Urban Planning System in Japan**

Source: Author.

*City designated by ordinance: Large city, with population of 500,000 or more, which is designated by ordinance under the Local Autonomy Law.*
the urbanization promotion area into the zone categories such as low-rise residential zone, middle and high-rise residential zone, commercial zone and industrial zone. These zones are provided with control items regulating building use, building coverage ratio (BCR), floor area ratio (FAR), building height and other aspects related to building profile.

Urban planning is institutionally the upper-level plan of LR. LR must follow what the urban planning map shows, including the zoning. Regarding alteration of zoning plans in the LR project site, local government revises the zone category, BCR and FAR, etc. to meet the land use plan of the LR project through discussion with the LR implementer and land right holders. In cases where more details or relaxation of building controls are required for township management (e.g., historical cityscapes, unified streetscapes, and high-rise development) at the district level, municipalities lay down a District Plan. The Plan shows not only the future vision of the district but also provides the regulations relating to detailed matters, such as site, use, construction and building. The Plan also shows individual features that reflect the views of the local community.

Under the Urban Planning Law, each “urban facility” is to be designated with its location and boundary on the urban plan. Urban facilities are categorized into 12 types: (a) transportation facility, including road; (b) public open space; (c) utility and its plant; (d) river and canal; (e) educational and cultural facility; (f) medical and social service facility; (g) other medical and social service facility; (h) market, slaughterhouse and crematory; (i) collective housing facility; (j) collective government and public office facilities; (k) distribution business park; and (l) other facility, such as disaster prevention and mitigation facility.

According to the LR Law, the LR Implementation Plan must follow designated urban facilities. Roads and green parks are typical urban facilities included in LR project. Lands for urban facilities in LR projects are secured by land contribution from the land right holders within the site. In addition, the LR project can apply for national subsidy equivalent with compensation cost for the lands and buildings in a hypothetical case where land acquisition is made.

The procedure for the designation or alteration can be executed for each facility as necessary. Each facility’s basic parameters, such as size and boundary, are decided through discussions at public meetings and through the Urban Planning Advisory Committee in the city or prefecture government. This flexibility is useful for rapid urban development as well as LR project implementation. An example of the designation map for a road as an urban facility is shown in the Figure 2.4.

In the Urban Planning Law, LR and UR are defined as urban development projects to be designated on the urban plan. In the designation process, the necessity, function and scale are decided through discussions at public meetings and through the Urban Planning Advisory Committee in the city or prefecture government. In addition, the project must be located within the Urbanization Promotion Area.6

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6 There are many cases where Urban Planning Areas are not divided into Urbanization Promotion Areas and Urbanization Control Areas. In such cases, LR can be implemented if the project area is not located within an Urbanization Promotion Area.
If a development through LR is planned within an Urbanization Control Area, the following procedures are required: (a) the Urban Planning Area Master Plan and City Master Plan must include the development; (b) the Urban Promotion Area needs to be expanded to include the proposed LR site; and (c) The LR project needs to be designated—and (b) and (c) must take place simultaneously.

The urban planning designation map must provide clarity about the project location and boundary, so that landowners can judge if their land is included in the area of the LR/UR project(s). After the public announcement of the designation, building activities are restricted in the designated area under the Urban Planning Law. This restriction system aims to facilitate implementation with respect to the negotiation with the land right holders and reduction of the compensation. Meanwhile, land transaction is not prohibited; land rights can be sold and bought after the designation. Figure 2.5 provides an example of a designation map for an LR project.

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7 Both the Urban Planning Law and the LR Law stipulate building restrictions. The Urban Planning law enforces restrictions until the implementation plan for the LR project is approved.
OBJECTIVES AND CHARACTERISTIC OF JAPANESE LR

OBJECTIVES AND SCOPE

LR in Japan is an urban development method; its fundamental objectives are as follows: (a) development and improvement of public facilities and (b) enhancement of land usability. Based on these, the LR scopes and functions have flexibility to enable applicability to multiple development objectives according to changing social-economic situations and urban management policy. LR addresses a range of scopes and functions, such as:

- land replotting to reorganize and reshape land plots;
- land contribution to create public spaces and reserve lands to recover development cost;
- development of public facilities; and
- promotion of public and private participation.

Most LR projects in Japan do not include new building development in their scope. New buildings are developed by land right holders and the purchaser of reserve land. However, there are some cases where the development objective of LR projects include building development (e.g., high-rise building development in underutilized areas and social housing development in large-scale new town development).

As previously described, high-rise buildings can be developed by integrated use of collective land replotting and urban redevelopment, converting the replotted lands to building rights under the UR Law, or cooperative rebuilding without special legal basis.

Regarding social housing development, the Japan Housing Corporation (JHC)\(^8\) has played a major role since the 1950s. JHC was established in 1955 in order to implement new town developments and to develop, sell and rent social housing. JHC purchased private lands and state lands in the LR project area before LR implementation. After LR, JHC constructed social housing on the replotted lands that were gathered into the site for the social housing development. Through this method, JHC was the implementer as well as a land right holder in the LR project. The social housing was constructed out of the scope of the LR project.

CHARACTERISTICS

Japanese LR has contributed to better-managed urbanization achieving various objectives across the whole country. The projects are controlled and promoted through the urban planning system and various subsidies under the governmental urban management policy. Characteristics of Japanese LR are summarized as follows:

\(^8\) Now it’s called Urban Renaissance Agency (URA).
Coordination with urban planning. As previously described, LR projects implemented by public implementers, or subsidized by central government, are required to be designated within the urbanization promotion area on urban plans in the preparation phase of the LR project. This coordination system ensures that LR projects generate positive social and economic impacts under the urban planning policy of the local governments. LR has also been an implementation tool to realize the polycentric spatial development patterns of large cities through construction of urban facilities such as city centers, new town areas, and transit corridors in coordination with urban planning.

Various LR implementers. The LR Law provides for three categories of public implementers: (a) local governments (prefecture and city), (b) central government, and (c) government corporations; as well as three kinds of private implementers: (a) individuals (i.e., a land owner or land owners group with several persons or entities), (b) LR cooperatives,9 and (c) LR corporations.10 In addition, the outsourcing agent for LR cooperatives is stipulated in the Law. This is one of the methods for private developers to participate in LR projects. Private developers, as the outsourcing agent, invest in the LR project and receive the reserve lands stipulated under the contract with the LR cooperative as return on their investment. After LR, the private developer carries out real estate development using the reserve lands.

Notable differences between public and private implementers include that public implementers are limited to implementing LR projects designated in urban planning. In other words, LR projects of public implementers are required to have necessity in urban management policy under local government. On the other hand, private LR projects basically are not required to have necessity—whether or not it is designated within urban planning; however, LR projects subsidized by central government must be designated in urban plans even if they are private projects.

The public sector has implemented LR projects of high urgency and social needs, such as post-disaster reconstruction, new town development and city center reconstruction. On the other hand, the private sector has tended to implement profitable LR projects generating high land value increases. LR cooperatives are organized by land rights holders within the LR project site, and have implemented most LR projects in Japan. The number and project area of LR projects in Japan are shown in Table 3.1. Agreements from land right holders.11 Private implementers are required to collect land right holder’s agreement in the approval procedure. In the case of individual-implemented projects having several land right holders, a representative land owner must collect agreements from all of the other land right holders (i.e., an agreement ratio of 100 percent is required for individual-implemented LR projects). In the case of implementation by LR cooperatives or LR corporations, agreement of two-thirds of the land owners and two-thirds of the land lease holders is required. The agreement ratios are calculated both in terms of the number of land rights holders and land area. Although the requirement of agreement ratio is two-thirds under the LR Law, local governments as approvers generally suggest to collect the agreement of 80–90 percent in consideration of the project risk, since the larger the percentage of people who oppose or misunderstand the project, the more difficult the implementation may become. In addition, it is worth noting that the agreements are sought on the Implementation Plan

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9 LR cooperatives are organized by land rights holders within the LR project site. To establish the LR cooperative, the applicant group (comprising seven or more land right holders) is required to have agreement of more than two-thirds of the land right holders. After establishment of the cooperative, all land right holders are registered as the cooperative members.

10 LR corporations are a type of special purpose company organized by land rights holders and a private company. This provision was added to the LR Law in 2005. To establish the LR corporation, land rights holders must invest more than 51 percent of the capital of the LR corporation.

11 Public implementers are not required to collect agreement from land right holders.
Objectives and Characteristic of Japanese LR and the articles of incorporation of LR cooperatives and LR corporations. The Implementation Plan is not required to include detailed plans relating to land reploting and compensation for each land right holder. These detailed plans are only formulated after the project approval.

Central government subsidy. Central government subsidy can be used for development of city planning roads in the LR project site. The maximum amount of subsidy is calculated by: (a) estimating a hypothetical cost of land acquisition, then adding (b) the compensation costs for the buildings and structures within the area of city planning roads, and also adding (c) the construction cost of roads. This is to provide comparability with the other subsidy programs for road construction. Since LR implementing bodies secure public lands for city planning roads through land contribution and not through land acquisition, but nevertheless have to spend (b) and (c), the amount for (a) can be used for other purposes, such as project management cost and compensation cost in areas outside the urban planning roads. In subsidized LR projects, more than 50 percent\(^{12}\) of the total of land value increase must be recouped into the project revenue through the sales of reserve lands.\(^{13}\) In other words, the development profits that land rights holders can obtain are limited to less than half of total development profits in the LR project supported by a central governmental subsidy. This subsidy system has promoted implementation of LR projects as well as development of urban infrastructure such as roads and parks while balancing public investments and land rights holders’ profits.

Governmental technical and financial support for private LR projects. A private LR project can receive technical and financial support from central and local governments. A person or group who tries to implement a private LR project can apply to local government for technical support for preparation and implementation. Local government dispatches LR experts to support preparation activities such as land owners’ meetings, feasibility study and

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\(^{12}\) This ratio has been the practice, while never formally stipulated.

\(^{13}\) There are the exceptions in cases where the LR projects did not increase the total land value.
formulation of Implementation Plan, and provides subsidies for implementation activities and construction of public facilities under the local government’s bylaw. This support system effectively promotes private LR projects under the local government’s jurisdiction. LR cooperatives and LR corporations can obtain other public financial support, such as no-interest governmental LR funds.

**Tax exemption for LR implementers and land owners.** LR implementers can receive exemption and reduction of taxation. Tax exemption is granted for the real estate registration tax for reploting lands and for the sale of reserve lands, and for corporate tax and income tax on the LR cooperative and government corporations. Also, land owners whose land is expropriated or acquired receive a reduction in the income tax on the income they receive from compensation and land expropriation. These tax incentives motivate land right holders to apply and cooperate in LR. These supports are intended to foster future increases in social and economic value and tax revenue from real estate developed in LR projects.

**Sales of reserve land.** Reserve land is a major financial resource for LR projects. The LR Law provides that reserve lands can be sold by LR implementers to recover LR project cost and to be used for the purposes prescribed in the LR articles. The LR Law also provides the upper limit of value of reserve land: the total value of reserve lands must not exceed the increase in total value of the lands in the project site. These provisions secure benefits of land right holders regardless of their agreement or disagreement regarding project implementation.

**Land exchange methods and land valuation.** The main principles of land exchange under LR are securing the existing private land value and maintaining fairness among land rights owners. The land exchange and land valuation are targeting the private lands in the LR project. The fundamental framework—regarding average land contribution ratio, total land areas, and average land prices before and after the LR project—is formulated through a ‘project frame’ as shown in Annex 3. Based on this framework, land exchange of individual land plot is calculated. In LR, there are three calculation methods for the size and location of replotted land: (a) land valuation-based method, (b) area-based method, and (c) mixed method using (a) and (b). Currently, the land valuation-based method is widely used. Under this method, the valuation is not based on the land price, but on the intrinsic value of each plot. As such, the results of the valuation are indicated by ‘points’, not ‘Yen’ in order to exclude external factors that affect land prices. The value of a land area after the project is calculated by multiplying the value of the existing land by the value-increasing ratio of the LR project. For each replotted area, value is obtained by division of the land value after the project by the unit land value of the replotted location. For instance, existing land with area of 1,000 square meters (m²) and value of 500,000 is provided with after-project land value of 750,000 (resulting from multiplication of 500,000 by the value-increasing ratio of 1.5). If the land is replotted in the area with the unit value of 1,000 per m², the replotted area is calculated as 750 m².

Regarding land valuation, although there are several kinds of land evaluation methods, the land value assessment based on accessibility, established in 1950, is widely used due to ease of use, which facilitates fast evaluation of many plots of land. If a land plot has better access by road, the unit value is higher. Based on this method, the total points in the area will be first calculated before and after LR and the value-increasing ratio is obtained. All the land parcels are entitled to be replotted so that the value for each parcel will be increased at the same value-increasing ratio. It is inevitable to have small differences (i.e., value more or less than this

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14 When the cooperative sells the reserve land, the sale income is tax exempt. Note: this exemption also applies to individual-implemented and corporation-implemented LR.
entitled value), and that difference will be settled through an adjustment payment.

By comparison, UR is basically carried out based on the principle of keeping the value of the existing real estate, including buildings, the same before and after the project. The value of each building unit which is provided through the UR project must be equivalent to the value of the real estate before the project.

Land right protection by designation of land replotting plan. Securing of land rights at any point throughout the replotting process is most important both for the land right holders participating in an LR project and for the implementing bodies. In Japanese LR, the land replotting plan—indicating the location, figure, and area of replotted land rights—is officially designated before the LR construction stage. This is called “tentative designation of replotted land” because it is not final replotting until the survey after construction is done. Each replotted land parcel is legally connected with the original land right by the designated replotting plan. During implementation, land right holders keep their certificate of original land right. If necessary, the replotting plan can be altered. After the completion of the construction work, each of the replotted land parcels will be registered all at once based on the final replotting plan. This designation system secures land rights both of original and replotted lands during project implementation. Even in the case of complicated land replotting in urbanized areas, this protection measure can smoothly transfer original land rights to new land rights.

In addition, the LR law provides the correlation principle in land replotting so that replotting land shall be correlated with the original land in terms of location, area, soil condition, water utilization, land use, environment, and so on. This provision secures the similarity of conditions between replotting land and the original land. The LR Law also provides for exception to the above principle based on the land owner’s requests for specific purposes such as promoting high-intensity land use and protecting owners of small land parcels.

Adjustment payment. The LR Law provides an adjustment method through monetary payment to correct for differences between the calculated replotted area and the measured area after development. The LR implementer pays or collects money to/from the land right holders based on the final replotting plan. This method can resolve minor differences in the values that could not be avoided in designing the replotting plan.

Special treatment for small land parcels. In the land replotting planning, small land parcels can be provided with special treatment, such as: (a) exchanging land for money; and (b) designation of minimum size of replotted land. Exchanging land for money is carried out through the adjustment payment in lieu of receiving the replotted land, based on the land owner’s request. Land contribution for small lands can be reduced by adhering to a minimum size designated by the LR implementer. To make up for the reduced contribution from small land parcels, land contribution for other larger land parcels may be increased.

Restriction of building activity. Building restriction in the LR project area is enforced by two stages of the planning and implementation process. In the planning stage, before approval of the LR project, the restriction under the Urban Planning Law is enforced (as described in the section on urban planning). Under the LR Law, after approval of the LR project, permission from the approver of the LR project is needed for any land development, new building, rebuilding, and/or extension of building that could possibly interfere with the LR project implementation, and any installation of unmovable structures. This provision functions to foster smooth implementation of LR projects.

15 These land right owners still have to pay an adjustment fee in such cases to ensure equity among the land rights holders.
Temporary relocation. In order to undertake construction activities during the implementation stage, usage of specific land parcels by the holders of land rights in the project area is temporarily terminated by notification from the LR implementer. For houses and shops, the users temporarily rent other houses and shop buildings while they are unable to use their own. The cost, including rental fee and moving, is compensated by the LR implementer. In public LR projects in urbanized areas, there are some cases where the LR implementer constructs apartments for temporary relocation of the existing residents.

Forced relocation on site. LR implementers can relocate or demolish buildings and structures any time after expiration of the period stipulated on the relocation notification. In case of LR projects implemented by private implementers, once they have the required approval of the mayor of the municipality. This forced relocation is not a regular method, and is recognized as a last resort due to the time and costs associated with obtaining the approval and supervising of the relocation work. In fact, there are many cases to solve by negotiation before executing forced relocation.

Dispute resolution. Regarding dispute resolution, the implementer’s implementation activities (e.g., designation of replotting plan) are defined as administrative disposition, which is eligible for request for examination under the Administrative Complaint Investigation Law. Persons and legal entities can submit a request for examination to the prefecture Governor or Minister of Ministry of Land, Infrastructure, Transport and Tourism (MLIT), depending on the type of the implementer. In case of dissatisfaction with the Governor’s decision, the person or legal entity can submit a request for re-examination to the Minister of MLIT.

Penalty. The LR Law provides for penalty—for individuals, land right holders, executives of LR cooperatives and LR corporations and stakeholders—for bribery, concealments, obstructions and violations of governmental orders and inspections.

Combining LR and other land value capture tools. In LR, a part of land value increase shall be contributed to reserve lands through land contribution. The remaining value belongs to private lands. Although Japanese LR doesn’t have any tool to directly capture the remaining value from the project in order to use for other public purposes, administrative bodies can capture part of the remaining value through the levying of the real estate tax for all properties and urban planning tax\textsuperscript{16} for properties in urban areas. In addition, it is expected that revitalization of land use and activities will increase other tax revenues, such as corporate tax, income tax and consumption tax. This is one of the incentives of governmental support for general urban development and redevelopment projects including LR in Japan.

TYPOLOGIES OF JAPANESE LR PROJECTS

Given its flexibility, Japanese LR has been used to achieve multiple development objectives. The types of Japanese LR projects are categorized as follows:

- new town development in peri-urban areas;
- post-disaster reconstruction;
- city center and station area redevelopment;
- improvement of congested and wooden residential areas;
- integrated LR with railway development; and
- small-scale LR for land consolidation in urbanized areas.

New town development in peri-urban areas. The most typical LR projects in Japan are those that aim to develop large- and medium-scale residential areas in agricultural land and vacant land areas. During the period of huge housing demand in the 1950s to 1990s, LR supplied numerous housing lands. LR

\textsuperscript{16} One kind of real estate tax imposed by some municipalities in Japan.
cooperatives are often adopted as the implementing entity due to profitability and ease of operation. Most of the LR cooperative project have utilized sales of reserve land as the major financial resource. Figure 3.1 illustrates an example of new town development in a peri-urban area.

Post disaster reconstruction. LR has been applied for urban reconstruction after WWII and after the Great Kanto Earthquake of 1923. In recent years, post-earthquake LR projects have been implemented after the Great Hanshin Earthquake in 1995 and the Great East Japan Earthquake in 2011. In Kobe City (see Figure 3.2), 13 LR projects with a total area of 145 ha have been implemented for post-earthquake reconstruction. In these projects, effective use of collective land replotting into a large-scale site has supported apartment development, and land right exchanging with money has provided support for livelihood restoration of the disaster affected people.

City center and station area redevelopment. To meet the objective of urban redevelopment for city center and station areas (see Figure 3.3 for an example), LR is applied for land and infrastructure development. This type of LR project is mostly implemented by local governments due to urgency, high-priority, complication of existing land rights and financial constraints, but is also implemented by railway companies and the Urban Renaissance Agency (URA). In this type of project, land replotting is effectively used for consolidation of vacant lands and private lands for the improvement of the land use, and for creating spaces for urban facilities such as arterial roads and station plazas. Simultaneously with the LR project, other related projects—such as commercial complex development, station building reconstruction and railway elevation—are implemented by local government, private companies and the railway companies.

Integrated LR with railway development. Under this category, there has been only one special case so far—the Tsukuba Express Railway (see Figure 3.4). Tsukuba Express connects Akihabara in Tokyo and a suburban research and development area and has total length of 58km with 22 stations. To secure the right of way for the railway facilities, a special methodology—using a combination of prior-LR land acquisition and land replotting—was established.

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17 Because there is little space available to create reserve lands.
Figure 3.2: Post-Earthquake Reconstruction LR Project

After earthquake  |  Land use plan

Source: Rokkomichi North Station LR Project and Rokkomichi Western Station LR Project, Kobe City.

Figure 3.3: Station Area Redevelopment

Before  |  After LR project

Source: Akihabara Station Area LR Project, Tokyo.
under the Law on Special Measures Concerning the Promotion of Integrated Urban Development with Railway Development in Metropolitan Area. This method aims to widely cover target lands which are easy to acquire. The outline of the methodology is shown in Figure 3.5.

Parts of the section of the right of way were secured through this method and 15 station areas were developed by the LR project.

**Improvement of congested and wooden residential areas.** This type of LR aims to improve the safety and disaster prevention of urban

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**Figure 3.4: Integrated LR with Railway Development**

*Source: Kashiwa Hokubu East LR Project, Urban Renaissance Agency, Japan.*

**Figure 3.5: Methodologies of Integrated LR with Railway Development**

*Source: Author.*
infrastructure and buildings in existing congested residential areas with wooden structures (see Figure 3.6 for an illustration). The LR project has the specific objectives such as: (a) securing evacuation routes and public spaces to prevent fires from spreading; (b) promoting reconstruction of old buildings having high risks of collapsing and burning down; and (c) land consolidation to support collective reconstruction for apartments.

**Small-scale LR for land consolidation in urbanized areas.** This type of LR has been used for maximizing the usability of private lands and vacant lands in urbanized areas. The major objectives of this type of LR are land consolidation and replacement of existing roads. This type of LR does not require increasing the amount of area for public facilities; hence, land contribution is not always necessary. In addition, where appropriate, application of exceptional or reduced standards for road width and park areas is encouraged, based on the LR Management Guideline published in 2001. Through land replotting, the land owners can receive a collective land lot to be used for large-scale building construction (see Figure 3.7).

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**Figure 3.6: Improvement of Congested and Wooden Residential Area**

*Source: Suehiro Minami LR Project, Kadoma City, Japan.*

**Figure 3.7: Small-scale LR for Land Consolidation in an Urbanized Area**

*Source: Land Readjustment Promotion Agency, Umeda 2-chome LR project, Osaka.*
NEW TOWN DEVELOPMENT IN PERI-URBAN AREAS: NAGAKUTE NANBU LR PROJECT IN AICHI PREFECTURE

Background. Nagakute City is a city adjoining Nagoya, which is the third largest city in Japan. As of 2015, the city has an estimated population of approximately 58,000, and total area is 21.6 square kilometers. Until the 1960s, the city’s population was approximately 10,000 and most of the city area was covered by farm lands and forests. After opening a terminal station of the urban railway in 1969, new town development using LR was promoted by the city government.

To date, nine LR projects have been implemented by phases in the city area. The total project area is 599 ha, which covers 80 percent of the urbanization promotion area. Among the nine projects, eight projects were implemented by LR cooperatives. As a result of the well-controlled urbanization, Nagakute city was chosen by the City Data Pack in 2015 (published by Toyo Keizai Inc.) as the third-best livable city in Japan. The locations of the nine LR projects are shown in Figure 4.1.

Figure 4.1: Location of LR Projects in Nagakute City

Source: Nagakute City.
Preparation of the Nagakute Nanbu LR project started since 1990. At that time, the project area was mostly covered by farm lands and forests within the urbanization control area. Motivation for the project came from the land owners who were concerned about environmental deterioration from increasing dumping of garbage and lack of public infrastructure. The land owners’ group conducted study meetings and surveys to discuss the need for town development. For two main reasons—difficulty of land acquisition and importance of land owners’ participation—they chose the LR scheme. In 1993 the preparatory meeting was held to formulate the Implementation Plan and establish the LR cooperative, with technical support provided by the municipality. In 1997, the project area was incorporated into an urbanization promotion area, and the LR project, urban facilities and zoning plan were designated on the urban plan. Through the legal procedures, the LR cooperative and the Implementation Plan were approved in 1998.

Overview of the LR Project. The Nagakute Nanbu LR project aimed to develop a new town with residential area, commercial and business area, a primary school and a nursery school, and green parks and cemetery areas, under the concept of “People and Nature-friendly Town”. The project included development of four roads designated on the urban plan. The project was implemented by an LR cooperative organized by the land right holders in the project area. The project cost of 20.8 billion JPY (208 million USD) was covered by central government subsidy, municipal subsidy and sales of reserve land. The sales of reserve land were the major financial resource accounting for 67 percent of the total revenue. Around 40 percent of the total area of private lands was used for both public facilities and reserve lands through the land contribution. The project was completed in 2015.

The land use plan is shown in the Figure 4.2 and Figure 4.3 shows the site conditions before and after the LR project. The project frame abstracted from the approved Implementation Plan is described in Annex 3.

Notable features. For the enhancement of the convenience and amenity as a new town area, and promotion of the project finance, the LR cooperative applied special techniques and programs as described below.

(a) Request-basis land replotting. For the commercial area development in the center area, collective land replotting based on the land owners’ request was used (see Figure 4.4). Lands for which the owner wanted to join the lease business were collectively replotted into the large-scale commercial block. The shape of each replotted land parcel was designed to be long and narrow in order to avoid

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### Overview of the Nagakute Nanbu LR Project:

- **Project Area:** 98.2 ha
- **Implementer:** Nagakute Nanbu LR cooperative
- **Number of Land Right Holders:** 780
- **Project Period:** 17 years (from 1998 to 2015)
- **Total Expenditure:** 20.8 billion JPY (208 million USD)
- **Average Land Contribution Ratio:** 39.86%
- **Planned Population:** 5,000 people

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**Figure 4.2: Land Use Plan of Nagakute Nanbu LR Project**

*Source: Nagakute Nanbu LR Cooperative.*
its individual land use. After the replotting, the land owners collectively leased their lands to a commercial developer to build a shopping center.

In addition, the project included an eco-friendly residential area in the southern area with natural and hilly landscape. This was also carried out through a request-based land replotting.

(b) District plan and cityscape guideline. A District Plan, which controls land use and building profiles in more detail than the zoning plan, was designated

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18 The LR law does not allow conversion of a group of individually owned land parcels into a jointly-owned parcel in order to protect property rights of individual landowners, except for special cases for small land parcels.
in the project area. The plan regulates minimum land size, construction line, advertisement, structure of fences, building height, and specific land use. In addition, a cityscape guideline was formulated to control wall and roof color, size and illumination of advertisement, and to promote planting in open spaces (see Figure 4.5). The plan and guideline had an effect not only in terms of improving the living environment, but also increasing land value which is important for cost recovery through the sale of reserve lands.

(c) Promotion for sales of reserve land. With the stagnation in the housing market in Japan, the sale of reserve lands is key to successful implementation of an LR cooperative project. In the replotting plan, priority was given to having the reserve lands at good and commercially attractive locations before assigning lands for replotting. In addition, promotion targeting housing companies started in the beginning stage in order to incorporate the opinions of the housing company (as the buyer) in terms of the land use plan and replotting plan. Through those efforts, the reserve lands were sold earlier than expected.

(d) Local government subsidy. The LR cooperative received financial support from Nagakute City in accordance with the municipal bylaw. The subsidy covers a part of the cost for the project’s activities (e.g., establishment of LR cooperative, securing public land for a part of the road exceeding the width of 12 m, drainage, green park, and administration costs). This helped to secure profitability for the LR cooperative and promoted the LR cooperative’s project.

(e) Establishment of town management association. The LR cooperative implemented not only the LR project, but also nature-friendly activities for the community including new residents. The LR cooperative had conducted several community events for planning, agricultural experience tour, and wildlife preservation activities in the green area in the project site (Figure 4.6). However, the LR cooperative had to be dissolved at the end of the project according to the LR Law. For the continuation of the LR cooperative’s mandates, a town management association, Nagakute Minami Satoyama Club, was established by the members of the LR cooperative. The town management association continues to implement those community-based activities, collaborating with the municipality, universities and private companies.

Key results of LR project:
The development effect of the LR project is summarized as follows:
Profiles of Selected LR Projects

- city road network was developed, connecting to other neighboring cities and public green park;
- creation of new town brought convenience and defined the cityscape;
- promotion of private buildings (such as residences, apartments, and shops) constructed by land right holders and buyers of reserve created new uses of land; and
- the number of residents in the LR project area increased from 30 to 5,000 people.

POST-EARTHQUAKE RECONSTRUCTION: SHIN-NAGATA EKIKITA POST-EARTHQUAKE RECONSTRUCTION LR PROJECT IN KOBE CITY

Background. The Shin-nagata Ekikita area is one of the enormously damaged areas affected by the Great Hanshin Earthquake that occurred on the 17th of January 1995. The earthquake brought about 4,600 deaths, with 15,000 injured in Kobe City only. 123,000 buildings collapsed or were partially destroyed, and 7,000 building were burned. In the project area, around 80 percent of the buildings were demolished or partially destroyed by the earthquake and fire. Before the earthquake, Shin-nagata area was a congested urbanized area with many small, wooden houses along narrow passages, and small factories and workshops of shoe manufacturers. The local industry had been on the decline due to the aging workforce and intensification of international competition. For urban reconstruction, Kobe City urgently designated the Shin-nagata Kita area (42.6ha) as an LR project on the urban plan in March 1995. The project plan of the LR was approved in July 1996. In addition, the Takatori Kita area (17 ha) was incorporated into the LR project in 1997. Figure 4.7 illustrates the location of the LR project area.

Overview of the LR Project. The project area consists of two areas: (a) Shin-nagata Kita area, a congested area with many wooden houses; and (b) Takatori Kita area, part of a huge factory land parcel owned by the railway company. The LR project’s objectives were to reconstruct the urban facilities and improve land use as well as the livelihoods of the disaster-affected residents in Shin-nagata Kita area. Takatori Kita area was incorporated into the LR project to develop a new housing area with disaster-prevention function and providing commercial and cultural facilities. The LR project was implemented by Kobe City. The project cost of 103 billion JPY (1.03 billion USD) was covered by public funds such as central government subsidy, contribution for urban park construction, and municipal general budget. Reserve land was not secured due to a

Figure 4.6: Community Events in Project Area

Source: Tamano consultants Co. Ltd.
decrease in total land value. The average land contribution ratio for both areas was 15.07 percent. Within Shin-nagata Kita area, the average land contribution ratio was set at 9 percent in consideration of existing small land lots with an area of around 40 m². In addition, land contribution for small plots with an area of 60 m² or less was reduced to 0–9 percent as a special treatment. The project was completed in 2011. The land use plan is shown in Figure 4.8.
Profiles of Selected LR Projects

Notable features. For the reconstruction of urban facilities and livelihoods in disaster-affected areas, the LR project applied special techniques and programs as described below.

(a) Land acquisition as a means of compensation due to decrease in total land value. Most LR projects aim to increase land value; however, in some cases, in urbanized areas, the total land value of private land after the LR project is lower than it was before the LR project. The decrease in private land value is a result of a combination of land contribution from private to public land and small increases in land unit price due to the already high unit price of existing land. According to the LR Law, the LR implementer must compensate if there is a decrease in land value. In reality, it is commonly practiced that the public LR implementer acquires lands before LR instead of paying the compensation after LR. The purchased lands are defined as public lands, which decreases the pre-LR total value of private land. As the result, the total value is balanced between before the LR project and after. The calculation model is shown as Figure 4.9.

In the Shin-nagata Ekikita LR project, the land value was estimated to have decreased by 27 billion JPY (270 million USD). Kobe city purchased lands instead of paying the compensation later, and reclassified the purchased lands to public land. The land acquisition supported the speedy resettlement of the disaster-affected peoples.

(b) Joint apartment development using collective land replotting. In the project area, many of land right holders lost their houses due to the earthquake and fire. The reconstruction faced a number of challenges, such as: (a) under the current building code, it was impossible to secure the same living spaces as before the disaster; (b) land right holders lacked their own budget due to old age and “double loan” problem. To address this, joint apartment development was proposed. Through the coordination and participation of the land right holders, eight apartment projects were implemented in the LR project site (see Table 4.1 and Figures 4.10 and 4.11).

Those apartment projects were ordinary building projects—not following the UR Law, in order to avoid losing time to the legal procedures. Land rights holders who joined the apartment development were replotted into the apartment project site. After designation of the land replotting plan, the apartment developer temporarily purchased the participants’ land rights, under a contract that

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19 Households already had a loan for the house they owned. When their house was demolished or burned by the earthquake and fire, in order to re-build they needed to take out another loan -- while they still had the original loan as well.
described the condition for returning the rights with an apartment unit. After development, the developer sold a part of the apartment building to the market to recover the development costs. Then, the original land right holders received the remaining apartment units. This process supported livelihood recovery as well as disaster prevention of housing, and also promoted high-intensity land use while keeping the existing community intact.

(c) Proposal of land use plan from Residential Town Planning Committee. Shin-nagata Kita area

Table 4.1: Joint Apartment Development in Shin-nagata Ekikita LR Project

<table>
<thead>
<tr>
<th>Land Area (m²)</th>
<th>Participated land right holders</th>
<th>Apartment Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Total housing (unit)</td>
</tr>
<tr>
<td>1</td>
<td>2,072</td>
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<td>2</td>
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<td>7</td>
<td>728</td>
<td>34</td>
</tr>
<tr>
<td>8</td>
<td>195</td>
<td>11</td>
</tr>
</tbody>
</table>

Source: Kobe City.
consists of more than 20 urban blocks with an area of approximately 1 ha each block. Kobe City decided to establish twenty-one units of the Residential Town Planning Committees in each community after the designation of the LR project on the urban plan. The activities of the committees were supported by town planning experts such as university professors and consultants who were dispatched by Kobe City. Each committee formulated a local land use plan for each urban block, with technical advice provided by the town planning expert, and proposed it to Kobe City. Based on the proposal, Kobe City adjusted the land use plan of the LR project. In addition, the committee discussed joint apartment development, as previously described, and also proposed an increase of the designated FAR, to improve feasibility of the apartment development. Then, Kobe City adjusted a part of the Zoning Plan and formulated the District Plan in order to support the joint apartment development.

**Key results of the LR project:**
The development effect of the LR project is summarized as follows:

- disaster prevention of the project area was improved through widening city roads, creating community roads and open spaces, newly-built buildings with aseismic and fireproof structure, and construction of a fire prevention water tank;
- livelihood rehabilitation of disaster-affected people was aided by the exchange of money for existing land rights through land acquisition before approval of the LR project, and joint apartment development using collective land replotting.
- the population in the project area increased from 7,587 persons before the earthquake in 1994 to around 9,400 persons after completion of the LR project in 2011; and
- the cityscape in the project area was improved by development of underground power lines and cityscape guidelines formulated by the Residential Town Planning Committee.

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**STATION AREA REDEVELOPMENT: AKIHABARA STATION AREA LR PROJECT IN TOKYO**

**Background.** Akihabara station area is located at the city center of Tokyo, just 2km north of Tokyo Station. It has an important transport hub function in Tokyo and is also one of the world’s largest shopping areas for electrical product, with both big vendors as well as many medium- and small-size shops. Previously, the area had huge vacant lands along the railway tracks that were used for a public vegetable market and a freight depot. The market land (area of 2.7 ha) was owned by the Tokyo Metropolitan Government. The freight depot land (area of 3.2 ha) was owned by the former Japanese National Railway Settlement Corporation. In 1993, a decision was taken to build a new urban railway, the Tsukuba Express, which provides a 58km-long connection between Akihabara station and a research and development area in Ibaraki prefecture.

The Tokyo government included redevelopment of the vacant lands in the Akihabara station area in the 3rd long-term development plan in 1990, and formulated the conceptual plan for the urban redevelopment in 1992. In the conceptual plan, LR would be implemented by the Tokyo government for the redevelopment due to the necessity to reorganize land rights of the huge vacant land parcels and surrounding small private lands. Furthermore, urban control and

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**OVERVIEW OF THE LR PROJECT:**

- **Project Area:** 8.76 ha
- **Implementer:** Tokyo Metropolitan Government
- **Number of Land Right Holders:** 35 (as of project approval)
- **Project Period:** 19 years (from 1997 to 2015)
- **Total Expenditure:** 34.6 billion JPY (346 million USD)
- **Average Land Contribution Ratio:** 35.10% (34.22 % for public land, 0.88% for reserve land)

*Source: History of Akihabara Station Area LR Project, Tokyo Metropolitan Government.*
integrated land use were to be achieved by applying the District Plan and guidelines. The LR project and the related urban facilities were designated in the urban planning in 1996. The Implementation Plan of the LR project was approved in 1997.

**Overview of the LR Project** (see Figures 4.12 and 4.13). The LR project’s objective was to redevelop the Akihabara station area, including the huge vacant lands, for urban land use with commercial, office, residential and cultural facilities. It also aimed to achieve synergy with urban transportation and enhancement of urban function utilizing the existing characteristic as an electrical shopping town.

The development concept targeted to introduce three urban functions: (a) innovation hub for digital media and next-generation industries; (b) communication and information function; and (c) living and accommodation function. The LR developed four city roads designated in the Urban Plan, including two station plazas, and community roads and a park. The project cost of 34.6 billion JPY (346 million USD) was covered by a central government subsidy, Tokyo government’s general budget, and sales of reserve land (600 m² of 2.3 billion JPY (23 million USD)). The average land contribution ratio was 35.10 percent, and was mostly used for securing of public facility land. The basic design of public facilities is shown in Figure 4.14.

The reploting plan was designated in 1998. After land rights registration for replotted lands in 2011, the project was completed in 2015. Figure 4.15 illustrates the private urban development that has taken place in the Akihabara Station area.

**Notable features.** To achieve the project objective, the LR project applied special techniques and programs as described below.

(a) **Designation of Urban Renaissance Urgent Redevelopment Area (URURA).** The URURA is a central government program to support creation of urban centers in large-scale cities through public-private collaboration under the Act on Special Measures Concerning Urban Renaissance, established in 2002. In the area, designated urban
development projects can receive special measures such as: deregulation of land use control, private proposal of urban planning, expediting of legal procedure, and Minister’s permission for financial support20 and tax reductions.21 In addition, relevant government offices and local government strongly promote projects and programs for urban renewal under the development policy decided by the Urban Renaissance Headquarters of the Prime Minister’s Office. At present, 63 areas with a total area of 8,372ha are designated as URURA in Japan.

Akihabara and Kanda Area, with an area of 157ha including the LR project urban area, was designated

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20 Long-term loan with stable interest rate for middle-risk investments for private urban renewal projects.
21 Tax reduction is applied to (a) real estate acquisition tax on land acquisitions by the certified project implementers; (b) income tax, corporate tax, registration and license tax, real estate acquisition tax, real estate tax and urban planning tax on building constructions by the certified project implementers; and (c) income tax and corporate tax on land transaction from land owners to the certified project implementers.
as an URURA in 2002 (Figure 4.16). The development policy aims to create an urban core of IT industry through land use renewal using huge vacant lands. In the Akihabara and Kanda Area, the special measures of the URURA related to: (a) financial support and tax reduction for a private urban reconstruction project in the LR project area; and (b) deregulation of the maximum floor-area-ratio for UR projects and private urban reconstruction projects—which are designated as a Special Urban Renewal District in the area outside of the LR project (but still within the URURA).

(b) District plan. The District Plan was designated in the project area. The plan designates urban facilities, such as roads and open spaces, and regulates land use and building in detail in terms of land size, FAR, construction line, advertisement, structure of fences, building height, specific land use and eco and green technologies. In particular, deregulation of the FAR is provided for two urban blocks to promote large-scale urban development projects.

(c) Special Purpose Company for Commercial and Office Complex. For the development of a commercial and office complex in the LR project area, a special purpose company, UDX, was established by investment companies. The UDX developed the Akihabara UDX Building and leased its floors to tenants. In the beginning of the establishment of the UDX, the project cost was funded from the sale of preferred equities issued by the investment companies and project finance aiming to achieve high profitability. For the development, UDX purchased replotted land owned by Tokyo government. The project scheme is shown in Figure 4.17.

(e) Effect of the LR Project

In the History of Akihabara Station Area LR Project, the development effect of the LR project is summarized as follows:

OUTLINE OF AKIHABARA UDX:

- Project Area: 1.1 ha
- Building: 22 stories and 3 stories of basement
- Floor area: 161,600 sqm
- Floor use: office, shops, event space
- Construction Period: 3 years (from 2003 to 2006)

Source: Chiyoda Ward Office, Tokyo.
- convenience for shopping, pedestrian safety, and cityscape were improved;
- in the surroundings of the LR project area, the number of offices related to the IT industry has increased 30 percent (194 offices) over six years (since 2000);
- 121 new apartment buildings (total floor of 480,000m²) were developed and the population increased 27 percent (681 people); and
- the total economic multiplier effect of the LR project was 10 times the investment: (i) building relocations in the LR project area triggered private construction investment equivalent to 6.4 times the compensation cost; and (ii) construction for the LR project and related private development created economic activities, such as procurement of construction materials and other consumption, amounting to 2.55 times the construction cost.
CONCLUSION

LR in Japan has been used quite successfully for various kinds of urban development countrywide over a long period of time. LR realizes reorganization of fragmented land parcels and supports development of public facilities through land contribution. This can be achieved while firmly protecting land rights throughout the replotting process. Two main factors have contributed to the need for LR in Japan: (a) highly fragmented patterns of land ownerships resulting from establishment of the modern land management system in the 19th century and the Agrarian Reform in 1940s; and (b) low share of publicly owned land in urbanized areas. At the same time, a number of factors have contributed to the success of LR as a community-based development tool in Japan, including: (a) strong land ownership rights, secured by the modern land management system since the 19th century; (b) general trend of increasing land price; (c) provision of framework to support community-based LR; (d) good governance, with government’s consistent urban management policy; (e) local governments have political and financial autonomy, including taxing power which generates budget for local government to support LR; (f) capacity at prefectural and municipal governments as well as the private sector; (g) comprehensiveness of urban planning system covering all aspects of land uses, urban development and infrastructure into one integrated system; (h) people’s recognition of the value of land and awareness about the advantages of town improvement; and (i) provision of government subsidies and incentives with respect to taxation.

To effectively apply LR in developing countries, it is important to:

- clarify the need for and objectives of applying LR in terms of its contribution to social and economic benefit in the major cities and countrywide;
- clarify the process for LR and its relation with urban planning, incorporating the definition of LR into the urban planning system while maintaining consistency with the government’s urban management policy;
- have clarity, with as much detail as possible, in the decision making procedure;
- make available governmental technical and financial support in order to promote effective undertaking of LR and to provide incentive;
- establish other land-based financing mechanisms such as property taxation to generate resources to support sustainable development;
- establish effective uses of land replotting, such as: collective replotting for large-scale land use, converting land rights to building floor area rights, special consideration for small land plots, and responding to land use demand and accommodating specific purposes;
- secure land rights and ensure fairness in land replotting and land valuation in order to promote consensus building among land right holders;
- delineate appropriate requirements for agreements;
- consider the compulsory relocation clause as a last resort; and
- ensure that measures are in place to prevent activities such as land development and building construction that would otherwise harm LR implementation.
## Annex 1: History of LR in Japan

<table>
<thead>
<tr>
<th>Year</th>
<th>Topics</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1872–1899</td>
<td>Establishment of modern land management system</td>
<td>Certificates of land title had been published since 1872, and the cadastral maps covering the whole country, without Hokkaido and Okinawa, were completed in 1885. The Real Property Registration Law was established in 1899.</td>
</tr>
<tr>
<td>1899</td>
<td>Establishment of Agricultural Land Consolidation Law</td>
<td>ALC was established for agricultural land development. The ALC projects were implemented by landowners’ cooperatives, and the expenses were raised by landowner’s own budget and subsidy of local government.</td>
</tr>
<tr>
<td>1919</td>
<td>Establishment of LR under the Urban Planning Law</td>
<td>Provisions of LR were added into the Urban Planning Law. Institutionalization of LR is understood to have been with reference to a German LR Law. Provisions of the ALC Law were applied to the implementation procedure of LR.</td>
</tr>
<tr>
<td>1923</td>
<td>Application of LR to post-earthquake reconstruction</td>
<td>LR was applied to the post-earthquake reconstruction of Tokyo region after the Great Kanto Earthquake. For the smooth implementation in financing, replotting and compensation, the Special Urban Planning Law was established in 1923. After the completion of the LR projects, the Law was repealed in 1940.</td>
</tr>
<tr>
<td>1933</td>
<td>Formulation of design guideline for LR</td>
<td>Based on the experiences of LR, the design guideline for LR was formulated by the Government.</td>
</tr>
<tr>
<td>1946</td>
<td>Application of LR to post-war reconstruction after World War II</td>
<td>LR was applied to urban reconstruction in war-damaged cities across the whole country. For implementation, the Special Urban Planning Law was established again in 1946, and the rule of LR was improved to allow for national subsidy for local governments and to protect small land plots in consideration of the serious economic and land situation.</td>
</tr>
<tr>
<td>1947–1950</td>
<td>Implementation of Agrarian Reform</td>
<td>The central government expropriated agricultural lands from huge landowners and distributed those land rights to the tenant farmers. As a result, the increasing number of agricultural landowners prompted the need for LR.</td>
</tr>
<tr>
<td>1949</td>
<td>Repeal of ALC Law</td>
<td>The ALC Law was repealed, and the Land Improvement Law was established, focused on agricultural land development. As a result, LR lost the legal basis for its implementation procedure.</td>
</tr>
<tr>
<td>1954</td>
<td>Establishment of LR Law</td>
<td>The LR Law was established by utilizing the experiences of LR projects and related old laws such as the Urban Planning Law, the Special Urban Planning Law, and the ALC Law.</td>
</tr>
<tr>
<td>1950s–</td>
<td>Implementation of large-scale LR projects in rapid economic growth</td>
<td>Large-scale LR projects had been implemented for housing supply to address huge population growth in the major metropolitan areas. For the promotion of LR projects, the central government established financing programs, such as the national subsidy, by using the Special Account for Road Construction and no-interest loans for LR cooperatives.</td>
</tr>
<tr>
<td>1955</td>
<td>Establishment of Japan Housing Corporation (JHC)</td>
<td>JHC was established to implement new town developments and develop, sell and rent social housing. In new town LR projects, JHC secured lands for construction of social houses in the LR project site.</td>
</tr>
<tr>
<td>1968</td>
<td>Establishment of the Urban Planning Law</td>
<td>The new Urban Planning Law was established to control rapid urbanization. The LR project was defined as one of the urban development projects under the Law.</td>
</tr>
<tr>
<td>1995</td>
<td>Application of LR to post-earthquake reconstruction</td>
<td>LR was applied to urban reconstruction after the Great Hanshin Earthquake. In the LR projects, a land replotting system was effectively used for integration with apartment development—and the exchange of land rights to money helped with livelihood restoration for the earthquake-affected land owners.</td>
</tr>
</tbody>
</table>
Annex 1: History of LR in Japan (continued)

<table>
<thead>
<tr>
<th>Year</th>
<th>Topics</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990s</td>
<td>Struggles of private LR and shifting the purpose of LR</td>
<td>After the collapse of the bubble economy in the early 1990s, private LR projects depending on the sale of reserve lands stagnated. For financial recovery, some counter-measures—such as additional land contribution to increase reserve lands and additional charges—were required of land owners in the project site. In addition, the project plans were revised to reduce cost and local governments increased their subsidy to help LR’s financial problems. The purpose of LR was shifted from new town development to urban renovation, such as station area redevelopment, integrated urban development with commercial complex, and small-scale LR for land consolidation in urbanized areas.</td>
</tr>
<tr>
<td>2001</td>
<td>Formulation of the LR Management Guideline</td>
<td>The LR Management Guideline was formulated by reorganizing past governmental and ministerial circulars relating to LR. In addition, the guideline presents the governmental policy to utilize LR for urban renovation.</td>
</tr>
<tr>
<td>2005</td>
<td>Addition of LR company</td>
<td>Provision of LR company as LR implementer was added into the LR Law in order to promote private investment in LR projects. The LR company is organized by land right holders and a private company (such as developers and construction companies).</td>
</tr>
<tr>
<td>2011-</td>
<td>Application of LR to post-earthquake reconstruction</td>
<td>Post-earthquake LR projects are currently being implemented for reconstruction after the Great East Japan Earthquake in 2011.</td>
</tr>
</tbody>
</table>

---

*a Adickes Act. Der Gesetzentwurf Betreffend Stadterweiterungen Und Zonenenteignungen (lex Adickes, 1894). Frankfurt am Main.*

*b The major objectives of the Special Urban Planning Law were: (a) allowing inclusion of lands with buildings into LR; (b) cost allocation to local government; (c) land contribution with 10 percent without the compensation; (d) organizing the Inspection Committee for compensation; and (e) tentative land replotting to allow land use before the registration of replotted lands.*
## Annex 2: Legal Procedure of LR Project in Japan

<table>
<thead>
<tr>
<th>Type of</th>
<th>LR Cooperative</th>
<th>Local Government</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preparation</td>
<td>Establish preparatory meeting by land owners group</td>
<td>Apply for local government’s technical support</td>
</tr>
<tr>
<td></td>
<td>Develop draft land use plan with land right holders</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Designate LR project on urban planning</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Formulate Implementation Plan and articles of LR cooperative</td>
<td>Formulate Implementation Plan and implementation rule</td>
</tr>
<tr>
<td>Approval</td>
<td>Approve public facilities plan by the administrative agencies</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Collect land right holder’s agreement on Implementation Plan and articles</td>
<td>Public inspection of Implementation Plan and collect public opinions</td>
</tr>
<tr>
<td></td>
<td>Apply for establishment of LR</td>
<td>Apply for Implementation Plan</td>
</tr>
<tr>
<td></td>
<td>Public inspection and collect public opinions</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Approve establishment of LR cooperative by prefectural governor or mayor of major city designated by</td>
<td>Approve Implementation Plan and implementation rule by prefectural governor</td>
</tr>
<tr>
<td>Implementation</td>
<td>General meeting for election of executive members of LR</td>
<td>Establish advisory committee</td>
</tr>
<tr>
<td></td>
<td>Survey, facility design, replotting design</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Approve provisional replotting plan</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Relocation, compensation, construction</td>
<td></td>
</tr>
<tr>
<td>Completion</td>
<td>Approve final replotting plan and the public notification</td>
<td>Registration of replotting lands, adjustment money for re-plotting lands and transfer of public facilities</td>
</tr>
<tr>
<td></td>
<td>Dissolution of LR cooperative and the liquidation</td>
<td></td>
</tr>
</tbody>
</table>

*Source: Author.*
### Annex 3: Project Frame of Nagakute Nanbu LR Project

#### (a) Land Classification

<table>
<thead>
<tr>
<th>Items</th>
<th>Original (Before Project)</th>
<th>Plan (After Project)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Area (m²)</td>
<td>Rate (%)</td>
</tr>
<tr>
<td>Public Facility lands</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Road</td>
<td>25,824.49</td>
<td>2.63</td>
</tr>
<tr>
<td>Park</td>
<td>652.87</td>
<td>0.07</td>
</tr>
<tr>
<td>Green</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Drainage</td>
<td>12,313.23</td>
<td>1.25</td>
</tr>
<tr>
<td>Sub-total</td>
<td>38,790.59</td>
<td>3.95</td>
</tr>
<tr>
<td>Private lands and non-administrative lands</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Private land</td>
<td>825,382.86</td>
<td>84.07</td>
</tr>
<tr>
<td>Non-administrative lands owned by municipality*</td>
<td>38,504.29</td>
<td>3.92</td>
</tr>
<tr>
<td>Sub-total</td>
<td>[A] 863,887.15</td>
<td>87.99</td>
</tr>
<tr>
<td>Reserve lands</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Difference between registration and measurement**</td>
<td>[s] 79,168.99</td>
<td>8.06</td>
</tr>
<tr>
<td>Total</td>
<td>981,846.73</td>
<td>100.00</td>
</tr>
</tbody>
</table>

*Note: *Lands for nursery school and cemetery, which to be obliged with land contribution.

**Difference in area between total of land registration and result of measurement of project boundary.

*Abstracted from the Implementation Plan, 8th amended in 2012.

#### (b) Land Contribution

<table>
<thead>
<tr>
<th>Total Private Land Area (Before Project) (m²)</th>
<th>Total Private Land Area including Difference (m²)</th>
<th>Total Private Land Area (After Project)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>A' = A + s</td>
<td>D = B + R</td>
</tr>
<tr>
<td>863,887.15</td>
<td>943,056.14</td>
<td>670,480.58</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Excl. reserve land (m²)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>B</td>
</tr>
<tr>
<td></td>
<td></td>
<td>567,148.57</td>
</tr>
</tbody>
</table>

#### Total Area of Land Contribution

<table>
<thead>
<tr>
<th>For public facilities land (m²)</th>
<th>For reserve land (m²)</th>
<th>Total (m²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>P=A' – D</td>
<td>R</td>
<td>E = P + R</td>
</tr>
<tr>
<td>272,575.56</td>
<td>103,332.01</td>
<td>375,907.57</td>
</tr>
</tbody>
</table>

#### Land Contribution Ratio

<table>
<thead>
<tr>
<th>For public facilities land (%)</th>
<th>For reserve land (%)</th>
<th>Total average (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>P/A'</td>
<td>R/A'</td>
<td>E/A'</td>
</tr>
<tr>
<td>28.90</td>
<td>10.96</td>
<td>39.86</td>
</tr>
</tbody>
</table>
### Annex 3: Project Frame of Nagakute Nanbu LR Project (continued)

#### (c) Reserve Land

<table>
<thead>
<tr>
<th>Total Land Value</th>
<th>Average Land Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before project (JPY)</td>
<td>After Project (JPY)</td>
</tr>
<tr>
<td>( V = A \times a )</td>
<td>( V' = D \times a' )</td>
</tr>
<tr>
<td>75,464,528,840</td>
<td>93,062,704,504</td>
</tr>
</tbody>
</table>

#### (d) Expenditure

<table>
<thead>
<tr>
<th>Items</th>
<th>Unit</th>
<th>Amount</th>
<th>Cost (JPY)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public Facilities</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arterial roads</td>
<td>m</td>
<td>3,358</td>
<td>974,404,124</td>
</tr>
<tr>
<td>Community roads</td>
<td>m</td>
<td>61,793</td>
<td>1,114,521,976</td>
</tr>
<tr>
<td>Pedestrian roads</td>
<td>m</td>
<td>2,258</td>
<td>129,202,700</td>
</tr>
<tr>
<td>Park and Green</td>
<td>L.S.</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Drainage</td>
<td>L.S.</td>
<td>1</td>
<td>1,645,393,509</td>
</tr>
<tr>
<td>Sub-total</td>
<td></td>
<td></td>
<td>3,863,522,309</td>
</tr>
<tr>
<td>Relocation and Reconstruction</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relocation of existing building</td>
<td>building</td>
<td>12</td>
<td>1,621,000,000</td>
</tr>
<tr>
<td>Reconstruction of existing utilities</td>
<td>L.S.</td>
<td>1</td>
<td>181,689,034</td>
</tr>
<tr>
<td>Sub-total</td>
<td></td>
<td></td>
<td>1,802,689,034</td>
</tr>
<tr>
<td>Utility</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water supply</td>
<td>L.S.</td>
<td>1</td>
<td>650,188,488</td>
</tr>
<tr>
<td>Gas supply</td>
<td>L.S.</td>
<td>1</td>
<td>216,083,331</td>
</tr>
<tr>
<td>Sub-total</td>
<td></td>
<td></td>
<td>866,271,819</td>
</tr>
<tr>
<td>Land reclamation</td>
<td>L.S.</td>
<td>1</td>
<td>6,034,000,000</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>L.S.</td>
<td>1</td>
<td>2,626,862,563</td>
</tr>
<tr>
<td>Allocated charge</td>
<td>L.S.</td>
<td>1</td>
<td>1,173,000,000</td>
</tr>
<tr>
<td>Survey and design</td>
<td>L.S.</td>
<td>1</td>
<td>2,193,000,000</td>
</tr>
<tr>
<td>Compensation</td>
<td>L.S.</td>
<td>1</td>
<td>130,000,000</td>
</tr>
<tr>
<td>Loan interest</td>
<td>L.S.</td>
<td>1</td>
<td>175,654,275</td>
</tr>
<tr>
<td>Administration</td>
<td>Year</td>
<td>17</td>
<td>1,945,000,000</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>20,810,000,000</td>
</tr>
</tbody>
</table>
### Annex 3: Project Frame of Nagakute Nanbu LR Project (continued)

#### (e) Revenue

<table>
<thead>
<tr>
<th>Items</th>
<th>Revenue (JPY)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Subsidy</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Central government subsidy</td>
<td>4,324,798,000</td>
<td></td>
</tr>
<tr>
<td>Local government subsidy</td>
<td>2,207,000,000</td>
<td></td>
</tr>
<tr>
<td><strong>Sub-total</strong></td>
<td>6,531,798,000</td>
<td></td>
</tr>
<tr>
<td>Sales of reserve land</td>
<td>13,919,600,000</td>
<td>103,332 m² x 134,700 JPY/ m²</td>
</tr>
<tr>
<td>Others</td>
<td>358,602,000</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>20,810,000,000</td>
<td></td>
</tr>
</tbody>
</table>
Corridor Level Transit-Oriented Development Course

Executive Summary
Module 1: TOD as a strategy to achieve a sustainable city

Introduction

The 21st century has become the century of the city: 2009 marked the first year in history that the majority of the world’s population lived in urban areas, and cities throughout the world are expected to continue to expand rapidly throughout the course of this century. By 2030, it is projected that 5 billion people will live in the world’s cities, with the majority of this urban growth occurring in developing nations in Asia and Africa. With such rapid urbanization, today’s cities face great challenges that must be addressed in order to create a sustainable future. Cities can represent innovation and opportunity; however, cities also house concentrated populations living in extreme poverty, and, with densely-packed populations, can be primary culprits in the creation of greenhouse gas (GHG) emissions.

Faced with such pressing problems, cities are uniquely positioned to be at the forefront of creating solutions to reduce the negative impacts of climate change and be at the epicenter of economic growth. There are many tools that cities can use to advance sustainability goals, address the problems of rapid urbanization and increase their social equity and economic competitiveness. In this course, we will focus on a particular strategy known as transit-oriented development (TOD), at a corridor level scale.

Scope

Module 1 focuses on the concept of TOD and the potential benefits it can bring to a city. It delves into the root cause and interconnectedness of three pressing issues plaguing cities today: urban sprawl, rapid motorization, and high energy consumption. Using international examples and data, the module discusses how perverse incentives such as road subsidies, large housing initiatives relegated to urban peripheries and an emphasis on personal vehicle ownership have led to sprawling suburbs. This problem has been compounded by increases in vehicle ownership, leading to congestion and pollution. The module explains why there is a negative correlation between density and energy consumption, and highlights other economic costs of sprawl. The module also highlights the disproportionate impact of uncoordinated transport-land use planning the most economically vulnerable populations. The poor are often priced out of cities, forced to travel longer distances to get to work, and pay a higher percentage of their income on housing and transportation costs.

TOD is presented in this module as a transformative solution that addresses each of these problems. As a comprehensive strategy, TOD encourages compact development and prioritizes public transit and active transport over personal vehicle ownership. By building more compact, higher density cities and concentrating jobs, housing, services and amenities near public transit, cities consume less energy. The module provides the history of TOD, discussing both the historical context in which cities form naturally around a walkshed, and the re-emergence of the concept and term coined by Peter Calthorpe.

The module presents an overview of the implementation cycle of a TOD project, illustrating the actors, sectors, institutions and regulations that must be coordinated for a project. The module draws on lessons learned from the field and highlights common barriers to TOD.
Conclusion

Cities facing the challenges of sprawl, rapid motorization, and wasteful energy consumptions, must avoid the common short-sighted approach of addressing these problems individually. Instead they must think of solutions that are holistic and comprehensive. After viewing Module 1, viewers will understand the interlinkages of these problems and how adopting transit-oriented development strategies can work to overcome such challenges. The module provides viewers with a high-level understanding of the concept and complexity of TOD, providing the foundation to delve into the details laid out in later modules. It can be used as stand-alone presentation for audiences not familiar with the TOD concept.

Module 2: TOD Corridors

Introduction

In cities that have just started to build a transit network, choosing the right corridor to construct can support momentum for both transit and TOD. Corridor planning that incorporates a strategic, region-wide analysis of the impact of transit can use the identification of where the real estate market is or will likely be most active to shape the corridor being studied, its secondary influence areas, and how new transit lines will affect the entire city and transportation network. Existing transit lines can also benefit from corridor-level TOD planning, especially if there is a need for community revitalization or the connection of employment hubs and residential areas. While TOD planning is often only considered on the station-area scale, city-level and corridor-level TOD planning are often considered to be a more efficient scale for study; this can save stakeholders valuable time during project implementation.

Scope

The second module provides an explanation of the benefits for a city to think about implementing TOD strategies at the corridor level. Advantages discussed include better stakeholder engagement; increased efficiency through prioritizing station phasing based on TOD readiness, improving economic development via economies of scale, and offering a wide-angle lens to determine complementarity of characteristics such as densities, amenities, affordable housing and land use across the entire corridor. The module also classifies three distinct types of corridors – destination connectors, commuter corridors, and district circulators – and their implications for implementation.

Next, an overview of the common economic, social, and environmental objectives that cities hope to achieve through the creation of TOD corridors are discussed. Finally, specific examples of successful TOD corridor implementation from cities around the world are examined.

Conclusion

The goal of Module 2 is to make the case for why and how to apply TOD at the corridor scale, to unlock several benefits. When a corridor is implemented successfully, the transit system will serve to unite adjacent communities. Successful TOD corridors adapt to the context of each community, and are accessible to drivers and non-drivers alike. When local planners consider TOD at the corridor scale, they can enhance their understanding of how transit will influence the TOD, ridership, and market potential at each station. When planners only consider the station area, they can miss this important broader context.
Module 3: The Building Blocks of TOD

Introduction
Implementing a corridor-level TOD project is a long-term investment in time, capacity and money. It requires ongoing coordination of many, often disparate, groups of people from the public and private sector and civil society; creative financing and investment models; land assembly; analysis and adjustment of existing institutional structures and regulations; evaluation of an array of supporting infrastructure; and implementation of strategies to protect vulnerable populations. Officers in charge of TOD projects must acknowledge the importance of each of these blocks and understand how they impact one another and fit together. This can be a daunting process which is often met with obstacles at every turn, especially when a project is first of its kind. However, challenges can be lessened when obstacles are identified early on.

Scope
Module 3 provides a menu of options and tools which can help decision makers to begin thinking about the elements necessary for corridor-level TOD project implementation. The tools are illustrated with examples based on case studies, with a focus on developing country cities. The following 6 building blocks are explored in Module 3. Although design, finance, and affordable housing are also building blocks of TOD, they are discussed in greater detail in later modules.

Political leadership is a key factor throughout TOD project implementation. Because TOD implementation is a long-term, transformative process, which generates disruptions and is inherently risky, political leadership is essential to managing the change process so that all stakeholders feel engaged, understand its importance to the future of the city, and have genuine outlets to participate.

Institutional Structure: TOD is necessarily an interdisciplinary task. It requires the coordination of the economic, transportation and land use planning efforts, at the very least. The nature of TOD projects also requires vertical coordination between different levels of government, from national agencies – who are often in charge of economic, transportation and urban development programs and their funding, to metropolitan agencies in some cities, and down to the local and neighborhood levels. It also requires the coordinated work of the public sector, private developers, funders and community stakeholders.

Regulatory Environment: Zoning and building codes can have an enormous impact on the shape of a city. TOD corridors are only possible when codes allow for mixed-use and higher densities near mass transit corridors. Many zoning codes are outdated, or have not been created in conjunction with transportation plans. For example, instead of requiring a minimum number of parking spots per apartment unit, codes may require a maximum number, and in this way, provide the right incentives to build less parking and switch from car to use public transportation use. However, designing and enforcing zoning and building codes, long-term and local plans cannot be left to only one sector. Instead, they must be crafted and implemented through an integrated planning effort to avoid undermining efforts.

Stakeholder Engagement: Inclusive TOD has, as a core value, the improvement of the quality of life of current and future residents—however, much of TOD planning and implementation relies on public and private institutions with little public participation, beyond the election of public officials. There is a need for public participation and stakeholder engagement to increase the inclusiveness of TOD and ensure that the beneficiaries’ thoughts and inputs are being considered.

Infrastructure: TOD corridors, as a pre-condition, need core mass transit infrastructure, and can be structured around Bus Rapid Transit (BRT) systems, light rail (LRT) systems, or Metro systems. They also
require supporting non-motorized transportation infrastructure to encourage the use of active transportation: biking and walking. TOD encourages densification, which in turn requires expanding/creating supporting horizontal infrastructure such as water, drainage and sanitation (unless the project area has excess capacity), as well as social infrastructure to accommodate the additional population living in the area.

**Land:** Land is often the most valuable asset a city possesses to leverage TOD. It can be used strategically, and as a tool to place the different players on the same table. Many funding and financing tools covered in this course can be used to harness land assets to generate the required resources to implement TOD. Finally, given the variety of land-ownership regimes, diverse tools and cooperation between different entities are key to assemble land for TOD corridor projects.

**Conclusion**

The objective of this Module is to present the elements, concepts and vocabulary that are required to look at TOD corridor projects as interdisciplinary strategies. Professionals coming from different sectoral spheres will better understand the perspectives and language of colleagues from other sectors and improve communication and coordination. The final goals are to open up the opportunity for multi-actor dialogue and cross-fertilization of ideas and more effective project implementation.

**Module 4: Design and urban planning components of TOD**

**Introduction**

As was discussed in Module 3, a TOD project is made up of several building blocks. However, it is not enough to simply assemble those building blocks together as they do not ensure social or economic vibrancy, characteristics which are at the core of successful TOD. Creating TOD corridors that are in high demand requires careful attention to design and urban planning. Unique local heritage, safe and inviting complete streets, mixed-use building design that engages the street, and networks of welcoming public and green spaces are just some of the design and urban planning components that must be factored in to TOD planning at a corridor level. Module 4 discusses nine design and urban planning components of TOD adapted from the World Resources Institute publication “TOD Guide for Urban Communities,” with some new components added.

**Scope**

The objective of this module is to introduce participants, particularly people without an urban design or architecture background, to a variety of design concepts that are central for successful TOD project implementation. After completing this module participants will be familiar with design and planning vocabulary commonly used in TOD projects, and will be able to utilize these concepts when designing and implementing TOD corridor projects.

Module 4 defines the following design and urban planning components and describes strategies for how they can be applied to a TOD project at the corridor and nodal level.

**Density:** Dense populations create the ridership numbers needed to sustain public transit financially, while mixed-use neighborhoods create more balanced demand that generates 2-way trips across a region. Higher concentrations of people establish the customer base needed for businesses and services to survive, and, with proper design, can encourage walking and biking, which can bring vibrancy to roads and public spaces.
Quality public transit, a cornerstone of TOD, is the provision of reliable, safe, affordable, and connected public transportation. Public transit can operate using many different forms, including rail, bus, BRT, LRT, or metro. A connected public transit network will ideally include an integrated mix of several transit technologies, with increasing multi-modal stations clustered in the urban core of city, allowing for easy transfers between modes.

Non-motorized transportation (NMT), a fundamental concept of TOD, is a term that encompasses the modes of walking and bicycling. Most mass transit trips begin and end with walking or cycling, modes that conveniently bring people to transit stations. In order to encourage NMT, safe, connected, and inviting infrastructure must be provided.

Vehicle demand management (VDM), is the application of strategies and policies to reduce or redistribute travel demand for private vehicles. Utilization of some of these concepts is also termed Transportation Demand Management, or TDM. Discouraging the use of private automobiles in the planning and design of a community gives priority to users of more sustainable means of transportation.

Mixed-use development: Well-designed mixed-use spaces can provide a diverse range of urban services for city residents that establish 24-hour districts. This can decrease the number of trips residents take by car outside of their neighborhood. The diversity of uses within sustainable urban communities makes them appealing and vibrant destinations, encourages the use of public spaces, promotes the use of non-motorized transit, and generates economic value. Specific design strategies, including the strategic location of regional facilities and neighborhood facilities, can be used to create more efficient TOD neighborhoods and bolster agglomeration economies.

Neighborhood centers and active ground floors: Creating central public spaces and buildings that engage pedestrians is a necessary component of TOD; including such features in the design of a TOD neighborhood can prevent the creation of an isolating built environment. In addition, creation of vibrant neighborhood centers can drive demand along an entire TOD corridor, improving access to amenities and bringing prosperity to residents throughout the area.

Public spaces and natural resources are important components of successful TOD, as well-planned public spaces have countless social, environmental, and economic benefits for a community’s residents. Public spaces, including green space, provide places of meeting and cultural exchange for all segments of the population, regardless of social or economic status.

Community identity and heritage: Preservation of local identity is key in defining unique places and creating a sense of belonging among residents, which are central for TOD projects. Effort should be made to recognize local assets when planning a TOD project. TOD design can serve to compliment, enhance, and reflect local cultural, heritage/historical, and environmental features.

Resilience: For a TOD project to be successful, its design must also be resilient; TOD design must take into account and plan for uncertainty and hazards. Understanding and planning for risks, while seemingly more costly and time-consuming in the short-term, can help protect communities from disasters and lessen economic and social costs during times of crisis.

Conclusion

Urban planning and design concepts are not only useful for planners and architects. TOD projects require the interaction of stakeholder from multiple public sector departments, private sector and civil society, all of whom must understand and embrace a shared vision of TOD. Users who complete Module 4 will have a deeper understanding of the need to create vibrancy along a TOD corridor.
Module 5: Investing in TOD

Introduction

Transit-oriented development has great potential to address many urban problems that cities are facing. But investing in TOD requires careful coordination between different kinds of stakeholders and over long time periods, especially at the level of corridor.

There is a wide variety of funding and financial instruments that can be used to develop transit and TOD projects. In most cases, teams in charge of developing TOD projects need to be creative and put together a package that includes multiple sources of financing, and both public and private resources. The package will take into account the available funding and financing tools that cities have (for example, if they have the capacity to take on debt or not, or if they have access to federal lines of financing or grants for TOD), the economic situation of the city (the market for a city that is growing will be different from one that is shrinking), the availability of public land in the TOD corridor area, and interest and expertise in the private sector to develop TOD projects.

Scope

Module 5 explores the key elements involved in TOD investments; the elements must come together for successful TOD investment. The key to operationalizing TOD is to find a business model that works for everyone – so that the public and private sector actors can find win-win solutions.

The TOD “business model” presented has been developed within the framework of the Financing Sustainable Cities Initiative, an initiative of the WRI Ross Center for Sustainable Cities and C40 Cities, funded by the Citi Foundation, focused on helping cities develop business models that can accelerate the implementation of sustainable urban solutions, such as TOD. It is here applied to TOD investments, but it can also apply to other kinds of urban investments.

The module begins by addressing lessons learned from case studies on financing TOD at a corridor level. Findings include difficulty in structuring manageable transaction sizes; necessity of utilizing institutional and contractual frameworks to establish productive commercial relationships and guide decision-making; importance of unlocking and capturing funding sources to pay back investments beyond public budgets to cover investment in capital infrastructure and transit services; and the need of financing by third parties due to capital-intensive and upfront investments needed.

The module defines a business model framework comprised of investment components, funding sources, delivery mechanism and financial products with each piece and its application discussed in detail.

Conclusion

The financing required for a TOD investment is, ultimately, context-specific. Stakeholders involved in a TOD investment must collaborate to determine what elements might work best for a specific project based on the instruments available in their specific context.

Though the structure of individual TOD investments varies widely, the business model framework provides a clear way in which to understand all of the elements that stakeholders must consider. This is particularly applicable for stakeholders in emerging cities, where a concrete framework for TOD finance can help to improve TOD implementation.
At the end of this module, the user will understand the elements of a business model for sustainable investments in TOD projects, including: investment components, delivery mechanisms; financial products and funding sources.

Module 6: Sequencing for implementation of TOD corridors

Introduction
TOD corridors are multifaceted and long-term endeavors that require facilitation and coordination of numerous stakeholders, plans and processes, investment and financial flows, and construction phases. Adding to the complexity is the reality that the nature of any TOD project depends greatly on local circumstances. Promoters of a TOD corridor project must utilize whatever planning process exists in their particular city, as comprehensive regional master planning should serve as the base for TOD corridor planning.

Once the corridor has been selected, implementing new transit service and cohesive TOD districts requires participation from diverse groups in the public and private sectors. Many steps, including transit infrastructure design, transit service planning, urban planning and design, land acquisition, and arranging necessary financing, must happen concurrently for timely completion the corridor. In particular, navigating the financing of a TOD corridor can be especially challenging – some cities and financial institutions may require full-fledged “cost-benefit analyses” before public funds can be expended; others may have ad-hoc financing mechanisms. As financing is often the key hurdle for implementation, the Module highlights that economic development officials and private developers must be involved up front to avoid delay. While implementing a TOD corridor is highly context-based, this Module presents a stylized sequence of implementation to make each requirement easier to understand.

Scope
Module 6 of this course focuses on practical recommendations for TOD corridor implementation, introducing sequencing steps to get the project on the ground. Having reviewed the building blocks for implementation such as institutions, financing and design, participants will now learn to take the concepts reviewed to a more practical level. The module is structured around seven logical and chronological steps: regional master planning, consultation and preparation, transit infrastructure and operational design, financing and business model, station area prioritization and TOD plans, land assembly and integration, and implementation. Each step is further broken down by a series of broad sub-steps that emphasize the variety of activities that can take place in each phase.

The sequencing presented in the module is not intended to be thought of strictly as a linear process. Instead, many of the steps/sub-steps must be revisited at different stages. For example, although we touch on monitoring and evaluation (M&E) at the end of the sequencing process, M&E should be planned for early on in the process to ensure clear targets and indicators are established, and funding for M&E is identified and secured to cover the costs associated with properly assessing performance and making necessary adjustments during and after implementation (see more on this in Module 8). The same is true for other steps of the process, especially stakeholder engagement, which in many cases are iterative and adjusted after successive renegotiations/consultations.
Conclusion

Participants who complete Module 6 will have a clear sense of the general steps, and subsequent sub-steps involved in TOD corridor level planning and implementation, including the specific groups that should be included and when key decisions require cooperation between different parties. The sequencing order defined in the module is presented as one option, but participants will learn that local context will influence the specific order. Participants will be better prepared to steward the planning and implementation process, understanding how to balance the steps within the boundaries of their city’s planning processes, financing structures, and public engagement initiatives. They will also be able to identify areas for improvement and make recommendations or take appropriate action to revise and streamline the process for TOD corridor projects.

Module 7: Housing strategies & local economic development tools for inclusive TOD

Introduction

One of the major social ramifications of ill-conceived spatial development is the burden placed on residents who cannot afford to purchase a private vehicle or are unable to live close to work and schools. Many of the poor must consequently endure long-distance commutes to make ends meet. Transit investments help increase mobility and accessibility. But at the same time, investment in public transit also increases property values near transit corridors and stations, raising housing costs and rental prices. Higher property values and gentrification continually force low-income residents farther and farther out toward the periphery of the city, further from amenities and transit service. Local governments must consider mitigation measures for the resultant shortage of affordable housing while promoting TOD investment.

Besides having access to affordable housing, the local population residing in the TOD area must have opportunities to participate in the local economy in order to reap the benefits of increased economic activity in the area. Gentrification is not only related to pushing original population out as a consequence of higher land values and rents; in addition, new economic opportunities in the area might not match the labor force qualifications of previous residents.

In order to maximize benefits to society, TOD planning should strive to be inclusive.

Scope

Module 7 explores two broad areas of concern: affordable housing and business dynamics/ local economic development. The module is divided into three sections: the first section describes strategies to address the challenges of inclusive TOD; the second presents tools to provide inclusive and affordable housing options in a TOD corridor; and the third presents strategies for local economic development that work with existing and low-income communities within TOD corridors. Through the presentation of real-life applications of strategies from cities in countries around the world, users gain a clearer understanding of how to customize these approaches for their own cities.

Conclusion

Inclusion and equity are among the most challenging issues in adopting TOD in any city in the world. These challenges are particularly compounded in cities located in developing countries, where sizeable populations cannot find affordable shelter. Though a complete solution to this problem has not yet been found, this module presents approaches for inclusion and equity that have been successful in different
contexts, equipping those who complete the module with ideas on how to apply such strategies to their local contexts.

**Module 8: Monitoring and evaluating TOD Projects**

**Introduction**

The role monitoring and evaluation (M&E) systems can play in ensuring the success of TOD projects is often overlooked, due to such factors as monetary and capacity constraints. M&E systems play a vital role in all development projects, including TOD projects: they ensure that the goals of a project are achieved, and that improvements to people’s lives are realized. M&E helps ensure the successful implementation and the materialization of the intended outcome of the project. Linking outputs – activities or efforts – with outcomes, the actual end results, are an important piece of this process.

**Scope**

Module 8, establishes a definition of monitoring and evaluation, and provides an overview of the strategies used to apply M&E to TOD projects. The module incorporates elements of M&E systems, describing the difference between project and impact evaluation. Designing and implementing M&E systems is covered. The module also notes that in the highly diverse group of stakeholders who are included in a corridor-level TOD project, each group may have differing definitions of success. Performance indicators are addressed by the qualities and benefits they measure (mobility, social, and environmental). Finally, specific measurement models for TOD implementation, such as WRI’s Safe Access Manual and ITDP’s *TOD Standard*, are discussed.

**Conclusion**

By end of this module, participants will understand the important role M&E systems play in TOD implementation, and the application of M&E systems to TOD corridor planning and implementation. The underlying goal is that participants will be motivated to include M&E systems early on in their projects, allocating dedicated resources to ensure the project’s success can be accurately measured, allowing adjustments and improvements if needed to improve outcomes.
MODULE 1: TOD AS A STRATEGY TO ACHIEVE A SUSTAINABLE CITY

Transit Oriented Development at a Corridor Scale
Course Objective

- **Transit-oriented development (TOD):** Planning and design strategy focused on compact, mixed-use, pedestrian and bicycle friendly urban development closely integrated with transit stations.

- **Objective:** Be able to have a general understanding of the central pillars of TOD planning and tools for implementation.

- The course introduces the concept of TOD at the corridor level:
  - TOD can also be a central strategy for city-wide and regional planning, and influences specific local-area planning around stations, connecting these frames together.

- **Complementary WB Courses**
  - Sustainable Urban Land Use Planning
  - Integrated Urban Transport Planning
  - Land Readjustment
  - Land Market Assessment
  - Land-based Financing
  - Flood Risk Sensitive Land Use Planning
Course Structure

Module 1: TOD as a Strategy to Achieve a Sustainable City
Module 2: TOD Corridors
Module 3: The Building Blocks of TOD
Module 4: Design & Urban Planning Components of TOD
Module 5: Investing in TOD
Module 6: Sequencing for Implementation of TOD Corridors
Module 7: Housing Strategies & Local Economic Development Tools for Inclusive TOD
Module 8: Monitoring and Evaluating TOD Projects
Module 1:
TOD as a Strategy to Achieve Sustainable Cities

Bicycle parking in Kathmandu, Nepal

Module Objective and Outline

- **Objective:** Understand the concept of TOD, its benefits and how it can help cities become more sustainable. Become aware of main barriers for implementation.

- **Outline:**
  - The context faced by cities
  - TOD definition
  - The benefits of TOD
  - The history of TOD
  - Scales of TOD
  - Lessons from the field
  - Barriers to implementation
The Context: Urban Sprawl

The Context: Unsustainable Urban Growth

Ghost towns in China

Photo by: Kai M. Caemmerer http://kaimichael.com/
[copyright provided]
The Context: Rapid Motorization

![Graph showing actual and projected number of motorized vehicles in the world, 1975–2050.](image)

*Source: Fulton and Cazzola 2008.*

The Context: Energy Consumption and Density

The Context: Energy Consumption and Density

Whitby, Toronto: Sprawling suburb
13.0 tCO2e per capita

Etobicoke, Toronto
Single family homes near city center
6.6 tCO2e per capita

East York, Toronto
Dense inner-city neighborhood
1.3 tCO2e per capita

tCO2e = tonnes of carbon dioxide equivalent-
a standard unit for measuring a carbon footprint

The Context: Additional Costs of Urban Sprawl

- **Lost Time**
- **Increased Infrastructure Costs**
- **Poor Health**
- **Loss of Public Space**
The Context: High Cost of Sprawl

Suburban
City's Annual Cost, per Household

- Parks & Recreation $129
- Fire Department $406
- Transportation $171
- Culture / Economy $36
- Sidewalks & Curbs $194
- Roads $380
- Transfers to Provinces eg. School Boards $435
- Storm & Waste Water $613
- Water $197
- Total: $3462

Urban
City's Annual Cost, per Household

- Parks & Recreation $69
- Fire Department $177
- Transportation $91
- Culture / Economy $19
- Sidewalks & Curbs $27
- Roads $36
- Transfers to Provinces eg. School Boards $332
- Storm & Waste Water $147
- Water $42
- Total: $1416

For more data and more reports, visit thecostofsprawl.com.
Data based on Halifax Regional Municipality.
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Sprawl’s Harm on the Urban Poor

Urban Sprawl and automobile-dependency have a number of adverse effects on the urban poor:

- Sprawling cities remain largely inaccessible to the urban poor
- Urban poor are generally concentrated on periphery of city, often in informal settlements
- Difficult to access public services and economic opportunities located in city center

What is TOD?

TOD is a planning and design strategy used to achieve well-designed, high-density, mixed-use, mixed-income, pedestrian and bike-friendly urban development, organized around mass transit stations.
Key Elements of TOD

- Access to opportunities
- Mixed-use development
- Mixed-income development
- Access to mass transit
- High-density development
- Walkability and bikeability
The Case for TOD: Sustainable City
TOD and City-wide Accessibility

London

- 9% of population >2km
- 16% population 1-2km
- 32% population 0.5-1km

43% population within 500m

New York

- 18% 29% 31% 22%
- 28% 24% 23%
- 25%

Hong Kong Residents

Hong Kong Jobs

- 5% of jobs >2km
- 12% of jobs 1-2km
- 27% of jobs 0.5-1km

57% of jobs within 500m

New York

London

Image Source: LSE Cities.
Like many cities in Europe, the city center of Florence, Italy, is dense and walkable.
City Development Always Limited by Range of Accessible Areas

- As transport technologies evolved, the amount of ground that could be covered in a day was increased.
- Cities – their labor markets and commercial influence – grew with trains and then private cars.
- In the 20th century, auto-centric infrastructure increased average speeds and cities spread out.
  - In addition, buildings separated from each other to make room for car storage - parking.
A diagram of Peter Calthorpe’s vision for TOD
TOD in Tokyo Metropolitan Area

- Mega-Cities in Japan = Chains of Walkable Cells connected by Railways

- A network of 800m radius walk-able areas from each railway station in Tokyo Metropolitan Area

Source: Hidetoshi Ohno, Tokyo 2050 fibertcity, 2006, the University of Tokyo
TOD in Developing Countries: Curitiba's BRT Corridor Development
Scales of TOD: Regional/City Level

Boston, Massachusetts' Fairmount Indigo Railway Corridor

Scales of TOD: Corridor Level

Boston, Massachusetts’ planned Fairmount Indigo Railway Corridor

**Median Household Income**

in the past 12 months, by census tract

- $100,000.01 - $218,419.00
- $50,684.01 - $100,000.00
- $35,001.01 - $50,684.00
- $22,314.01 - $35,000.00
- $12,413.00 - $22,314.00 (poverty threshold*)

(*Weighted average poverty threshold for a family of four in 2010.
2010 American Community Survey, 5-year estimates)

http://www.bostonplans.org/attachment/56f84e68-d08f-9b66-71c0-02244f711ea4)
Scales of TOD: Station Area Level

The station area around a bus rapid transit stop in Bogotá, Colombia

TOD Implementation Project Cycle

Image Source: WRI.
Barriers to TOD Implementation

- **Lack of integrated and coordinated planning:** Departments at national, regional, and local level must coordinate to ensure successful TOD
- **Lack of supportive TOD policies and regulatory framework:** Policies and regulations must encourage TOD- in particular, high-density development must be allowed
- **Lack of funding:** Land value capture schemes and BRT systems can make TOD more affordable

TOD: Lessons from the Field

Political economy

• Political leadership and vision for the city
• Appropriate institutional structures
• Community participation
• Intergovernmental and metropolitan collaboration
TOD: Lessons from the Field

Planning and Regulation

• Holistic and integrated approach
• Supportive regulatory environment

Finance

• Leverage capital
• Use a combination of financing options
• Use public sector investment to encourage private sector investment
• Stakeholders must have shared vision
TOD: Lessons from the Field

Implementation

*TOD takes time and accordingly:*

• Create democratic, transparent, and fair processes
• Create new spatial identities through placemaking strategies to create vibrant communities
• Allow for adjustments over long-term market cycles
• Limited transit network diminishes TOD appeal
• Limit gentrification through increased access to low-income housing
1. **Which one of the following statements about Transit-Oriented Development (TOD) is true?**
   a. TOD encourages visionary urban design, mass transit, walking and cycling.
   b. TOD aims to create an urban road system that is friendly to private vehicles.
   c. Private vehicles fueled by clean energy are encouraged by TOD because they are environmentally friendly.
   d. Social equity is not a consideration of TOD.

2. **Which one of the following choices is NOT an element of TOD?**
   a. Walkable access to public transport
   b. Fast and convenient networks of highways
   c. Compact and mixed use of land
   d. Mixed-income neighborhoods
   e. Easy access to public transport and economic opportunities

3. **Which of the following choices is NOT an obstacle to the implementation of TOD?**
   a. Lack of integration and coordination in planning and implementation
   b. Lack of supportive policies
   c. Lack of funding
   d. Lack of innovative designs
Module Quiz

4. Which was NOT a key lesson of TOD implementation? 7
   a. Create democratic, transparent, and fair processes
   b. Maintain spatial identities by limiting low-income housing
   c. Limited transit network diminishes TOD appeal
   d. Allow for adjustments over long-term market cycles

5. Which of the following aspects is NOT included in a TOD community?
   a. Commercial and residential development
   b. High-quality public transit
   c. Safe pedestrian and biking corridors
   d. Special lanes dedicated to accelerate travel by private automobiles
MODULE 2: TOD CORRIDORS

Transit Oriented Development at a Corridor Scale
Module Outline and Objectives

Objective: After completing this module, participants will be able to recognize different types of corridors. Examples of TOD corridors and lessons from the field will also be examined.

Outline

1. TOD corridor definition
2. Types of Corridors
3. Objectives for TOD at the Corridor level
4. Taste of TOD: examples from around the world
Defining Transit Corridors

- **Transit corridor**: the areas influenced by a transit line, particularly the catchment areas of riders, around all of the stations and along a transit line.
  - The areas well connected with a transit station by feeder bus services can also be considered as a transit corridor.

- The transit technology used and the quality of connection to stations by bus, biking and walking determines a transit corridor’s area of influence

- Potential for TOD depends on such factors as:
  - High-quality transit service
  - Fixed location of transit corridors

The planned Fairmount Indigo transit corridor in Boston, Massachusetts, USA


What makes a corridor successful?

- TOD corridors serve as the backbone of the city, shaping its network and spatial structure
- Promote communities’ long-term goals
- Offer a variety of land uses
- Provide community destinations
- Connect centers of significant travel demand
- Incorporate community input

The city of Ahmedabad, India’s BRT system

TOD Corridor Planning: Integrating Regional and Local Contexts

• Broadens perspective on both regional needs and local needs
• Clarifies corridor type and function within the regional network
• Prioritizes high-potential stations for development and investment
• Enhances understanding of the roles of different station areas along a corridor

TOD Corridor Planning: Creating Momentum for TOD Implementation

• TOD corridor planning can attract the attention of the community, public agencies, and the private sector such as developers

• Input from the community and the private sector can lead to better decision-making

TOD Corridor Planning

- Strategic phasing of development around stations
- Implement changes along entire TOD corridor than in a single station area
- Complementary planning of amenities, density, and land use between station areas

A station area in Hangzhou, China

Types of Urban Corridors

- Destination connector
- Commuter corridor
- District circulator
Type 1: Destination Connector

• Destination connectors link residential neighborhoods to multiple activity centers

• Encourage ridership in both directions throughout the day because they link employment centers and other destinations

• Implications for TOD: creation of TOD in destination station areas and throughout corridor

Type 2: Commuter Corridor

• Serves one major activity center, typically a central business district (CBD)

• Heavy rail transit technology is often used for commuter corridors

• Transit service along commuter corridors is typically high-frequency during peak commuting hours, low-frequency off-peak commuting hours or the weekend.

• Implications for TOD:
  • new development along corridor tends to be residential; must create plan to increase mixed land use
  • Parking may need to be provided at outlying stations

Type 3: District Circulator

- District circulators connect areas within an “activity node”: typically connecting a downtown or a commercial, medical, or educational center

- Circulators increase the walkability of these districts, making it easier to access amenities without a car

Objectives for TOD at the Corridor Level

**ECONOMIC**
- Guide urban growth and new real estate development
- Spur economic growth through accessible and agglomerated jobs
- Support local economic development and revitalization

**SOCIAL**
- Enhance equity along the corridor
- Increase accessibility and mobility for low-income households living along the corridor
- Reduce corridor road accidents

**ENVIRONMENTAL**
- Reduce energy consumption and GHG emissions
- Reduce air pollution
- Preserve green space
Economic Objective: Guide Urban Growth and New Real Estate Development

Strategies

- Transit corridors can influence urban growth and the real estate market by:
  - Activating markets around stations
  - Attracting new market activity around other station areas along a corridor
  - Channeling growth in areas well connected by transit

Density along Curitiba, Brazil’s BRT transit corridors
Buildings in Curitiba, represented in bright yellow and orange, are strategically built along the BRT corridors.

Image Source IPPUC 2009
Economic Objective: Spur Economic Growth

**Strategies**

- Identify and map key regional destinations along the corridor and help to connect them
- Align new transit corridors with existing travel behavior
- Increase density when appropriate
- Create conditions for job creation, knowledge and business clusters


Economic Objectives: Support Local Economic Development and Revitalization

**Strategies**

- Local hire requirements
- Incentives to attract businesses to corridor
- Business Improvement Districts or Tax Increment Financing districts
- Strategies to support local merchants and small businesses
- Strategies to preserve access to local businesses during and after construction


A business improvement district (BID) in Glasgow, Scotland closed off for pedestrian access
Social Objective: Enhance Equity and Increase Accessibility and Mobility Along the Corridor

Strategies

• Creation of transit corridors have many benefits and consequences for neighborhoods
  • Connect low-income populations to employment and public services
  • Displacement of low-income populations

• Steps must be taken to ensure that a transit corridor is inclusive
  • Preservation and development of new affordable housing
  • Ensure that transit corridors are accessible to all residents

Public housing under construction in Singapore

Environment Objective: More Sustainable and Compact Cities

• TOD and transit corridors can help reduce GHG emissions by decreasing automobile dependency

• Compact development and the creation of reliable transit corridors can help reduce automobile usage

• By increasing walking and biking and preserving green space, compact development helps reduce air pollution and airborne diseases

The metro system in downtown Chicago, Illinois


Taste of TOD: a Plan for Surabaya, Indonesia

Taste of TOD: Singapore

Taste of TOD: Arlington, U.S.A.

A metro station in Arlington, Virginia

Image Source: Cervero and others, 2014
Taste of TOD: Johannesburg, South Africa

Module Quiz

1. What determines a transit corridor’s area of influence?
   a. Regulations and zoning codes
   b. Placemaking strategies
   c. Last mile connectivity
   d. Transit technology

2. Which of the following is an important reason to plan TOD at the corridor-level?
   a. TOD planning at the corridor-level is more efficient because it allows for the elimination of multiple stakeholders from the TOD planning process.
   b. TOD planning at the corridor-level allows planners to integrate local and regional contexts by enabling them to envision how stations along the corridor will form connections.
   c. TOD planning at the corridor-level guarantees private sector investment.
   d. TOD planning at the corridor-level ensures that private developers will create mixed-income housing.

3. As discussed in this module, in which city was the constellation plan used to implement TOD corridors?
   a. Johannesburg, South Africa
   b. Singapore
   c. Portland, Oregon
   d. Surabaya, Indonesia
Module Quiz

4. City officials in Buenos Aires, Argentina, hope to redevelop an economic district in the city center. Which of the following strategies can they use for economic revitalization? Select all that apply.
   a. Placemaking Strategies
   b. Creation of a Business Improvement District
   c. Improved access to transit
   d. All of the above

5. Which is a characteristic of Destination Connectors?
   a. Link residential neighborhoods to multiple activity centers
   b. Serve only one major activity center with moderate to high-frequency peak hours
   c. Facilitate movement within activity nodes extending district walkability
   d. Connect neighboring activity nodes
MODULE 3: THE BUILDING BLOCKS FOR TOD

A Corridor Level Transit-Oriented Development Course
Module Structure and Objective

Covered in other modules:
- **Design**: Module 4
- **Financing**: Module 5
- **Affordable Housing**: Module 7

**Objective**: This module will present the elements, concepts, and terms used in the interdisciplinary planning and implementation of TOD corridor projects.

Image Source: WRI with WB adjustments
Leadership and Vision: Building Support for TOD

Political leadership involves:

• Developing a strong project vision
• Managing the tension between short-term and long-term horizons
• Creating democratic, transparent, and fair processes
• Promoting the project’s vision
• Setting priorities and allocating scarce resources
• Galvanizing coalitions and PPPs
• Leveraging capital
• Managing succession and legacy for intertemporal consistency
Case Study: Singapore

• **Constellation Plan:** long-term TOD plan for urban growth
• **Urban Redevelopment Authority:** municipal urban planning agency
• **Land Transport Authority:** municipal transport planning agency

Institutional Structure

Typical responsibilities of a TOD project implementing agency:

• Resolve conflict of interest between different stakeholders
• Maintain and update the vision for the area
• Address changes in the environment/market conditions by adjusting the project
• Create a vertical and horizontal coordination structure that shares risks and benefits between all stakeholders over time
Municipal Government Structure example

City Council
- Audit
- Civic Appointments
- Board of Health
- Striking

Executive Committee
- Budget
- Employee & Labour Relations
- Affordable Housing

Standing Policy Committees
- Community Development & Recreation
- Planning & Growth Management
- Economic Development
- Parks & Environment
- Public Works & Infrastructure
- Licensing & Standards
- Government Management

These Committees report to City Council and the Chairs sit on the Executive Committee.

Community Councils
- Etobicoke York
- North York
- Scarborough
- Toronto & East York

These Committees report to City Council for some matters and have decision-making authority for some matters.

Source: http://www1.toronto.ca/wps/portal/contentonly?vgnextoid=762b6804e1f22410VgnVCM10000071d60f89RCRD
Possible Structures of TOD Implementation Agencies

- Private-Public Partnerships
- Development/Transport Corporations
- Steering Committee/Advisory Board
- Single Public Transit Authority
- Town Planning and Urban Design Department
Modes for Intervention Depending on Land Ownership

100% Public Land Ownership

Public: Land ownership, infrastructure financing
Private: financing, planning and construction of real estate project

Public sector: Land ownership, infrastructure financing, planning and construction of real estate project, project management

100% Private Land Ownership

Public: Land use regulation
Private: Owner, developer, financier and operator of project

Public: Land ownership
Private: Infrastructure financing, planning and construction of real estate project, project management
Case Study: Copenhagen, Denmark

- **Finger Plan**: Long-term planning framework that emphasizes TOD principles for urban growth and transit

- Planning for Copenhagen and surrounding municipalities has been responsibility of different regional planning agencies

- Since 2007, urban planning of Greater Copenhagen is the responsibility of Denmark’s Minister for the Environment

The Greater Copenhagen Area: beige areas indicate urban growth, illustrating the Finger Plan

Regulatory, Planning, and Zoning Tools

• Planning processes:
  • Master planning
  • Integrated transportation and land use planning

• Regulatory instruments:
  • Zoning and land use planning
  • Building codes
  • Design standards

Land Use and Transport Integration: Barriers

- Lack of regional coordination
- Sector silo behavior and practices
- Inadequate policies and regulations for strategically creating adequate densities for TOD
- Restrictive national regulations and administrative constraints
- Inconsistencies in planning
- Inadequate policies, regulations, and supporting mechanisms for redeveloping built-up areas, particularly brownfields or distressed and blighted districts
- Neglected urban design at the neighborhood and street level
- Financial constraints

Here is a land-use vision, conveying a sense of where population, jobs, and other key elements of urban structure will be in 20 years.

Thank you! Here is a sketch of a frequent transit network, including both rapid and local elements, which will serve that land use pattern.

This network creates certain opportunities for land use, and also has inefficiencies that you can eliminate by adjusting the land use. Here are some stations that need to be provided for.

The conversation gets updated continually in this way.

Thanks! Given that, here is a revised land-use plan that would take better advantage of your draft frequent transit network, perhaps by putting more density around the stops.

Notice in our network these new opportunities, challenges, and needs.

Also, a couple of years have passed, so here is an updated plan to take us 20 years into the future.

Land Use and Zoning Tools to Promote TOD

- **Parcel Size**: increase the diversity of land parcel sizes to create a vibrant land market
- **Density Bonus**: increased density in exchange for funds or in-kind support for policy goals
- **Up-zoning**: re-zoning to allow for higher value development (industrial to residential, or increased floor-area-ratio/FAR)
- **Transferable Development Rights**: sale of excess density rights by public authority or sale of unused density rights by private landowners, as a financing tool
Land Use and Building Regulations that Affect TOD Performance

- Plot size
- Types of land use
- Vertical mixed-use
- Parking requirements
- Density limits: (FAR)
- Construction standards

### Density ranges by type of station area

<table>
<thead>
<tr>
<th>Station type</th>
<th>Floor area ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban Core</td>
<td>8 – 30</td>
</tr>
<tr>
<td>Town center</td>
<td>3 – 10</td>
</tr>
<tr>
<td>Neighborhood</td>
<td>1.5 – 5</td>
</tr>
<tr>
<td>Arterial corridor</td>
<td>1 - 6</td>
</tr>
</tbody>
</table>

Source: MARTA TOD guidelines
Case Study: Washington, DC

- Served by the Metro, which offers both bus and rail service
- When railway service was first constructed in the 1970s, planners in Arlington County prepared for impact by creating strategies to encourage TOD
- Washington Metropolitan Area Transit Authority (WMATA)
  - Funded by rider fares, advertising, municipal funding, federal grants
  - Real estate department purchases land on open market as part of land value capture scheme

**Participatory Planning:** Participatory planning mechanisms offer opportunities open to citizens to have a role in the governing and decision making processes in their neighborhood, their city and beyond.

- Community participation in project planning is fundamental for success and sustainability
- Community participation integrates local knowledge and desires into the planning process
- Ground rules and targets must be set for community participation to ensure it informs the plan
Tools for Stakeholder Engagement

- **Charrettes**: Participatory planning process that assembles interdisciplinary team to create design and implementation plans for a project. Design-focused brainstorming between different combinations of stakeholders.

- **Technology and social media**: Social accountability tools (blogs, online forums, etc.) are platforms for citizen review and input. Offer barrier-free, real-time participation opportunities.

A woman uses cellphones during a community meeting in India

Case Study: Ho Chi Minh, Vietnam

- Proposed **BRT system** with accompanying residential, commercial, and greenway development
- City’s planning and transit departments hosted **charrette** in July 2011
- **Intensive planning workshop** with goal of creating concept design for BRT system and TOD initiatives

Proposed BRT corridors in Ho Chi Minh City

# Design Elements of TOD at Various Scales

<table>
<thead>
<tr>
<th>COMPONENTS</th>
<th>SCALES</th>
<th>CITY</th>
<th>INTER-NEIGHBORHOOD</th>
<th>NEIGHBORHOOD</th>
<th>STREET</th>
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<tbody>
<tr>
<td><strong>QUALITY PUBLIC TRANSPORT</strong></td>
<td>CITY</td>
<td>Proximity to urban centers</td>
<td>Financial viability of public transit</td>
<td>Access to public transit</td>
<td>Public transit infrastructure</td>
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<tr>
<td><strong>NON-MOTORIZED MOBILITY</strong></td>
<td>INTER-NEIGHBORHOOD</td>
<td>Continuous street network</td>
<td>Pedestrian and cycling networks</td>
<td>Internal connectivity</td>
<td>Sidewalks and bike paths</td>
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<tr>
<td><strong>VEHICLE DEMAND MANAGEMENT</strong></td>
<td>NEIGHBORHOOD</td>
<td>Optimization of daily commutes</td>
<td>Safe and orderly roads</td>
<td>Parking management</td>
<td>Road safety for all users</td>
</tr>
<tr>
<td><strong>MIXED-USE AND EFFICIENT BUILDINGS</strong></td>
<td>STREET</td>
<td>Regional facilities</td>
<td>Public amenities and marketplaces</td>
<td>Efficient buildings</td>
<td>Live streets</td>
</tr>
</tbody>
</table>
### Design Elements of TOD at Various Scales

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<tr>
<td><strong>Neighborhood Centers and Active Ground Floors</strong></td>
<td><strong>CITY</strong></td>
<td>Local economy</td>
<td>Neighborhood centers</td>
<td>Active ground floors</td>
<td>Public-private transition</td>
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<tr>
<td><strong>Public Spaces and Natural Resources</strong></td>
<td><strong>CITY</strong></td>
<td>Green area networks</td>
<td>Energy, water and waste efficiency</td>
<td>Green and public space networks</td>
<td>Public life</td>
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<tr>
<td><strong>Community Involvement and Identity</strong></td>
<td><strong>CITY</strong></td>
<td>Inclusive stakeholder engagement</td>
<td>Place identity</td>
<td>Community management</td>
<td>Sharing the street</td>
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<td><strong>INTER-NEIGHBORHOOD</strong></td>
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Supporting Infrastructure

• **Key Pre-requisite: High-capacity rapid transit**

• **Horizontal infrastructure to consider:**
  • Connecting mass transit
  • Complete streets
  • Non-motorized transportation amenities
  • Non-transport related supporting infrastructure
    • Water, sewage and storm water systems
    • Solid waste management
    • Green infrastructure

• **Additional social services: health, educational, day care facilities**
Walking Facilities

• The quality of sidewalks greatly determine if mass transit systems will be used and the vitality of the TOD neighborhoods and corridors

• **Common pedestrian challenges in developing countries:**
  • Complete lack or poor quality of pedestrian pavements
  • No physical separation from high-speed traffic
  • Extreme levels of noise and air pollution
  • Unsafe intersections and crossings
  • Obstructed pavements and lack of lighting

• Lack of direct routes between their homes and public transport stations can encourage people to drive cars and motorcycles.

• Good quality pedestrian sidewalks (pavements) are a **necessary** requirement for TOD neighborhoods
The public realm is a network of collective spaces that physically frame the community and generate the vibrancy, visual interest, and ease of access that make TOD work.

Transit-oriented development is pedestrian-oriented development, especially within the 800 meter radius that most people walk as part of a daily commute.
Parking

- TOD needs less parking than development in non-transit settings
- Where needed, park-and-ride for transit commuters should be located and managed in a way that is supportive of TOD
- Parking can and should be shared to the greatest degree practicable
- Parking should be located and designed so as to reinforce the transit, pedestrian, and bicycle-friendly nature of TOD

Case Study: Curitiba, Brazil

- Curitiba became known worldwide because of its bus rapid transportation (BRT) systems, the first in the world.
- Since 1960s, Curitiba has had ‘transit first’ policies that promote TOD along BRT corridors.

An illustration of Curitiba’s trinary pattern of development, in which high-density development is required to occur along BRT routes

Financing TOD [More in Module 5]

• TOD projects require financing for a variety of pieces to work and be successful.
• There is a wide variety of financial instruments, mechanisms, and products that can be used to develop TOD projects.
• Financing packages usually include multiple sources of financing and funding mechanisms or products, with both public and private resources.
• TOD projects need to analyze risk structures, assign risks and responsibilities to the public and private sector, and determine returns for investments.
• The general political and economic environment of the region also establishes conditioning factors for project implementation and success.
Land: The Foundational Building Block for TOD

• Land is often the most valuable asset a city possesses to leverage TOD

• Many funding and financing tools covered in this course can be used to harness land assets

• Given the variety of land-ownership regimes, diverse tools and cooperation between entities is key to assemble land for TOD Corridor projects
Land Related Tools

**Tools for Land Assembly**

**Voluntary**
- Tool 1: Land Readjustment
- Tool 2: Urban Redevelopment
- Tool 3: Land Sharing

**Involuntary**
- Tool 1: Eminent Domain
- Tool 2: The Right of Preemption

Land Tools: Voluntary

- **Land readjustment**: Pooling of multiple land plots, designation of public space, and return of smaller land plots with higher value to owners

- **Urban redevelopment**: Similar to land readjustment with up-zoning of existing urban area

- **Land sharing**: Land occupied by squatters is densified to accommodate original residents in vertical developments as well as market-uses for remaining land

Land Readjustment Concept

Urban Redevelopment Scheme

Single-use maximum FAR: 2.0

Zoning change

Mixed-use maximum FAR: 6.0

"Fragmented" owners

"Consolidated" owners

Public facilities

New owner X

Metro (proposal)

Land Tools: Involuntary

• **Expropriation**: The right of the government to acquire private land for public benefit with just compensation

• **The Right of Preemption**: The right of the government to acquire private land put up for sale within a given timeframe for a negotiated price

Affordable Housing [More in Module 7]

• TOD projects increase property values near transit station areas and transit corridors
• Higher property values, gentrification, and displacement might force low-income residents farther and farther out toward the periphery of the city
• TOD corridors should aim to be inclusive
Case Study: Bogota, Colombia

- High-quality BRT System: TransMilenio
- Social housing program: Metrovivienda