

Financing Transportation Infrastructure through Land Value Capture

Concepts, Tools and Case studies



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With tightening public finances, land value capture (LVC) can be an attractive fiscal tool to finance ever-increasing demands for transport infrastructure. This paper begins by discussing the principles of LVC and individual LVC instruments in the context of infrastructure provision, with a focus on the opportunities and challenges for LVC implementation. It then presents unique case studies of LVC use in France, Japan, Korea and the United Kingdom, highlighting how it was used to fund the construction of major subways and railways. Based on these case studies, the paper discusses some key insights, including how to use LVC together with expropriation, enacting enabling legal frameworks, and diversifying revenue streams. It also highlights some common considerations for successful implementation, most notably for eliciting public support, promoting transit-oriented development, and establishing fair and transparent rules for LVC.

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Executive summary

Land readjustment and expropriation together with effective enabling legal frameworks can successfully fund the development of transportation systems and their surrounding areas

Land expropriation and readjustment techniques are a proven method to fund infrastructure development, with Korea and Japan using them successfully since at least the 1960s. The experience of Korea highlights the importance of flexible approaches for land acquisition based on the cost of land and local circumstances, as well as the potential and benefits of using a combination of expropriation and readjustment schemes within the same project area. The case of Japan underscores the importance of negotiation and consensus building in the land acquisition process to avoid controversial social tensions and drawn-out lawsuits. Specific legal frameworks to encourage the effective development of areas around railway and subway stations exist in Korea and Japan. The *Station Areas Act* in Korea and the *Housing-Railway Integration Law* in Japan both provide specific procedures for the development of railways and their surrounding areas, while also containing provisions for more streamlined administrative processes as well as less burdensome land use regulations under certain circumstances.

- Flexible approaches to land acquisition that utilise both expropriation and readjustment methods where appropriate, rather than approaches utilising expropriation alone, can be beneficial in reducing costs, easing administrative processes, and building citizen consensus.
- Specific legal frameworks that outline development procedures for areas near railways can also reduce potential confusion as legalities regarding development are clearly laid out. Furthermore, streamlined administrative processes and land use regulations in these laws can help ease the administrative and fiscal burden for local governments and make projects overall more feasible to implement.

A balanced and effective framework for expropriation is essential for large infrastructure projects in urban areas

The case study of France showcased in this paper shows how a clear and accommodating legal framework for expropriation, together with general public acceptance of expropriations allowed for land to be acquired in a timely and efficient manner for the construction of the Grand Paris Express. In addition, the experience of France highlights how land value increments from infrastructure developments can be captured during expropriations, by setting the reference date for valuation to be prior to the publication of the planned project.

- To endorse public acceptance, legal frameworks for expropriation should be as clear as possible, detailing specific procedures, criteria, and valuation rules
- Balancing the scope of authority granted to governments with public acceptance and consensus is key to a streamlined land acquisition process that is also better accepted by property owners.
- Land increments can be captured through expropriations by valuing the land based on pre-development prices.

Using a variety of land value capture instruments diversifies revenue streams and reduces risk

The development of Crossrail in the United Kingdom highlights the importance of diversified revenue streams. The funding for Crossrail comes from a variety of sources, ranging from direct funding from the Department of Transport to various betterment levies, property taxes, and developer contributions, among others. In particular, betterment fees such as the Business Rate Supplement and Mayoral Community Infrastructure Levy (while not land value capture instruments in a strict sense) are aimed at generating roughly one-quarter of the total project costs. In addition, the project utilises other value capture instruments such as developer exactions that enter developers into legally binding agreements with authorities as a condition to being granted development permission, and joint developments between the private and public sector for the development of properties above and around stations.

- Using a variety of instruments to fund infrastructure projects allow for diversification of the revenue base, which reduces risks for public authorities.
- When using multiple instruments, it is important to avoid double-taxation by implementing legal frameworks that provided for various exemptions and offsets against other contributions.

Common considerations for successful implementation of land value capture

Eliciting public support is key

Land value increments are captured more successfully when land owners acknowledge that the benefits gained from a proposed public intervention outweigh the costs paid. Thus, value capture tools are more likely to succeed when the public is provided with as many opportunities as possible for dialogue and information sharing. This is especially the case in the land acquisition phase, where it is especially important to balance private property rights with public interests. Projects often become unfeasible when only property rights prevail, while they are often delayed or cancelled altogether due to citizen unrest when only public interests are considered.

Enable intensive transit-oriented development around stations

Flexible regulations for station area developments give developers leeway to implement more complex and integrated approaches such as mixed-use developments. Increased Floor-Area-Ratios and Building-to-Land-Ratios in and around station areas encourage Transit-Oriented-Development and improve the financial feasibility of development projects by encouraging densification of station areas. Densification also results in environmental benefits and more sustainable settlement patterns. Such flexible regulations also increase potential revenues for the infrastructure itself by attracting more people and increasing user fees. Importantly, sufficient value increments should be captured from developers, which in turn could be used to improve local services and the built-environment in the development area.

Utilise multiple funding sources and value capture techniques

No single value capture instrument can capture the entire (or even a large share) of the land value increment. Diversifying across several instruments helps to increase the share of the increment that is recouped. Furthermore, diversifying the funding base to include non-value capture instruments is also helpful. For example, strategic utilisation of property taxes to fund infrastructure development (as in the case of Crossrail) can help to diversify portfolios while also providing a steady stream of revenues.

Establish fair and transparent rules for land value capture

Establishing clear and fair rules for potentially contentious issues such as sharing of the costs, benefits, and risks is a prerequisite for the long-term commitment of both public and private entities to successfully deliver on projects. For example, Hong Kong offers three options for benefit sharing to private developers that are arranged on a case by case basis: assets in kind, up-front payments, or profits in agreed proportions. In the case of Korea, many transport infrastructure projects are initiated through a public-private partnership where local governments and public corporations partner with land owner cooperatives, which aids in establishing fair and transparent rules, as both parties are part of the implementing entity.

Assessment and recommendations

With tightening public finances, land value capture is an attractive fiscal tool to finance ever-increasing demands for transport infrastructure

Governments are finding it increasingly difficult to meet growing infrastructure needs. The latest available data suggests a shortage in infrastructure spending equivalent to 1% of GDP in OECD countries from 2007 to 2012, likely having resulted in forgone growth and productivity gains. The world will need to spend \$3.2 trillion annually in real terms to keep up with infrastructure needs. The need for adequate and efficient public transport infrastructure is particularly pronounced due to increasing built-up land per capita and urban sprawl, together with a general trend towards urbanisation. Whilst there remains some uncertainty around long-term trends of investment in public transport in the wake of the COVID-19 pandemic, the likelihood is that the impacts will dissipate in the short-term as confidence returns, not least to support the reduction of greenhouse gas emissions, and to benefit from compact development near transit corridors.

Land value capture is a favourable way for governments to source revenues as it taps into the “windfall gains” acquired by property owners as a result of decisions initiated by the public sector. The variety of different land value capture mechanisms makes the tool versatile enough to be applied to various institutional frameworks. Nonetheless, this versatility also implies complexity, which underscores the importance of documenting global experiences and transferring policy knowledge to support the successful implementation of land value capture across the globe.

Assessment of case studies

Land readjustment and expropriation together with effective enabling legal frameworks can successfully fund the development of rail systems and their surrounding areas

Legal frameworks auxiliary to general planning legislation can be used to promote the systematic development of station areas in the vicinity of railways and urban subways. When combined with relaxed density restrictions, this can result in reduced land usage per capita and sustainable development patterns. Importantly, value increments need to be captured from developers to provide for infrastructure and services in the development area that meets the increased demand due to increased density.

In the case of Korea, the *Station Areas Act* was created in 2010. Here, the main benefit of being designated a station development area is that developers have access to a streamlined administrative process of approval, along with eased restrictions on land use regulations such as Floor Area Ratios or Building-to-Land Ratios (up to 1.5 times the legal amount) for the sake of high-density development. Japan also benefited from such a legal framework, with the *Special Urban Rail Development Promotion Special Measure Act* (hereafter the *Housing-Railway Integration Law*) enacted in 1989 providing details regarding legal and administrative procedures for the coherent development of railways and their surrounding areas. Before it existed, development along new railway lines normally occurred after the construction of the line had been completed. As such, uncoordinated real estate development after railway construction tended to result in the disorderly development of areas near rail systems. Under the *Housing-Railway Integration*

Law, municipal and prefectural governments as well as authorised public housing agencies can designate development zones where land readjustment can be used for railway station development. The governments and/or agencies responsible for readjustment are also given authority to assemble and consolidate readjusted land for the development of new housing units and to secure right-of-way for railways. Parts of the assembled land are then transferred to the railway construction agency.

Flexibility in land acquisition techniques acts to reduce land costs and increase project feasibility, while also streamlining administrative processes. This also gives landowners a choice between different approaches, reducing potential disputes. Korea's approach of allowing expropriation, readjustment, or a mix of the two approaches in developing infrastructure is informative. In the case of expropriation, compensation is decided in reference to officially assessed land prices determined by the government, which are calculated based on standard tables of land prices. As such, expropriation in Korea can be considered a strong form of land value capture, as none of the windfall gains attributable to development are reimbursed to land owners. In the case of readjustment, the land value capture component is also strong, as a large portion of the original land plot (up to 70% in some cases) is allocated towards both infrastructure as well as to subplots designated for sale to recover development costs. In general, expropriation methods have been shown to work best for relatively cheap land plots, while readjustment works best for more expensive properties.

- Enabling legal frameworks make it possible to streamline the process of development near rail systems while also clearly laying out procedures and legalities so that development timeframes and administrative burdens are minimised. Importantly, including in law provisions to ease land use regulations helps local governments acquire funds and makes projects overall more feasible to plan, while also promoting efficient land use through densification.
- Utilising flexible approaches to land acquisition based on prices and local factors may be a viable solution to develop infrastructure in urban areas where land prices vary substantially and many buildings already exist. This also benefits land owners as they can choose to receive compensation (for expropriation) or keep their land and return upon project completion (for readjustment).
- Nonetheless, care must be taken to steer development in a coherent manner, as expropriation and readjustment entail different limitations as to how areas can be developed.
- In addition, utilising other land value capture techniques such as betterment levies or development rights sale in addition to expropriation and readjustment can diversify the revenue base of development projects, resulting in greater profits and lower risks.

A balanced and effective framework for expropriation is essential for large infrastructure projects in urban areas

Expropriations are an important instrument for infrastructure development and urban development, especially when the development area is large and complex. The example of France highlights how a balanced and effective framework for expropriation aided in the land acquisition phase of the development of the Grand Paris Express, a set of rail lines that is under construction in the Paris metropolitan area that span 200km, including 68 new stations and 7 technical centres. In France, the administrative and judicial process for expropriation is clearly defined and offers public authorities significant scope for expropriations. For the construction of the Grand Paris Express, expropriations have been a crucial tool. For the western and southern half of the project alone, an estimated 3300 properties are potentially subject to expropriations. It is unlikely that a project of this magnitude could be realised if authorities could not resort to expropriation to acquire the necessary land.

Nonetheless, expropriations are also facilitated by public acceptance of expropriations as a necessary policy instrument. This is crucial in developing public infrastructure, as without it, widespread citizen unrest often leads to protests and project delays or cancellations. In France, media reports on expropriations are rare, which indicates that expropriations are not considered newsworthy in most instances. Likewise,

transcripts from public hearings on expropriations show that the need for expropriations is generally not questioned. As a consequence, it is not surprising that there is little political resistance to the use of expropriations.

Like Korea, expropriation in France also contains a strong land value capture component due to the timing of the value assessment. For expropriations in relation to the Grand Paris Express, the reference date was set to one year prior to the publication of the general study for the Grand Paris Express. This ensures that the government does not have to pay expropriated owners for increases in property value that are due to the public improvement for which the expropriation takes place. As the value increase is captured by the government, expropriation under these conditions serves as a land value capture instrument.

- For expropriations, balancing the scope of authority granted to governments with public acceptance and consensus is key to a timely and streamlined land acquisition process.
- Land increments can be captured through expropriations by valuing the land based on pre-development prices.

Using a variety of land value capture instruments diversifies revenue streams and reduces risk

Funding large infrastructure projects requires not only a steady stream of revenues, but diversified funding portfolios that reduce risk and volatility. The example of the development of Crossrail in the United Kingdom highlights how a large infrastructure project was enabled through a diverse set of revenue streams that included both land and non-land-based instruments. Crossrail, with a budget of USD 23.6 billion, stretches over 100 kilometres and is expected to serve an estimated 200 million passengers across its 41 stations annually. According to official statistics, it is estimated that by 2026, the total uplift in property values within 1 kilometre of a station will amount to USD 26.7 billion, bringing in 180,000 new residential units. Funding for this large infrastructure project comes from a variety of sources. The Crossrail Business Rate Supplement, a type of betterment tax levied on businesses, is expected to contribute USD 5.4 billion. As this tax is levied on all eligible properties in Greater London (as opposed to properties in the vicinity of railway stations), it is not a land value capture instrument, but rather a general tax. The Mayoral Community Infrastructure Levy is a more focused instrument that charges betterment levies to developers, amounting to roughly USD 400 million in revenues. In addition to taxes and fees, developer exactions in the form of in-kind contributions or cash (Section 106 Agreements) are also charged to developers as a condition to being granted planning permission. Furthermore, the sale of surplus land and properties for over-site development above and around Crossrail stations is expected to generate an additional USD 730 million.

The good performance of different funding mechanisms is dependent on social support, which requires extensive communication between the government and relevant stakeholders. In this regard, authorities have commissioned numerous studies to demonstrate and communicate the direct and wider benefits of Crossrail to the public. Furthermore, in cases where several value capture mechanisms may apply to the same entity, authorities have put in place exemption clauses and thresholds to ensure that double-taxation does not occur. Finally, the judicial use of expropriation in land acquisition processes minimised the amount of land compulsorily purchased, safeguarding rights holders' interests and promoting social support for the project.

- Using a variety of instruments to fund infrastructure projects allow for diversification of the revenue base, which reduces risks for public authorities.
- When using multiple instruments, it is important to avoid double-taxation by implementing legal frameworks that provided for various exemptions and offsets against other contributions.

Common considerations for implementing land value capture

Across the globe, value capture policies and tools are undoubtedly arousing new interest and becoming more acceptable. One main reason for the increased popularity of value capture approaches in general is the fact that local governments are increasingly faced with a general trend of decentralisation of public functions that expands the scope of services that need to be provided, without significant increases in fiscal resources. Public authorities are realising that they can raise funds to improve infrastructure or provide services by capturing the gains that would otherwise have been obtained by land-owners and/or developers affected by administrative decisions. The proper implementation of value capture techniques however is far from simple. It requires political will, administrative capacity, and continued public engagement. Some considerations for successful implementation are highlighted below.

Eliciting public support is key to successful implementation

A general prerequisite of successful implementation is eliciting greater public understanding, support, and participation. Many studies show how land value increments are captured more successfully from land owners and other stakeholders when they acknowledge that they are receiving greater benefits from a proposed public intervention compared to the costs they pay. Land value capture fundamentally entails surrendering individual gains for the betterment of the group. Thus, value capture tools are more likely to succeed when stakeholders understand that the problem to be solved (whether it be lack of infrastructure or insufficient services) is a local one that directly affects their individual well-being. For landowners subject to expropriation, it is important that the government communicates the terms of expropriation clearly and well beforehand, and gives owners alternatives to expropriation, when possible.

More generally, in order to elicit public support, developing entities and governments should provide to the public as many opportunities as they can for dialogue and information sharing. The case study of Japan highlights how these communication channels contributed to the successful development of station areas. This is especially the case in the land acquisition phase, where it is especially important to balance private property rights with public interests. During the land acquisition phase (for example during expropriation or readjustment) projects often become unfeasible when only property rights prevail, as the costs versus benefits become too high due to high acquisition costs. On the other hand, projects are often delayed or cancelled altogether due to citizen unrest when only public interests are considered. To elicit public support, governments and developing entities should communicate with clarity the details regarding value capture boundaries, rates, and assessed property values. In this regard, previous experience shows how deciding upon these factors utilising a tiered approach that differentiates properties and areas based on their characteristics has a higher chance of success compared to across-the-board approaches.

Enable intensive transit-oriented development around stations

As a general rule, zoning codes and planning parameters around infrastructure sites should be flexible enough to meet changing market demands and diverse local needs. When flexible regulations are implemented, for example, to station area developments, developers have leeway to implement more complex and integrated approaches such as mixed-use developments. Furthermore, the case study of station area development in Korea illustrates how relaxed Floor-Area-Ratios and Building-to-Land-Ratios in and around station areas have the potential to not only encourage Transit-Oriented-Development, but also improve the financial feasibility of development projects by allowing governments to capture greater value increments that accrue due to further densification of development areas. Such approaches are not unique to Korea. In Hong Kong SAR, China, “Comprehensive Development Areas” were designated around key stations to coordinate more complex, integrated mixed-use development packages, while Japan’s “urban regeneration districts” in Tokyo were designated to attract private real estate investments with relaxed development codes around railway sites. Relaxed regulations around station areas also has

the benefit of increasing potential revenues for the infrastructure itself, as greater density attracts more people to the station and surrounding areas, which increases user fees. Nonetheless, it is important to couple these relaxed regulations with proper provisions for required infrastructure investments and services. These investments and improvements in services should be paid for by value increments that are captured from developers who benefit from the relaxed regulations. In this regard, utilising air-rights sale together with flexible land use regulations to concentrate development near station areas could be one viable approach to successfully implementing value capture techniques to fund infrastructure investments.

Utilise multiple funding sources and value capture techniques

Land value capture should not be regarded as the sole funding source for the development of infrastructure. Theoretically, the primary funding source for transport systems (in the absence of externalities) should be fare revenues. However, in practice it is impossible to fund transit infrastructure — with high upfront costs and long development horizons— using fare receipts alone. The capital intensity of such projects is a challenge for municipalities and transit agencies. Governments should recognise the wide-ranging impacts of transportation infrastructure across numerous sectors, and also the positive externalities that such infrastructures bestow upon impact areas by mobilising diverse funding sources.

Land prices in general are volatile in nature, and shift based on changing macroeconomic and political circumstances. This poses a risk for land value capture techniques that fundamentally rely on land value increments for their success. This volatility in the land market is one reason why governments and project entities should diversify their funding base to include other non-value capture instruments. The case of Crossrail in London for example is a good example of how city-wide property taxes levied to contribute to general infrastructure funds were instrumental in supporting value capture instruments and government transfers to fund railway infrastructure. Tokyo's Roadway Special Fund —comprising of earmarked gasoline charges and vehicle registration fees— financed one-third of bridge and underpass construction, which in turn reduced traffic congestion and improved pedestrian circulation while improving street amenities as well. Among other sources, property taxes tend to be an important source of revenue for local governments. Strategic utilisation of such taxes by municipalities to fund infrastructure development can help to provide diversification in the financial portfolios of such projects.

Establish fair and transparent rules for land expropriation and value capture

Land value capture in theory should be used for the joint creation and sharing of land value increments among different stakeholders. In this regard, establishing clear and fair rules for potentially contentious issues such as sharing of the costs, benefits, and risks ensures the long-term commitment of both public and private entities to successfully deliver on projects. For example, the railway corporation (MTR Corporation) in Hong Kong offers three options for benefit sharing to private developers: assets in kind, up-front payments, or profits in agreed proportions from the sale or lease of properties. Case by case arrangements are made for each private entity based on locations and market conditions. In the case of Korea, many transport infrastructure projects are initiated through a public-private partnership where local governments and public corporations partner with land owner cooperatives. This can also aid in establishing fair and transparent rules, as both parties are part of the implementing entity.

Establishing stable and equitable rules are especially important in the land acquisition phase of development. Arguably the most controversial aspect of development involves the public acquisition of private land through expropriation (or “eminent domain” in the United States). Here the public sector's ability to finance the infrastructure project depends on both acquiring the maximum amount of land from private owners (potentially exceeding requirements for infrastructure construction) and in purchasing the land at a price that does not include capitalisation of expected benefits from the project itself. In reality, the rights to the land increments brought by public investment are highly contested. Clear laws that define how

expropriation can be used, the compensation that must be paid, and the procedures by which disputes will be resolved are critical to the continuing use of this type of land finance instrument for infrastructure development. The case studies of the UK, Korea, and France all highlight the legal and procedural frameworks for which expropriation takes place. Arguably the success of infrastructure developments in those cases was in part due to the clear and fair expropriation rules that were implemented by the public sector.

1 Introduction

Infrastructure in its physical form can generally be defined to include the structures —roads, bridges, airports, electrical grids, schools, hospitals— that are essential for a society to function and an economy to operate (World Economic Forum, 2014^[1]). In economics, infrastructure is considered a type of durable capital that inherently cannot be provided for efficiently by the private market alone. A few common characteristics differentiate infrastructure from other long-term capital assets. First, infrastructure development creates externalities that spill over across physical space as well as onto a wide range of other sectors. These externalities are fundamentally difficult to measure and thus are generally not properly incorporated into prices. Particularly in the case where developments create positive externalities, this results in the under-provision of infrastructure when development is left to the unregulated market. Second, infrastructure is typically configured within a spatial network, for example in systems of roads, sewers, or railways. This results in a tendency for monopolies, as economies of scale result in greater efficiencies in larger networks compared to smaller ones. Finally, infrastructure investments tend to generate cash flows only after the initial phases of development, and are thus subject to high upfront costs and greater initial risks. These characteristics highlight the critical role of government entities to support infrastructure provision in the face of market failures. This is true even in instances where some form of private ownership exists, such as in public-private partnerships or regulated privatisation.

Despite their critical role, governments are finding it increasingly difficult to meet the growing infrastructure needs of their citizens. Estimates suggest a GDP spending shortage in infrastructure of 1% in OECD countries from 2007 to 2012, likely having resulted in forgone growth and productivity gains (The Economist, 2015^[2]). As a whole, it is estimated that the world will need to spend an aggregate \$57 trillion (at 2010 prices) up to 2030 to keep up with infrastructure needs, amounting to \$3.2 trillion annually in real terms (Walter, 2016^[3]). The strain on transportation infrastructure in particular is pronounced in both developing and developed countries due to issues such as urbanisation, urban sprawl, sustainable development, and Transit-Oriented Development. Regardless of the motivations, countries, regions and cities around the world will need to meet ever-increasing traffic demand with investment in extremely capital-intensive public transit systems. Most governments cannot however cover the high cost of these investments with simple fare-box receipts. In addition, the costs of operation and maintenance of these public transit systems are also prohibitively high in many cases. With construction and operation costs often exceeding the fiscal means of local governments, a stimulated interest in new revenue and funding sources has emerged.

Post Habitat III, land value capture policies have gained popularity as a promising alternative to solve the urban financing challenge. The term land value capture refers to a family of public finance mechanisms that raise funds in proportion to the increase in land value associated with new or improved public infrastructure (Levinson and Istrate, 2011^[4]). It is founded on the principle that land value is not only determined by its intrinsic value, but also through external factors such as the change in land use regulations, public investment in infrastructure and services, and general population and economic growth (Suzuki et al., 2015^[5]). The idea is that “the beneficiaries of the public investments or the public decisions that increase their land values should partly cover public investment costs or return their benefit to the public” (United Nations, 1976^[6]).

Land-based financing instruments are advantageous to local governments as a key source of revenue to fund the needs of local residents. For one, land is fixed and immobile, and thus a fee or tax can only be evaded if one actually sells the property and moves to (or invests in) a different piece of land. This makes land-based taxes and fees difficult to avoid, thus representing a steady source of revenue for local governments. In addition, local governments usually have discretion in land use and planning schemes that can be devised to generate additional value to existing pieces of land, which can in turn be captured to fund infrastructure and public services. This generally leads to land-based taxes and fees promoting greater efficiency in land use, resulting in more compact and sustainable urban development. Also, from the perspective of land owners, such fees increase the price of obtaining and keeping land which leads to land being used for more productive purposes.

There are many different ways in which the “windfalls of development” can be captured through land-based fees and taxes. Thanks to this variety, land value capture has the potential to be applied to a wide range of institutional and governance frameworks. Nonetheless, this versatility adds complexity, as there is no universal best mix of land value capture instruments and policies. The proper implementation of land value capture and the arsenal of value capture instruments used depends very much on local conditions, the type of infrastructure development proposed, and the administrative and fiscal capacity of local governments. This suggests that documenting the variety of global experiences of land value capture implementation in different contexts, and transferring policy knowledge from one institutional context to another is key to the successful implementation of land value capture across the globe.

2 Principles of land value capture

Conceptualisation of land value capture

Land value capture is based on a simple core premise: public action should generate public benefit. It can be regarded as a redistributive mechanism where the unearned benefits of development accrued by land owners are shared with the local community as a whole. Without value capture, the localised benefits of new infrastructure flow almost exclusively to private entities —households, businesses and property developers (Fainstein, 2012^[7]). When used in conjunction with good governance and urban planning principles, land value capture can be an integral tool to help governments advance positive fiscal, social, and environmental outcomes while promoting the equitable distribution of wealth in society

More specifically, land value capture is a public financing technique by which governments take part of the land value increment derived from both tangible developments (such as those due to public investment in infrastructure or services) and intangible developments (such as those due to administrative decisions) initiated by the public sector. Tangible developments include the creation or improvement of infrastructures for water, energy, housing, public spaces and transportation, or facilities such as schools, parks and hospitals. For example, Smolka (2013^[8]) finds that an investment in piped water provision of \$1.02 per square meter of land increased land prices by \$11.10 per square meter in locations within 10 kilometres from city centres in Latin America, while access to public transportation increased land prices by 15% to 20% in Bogotá. Intangible developments include planning decisions that for example alter land use and zoning regulations, convert rural areas to urban areas, or allow for higher urban density. Take for example the case where a new land use plan assigns a higher floor-area ratio (FAR) to a set of land parcels. Land owners earn a windfall gain that is due to public intervention that allows the land to be utilised in a more profitable manner.

The general process of land value capture can be divided into three stages (Suzuki et al., 2015^[5]). In the first stage, a government action in the form of public infrastructure investment (tangible benefit) or administrative decision (intangible benefit) is initiated (or anticipated), resulting in the valorisation of land values. In the second stage, the government institutes a set of land value capture policies and instruments (or modifies current instruments) to capture a portion of this land value increment for the common good of the public. In the last stage, the revenues generated from these land value capture instruments are collected and used to finance the initial infrastructure project or other improvement in the area that requires additional funding, or in some cases used as part of the general budget of the collecting entity.

The scope of projects for which land value capture revenues can be redirected towards varies with the institutional and political context. Most commonly, the revenues are utilised to directly fund the initial project or some other investment that directly benefits the area charged with the value capture fee. An example is the case of Hong Kong where the transportation authority (The Mass Transit Railway Corporation) generated revenues using value capture techniques to fund the rail system through the Rail Plus Property programme. In other instances, land value capture revenues are redirected towards different projects within the same area, as is the case of the sale of development rights (air rights) in New York City (Suzuki et al., 2015^[5]). In the broadest sense, land value capture revenues can also contribute to a general

development fund that is used to fund urban development projects in other areas, as is the case of betterment contributions in Colombia (Blanco Blanco et al., 2016^[9]).

Opportunities and challenges for land value capture

The successful implementation of land value capture depends on many different variables, both internal and external to the project. Important factors include the type of project, context of the real estate market, institutional capacity, and legal frameworks. As an example, the sale of public land is likely to work better in countries such as the Netherlands where public holdings of land are considerable and municipalities have the administrative capacity for large scale land management. Betterment levies have been applied regularly in Latin America (contribución de valorización and contribución por mejoras) due to influences coming from inherited principles incorporated in Spanish law.¹ Land readjustment has a long history of use in South Korea, where rapid industrialisation and urbanisation after the Korean War resulted in a need to transform many rural areas into urban areas.

Most obviously, land value capture presents opportunities for local governments from the viewpoint of public finance, as it allows them to tap into new finance mechanisms for public investment in infrastructure, especially in the face of tightening fiscal budgets and increased infrastructure needs. It also promotes infrastructure cost-sharing with win-win outcomes for both public and private stakeholders, while also incentivising wider policy measures that increase land value, resulting in greater fiscal revenues.

Equally important however, is how land value capture presents opportunities for economic development. Infrastructure investments play a fundamental role in the economic development of cities, with studies suggesting that doubling infrastructure investments boosts the annual growth rate of regions' Gross Domestic Product (GDP) by around 2% (Blanco Blanco et al., 2016^[9]). Providing for adequate infrastructure and public services also creates a better business environment that attracts firms, boosting productivity while also promoting job creation. Land value capture allows for better provision of these infrastructures and services that are key to sustained growth.

There is also an argument to be made for land value capture in improving distributive outcomes. Fainstein (2012^[7]) considers the case of public leasehold systems and argues that such value capture mechanisms are the most effective method of ensuring that land value increments are distributed in an equitable manner. Wolf-Powers (2012^[10]) argues that community benefits agreements—which ensure the gains resulting from development accrue to nearby residents—can be targeted towards low-income neighbourhoods which otherwise lack the local fiscal capacity to provide for infrastructure and attract economic growth. In this sense, land value capture can be effectively used as a reinvestment scheme that redirects windfall gains obtained through public intervention towards disadvantaged areas and their residents.

Nonetheless, land value capture is challenging to implement. For one, there is often a lack of public support for any increase in taxes on land and property. This is because such taxes and fees are clearly visible, and in most cases quite large in amount, typically levied as lump sums. In comparison, consumption taxes (sales tax or VAT) for example are paid in small increments and are uniformly levied. Second, local governments often lack the administrative capacity to implement value capture schemes, which can be due to poor knowledge and the lack of experience in implementing land value capture mechanisms. Third,

¹ The Spanish system uses several instruments for capturing gains in land value. The contribución por mejoras captures gains that come as a result of public improvements, while cuotas de urbanización require land donations and sharing of infrastructure costs for private developers whose land receives planning approval for urban use. In addition, a special tax separate from property taxes is levied on land and property value increases, which aims to capture benefits accruing from publicly supported urban growth. See Henao González CITATION Mendeley_L8

governments often lack the political will to adopt unpopular fiscal instruments such as a new land tax or fee. This is because a reform to taxes and fees requires strong leadership from government officials committed to good governance, who possess a long-term perspective and are not easily swayed by immediate political ramifications. A summary of common challenges and conditions for the successful implementation of value capture tools is presented below in Table 2.1.

Table 2.1. Challenges and conditions for adoption of LVC tools

Challenge	Conditions for successful implementation of LVC
Effective land market	<ul style="list-style-type: none"> – Clearly defined property rights – Adequate assessment of real estate values – Updated property registry, with value records – Rule of law, especially eminent domain and takings laws
Local capacity	<ul style="list-style-type: none"> – Fiscal and legislative autonomy of local government – Technical capacity to create and enforce tools – Transparent public decisions and actions – Monitoring and evaluation of adoption of tools (3Es)
Political will	<ul style="list-style-type: none"> – Leadership to adopt unpopular instruments e.g. pure land value tax – Effective communication with citizenry – Accountability of decisions – Fighting corruption and rent-seeking behaviour
Legal clarity	<ul style="list-style-type: none"> – Well-defined conditions and rules for adoption of tools – Collected funds attached to local urban development – Causal link between the public action and application of funds
Planning coherence	<ul style="list-style-type: none"> – Strategic vision for urban development – Inter-sectorial cooperation, especially planning and fiscal agencies – Priority for affordable housing and public transportation projects – Trade-off between maximising revenues and ensuring quality of public spaces

Source: (Figueiredo, n.d.^[11])

3 Land value capture instruments

The next sections discuss seven instruments most commonly used in implementing land value capture across a variety of contexts. Table 3.1 provides a brief overview of these instruments, classified according to whether they are tax-based or development-based. Tax-based tools have the advantage of being comparatively simpler to implement, but are often unpopular because they are clearly visible to the public. Development-based instruments suffer less from public opposition, but are administratively more difficult to implement. Regardless of instrument type, the goal of land value capture should be to i) provide an adequate amount of revenue to fund infrastructure projects without over or under-taxation, ii) collect in a timely manner land value increments so that the project is adequately funded throughout its lifetime, and iii) minimise administrative burden for governments and compliance costs for taxpayers.

Table 3.1. Land value capture instruments

Category	Instrument	Description	Examples
Tax-based	Land Tax (pure land value or split-rate property tax)	Tax on land value or a higher tax for land than for buildings. Considered less distortionary, more progressive and efficient than the composite property tax (land + building) and taxes on commercial activities or labour.	Pure land tax: Denmark, Australia, Estonia Split-rate: France, Belgium
	Betterment contribution (levy or charge)	One-time tax, levy or charge imposed on landowners adjacent to public infrastructure investment that contributed to land valorisation. "Beneficiaries pay" rationale. Yet clear link between investment and land valorisation beneficiaries is difficult to assess in practice.	Betterment charge in Colombia and Brazil. Special Assessment Districts in the US.
Development-based	Developer contribution (impact fee or developer exaction)	Developers supply off-site infrastructure and service needs steered by their project (schools, hospitals, highways). If in cash, it is a standardized impact fee or development charge. If in-kind and negotiated, it is a developer exaction.	Korean land development charge, US cities (TOD fees in SF), London and Paris, India (impact fee in Hyderabad Growth Corridor).
	Development rights sale (air rights, building rights)	Additional building potential is sold to developer by municipal authority (auctions or direct negotiation). It allows for higher density in special operations. Alternatively, it may be transferred to compensate for previous restriction of building capacity due to historical or environmental protection.	Brazil (São Paulo CEPACs and OODC); transfer of building rights in NYC, for historical properties, and air rights sale (Atlantic and Hudson Yard projects).
	Joint Development (Public Private Partnership, urban redevelopment)	Public and private actors cooperate in a project. Typically involves large infrastructure. Can be a joint venture or a concession. Risk sharing. Must coordinate with land development and resale or lease.	TOD in Tokyo, London, Taiwan, Hong Kong and Washington, DC. PPPs common in France, Poland. Urban Operations in Brazil
	Strategic land asset management	Local authorities acquire land, develop it and resell it; or sell land to raise funds for a specific project; or stay in control of land property and lease it.	India, China, Netherlands, NYC, Tokyo. Public land leasing: Poland, Ethiopia.
	Land readjustment (land pooling schemes)	Land of multiple owners is pooled and plots are reshaped for development, which is financed with future sale of portions of serviced land.	Korea, Tokyo, Taiwan, Germany, France, Botswana.

Source: (Figueiredo, n.d.[11])

Box 3.1. Just allocation of infrastructure costs between the public and private sector

Land value capture instruments provide a way for national, regional, and municipal governments to defray a significant portion of infrastructure costs by recouping the “windfalls” of development that arise from public action. However, the exact portion of the infrastructure costs that are footed by private land owners depends on factors including the total cost of the infrastructure project, existing legislature, and the amount of benefit accrued to local owners versus the general public.

In principle, the amount of value captured from the private sector through land value capture instruments should be less than or equal to the amount of additional value increments that fall to local land owners (within the impact area) versus the general public. In calculating this value, it is important to distinguish between direct development windfalls accruing to local land owners, versus indirect benefits enjoyed by the wider population as a result of infrastructure development. For example, the Greater London Authority charged a Business Rate Supplement (a form of betterment levy) on all eligible properties in the Greater London area to fund the Crossrail railway project (see Section 4 below for an in-depth case study). This flat rate calculation across different boroughs and business sectors, while simple in application, questioned the role of the levy as a value capture instrument, rather likening the tool as more of a general infrastructure tax imposed on all London citizens.

Nonetheless, in actual implementation, such flat rate calculations spanning larger areas have often proven less controversial to citizens as the costs are defrayed across a larger population, resulting in less legal disputes. In practice, the successful implementation of betterment levies depends heavily on how accurately land value increments are calculated, effective communication with private owners regarding these costs, and the administrative costs associated with such calculations.

The use of betterment levies in Colombia

Colombia has long been cited as a classic example for the successful usage of betterment levies to fund infrastructure projects. However, in reality Colombia has faced many problems in implementation rooted in disputes over the assigned land value gains used as a basis to calculate levies. Traditionally, betterment levies in Colombia were calculated based on both benefit capitalisation and cost recovery. While the payments from landowners were allocated proportionately to estimated land value increments, the total amount collected was based on cost recovery, calculated as:

- 100% of (budgeted) infrastructure costs, plus
- 10% of contingency fees, plus
- 30% of administrative costs

The calculation of land value increments was not normally measured using market prices or appraisals, but rather through formulas based on factors such as lot size, location relative to infrastructure work, and land-use activity, among others. This implementation of betterment levies faced difficulties because the total cost allocated to individual land owners was not based on market values but rather on the costs in developing the infrastructure. In response, the government changed legislature in 1997 to allow more flexible approaches to implementation. Rather than fixed percentages, municipalities were granted discretion over how much of the costs were levied to private land owners. As an example, Bogota launched a new program in 2007 that attempted to fund citywide improvement of streets and related infrastructure. In the initial stages, the financing strategy included a total of US \$700 million in revenues, of which roughly half (US \$350 million) was funded by betterment levies, US \$50 million was funded from a loan from the International Finance Corporation, another US \$50 million funded from a loan from the Andean Development Corporation, and US \$300 million from an international, peso-linked bond issue. The levy was paid for by over 1,200,000 landowners. As such, while the broad application of

levies across many landowners resulted in a less pure version of value capture, the lower per-owner costs and reduced administrative burden mitigated public resistance and aided in easier implementation of the betterment levy.

Special Assessment Districts in the United States

Special Assessment Districts (as used in the United States) are a financing mechanism that enables governments to designate specific areas as Assessment Districts with the approval of a majority of land owners, while allowing these districts to collect taxes or fees to finance infrastructure improvements that benefit owners within the area. As opposed to the usage of betterment levies in Colombia, by definition Special Assessment Districts clearly define an impact area from which levies are to be collected. Thus, these Districts better align conceptually to value capture motives, as they match the payees and beneficiaries of a particular infrastructure project. Nonetheless, in many cases the administrative costs of implementing such a financing tool are high, as it requires formal approval from property owners as well as agreement on how levies (i.e. assessments) are calculated.

Special Assessment Districts have been used in many states to fund a variety of infrastructure projects. The development of NoMa – Gallaudet U station sponsored by the Washington Metropolitan Area Transit Authority in the District of Columbia successfully utilised Special Assessment Districts to collect roughly one-fourths (or US \$25 million) of the total US \$104 million in development costs through increased property taxes in the District. Specifically, property owners within 2,500 feet (or roughly 760 metres) of the station's entrance agreed to increase property taxes to pay an annual amount of 1/30th of the US\$25 million total over 30 years. The federal government matched these revenues with an additional US \$25 million, while the District of Columbia funded an additional US \$44 million through the Capital Budget. In addition, the District of Columbia government formed the 35-block NoMa Business Improvement District (BID) in 2007 to spur additional economic improvements, where the BID levied property taxes on commercial, multi-unit residential, and hotel properties to support the continued development of the NoMa neighbourhood.

Similarly, the South Lake Union (SLU) Streetcar project in Seattle, Washington, consisting of a 2.6 mile streetcar line connecting the South Lake Union area to downtown Seattle, acquired roughly half (or US \$25 million) of its total US \$53.5 million budget through imposing levies on businesses and owners within the designated Local Improvement District. Local businesses and property owners within five blocks of the streetcar line agreed to a special property tax that ranged from 8 percent for directly adjacent parcels to 1 percent for parcels located in the outer boundary of the District. The Federal government funded an additional US \$13 million, the state government funded US \$3 million, while the rest was funded by the local government.

Australia's approach to funding infrastructure through land value capture

Australia has used forms of land value capture at least since the 1920s. In the 1920s and early 1930s, value capture instruments were used to fund the Sydney Harbour Bridge, where one third of the costs were to be funded through a tax (via council rates) on benefited land owners, which was set at 0.2% of land values prior to development. Various other value capture instruments such as developer exactions and local government property taxes have been in place for many decades, with governments increasingly funding significant infrastructure developments through land-based finance.

The development of Melbourne's City Loop is an example of how the state, metropolitan, and local governments shared the burden of infrastructure costs, both amongst themselves and with private land owners. Following a 1960 Act that established funding arrangements for the project and an Act of Parliament in 1971 that established an authority to oversee its construction, construction of the City Loop commenced in 1971, with it being completed progressively between 1981 and 1985. The initial funding scheme established a 25-25-50 percent split of costs between the City of Melbourne, the

Melbourne Metropolitan Board of Works (MMBW), and the State government. The City of Melbourne was to fund its portion through a special council rates levy (Benefited Area Levy) over 53 years, where benefited CBD businesses and non-residential landowners contributed to the cost of the project. The MMBW was to fund its portion via a city-wide levy, while the State government was to pay the balance of the 50 percent not collected by ticket revenues. With recent estimates suggesting a total cost for the City Loop amounting to roughly US \$400 million, this suggests that roughly US \$200 million was to be funded by the private sector through value capture instruments. Nonetheless, due to financial difficulties resulting from financial collapses and recessions, the contribution of private landowners was later capped to 25 percent, with the Benefited Area Levy and city-wide levy contributing 10 percent and 15 percent respectively.

A more recent example of value capture usage in Australia concerns the development of the Gold Coast Light Rail. Opened in 2014, stage 1 of the project consisted of 14 vehicles and 16 stations servicing a 13-km route between the Gold Coast University Hospital and Broadbeach. Funding for the project was provided by three levels of government, with the Federal government providing roughly US \$300 million (40%), the Queensland state government providing US \$370 million (48%), and the Gold Coast council providing US \$95 million (12%). The Gold Coast council's contribution was funded by a metropolitan wide Transport Improvement Levy (TIL), which assessed a flat AUD \$123 annual transport improvement levy from ratepayers within the City of Gold Coast area. According to the Gold Coast City Annual Report 2013-14, 245,687 rateable properties existed in the city, suggesting that the TIL generated close to US \$23 million annually. As in Colombia's case, the city-wide levy acted less as a betterment levy and more as a general infrastructure tax imposed on properties. In addition to stage 1, stages 2 and 3 of the Light Rail have also either been opened or are in development, with the Federal government funding US \$290 million (32%), the State government funding US \$470 million (52%), and the Gold Coast council funding US \$140 million (16%) of the total US \$900 million budget.

Source: Peterson, G. (2008), Unlocking Land Values to Finance Urban Infrastructure, The World Bank, <http://dx.doi.org/10.1596/978-0-8213-7709-3>, https://www.fhwa.dot.gov/ipd/project_profiles/dc_noma.aspx (accessed 22 February, 2021), https://www.fhwa.dot.gov/ipd/project_profiles/wa_slc_streetcar.aspx (accessed 22 February, 2021), Smolka, M. (2013), Implementing Value Capture in Latin America, Lincoln Institute of Land Policy, Cambridge, MA, <https://www.lincolninstitute.org/publications/policy-focus-reports/implementing-value-capture-latin-america> (accessed 22 February, 2021), https://www.infrastructurevictoria.com.au/wp-content/uploads/2019/04/IV18-Value-Capture-Options_Final-web_v2_0.pdf (accessed 22 February, 2021), Infrastructure Victoria (2016), Value Capture – Options, Challenges And Opportunities For Victoria, https://www.infrastructurevictoria.com.au/wp-content/uploads/2019/04/IV18-Value-Capture-Options_Final-web_v2_0.pdf, Infrastructure Victoria (2016), Capturing Value: Advice on making value capture work in Australia, https://www.infrastructureaustralia.gov.au/sites/default/files/2019-06/Capturing_Value-Advice_on_making_value_capture_work_in_Australia-acc.pdf.

Land-value tax or split-rate property tax

The oldest and most commonly used form of a tax-based value capture instrument is land and property taxation. A tax on land value is a form of value capture in so far as much of the land value results from public interventions (Smolka, 2013^[8]). These taxes are generally levied on the estimated value of land, or in some cases land and property combined. Taxing based on land as opposed to taxing based on both land and property has significant ramifications for efficiency. Theoretically, taxing based solely on land values encourages high-density development and greater land use efficiency. Because land supply is relatively inelastic in the short run, land taxes do not alter the supply of land for development. Thus land taxes are generally regarded as a fiscal instrument that creates the least amount of distortions (or “dead weight losses”) to the market (Suzuki et al., 2015^[5]). Nonetheless, the majority of property tax systems consider property to be a composite of land, buildings, and improvements. Economists have argued that taxing buildings is inefficient, as it favours low-density and low-productivity uses of land, which stimulates

sprawl (Blöchliger, 2015^[12]). A split-rate property tax that levies taxes for land more heavily than for buildings is utilised in a few countries including France and Belgium (England, 2003^[13]).

When levying land and/or property taxes, there are two main issues that need to be considered. The first concerns how to value land and property. The amount of tax (or fee) due is a function of the value of the taxable base and the applicable tax (or fee) rate. For land value capture, determining the value of the taxable base can be technically challenging since the exact value of land parcels and attached buildings are unclear, especially if these assets are not often sold in the market. Even in the case where a database of transactions exists, it requires administrative time and knowledge to determine whether these reported prices are reasonable. This problem is amplified considering that in order to properly capture land value increments, the tax base must include the price increases that are due to public interventions. The simplest way to calculate the taxable base that is used in many countries is to charge a simple flat fee depending on the land's area, or possibly charging based on the physical attributes of the location or property. However, when using this approach, it is important to set the valuations to include price increments that are due to public interventions. In more sophisticated cases, a detailed database of land and property, along with their attributes and selling price is collected, and statistical models (such as hedonic pricing models) are used to estimate market value.

Non-market approaches to calculating land values include determining taxable value based on land area only, using an area-based assessment to assign values depending on the location zone and land use category, or a value-banding approach where the same value is assigned for properties within a price range. Market-based approaches are inherently more data intensive and administratively burdensome, but have the advantage of creating more accurate valuations. These include cost approaches where the cost of buying the land and constructing the building less depreciation is used as the taxable value; comparable sales approaches where values are set based on recent sales of similar properties; or possibly an income-based approach where the capitalised annual income able to be generated by the land is used as a benchmark. Non-market approaches are common in countries such as Chile, India, and Eastern European states, while market-based approaches are common in the United States and Western Europe (UN Habitat, 2020^[14]). Choosing a particular approach will depend on the administrative capacities of local governments and the extent of data available on the real-estate market.

The next consideration for land and/or property taxes regards how to set the tax or fee rates. Setting the tax or fee rate is a delicate political balancing act constrained by governments' revenue needs on the one hand and legal limitations and public acceptance on the other. International best practices suggest that national or regional governments set the range of acceptable rates, while local governments set the specific rate depending on local conditions and fiscal needs. In general, the tax or fee should be assessed on the broadest tax base possible so that rates can be kept low while still achieving revenue targets. Afterwards, the spending needs tied to the infrastructure investment less revenue from any other sources needs to be calculated to set the amount of revenue needed from land value capture instruments. Finally, the rate should be set to balance the funding equation.

The question of how many different rates should be used is important in a land value capture setting. From an administrative perspective, it is advantageous to set as few rates as possible. Nonetheless, factors such as distance to the proposed project, and whether land is designated as residential, commercial, or industrial should be taken into consideration in cases where the new infrastructure is expected to differentially affect land values based on spatial or land use characteristics. Again, the granularity at which rates are assessed will depend on the data available on the real estate market and the administrative capacities of local governments.

Most countries have property taxes, and their weight in government budgets vary greatly. Property taxes are generally levied at the sub-national level, and thus revenues tend to be concentrated at the level of local governments. Estimates suggest that up to 40% of local fiscal revenues come from property taxes, compared to roughly 2.5% for national governments (OECD, 2014^[15]). Well-designed, up-to-date and well-

functioning property tax systems are thus important to the financial autonomy of local governments. Properly levying land or property taxes requires a good cadastral system and large financial commitments to establish a database of properties for tax assessment and enforcement (Suzuki et al., 2015^[5]). In addition, these taxes require strong enforcement of property rights, as well as effective tax administration capacity at the local level. Nonetheless, land value taxes are relatively simple to implement once land values are assessed, compared to property or split-rate taxes that require regular assessments of not only land but also property and improvements done to buildings to be successfully implemented (Blöchliger, 2015^[12]).

Betterment contributions

A betterment contribution or levy is a fee imposed on land owners of select properties that is used to defray the costs of a public infrastructure project or service for which they specifically benefit from. Together with land and property taxes, it is the most consistently used value capture instrument, with usage dating back to the early nineteenth century in countries such as Argentina and Brazil (Smolka, 2013^[8]). They were introduced in the 1970s as a value capture instrument in the United States and United Kingdom.

Betterment contributions can either be collected *ex ante* or *ex post*, depending on the funding needs of the infrastructure project or service. Similar to land and property taxes, the goal of a betterment contribution is for governments to capture property owners' land value increments that result from public investments, which are used to pay the costs of the investment itself. Misczynski (2012^[16]) 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. For example, the Los Angeles subway system was initially funded from special assessments on properties within a one-mile radius of downtown stations, and a half-mile radius of other stations.

The use of betterment contributions carries with it room for potential conflicts. For example, the extensive use of special assessments in California triggered the passage of Proposition 218 in 1996, which required a more rigorous definition and distinction between special and general benefits generated by projects funded by special assessments (Misczynski, 2012^[16]). In other countries, as much as 60 percent of land value gains attributable to public investment have been captured from land owners through betterment levies, which has unsurprisingly been met with public resistance that has made implementation difficult (Peterson, 2008^[17]).

One major challenge with betterment contributions is in estimating the land value increments with precision. For example, 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) (Suzuki et al., 2015^[5]). As mentioned, land value increments can be calculated using a variety of non-market and market approaches. To the extent that detailed transactions and cadastre data on land is available, ideally more involved market approaches such as those based on the costs of buying land, comparable sales approaches that look at the sale price of similar properties, or income-based approaches that consider the capitalised annual income generated by land should be used.

Another major challenge comes with determining the impact area. In the context of land value capture, an infrastructure project's impact area can be considered to be the area of influence in which citizens are benefitted. More specifically, this area corresponds to the geographic space in which the project causes changes in land value. Determining this area is critical in maintaining the beneficiary pays principle and levying charges only on those who are impacted by the proposed infrastructure. However, this often proves difficult considering that such areas vary greatly with the type of infrastructure (for example highway intersections versus subway stations), quality of existing infrastructure alternatives, and real estate market conditions. Therefore, it is almost useless to use international benchmarks, such as the often cited "walking distance of 500 metres" (Smolka, 2013^[8]).

A more rigorous ex-ante method for defining an impact area is through commercial real estate appraisals. Borrero (2012^[18]) (as cited in Smolka 2013) illustrates how the city of Manizales in Colombia used this method of defined impact areas for betterment levies. In the first step, a broad area of influence (larger than the actual impact area) is defined and divided into numerous homogenous areas with similar characteristics in urban regulations, spatial structure, and land use. Next, statistical models are used to appraise land values under two different scenarios: one with the prevailing situation and the other with the hypothetical project. These models utilise data on similar projects that were previously carried out to make more accurate predictions. Lastly, the impact area is determined as the homogenous zones for which land value increments are identified. However, in cases where such rigorous methods cannot be applied due to administrative capacity or lack of data, local governments should at the very least utilise qualitative techniques using evidence from similar infrastructure projects in other areas together with interviews with municipal government officials, researchers, and appraisers to assess as best as possible impact boundaries.

Developer exactions and impact fees

Developer exactions or in-kind exactions are one-time charges negotiated for new land uses in single projects. They can be also called negotiated exactions. In the event of a newly proposed project (e.g. commercial centre or residential complex) that creates significant infrastructure needs in the surrounding area, the developer is required to contribute to meet them. If the developer directly builds the infrastructure and improvements needed by a new project, the tool is called in-kind exaction. If the developer pays the equivalent in cash, it is a developer exaction.

A similar tool that falls in this category is impact fees. When impact fees are levied, developers are assessed an extra cash charge to compensate the cost of area-wide infrastructure upgrades. Per standard scheme, it is generally a one-time charge applied routinely by a local jurisdiction to real estate development projects contemplated in the area impacted by infrastructure upgrades. The proceeds from the charge fund a portion of the cost of facilities upgrades. While similar to betterment contributions, impact fees and developer exactions work from the cost side of public budgets, as opposed to betterment contributions that aim to capture part land value uplift created by the government. While impact fees usually don't raise large sums per application, nonetheless they are a convenient tool commonly used by municipalities to transfer the costs for roads, water, electricity, schools, etc. to developers or land owners. Compared to others, they are one of the few land value capture instruments that even small municipalities can use routinely.

One example of developer exactions are Parking Directives in German cities. Instead of fulfilling the obligation of providing parking space in new commercial or residential projects, developers are able to pay a fee. This fee is used by the city to improve public transportation and non-motorized transportation modes. Other examples include exactions enacted in Portland, Oregon in the United States (known as a "system development charge") where developers were required to contribute five acres of land per 1,000 additional residents (or pay \$200,000 to \$1 million per 1,000 residents) brought into the city due to their development to fund the construction of public facilities.

Box 3.2. An innovative use of impact fees in Argentina

The city of Trenque Lauquen, in the province of Buenos Aires, Argentina, 444 kilometres from the capital city, has 43,000 inhabitants. Argentinian cities lack the legislative powers to create and implement property taxes, and transfers from the provincial government are very limited. Given these fiscal restrictions, the municipality of Trenque Lauquen adopted in 2008 an impact fee. To compensate some administrative uncertainties, such as the lack of updated municipal property registry, there was a strong political will to implement such tool and to convince citizens of the benefits of it for local development.

The impact fee is based on public infrastructure works and on changes in urban parameters (floor area ratio, zoning or land use). The novelty consists in the second application. Examples of changes that increase land values are: change in floor area ratio that allows for greater density, change in zoning that converts an area from residential to commercial or mixed-use, and the approval for plot division of newly converted urban land.

The design of the tool is simple and efficient. In the case of public works, the cost is distributed among all benefitting properties, proportionally to the floor area of each one; in the case of urban parameters change, the contribution is assessed as a percentage of the cost of building a square meter of such property. What this assessment method may lack in the precision of parcel-by-parcel analysis it gains in practicality.

For a middle-sized city, without a buoyant real estate market, the fee has brought in significant revenues. In addition, it allowed the municipality to have greater control over the real estate market and over directions of urban development and expansion. For these reasons, and for the simplicity of this tool, the experience of Trenque Lauquen shows positive results and high indication of replicability.

Source: Duarte, J. I. and L. Baer. (2014), *Recuperación de plusvalías a través de la contribución por mejoras en Trenque Lauquen, Provincia de Buenos Aires* in: Smolka, M. and F. Furtado (eds.) (2014), *Instrumentos notables de políticas de suelo en América Latina*. Lincoln Institute of Land Policy, 190p.

Development rights sale

The sale of development rights generates funding for public infrastructure by selling development rights instead of rights in land. Market freehold lands are normally subjected to land use regulations, such as height and use restrictions. For example, zoning areas have an established constructive potential (defined by the floor area ratio) beyond which construction is forbidden. 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. Sellable development rights fall into two categories: the right to convert less productive (lower) use to a higher use, and the right to build at greater densities than normally would be allowed by existing zoning. These rights can be sold to third parties or used directly in developments in predefined receiving areas.

A famous example of development rights sale is that for Sao Paulo, Brazil (Smolka, 2013^[8]). In 2014, Sao Paulo reduced all land rights to a basic Floor Area Ratio (FAR) of one, with higher zoning maximums in different areas of the city. The basis was the city's 2002 Strategic Master Plan, which applied "charges for additional building rights," known as OODC (*Outorga Onerosa de Direito de Construir*). The city issued special "potential additional construction bonds", which were sold as certificates in auctions. The advantage of these auctions was that market mechanisms established prices, overcoming the need to

calculate land value increments and negotiate prices. In addition, the city was able to control the quantity of certificates sold at each time, which allowed for better monitoring and control over private development. The revenue from these sales is used for improving infrastructure as well as for developing social housing across the city.

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 programme 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 (Suzuki et al., 2015^[5]).

Among the benefits of this financing approach is that the disposition of development rights does not cause a negative fiscal impact. In fact, the sale of development rights by the public sector generates positive fiscal revenues since cities in general do not include future expected values of these rights in their balance sheets. If a municipality owns land or expropriates it for certain purposes (for example, a public parking garage or government buildings below allowable density), it is able to sell or transfer the air rights to this land to willing developers. Nonetheless, the sale or transfer of development rights requires a well-designed regulatory framework that designates "sending" and "receiving" zones, as well as transparent land use controls that mitigate uncertainty in the air rights market. In addition, development rights sale is prone to vulnerabilities due to macroeconomic conditions, especially when demand for new construction is low or volatile.

Joint development

Joint development is an umbrella term that refers to public-private arrangements to provide services or build infrastructure by coordinating development between public agencies and developers. It can designate Joint Ventures (JV), which are mixed-capital legal entities, or Public-Private Partnerships (PPPs), which are agreements of public service concession to a private entity, combined or not with infrastructure construction. Private developers usually contribute to the development by constructing a facility (such as a station) or financing part or all of the construction costs.

JV and PPP are similar in that they are used to carry out large and complex urban projects (such as a new subway line or soccer stadium) when public resources and expertise are limited. The private sector is called in to bear some of the responsibility, be it the design, implementation, or maintenance of the project. The public authority in turn can provide the land or part of the funds to carry out the project. The responsibility and the risk for the project are shared.

The OECD (2008^[19]) defines a PPP as an agreement between the government and one or more private partners (which may include the operators and the financiers) according to which the private partners deliver the service in such a manner that the service delivery objectives of the government are aligned with the profit objectives of the private partners and where the effectiveness of the alignment depends on a sufficient transfer of risk to the private partners. JVs (popular in countries such as the Netherlands, United Kingdom and the United States) consist of a new legal mixed-capital entity that is formed to carry out projects of public interest. This new entity owns the infrastructure that is funded from user fees. The public sector typically contributes with vacant freehold land, while private capital is used to build infrastructure and conduct operations. Land values are captured when after completion, the public sector sells its share of land at market value, which has appreciated due to infrastructure development.

For joint developments to function as land value capture tools, first the project must cause land valorisation. Second, the partnership must be operationalised in a way that the gains from land valorisation are recouped by the public sector. This may be done directly, via the sales or lease of land adjacent to new infrastructure projects (as in Transit Oriented Development projects in many Japanese cities), or indirectly through the transfer of ownership back to the public sector. One important example is the ‘active land policy’ of the Netherlands, where land is both assembled and developed by municipalities, after which the land is sold to property developers, housing associations or individual home-owners. This unique tradition works to reduce risks and provide coherent development while also successfully capturing land increments as municipalities set prices based on the perceived value of land (van Oosten, Witte and Hartmann, 2018^[20]).

Strategic land asset management

In many cases, public authorities have valuable landholdings on the asset side of their balance sheets that are not being used or being used inefficiently. Strategic land asset management concerns inventorying public assets and making economic decisions as to how to extract maximum values from them, including land and developed property (Peterson, 2008^[17]). Often assessments point to an overload of land and property assets, together with acute infrastructure shortages. In such cases, selling or leasing publicly owned land to raise revenues becomes a valuable value capture mechanism to fund infrastructure development.

Governments can capture land value increments created by public infrastructure investment or regulatory changes (such as floor area ratio or land use) by selling or leasing their public lands to private landowners or developers. Public land leasehold systems have been adopted in the Netherlands, Australia, Sweden, Finland, Israel and the Ukraine (Bourassa and Hong, 2003^[21]). In the Netherlands, large municipalities have a tradition of acquiring undeveloped land, servicing it and then selling or leasing it to developers, while in Denmark, Copenhagen’s district of Ørestad is being developed mostly with funds from the sales of serviced land adjacent to a new subway line (Knowles, 2012^[22]).

Some key requirements need to be met in order for land asset management to function properly. First, an excess of underutilised public assets must be available either per se or through asset consolidation or optimisation. Second, the market value of the public assets must be clearly established. Third, public entities must have the power to negotiate on par with private sector developers to achieve fair pricing of assets.

Land asset management presents several opportunities for local governments. They not only result in direct cash revenue for municipalities, but they also put underutilised assets to public use, encouraging the efficient use of land. Furthermore, the sale or lease of land in particular is relatively straightforward, as it entails a simple two-way transaction between the public sector and private developers once the fair value of the property is negotiated.

Nonetheless several challenges exist. Importantly, the sale or leasing of locally-owned land could result in the loss of control over future development, especially when city level land use regulations are not robust. In addition, there are often political concerns over the negotiated disposition price of publicly-owned assets, which could lead to public objection. Finally, in the case of China, the practice of using land concessions extensively as municipalities’ main funding source has become unsustainable as slower growth and decreased demand for urban land, together with legislative changes have threatened the municipal finance system altogether (Liu, 2021^[23]; OECD, 2021^[24]). These lessons highlight how utilising a variety of value capture instruments (including land taxes) based on the relevant government’s fiscal circumstances and

the nature of the project help to diversify and manage the risks of municipal funding schemes, while providing for a stable source of local government revenue.

Land readjustment

Land readjustment concerns a participatory process in which land owners (or occupants) contribute all or a certain percentage of their land for infrastructure or public service development for sale to partially cover project costs. In return, the land owners receive a serviced parcel of land that is smaller in area but more valuable than the original due to land valorisation. There are three characteristics of land readjustment that make it unique as a land value capture instrument. First, land readjustment pools land from different owners. Before being returned to owners, the pooled land is reshaped into plots that are better suited for development and can be serviced by infrastructure, which increases land values. Second, land readjustment can set aside land for public infrastructure (roads, schools, parks) that governments obtain for free instead of having to buy it from the land owner. This is a form of land value capture that is commonly used in many East-Asian countries. Third, land readjustment can further capture land increments by setting aside additional land for sale, to recover the costs for infrastructure development. This is a common practice in Korea, where most infrastructure development projects utilise some form of land readjustment.

Often times land readjustment is used as an alternative to expropriation, to minimise public dissent and forced displacement. It also has the benefit of being much less costly to implement compared to land expropriation. This instrument is also called land pooling in Australia and land consolidation in Europe. In South Korea, land readjustment has been used extensively to convert small, irregular pieces of rural land into urban areas equipped with public services and infrastructure. For example, 60% of urban expansion in the Seoul metropolitan area in Korea was accomplished through land readjustment during the 1980s. In Japan, land readjustment has been used to fund the Tokyo subway system. In some instances, land readjustment has also been used to prevent disorderly urban sprawl in rapidly growing cities, to facilitate urban regeneration and slum upgrading, and even as a post-disaster measure to rebuild destroyed neighbourhoods (Smolka, 2013^[8]).

In the most typical case of land readjustment, a public project usually spans an area that belongs to many individuals, each owning a small portion of land. Thus, it can be difficult to coordinate individual interests to generate a win-win result. Thus, often land readjustment is accompanied by the establishment of a third-party public, semi-public, or even private entity in the form of a trust that oversees the implementation of the project and the land readjustment process (Smolka, 2013^[8]). The key factors for successfully implementing land readjustment include i) acquiring a supermajority consensus among land owners to approve the project, ii) an appropriate legal framework that empowers local authorities to legally take land from dissenting landowners when the supermajority agrees, and iii) a detailed and accurate cadastre database of property records to properly assess land values.

There are several advantages to land readjustment as a land value capture instrument. For one, land readjustment promotes the densification of land use, which enhances land values for landowners, expands the property tax base for localities, and encourages sustainable development. Secondly, infrastructure and urban development projects can be undertaken with minimal resident displacement compared to other financing schemes. Finally, land readjustment schemes are favourable from a distributive perspective, as the land redevelopment costs and benefits are shared equitably among landowners and other stakeholders. Nonetheless, challenges including difficulties in obtaining a supermajority consensus, as well as requirements for strong project management and technical capacities for local governments must be overcome in order for readjustment schemes to be implemented in an effective and timely manner.

4 Case studies

Expropriation, readjustment, and hybrid approaches to developing areas near subway stations in South Korea

Institutional framework

Korea uses a hierarchical planning system involving four main plans, with the *National Land Planning and Utilisation Act* providing the legal basis for the Korean planning system. At the national level, the *National Comprehensive Plan* provides a general framework for planning that contains spatial and non-spatial elements. At the regional level, *Metropolitan Area Plans* and *Provincial Comprehensive Plans* provide regional frameworks and focus on similar topics as the *National Comprehensive Plan*. They are legally binding for subordinate plans and may also include small scale land use plans. At the local level, *City Master Plans* are a comprehensive plan that contain strategic elements and detailed land use plans, and are prepared in consultation with citizens and independent experts. In addition, Seoul and the other six large “metropolitan cities” devise *District Unit Plans* at the lowest level to steer the development of small neighbourhoods and individual blocks in densely populated areas.

The development of station areas in Korea

Besides the general planning framework legislation, a number of other laws also have direct impacts on planning and land use. Several acts on urban development and housing aim at ensuring a sufficient supply of affordable housing, promoting sustainable residential development, and revitalising residential neighbourhoods. The *Industrial Sites and Development Act* for example has the goal of ensuring a sufficient and spatially balanced supply of appropriate land for industrial use, while the *Urban Traffic Readjustment Promotion Act* promotes the modernisation of transport infrastructure and the efficient management of urban transport systems.

Among these other laws, the *Development and Utilisation of Station Areas Act* (hereafter the *Station Areas Act*) was created in 2010 to promote the systematic development of station areas in the vicinity of railways and urban subways. It was enacted as a response to previous conflicts regarding the various different laws that each contained elements concerning the development of station areas, such as the *Railway Construction Act* and *Urban Railway Act*, among others. Consisting of 39 articles and supplementary provisions, the *Station Areas Act* aims to reflect the special characteristics of railroad sites and promote the streamlined planning and implementation of projects that properly link railway stations with their surrounding areas.

A site can be designated as a “station development area” under the act if i) a new station is constructed in the vicinity and systematic planning and development is deemed needed, ii) a station in the vicinity becomes old and obsolete, requiring redevelopment, iii) the site contains old and obsolete buildings that need to be redeveloped in conjunction with the station, and iv) the comprehensive development of the station’s area of influence is necessary for the restoration of urban functions. The main benefit of being designated as a station development area is that development projects can enjoy a more streamlined

administrative process of approval, along with eased restrictions on land use regulations such as Floor Area Ratios or Building-to-Land Ratios (up to 1.5 times the legal amount) for the sake of high-density development.

Station areas in Korea are also commonly developed based on the *Urban Development Act* which was enacted in 2000 to promote planned and systematic urban development and to contribute to the creation of a pleasant urban environment. While being more versatile compared to the *Station Areas Act* (and thus easier to obtain approval), it does not contain any provisions such as relaxed land use regulations that are provided for by the *Station Area Act*. Development is typically initiated by the public sector (governments and public entities), or in some cases by the land owners themselves, who sometimes form land owner cooperatives for the sake of the project. Projects are approved by the Ministry of Land, Infrastructure, and Transport (hereafter MLIT).

Typically, the development of station areas involves first developing a *District Unit Plan* (in the case of Seoul and the other metropolitan cities) or an *Urban Development Project Plan* (for other areas) for the proposed project site. These plans include key elements such as the detailed land use plan, land acquisition plan, permitted uses, Floor Area Ratios, and funding plans, among others. After an initial plan is drawn up, it is subsequently reviewed by the appropriate agencies and governing bodies after multiple rounds of public announcements, public hearings, and approval from experts and the local council, after which it is finally approved. After approval, the project commences, typically starting with land acquisition procedures.

It is important to note that station area development projects in Korea need to acquire land for development specifically through either land expropriation or land readjustment, or in some cases a hybrid approach that utilises both instruments. The *Act on Acquisition and Compensation of Land for Public Works* (hereafter the *Land Compensation Act*) governs the legalities and procedures regarding expropriation, while the *Urban Development Act* lays out the details regarding land readjustment.

Land expropriation and readjustment in South Korea

Article 23-3 of the Korean Constitution stipulates that “Expropriation, use, or limitation of private property due to public necessity and with regard to compensation shall be governed by an Act so that just compensation shall be paid.” Hence, expropriation, which means compulsory deprivation of private property rights by the governmental authority for public needs, is based on the assumption that there is a necessity for the public good when private property is to be compulsorily acquired regardless of a person’s will.

The *Land Expropriation Act*, together with the *Land Compartmentalisation and Rearrangement Projects Act* were established in the 1960s to secure land for public projects and large-scale housing provision. This was mainly due to necessity as the Korean war and rapid urbanisation thereafter had created a great need for land to be used to create urban housing and public infrastructure. While the two acts laid out the general legal framework for land expropriation and readjustment, nonetheless they were lacking a clear standard of procedures, and omitted important items such as procedures of notice, compensation plans, and negotiation terms. Thus, starting from the late 1960s, land necessary for public projects was mainly acquired through bargaining acquisition in accord with the civil law. This led to civil complaints as there was no general standing rule regarding just compensation or notice procedures. The large-scale housing projects that were carried out in the 70s and 80s together with Korea’s rapid industrialisation and urbanisation exacerbated this unrest.

The procedures and legalities regarding land expropriation were streamlined with the enactment of the *Land Compensation Act* in 2002. Importantly, the valuation of compensation for expropriated land was

clarified. The *Land Compensation Act* stipulates that for lands acquired through expropriation, compensation is decided in reference to the officially assessed land prices determined by the MLIT. These base land prices are calculated by the government first assessing the prices of land for a representative sample of all lots of land in Korea in reference to the standard comparison table of land prices for land price deciding factors, and subsequently the prices of land for all other plots are decided based on these representative prices. This method of setting prices is a strong form of land value capture, as none of the value increments are captured in these assessed prices.

For development projects (including those of station areas) that utilise land expropriation, a project operator estimates the final amount of compensation by appointing two certified public appraisers (who have passed a national certification examination) to appraise the final value of land based on the base land prices set by the government and any other price factors that are identified during physical examination. A land owner may also choose to appoint a third appraiser to evaluate the land, and the final price is determined by averaging the three appraisal values. The head of the local government is also required to establish and operate a Compensation Council to ease civil complaints and reflect inhabitants' opinions. The Compensation Council is a sort of autonomous advisory agency that is arranged for a public works project that covers an area of 100,000m² or greater and involves 50 landowners or more.

Land readjustment (or land substitution and replotting in Korea) is carried out on the basis of the *Urban Development Act*, which supersedes the *Land Compartmentalisation and Rearrangement Projects Act*. Under the *Urban Development Act*, land readjustment is carried out by first pooling land from all owners within the project boundary, and then subsequently redistributing land plots to landowners after development, excluding the public facilities sites and other land used to pay for the project costs. Historically, the ratio of land contribution was fixed so that 50% of readjusted land was retained by landowners, 30% was devoted to infrastructure, and 20% was allocated for sale to recover development costs. However, under the *Urban Development Act*, the area allocation in readjustment projects became flexible, albeit with specific clauses that specify the standards for infrastructure and facilities that must be met for project approval. This allows greater avenues for negotiation with land owners, and allows development projects to be more flexible and tailored to development circumstances. Current estimates of

Table 4.1. Strengths and weaknesses of different land acquisition approaches

	Land expropriation	Land readjustment	Hybrid approach
Strengths	<ul style="list-style-type: none"> – Ideal for land with few existing buildings and with low initial land prices – Relatively easy to provide infrastructure and public services – Quick payback of initial project expenses 	<ul style="list-style-type: none"> – Ideal for land with many existing buildings and with high initial land prices – Profits are shared with land owners and government – Mitigates civil complaints – Low initial costs – Easy to secure development funds through sale of claimed land 	<ul style="list-style-type: none"> – Ideal in a wide range of situations, especially when the project area contains a diverse set of land parcels – Flexibility in applying different acquisition methods depending on circumstances
Weaknesses	<ul style="list-style-type: none"> – Citizen backlash due to expropriation – Very high upfront costs – Delays due to difficulties in securing project costs – Profits mostly go to developers – Sensitive to real estate market fluctuations 	<ul style="list-style-type: none"> – High administrative burden – Typically takes longer for development to finish – Difficult to obtain adequate land for infrastructure (due to high burden for land owners) – Causes speculative behaviour in the land market 	<ul style="list-style-type: none"> – Backlash from land owners whose land is being expropriated – Typically takes longer to decide upon adequate land reduction rate when delineation between expropriated and readjusted land parcels is unclear

Source: Ministry of Land, Infrastructure, and Transport, Republic of Korea

land readjustment projects in the Seoul area given by the Urban Planning Bureau of the Seoul Government suggest that the land reduction rate (% infrastructure + % allocated for sale) hovers at around 40%, ranging from 35% to 68% depending on the type of development (Banerjee, 2019^[25]).

In spite of improved and more acceptable systems of land acquisition, the expropriation process is not free from problems. The *Urban Development Act* along with the *Development and Utilisation of Station Areas Act* allows for flexibility in cases of conflict. There may be situations where land prices are too high for public acquisition or where land owners are resistant to expropriation. In these situations, land readjustment can be used independently or in combination with expropriation methods. The general trend of urban development projects in Korea has shifted from sole expropriation or readjustment to hybrid methods that apply different approaches to the same development area depending on circumstances related to land prices and citizen resistance (Banerjee, 2019^[25]). Table 4.1 summarises the strengths and weaknesses of each approach.

Implementation

The *Urban Development Act* together with the *Development and Utilisation of Station Areas Act* lays down the legal basis for each of the stages and steps involved in land acquisition and project implementation for the development of station areas. The steps needed to be taken depend on whether the project is implemented based on land expropriation or readjustment, and are summarised in Figure 4.1 below. For hybrid approaches that utilise both methods, the sections of the development zone that correspond to each land acquisition method are developed based on their respective steps.

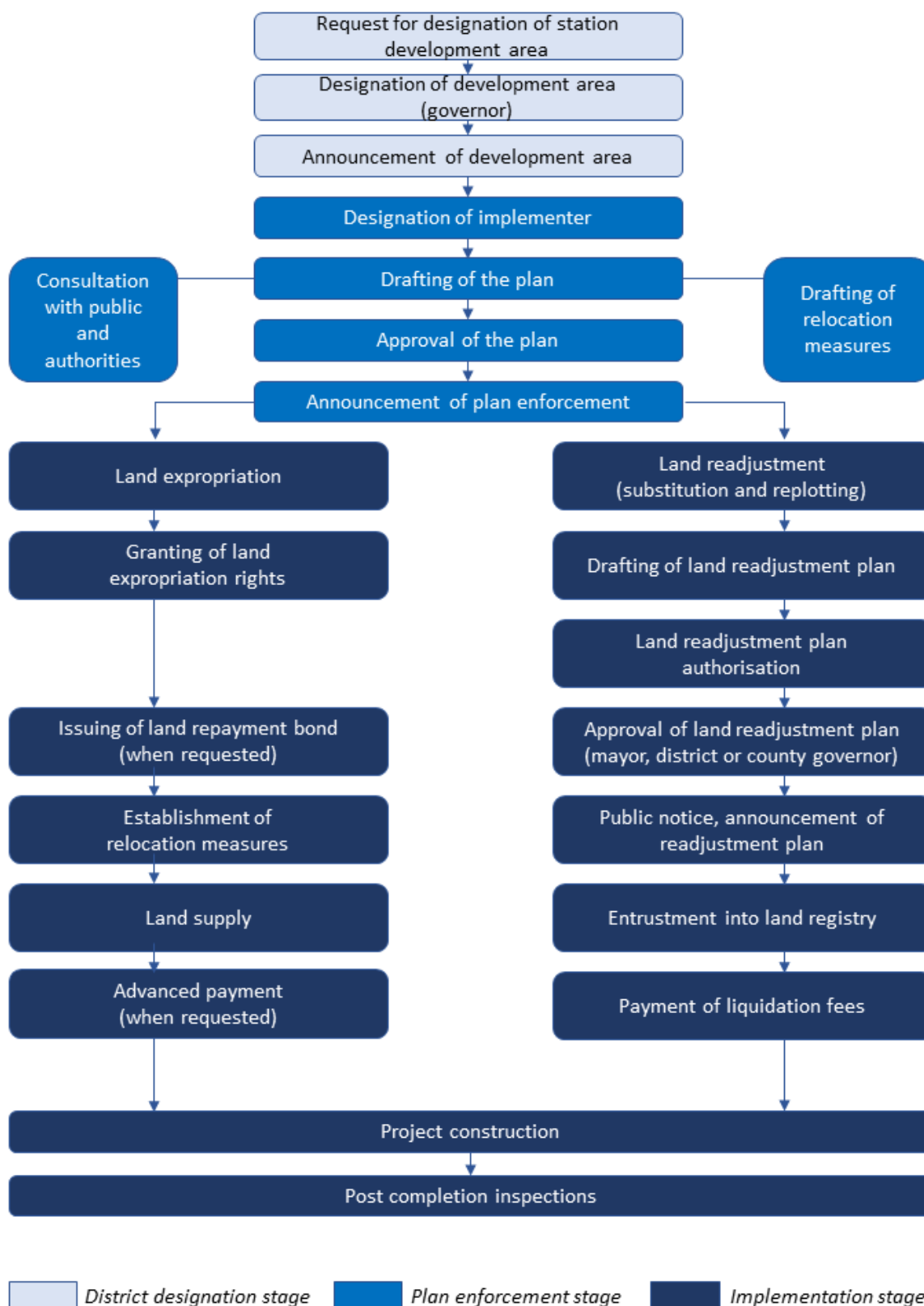
Station areas in Korea can be developed by a variety of different entities, including land owners themselves, a land owners' cooperative, or public entities such as the national or local government, public agencies, or public corporations (such as KORAIL, the Korea Railroad Corporation). Regardless of the implementing entity, law requires that landowners owning 2/3 of the total land area, and 1/2 of the total number of land owners must give consent for a project to commence. Priority to become the programme entity and implement the programme is given to the land owner and the cooperative. Only if this does not occur are the national or local governments, or other public entities allowed to implement the project. In addition, procedures regarding expropriation or readjustment—such as allocating substitute land plots or setting compensation levels—are carried out by the government regardless of the implementing entity.

Singyeongju station area development: land expropriation

Singyeongju (“New” Gyeongju) station is a relatively new railway station opened in late 2010 near the city of Gyeongju, in the North Gyeongsang province of South Korea, which is located in the Southeast portion of the Korean peninsula. Gyeongju, with a population of roughly 250,000, is a mid-tier city rich in historical heritage, with most of its economy being driven by tourism revenues. The Singyeongju station is on the Gyeongbu High Speed Railway line that connects the capital city of Seoul to Busan, Korea’s second largest city in the far south. The line is part of the greater Korea Train eXpress (KTX) high-speed rail system operated by KORAIL, a public corporation managed by the MLIT that serves as the national railway operator. The KTX system is a nation-wide railway system of 16 separate lines that was first launched in 2004, connecting the Seoul metropolitan area in the north to various key cities and destinations across the country.

Development of the Singyeongju station area started in late 2011 with designation as a station development area, and approval for the development plan was obtained in 2016. From the beginning, the area was set to be developed using land expropriation methods. The land expropriation plan was approved in 2016 alongside the development plan, and construction has been underway since 2018. Importantly, the expropriation of land constituted a strong land value capture mechanism, as land values were assessed

Figure 4.1. Procedures of a station area development project



Source: Modifications based on Banerjee (2019) and the *Urban Development Act*

using representative data on similar parcels, excluding any of the increments that arose due to the development of the station. The development of the station area is part of the nation-wide “Regional Development Plan for Fostering Regional Footholds” administered by the National Territorial Policy Committee and MLIT. The plan aims at creating a cohesive territorial strategy that fosters regional growth poles and establishes development strategies based on each region’s innate strengths, with a planned \$2.3 billion USD budget over the course of 10 years. The plan for the Singyeongju station area is to attract tourists and residents by better connecting Gyeongju with other nearby cities such as Busan and Gumi with the development of an advanced transportation hub integrated with attractive residential areas.

The development project is being implemented by the Singyeongju Station Area Public Development Corporation, a public-private partnership with Gyeongju city, North Gyeongsang province, and the Korea Land and Housing Corporation owning a 51% share of the company. The development area spans roughly 533,000 square metres, and has a planned resident capacity of 15,000. The total project cost is estimated at roughly \$240 million USD, of which roughly \$100 million was spent for land expropriation costs, another \$100 million was spent for developing the area itself, while the rest was spent on maintenance and other miscellaneous fees. Excluding land already having been owned by the public sector, this amounts to roughly \$200 USD paid per square metre of land to land owners. The national government did not provide any funds for the development of the station area, and all funds were provided for by the provincial government. Figure 4.2 shows the final land use plan for the station area.

Figure 4.2. Land use plan for Singyeongju station area



Source: North Gyeongsang province, Republic of Korea

Approval of the development plan for Singyeongju station was obtained in a relatively short period compared to other similar station area development projects in Korea. This was mainly due to two factors. First, the costs of expropriating land were relatively low, as the area initially consisted of a large share of rural plots with only a minimal amount of buildings that needed to be torn down. This allowed the budgeting plan to be approved in a timely fashion, as there were less worries about project feasibility. Second, the provincial and national governments played a large role in expediting administrative procedures, as development of the area was tied to a larger regional plan for which its successful implementation was in the interest of higher-level governments.

Gwangju station area development: a hybrid approach

The city of Gwangju is a suburb in Gyeonggi province that is located roughly 30 kilometres to the Southeast of Seoul, with a population of around 290,000. Due to its proximity to the Seoul metropolitan area, Gwangju station is part of the greater Seoul regional subway network, and is one of the stations on the Gyeonggang line, which connects it to other suburbs such as Pangyo and Yeoju. It is also in close proximity to the Gwangju city hall and the city centre.

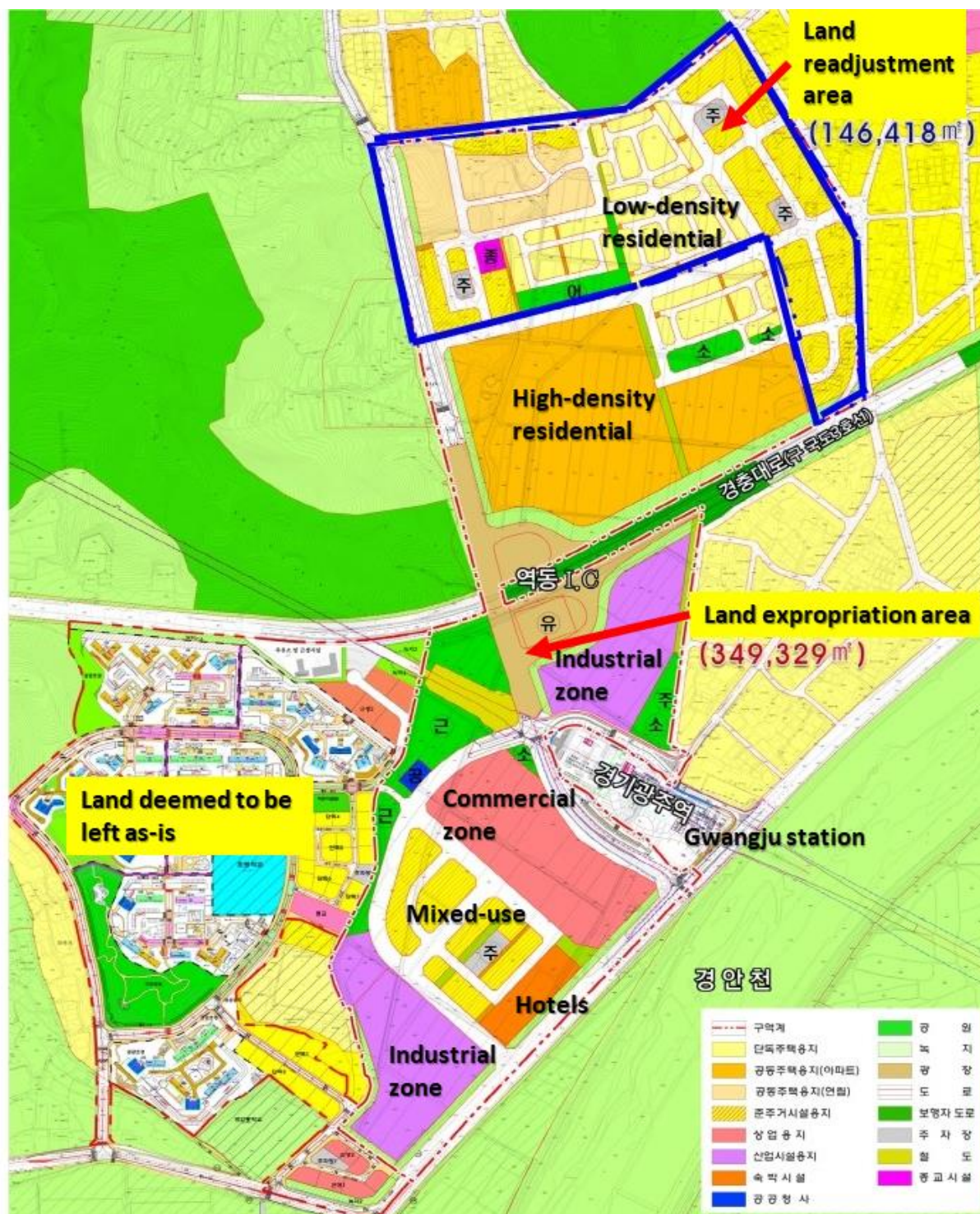
The station area development project was conceived and implemented by a consortium that involved the Gyeonggi Urban Corporation (a public corporation) and Gwangju city. Development started in early 2015 with an agreement between the provincial and city governments to redevelop the area surrounding the proposed Gwangju station, which was experiencing decline. As the subway station had yet to be constructed, the initiative from the beginning was to develop the subway station and its surrounding areas in a systematic fashion that would integrate the transport infrastructure with the commercial and residential areas already in place. The final version of the development plan was drafted and approved by 2018, while construction actually started beforehand in late 2017 after the subway station became operational in 2016. Currently, the project is expected to be finalised by late 2020.

The area surrounding Gwangju station was a mix between pre-developed urban areas that had existed since the late 1980s, and other areas that had not yet been developed. Thus, the land acquisition plan consisted of a hybrid approach that would use expropriation methods to acquire the land that was under-developed, and readjustment methods for the pre-developed urban areas. In addition, a portion of the development area was deemed to be left as-is for a few reasons. First, there was potential citizen unrest with regards to the project, as some land owners were in possession of properties that had only recently been developed. This posed the problem of not only an arduous consultation process with residents, but also heightened land acquisition costs if land expropriation methods were to be used. In addition, a large portion of the area surrounding the station had already been redeveloped as high-density residential, negating the need for additional densification.

The Gwangju station area development project consists of roughly 500,000 square metres of land (excluding areas deemed to be left as-is) and a planned population of around 8,000. Of the total development area, 350,000 square metres was obtained using expropriation methods, while 150,000 was obtained using land readjustment. With a total project cost of \$320 million USD, \$140 million was used for expropriation compensation, amounting to roughly \$400 USD of compensation per square metre of land. As was for the Singyeongju station area project, funding for the Gwangju station area development project came primarily from the provincial government. Due to the hybrid approach, approval of the development plan and land acquisition plan was obtained in a timely manner, and all land owners subject to expropriation had already received their compensation by 2018. For plots that were subject to land readjustment, the average land reduction rate—equal to the percentage of initial land that goes to infrastructure or is allocated for sale—was 25%. Figure 4.3 provides an illustration of the land use plan for the station area.

The development of the Gwangju station area is informative in its approach to land acquisition. The hybrid approach of applying land expropriation for under-developed sections and land readjustment for developed

Figure 4.3. Land use plan for Gwangju station area



Source: Gyeonggi Province, Republic of Korea

areas provides a lesson for developing areas near railways. As it is often the case that these areas consist of a mixture of high-density and low-density development, it is usually very difficult to impose only a single method of land acquisition. The example shows how in general, utilising expropriation for relatively cheap land and readjustment for more expensive plots can be an effective strategy. From a budget perspective, a hybrid approach is less expensive in that only a portion of land is expropriated, reducing upfront acquisition costs. In addition, utilising a flexible approach using both expropriation and readjustment allows the approval process to move in a timelier manner, as it becomes easier to tailor land acquisition to the demands of land owners. Nonetheless, utilising a hybrid approach also has its disadvantages, most notably in detracting from a coherent land use plan that integrates different portions of the project area into a common urban function.

Lessons from the case study

The experience of Korea provides valuable lessons on the usage of land expropriation and land readjustment for the purposes of developing areas in the vicinity of rail or subway stations. Korea is one of only a few countries that has in place a law specifically concerning the development of areas near railways. One advantage of such legislation is that it is possible to streamline the process of developing areas near railways so that development timeframes are minimised. In addition, relying on a specific law dedicated to areas near railways reduces confusion for both project implementers and land owners as the procedures and legalities regarding development are clearly laid out. Finally, as in the case of Korea, including in law provisions to ease land use regulations and streamline administrative processes for development projects in areas near railways can help ease the fiscal burden for local governments and make projects overall more feasible to plan.

The flexible approach of allowing land to be acquired using expropriation, readjustment, or a mix of the two approaches is also informative. Korea's long history of using both methods of land acquisition to develop areas near railways highlights key strengths and weaknesses of each approach. In general, utilising expropriation methods for relatively cheap land plots and readjustment methods for more expensive properties may be a viable solution to develop railways in urban areas where land prices vary substantially and many buildings already exist. Nonetheless, care must be taken for development to take place in a coherent manner, as expropriation and readjustment entail different limitations as to how the area can be developed. In addition, utilising other land value capture techniques such as betterment levies or development rights sale in addition to expropriation and readjustment can diversify the revenue base of development projects, resulting in greater profits and lower risks.

Land readjustment for railway construction in Japan

Institutional framework

Founded on the 1919 *City Planning Act*, Japan's urban planning framework was historically highly centralised. As urban sprawl became more prevalent, the *City Planning Act* was revised in 1968 to ensure sound and balanced development of national land by better regulating land conversion from rural to urban areas (Bureau of Urban Development of Tokyo Metropolitan Government, n.d.^[26]; Okazawa and Arai, 2019^[27]). The revised Act forms the current basis of the city planning system in Japan. It also delegates more planning powers to prefectural and municipal governments.

The urban planning system in Japan consists of three tiers: the national, prefectural and city levels. Under the Area Division System, the prefectural governments can designate a City Planning Area as either an Urbanisation Promotion Area (mainly land with an urbanisation plan in the near future) or Urbanisation Control Area (mainly land for agricultural/rural activities or natural conservation, as well as disaster-prone

areas). At the city level, municipal governments are in charge of *City Master Plans* that outline the visions, goals and policies for each urban sector. *City Master Plans* designate land use zones (consisting of 9 zones divided into 12 categories each with permitted Floor Area Ratios, Building Coverage Ratios, and maximum building heights), urban facilities (such as parks, roads, schools, etc.), and urban development projects (such as land readjustment projects or urban redevelopment projects), along with other land use regulations (Ministry of Land, Infrastructure and Transport, 2003^[28]).

In Japan, land readjustment has been performed in accordance with the *Land Readjustment Law* ever since its enactment in 1954. The law mainly deals with the rights and obligations of concerned parties as well as the preparation, approval, implementation and completion process of land readjustment projects. The *City Planning Act* provides the legal basis for land readjustment, allowing it to be utilised as a development tool for particular urban plans (Arai, Sakaki and Chen, 2019^[29]). However, the integrated use of land readjustment for railway line development was only streamlined into legislative measure with the enactment of the *Special Urban Rail Development Promotion Special Measure Act* (hereafter the *Housing-Railway Integration Law*) in 1989.

Housing-Railway Integration Law

Before the enactment of the *Housing-Railway Integration Law*, development along new railway lines normally occurred after line construction had been completed. Except for cases where development projects were undertaken by the railway companies themselves (such as Tokyu Corporation's private "Garden City" community along their Tama Denentoshi Line), uncoordinated real estate development after railway construction tended to result in disorderly and uncontrolled development.

Under the *Housing-Railway Integration Law*, municipal and prefectural governments as well as authorised public housing agencies such as the Urban Renaissance Agency can designate the development zones where land readjustment is to be used for the construction of new railway stations. The governments and/or agencies responsible for land readjustment are also given authorisation to assemble and consolidate readjusted land for the development of new housing units and to secure right-of-way for new railway construction. Parts of the assembled land are then transferred to the railway construction agency at the assessment price for the construction of the new railway line. The Law also obliges the concerned regional governments and public entities to provide essential public facilities for the development of residential areas within the development zone (Kurosaki and Ogura, 2013^[30]). The Tsukuba Express was the first large-scale suburban railway development implemented in accordance with the *Housing-Railway Integration Law*.

Implementation

Tsukuba Express (TX)

Despite being made up of roughly 48 public, semiprivate, private and privatised railway agencies, the Tokyo metropolitan area's railway lines are widely considered to be one of the world's most seamlessly connected rail networks. Opened in 2005, the 58.3 kilometre long high-speed TX Line connects the centre of Tokyo (via Akihabara station) to Tsukuba Science City in the Ibaraki Prefecture. Apart from serving the purpose of relieving a portion of the burden placed on transportation infrastructure in the north-eastern part of the Tokyo metropolitan area, the TX Line and its stations also have the potential to provide new residential areas and promote industrial and commercial activities through development of areas in the vicinity of planned stations. Whereas earlier developments along railway lines had incurred tremendous costs especially in land acquisition and interest payments, areas near TX railways managed to creatively combine land readjustment mechanisms with zero-interest loans and public assistance programmes to help drive down construction costs, estimated at around ¥810 billion (\$7.5 billion USD) (Suzuki et al.,

2015^[5]). In particular, more than 80% of funding came from zero-interest loans (40% from the Development of Metropolitan Railway Fund and 40% from regional governments and organisations), 14% from government contributions and 6% from the Fiscal Investment and Loan Programme (Kurosaki and Ogura, 2013^[30]; Japan Local Government Centre, n.d.^[31]). While land readjustment was not specifically used to cover the railway's construction cost, the mechanism was instrumental in offsetting significant acquisition cost for right-of-way of the TX Line.

Figure 4.4. Stations along the Tsukuba Express



Source: (Metropolitan Intercity Railway Company^[32])

Differing from earlier private railway developments, land readjustment for TX railways was collectively carried out by various public entities, including the Urban Renaissance Agency, Tokyo Metropolitan government, and prefectural and municipal governments. Land parcels along the planned railway line were assembled and consolidated, and portions of land reserved for future sales were sold to the Japan Railway Construction Transport and Technology Agency (JRTT) at pre-development market prices for railway construction. After construction was completed, JRTT transferred the rights to railway infrastructures along with the land upon which these infrastructures were built to the Metropolitan Intercity Railway Company (MIR). Established in 1991 as a joint venture between the public and private sector, MIR is responsible for TX Line operations. The company's stakeholders include the Tokyo Metropolitan Government, Saitama Prefecture, Chiba Prefecture, Ibaraki Prefecture, City of Tsukuba, Adachi Ward (within Tokyo), and other private companies. As a Class 1 licensed enterprise, MIR not only provides rail services but also owns the

railway vehicles, infrastructure, and the land upon which these infrastructures were built. The income from railway operations is expected to finance loans and other investments.

Table 4.2 shows the main land readjustment projects along the TX Line.

Table 4.2. Major land readjustment projects along the TX Line

Regional Government	City & Ward	Name of the Region	Area (m ²)	Executor of the project
Tokyo Metropolitan Government	Chiyoda Ward	Around Akihabara Sta.	90,000	Tokyo Metropolitan Government
	Adachi Ward	Adachi Ward Around Rokucho 4 Chome	69,000	Tokyo Metropolitan Government
Saitama Prefecture	Yashio City	Yashio-South-West	99,000	Saitama Prefecture
		Yashio-South-Central	72,000	Urban Renaissance Agency
		Yashio-South-East	88,000	Yashio City
	Misato City	Misato-Central	115,000	Urban Renaissance Agency
Chiba Prefecture	Nagareyama City	Ki	68,000	Chiba Prefecture
		Nshihirai-Hiregasaki	52,000	Nagareyama City
		Around Athletic Park	232,000	Chiba Prefecture
		New City District	286,000	Urban Renaissance Agency
	Kashiwa City	Kashiwa-North-Central	273,000	Chiba Prefecture
		Kashiwa-North-East	170,000	Urban Renaissance Agency
Ibaraki Prefecture	Moriya City	Around Moriya Sta.	39,000	Moriya City
		Moriya East	40,000	Association
	Tsukubamirai City	Ina • Yawara	275,000	Ibaraki Prefecture
	Tsukuba City	Kayamaru	293,000	Urban Renaissance Agency
		Shimana-Hukudatsubo	243,000	Ibaraki Prefecture
		Kamikawarazaki-Nakanishi	168,000	Ibaraki Prefecture
		Katsuragi	485,000	Urban Renaissance Agency
		Nakane-Kondadai	190,000	Urban Renaissance Agency

Source: Metropolitan Intercity Railway Company's Annual Report in 2011, cited by (Kurosaki and Ogura, 2013^[30])

Implementation: The Misato Chuo Station project

Situated in the Saitama Prefecture north of Tokyo, Misato Chuo was one of the TX stations where land readjustment was used to facilitate the construction of the suburban railway as well as the development of areas surrounding these stations. Details of project implementation for Misato Chuo station was documented in Japan International Cooperation Agency Research Institute's publication (Souza, Ochi and Hosono, 2018^[33]), using information provided by Shin-ichi Aoki from the Urban Renaissance Agency. The project was implemented as follows:

1. The Urban Renaissance Agency, which was responsible for the implementation of land readjustment, proposed a budget containing detailed expenditure items (such as costs for research, removal/relocation, construction) and revenues (such as different investment sources, government subsidies, and the sale of reserve lands). For Misato Chuo, 41% of revenues came from national, prefectural, and municipal subsidies while 57% came from the sale of reserve lands.

Table 4.3. Expenditure and revenue for land readjustment project in Misato Chuo station

Expenditure	in million JP¥	in \$USD\$	Revenue	in million JP¥	in \$USD
Construction costs	8,918	84,101	National subsidies	11,192	105,546
Removal and relocation costs	19,242	181,462	Prefecture subsidies	9,307	87,770
Infrastructure and soil preparation	12,059	113,722	Municipal subsidies	4,850	45,738
Research and project costs	6,950	65,542	Revenue from the sale of reserve lands	35,092	330,936
Miscellaneous and office costs	7,390	69,691			
Indemnity and interest	7,002	66,032	Other revenues	1,120	10,562
Total	61,561	580,553	Total	61,561	580,553

Note: The cost of construction for Misato Chuo station is not included in the table. Conversion is based on 2020 exchange rate where 1 USD = 106.039 JP¥

Source: Aoki (2004) updated by the Ministry of Land, Infrastructure, Transport and Tourism of Japan, cited by (Souza, Ochi and Hosono, 2018^[33])

2. As part of the financial plan and feasibility study, the Urban Renaissance Agency formulated a land evaluation system for concerned rights holders (both landowners and leaseholders). The plan established, among others, the overall contribution of land, contribution for land reserved for future sale, compensation for loss in land value, and other equity collection or payments, if any.

Table 4.4. Land use before and after the project

Category	Before the project		After the project	
	Area (m ²)	(%)	Area (m ²)	(%)
Public area				
Road system	82,285	7.2	267,461	23.3
Parks and green areas	12,329	1.1	40,812	3.6
Streams, rivers and water resources	65,752	5.7	65,294	5.7
Subtotal	160,366 (M)	14.0	373,567 (N)	32.5
Private area				
Private properties	987,667 (A)	86.0	614,329 (E)	53.5
Reserve land	-	0.0	160,137 (R)	13.9
Subtotal	987,667	86.0	774,466	67.5
Total (M + A) (N + E + R)	1,148,033	100	1,148,033	100

Note: M = total amount of land for public area before the project; N = total amount of land for public area after the project; A = total amount of land for private area before the project; E = total amount of land for private area after the project; R = amount of land reserved for future sales.

Source: Aoki (2004) updated by the Ministry of Land, Infrastructure, Transport and Tourism of Japan, cited by (Souza, Ochi and Hosono, 2018^[33])

3. The proposed replotting plan increased public areas from 14% to 32.5%, entailing a decrease in private areas from 86% to 67.5%. In order to maintain financial viability, 13.9% of land was also set aside as reserve land, with the aim of bringing in JP¥ 35 billion (\$ 330 million USD) in revenues from land sales.
4. The Urban Renaissance Agency established an overall contribution ratio, representing the total amount of private land being converted to land for public areas and land reserved for future sales. The ratio is calculated by dividing the sum of land increase for public areas plus reserve land for future sales (N – M + R) by the total area of private land before the project (A), and multiplied by 100.

$$\text{Overall contribution ratio (d)} = (N - M + R) / A = (373,567 - 160,366 + 160,137) / 987,667 * 100 = 37.8\%$$

For Misato Chuo, the overall contribution ratio was 37.8%. However, this ratio only represented an average land contribution ratio, which would eventually be adjusted for each rights holder by taking into account roads and land conditions as well as proximity to public facilities of their original and replotted lots.

5. After the overall contribution ratio was established, the Agency determined the expected land value increase ratio (y), calculated by dividing the estimated value per unit area after the project, JP¥

Table 4.5. Calculation for overall land contribution ratio

Private area		Contribution			Contribution ratio		
Before the project	After the project	Increase in public areas	Reserve land	Total	Public area	Reserve land	Total ratio
(A)	(E = A – P – R)	(P = N – M)	(R)	(P + R)	(P/A)	(R/A)	d = (P+R)/A
987,667 m ²	614,329 m ²	213,201 m ²	160,137 m ²	373,338 m ²	21.6%	16.2%	37.8%

Note: P = amount of land contributed for public area; d = overall contribution ratio

Source: Aoki (2004) updated by the Ministry of Land, Infrastructure, Transport and Tourism of Japan, cited by (Souza, Ochi and Hosono, 2018^[33])

295,000 per m² (\$2782 USD per m²) by the value per unit area before the project, JP¥ 151,000 per m² (\$1424 USD per m²). The ratio was established at 1.954, meaning an expected increase of 95.4% in land values after project completion.

6. The Agency determined the proportional ratio between the value of all private land (except for land reserve for future sales) after the project over the value of all private land before the project.

$$\text{Proportional ratio (Pr)} = V' / V = (E * e) / (A * a)$$

In other words, proportional ratio can also be calculated based on the contribution ratio and the expected land value increase ratio

$$Pr = (1 - d) * y = (1 - 37.8\%) * 1.954 = 1.215$$

Table 4.6. Calculation for proportional ratio

Before the project			After the project			Ratio	
Total private area (m ²)	Price per m ²	Total value of private area	Total private area (m ²)	Price per m ²	Total value of private area	Land value increase ratio	Proportional ratio
(A)	(a)	(V = A * a)	(E)	(e)	(V' = E * e)	(y = e / a)	(Pr = V' / V)
987,667	JP¥ 151,000 (\$1424 USD)	JP¥49,139,227,000 (\$1,406,437,808 USD)	614,329	JP¥ 295,000 (\$2782 USD)	JP¥ 181,227,050,000 (\$1,709,063,278 USD)	1.954	1.215

Note: V = total value of private area before the project; V' = total value of private area (excluding reserve land) after the project; a = price per m² before the project; e = price per m² after the project; y = ratio of expected land value increase after the project; Pr = proportional ratio. Conversion is based on 2020 exchange rate where 1 USD = 106.039 JP¥

Source: Aoki (2004) updated by the Ministry of Land, Infrastructure, Transport and Tourism of Japan, cited by (Souza, Ochi and Hosono, 2018^[33])

7. The proportional ratio (1.215), the pre-development value and area of the original plot, and the estimated value per unit area of replotted land were used to calculate the size of replotted land for individual rights holders.
8. The necessary amount of government subsidies were also determined based on expected revenues and development costs.
9. After the financial plan and feasibility study had been elaborated, the Urban Renaissance Agency mobilised the support of concerned rights holders to build consensus around these plans.

10. The draft project plan and related proposals were submitted to the Ministry of Land, Infrastructure, Transport and Tourism for approval, subject to potential amendments based on inspections and written complaints.
11. Once approved, representatives of rights holders were elected to form the land readjustment council, which also included other experts and advisors appointed by the Urban Renaissance Agency. The council was in charge of the provisional replotting plan (where rights holders were temporarily relocated for construction purposes), the designation of reserve land, and final replotting plan.
12. Upon completion of construction work, the Urban Renaissance Agency submitted the final replotting plan for public inspection and prefectural approval.
13. Individual rights holders registered their new plots and made/received equity payments accordingly.

In short, the project generated over \$US 330 million from the sale of reserve private land to cover land readjustment cost, and increased public areas by 18.5%. Land held by private owners after readjustment was 21.5% higher in value than land held before readjustment, although it was on average 37.8% smaller. While land readjustment was not specifically used to cover the cost of railway construction, it was crucial in assembling the right-of-way and ensure integrated development around the Misato station. Approved in 1998, the authorities took 4 years to convince rights holders and another 16 years to complete the land readjustment project. Generally, land readjustment project took a long time to complete due to local authority's focus on consensus building at every stage of development. Many municipal governments throughout Japan have dedicated a significant amount of time and efforts in convincing affected rights holders about the benefits of land readjustment. For example, the Omiya local governments organised 935 information sessions in the span of 8 years to persuade affected rights holders of 13 land readjustment projects. While the process required a lot of patience and commitment from the local authority, it has significantly transformed the urban landscape of Misato City. Initially made up of agriculture land, the city has seen remarkable growth in the city centre as well as an increase in residential area. The Misato Chuo station area is now surrounded by shopping malls, high-rise apartment buildings, parks, a nursery, a school, and numerous other facilities.

Lessons from the case study

Under a freehold system where the majority of land is privately owned, land readjustment as an urban development method presents several benefits for the government. In times of strained public fiscal resources, purchasing land outright for public facilities and infrastructures can be prohibitively costly for the government. Through land readjustment, public entities are able to assemble land to easily obtain right-of-way and develop coherent land use patterns that improve urban functions.

Compared to expropriation or eminent domain, land readjustment can significantly reduce the capital costs of land acquisition for the construction of infrastructure in both suburban and central areas. Land readjustment also represents a softer development approach that minimises the infringement of property rights. More than a value capture instrument, land readjustment is also beneficial for distributive purposes, as the costs and benefits of development are fairly distributed among stakeholders through consensus building (Suzuki et al., 2015^[5]). While landowners bear a portion of the cost of development in the form of land contribution, they also reap the benefits of private land value increments thanks to improvements in the area. In addition, land possesses sentimental values upon which social and cultural networks are built. By ensuring that landowners are returned a portion of their land close to the original lot, the process seeks to minimise social and physical displacement, and is argued by Sorensen (2009) to “enhance and enrich places based on social networks instead of obliterating them.” (Souza, Ochi and Hosono, 2018^[33]) Unlike expropriation, land readjustment projects, when judiciously carried out with proper protocols, can help governments avoid controversial social tensions and drawn-out lawsuits.

Unlike other LVC instruments, the average amount of land contribution and equity payments are not decided unilaterally in Japan. Guided procedurally by the 1954 Land Readjustment law, the process is based extensively on thorough negotiation and consensus building. Article 18 of the law stipulates that the consent of at least two-thirds of landowners and leaseholders respectively are required and that the total land area of consented rights holders shall amount to at least two-thirds of the proposed project area (with the exception of projects led by the public sector where such requirements may not apply). In practice however, the consent of almost all rights holders are typically sought (Suzuki et al., 2015^[5]). While the consensus building process can be time-consuming and administratively intensive, when done properly land readjustment results in a win-win situation for both the government and landowners. It also minimises citizen unrest as land owners are not deprived of their properties and share profits to a certain degree.

The example of financing transit-oriented development through land readjustment in Japan also shows the importance of visionary planning supported by well-established legal frameworks. Besides integrating land readjustment and railway construction into an overarching legislative framework, the Housing-Railway Integration Law also ensures comprehensive development of built environments through the creation of high-quality, mixed-use areas and the proper provision of essential public services.

Expropriation for the Grand Paris Express in France

Note: This section primarily discusses expropriation. While expropriation is not a land value capture instrument in itself, it is important to facilitate the construction of large infrastructure projects. Moreover, as the case below shows, land value capture can be incorporated into expropriation procedures through the process of determining compensation payments.

The Grand Paris Express

The Grand Paris Express is a set of railway lines that is under construction in the Paris metropolitan area (Figure 4.5). Its centrepiece is a circular line that creates a ring around Paris and has a length of approximately 75km. In total, 200km of new lines will be built for the Grand Paris Express, which will almost double the length of the existing Paris rail network. The new lines will be mostly underground and will be serviced by 68 new stations and 7 technical centres (Société du Grand Paris, 2020^[34]). The project is managed by the Société du Grand Paris, a public company that has been created for this purpose and is in charge of the budget of approximately EUR 35 billion. Besides the creation of the new rail lines, the Société du Grand Paris was also tasked with the extension of line 14 between Saint-Lazare and Mairie de Saint-Ouen, the Eole project (RER E) and the Mobilisation Plan. In 2013, the initial budget was fixed by the then Prime Minister at EUR 25.5 billion. The funding package would mainly come from tax revenues, public subsidies (from both state and local authority), and recourse to loans.

Starting 2014, the Société du Grand Paris was expected to receive more than EUR 500 million annually from three sources tax revenues:

- Local Office Tax (TLB): Initially, the state and the Société du Grand Paris had split the revenues from this tax on commercial real estate owners. Since 2014, all tax revenues were exclusively transferred to the latter.
- Special Infrastructure Tax (TSE): This represents an additional tax on top of the Housing Tax and Property Tax (on built or non-built properties), paid by all taxpayers and companies in the Greater Paris Region.
- Flat-rate Tax on Network Companies (IFER): Part of this tax, levied on the rolling stock deployed on the railway, RER A and RER B of the state-owned public transport operator RATP (Régie Autonome des Transports Parisiens), is used to finance the Grand Paris Express.

Depending on their financial situation, the Société du Grand Paris could draw from additional financial support from the state, up to EUR 1 billion. If necessary, the state may also call on local authorities to contribute up to EUR225 million. Meanwhile, the Société du Grand Paris is expected to resort to loans. (JLL, n.d.^[35]) By the end of 2017, the budget estimation substantially increased to 38.5 billion, from 25.5 billion in 2013 (Cour des comptes, 2017^[36]).

Large-scale construction on many lines has started between 2017 and 2019. Significant parts of the network are scheduled to enter service for the Paris Olympic Games in 2024 and construction is supposed to be mostly completed by 2030. As of late 2019, 12 tunnel-boring machines were working simultaneously on the tunnels for the various lines. Nevertheless, it remains unclear to what degree the ambitious timetable of the project can be kept.

The Grand Paris Express has multiple objectives. It is supposed to relieve strains on Paris's largely radially organised public transport network. Journeys within the Paris metropolitan area often have to go through one of a few hubs within central Paris, which are at their capacity limit. The project is supposed to reroute some of this traffic around the centre to free up capacity in central Paris. In parallel, it will drastically improve the connectivity between inner-suburbs and will shorten journey times for many suburban travellers.

Moreover, the Grand Paris Express aims at rebalancing economic development within the metropolitan area, which is currently concentrated in its western centre. For example, it connects a large greenfield site on the Plateau de Saclay in the south of the metropolitan area with Paris. Thereby, it enables the development of a large high-tech cluster comprised of universities, research institutes and businesses in the area. In the north and the east of the metropolitan area, the Grand Paris Express is supposed to support the regeneration of working class residential and former industrial neighbourhoods. In these areas, major urban redevelopment projects are ongoing or planned around the new stations of the Grand Paris Express.

Enabling the construction of new housing that is well connected to public transport is another major objective of the Grand Paris Express. Since 2010, the Paris metropolitan area has had a population growth rate of only 0.43% annually. This is much lower than the average of 0.76% among the 10 next largest metropolitan areas in France even though the Paris metropolitan area is by far the economically most successful metropolitan area of the country (OECD, 2020^[37]). A shortage of affordable housing within reasonable commuting distance to employment centres is a likely factor for this lacklustre population growth. To ameliorate this, it is planned to build 110 000 housing units on 186 sites as part of the Grand Paris Express project (Société du Grand Paris, 2019^[38]). 26 000 of those units have already been built.

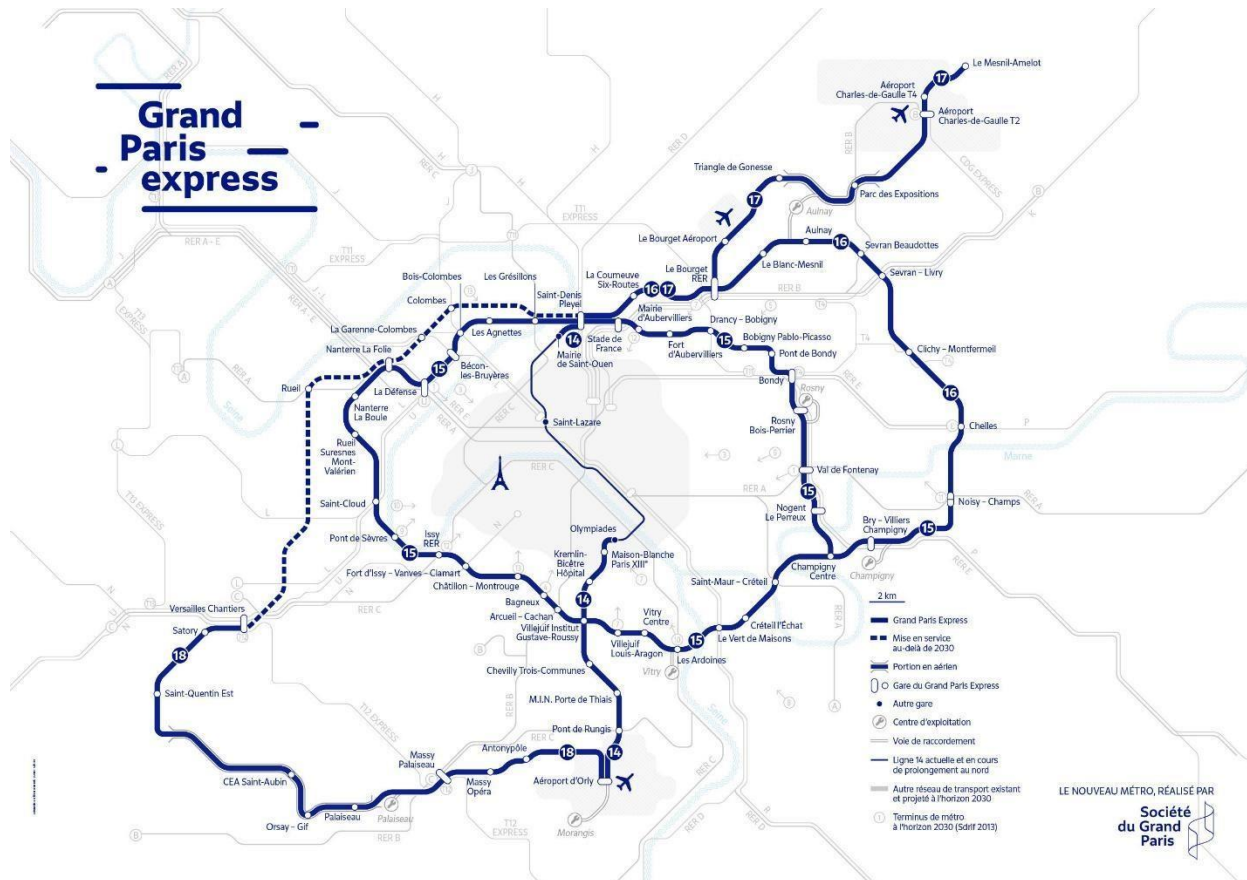
Expropriations in France

Expropriations have long been a clearly defined instrument in French law. Article 17 of the Declaration of Human and Civic Rights that was passed during the French Revolution in 1789 states:

Since the right to Property is inviolable and sacred, no one may be deprived thereof, unless public necessity, legally ascertained, obviously requires it, and just and prior indemnity has been paid. (Conseil Constitutionnel, 2002^[39]).

Today, expropriations can take place if they are in the public interest, whereby public interest is broadly defined and can cover a wide range of projects. Three criteria need to be met. The project must respond to an actual need or an opportunity, the expropriations must be necessary for the project to happen, and the benefits must outweigh the costs. As there are no specific justifications for expropriation defined in law, the scope of expropriations depends on judicial interpretation and has evolved over time.

Figure 4.5. Planned extent of the Grand Paris Express



Source: (Société du Grand Paris, 2020^[34])

Due to the breadth of these criteria, expropriations can take place for a wide range of reasons including urban development and redevelopment projects, public infrastructure projects, public safety and national defence. For the development of the Grand Paris Express, this implies that expropriation can be used not only for the construction of the infrastructure itself. Expropriation is also possible for the wide range of associated urban development and redevelopment projects that are associated with it.

Entities that can expropriate

The following entities can expropriate (Ministère de l'Intérieur, 2015^[40]):

- The state
- Subnational governments and their collective
- Public entities (établissement public)
- Private entities under some conditions (e.g. when they are charged with providing a public service or carrying out a public function)

The two phases of the expropriation procedure

The expropriation process is structured into two phases; an administrative phase and a judicial phase (Service Public, 2020^[41]). If expropriation goes along with changes to land use plans, the administrative phase has to be preceded by a public consultation regarding these changes.

Administrative phase of the expropriation process

The administrative phase of the expropriation procedure is again structured into two phases. The initial phase includes a general study that defines the perimeter and provides the reasons for the any necessary expropriations. It is conducted by a publicly appointed investigator and gives the public the opportunity to respond. Based on the outcome of the study, the prefect declares the public utility of the project. Once public utility has been declared, the administrative procedure of the expropriation process moves into its second phase. The parcels that are subject to expropriation are determined in a second public study and a detailed plan of the expropriated areas is prepared. Owners are informed that their properties are included in the areas scheduled for expropriation. The administrative phase of the expropriation procedure ends once these steps have been completed and the prefect issues a declaration of expropriation.

Judicial phase of the expropriation process

The judicial phase of the expropriation procedure starts with the expropriating public body requesting an expropriation notice from an administrative judge. Once this notice is issued, the expropriated owner is prohibited from selling or mortgaging the property. The expropriating entity proposes a compensation to the expropriated owner. The expropriated owner can accept the offer or enter into negotiations by making a counter-offer. If the parties fail to agree to a mutually acceptable compensation, the compensation will be decided by an administrative judge.

Valuation of expropriated properties

In the absence of an amicable agreement on a compensation, an administrative judge decides the amount of compensation. It is supposed to correspond the actual value of the property one year prior to the start of the administrative enquiry into the public utility of the project. A special provision on valuations for expropriations for the Grand Paris Express has been included in the respective law. Instead of using one year prior to the start of the administrative procedure as the reference date, the reference date was set to one year prior to the publication of the general study for the Grand Paris Express (see Box 4.1 below).

Box 4.1. Expropriation and land value capture

Land value increments from infrastructure developments can be captured during expropriations in France because the reference date for valuation is set prior to the publication of the planned project. A special provision has been inserted in the law on expropriations to ensure that this land value capture element works also in the case of the Grand Paris express:

- Expropriated land owners are compensated according to the actual value of the property. However, the reference date for the valuation of expropriated property is one year prior to the start of the administrative expropriation procedure. This ensures that the government does not have to pay expropriated owners for increases in property value that are due to the public improvement for which the expropriation takes place. As the value increase is captured by the government, expropriation under these conditions serves as a land value capture instrument.
- The Grand Paris Express is constructed over roughly two decades and expropriations take place throughout this period. In many cases, the location of new lines and stations have been known long before the administrative expropriation procedure has started and land values of expropriated land might have gone up correspondingly. To ensure that land value increases from the Grand Paris Express can nevertheless be captured, a special clause has been inserted. For expropriations related to the Grand Paris Express, the reference date for valuations was set to one year prior to publication of the public dossier that contained the location of the new lines. Thus, compensation payments do cover the price increases in anticipation of the new lines.

Expropriations for the Grand Paris Express

Expropriation for infrastructure directly related to the Grand Paris Express

The French prime minister declared the public utility of the central parts of the Grand Paris Express in 2016. The decree obliged the Société du Grand Paris to undertake all necessary expropriations within a 15 years' period.

Expropriations are possible within a corridor of approximately 100m along the tunnels with extensions for stations and other important sites. Land acquisition is necessary for stations, secondary access points, ventilation shafts, maintenance centres as well as for the approximately 20% of the project where rail lines run over ground. Moreover, compensation has to be paid where land values are negatively affected by tunnels underground (see below).

The Société du Grand Paris expects to spend €1.43 billion on land acquisition (Cour des comptes, 2017^[36]). While no further breakdown into spending on amicable acquisitions and spending on compensation for expropriations is provided, it is likely that expropriations make up an important fraction of the total amount. Moreover, many of the amicable transfers of land are likely to happen because owners know that they would be expropriated otherwise. For the western part of the project alone, it is estimated that approximately 1,500 parcels are potentially subject to expropriation (Préfecture des Hauts-de-Seine, 2019^[42]), while 1,800 parcels are affected by the southern part (Département des Hauts-de-Seine, 2015^[43]).

Importantly, the right for expropriations is interpreted broadly. Large mixed-use developments that contain residential and/or commercial developments will be attached to many stations. The area of these developments can considerably exceed the actual area needed for the transport infrastructure, but expropriations are nevertheless possible.

Moreover, land can be expropriated for other purposes, too. For example, land is expropriated and residential buildings are demolished for the construction of temporary container homes to house construction worker employed on the site (Préfecture des Hauts-de-Seine, 2019^[42]). In other cases, buildings are expropriated because they are too close to a construction site. However, the buildings will not be demolished, but will instead be used for other purposes by the Société du Grand Paris (Lesueur, 2020^[44]). There is also flexibility in terms of timing. Expropriations can take place in multiple stages as long as they remain within the perimeter of the project as defined in the general study. For example, two additional rounds of expropriations have taken place for the construction of the station at Perreux-sur-Marne, as the project plans and the requirements of the construction site have changed (94 Citoyens, 2019^[45]).

Expropriation for urban redevelopment in proximity of new stations

The construction of the Grand Paris Express is a driver for broader urban redevelopment in the vicinity of stations. They are initiated by local governments and other public entities that are usually independent from the Société du Grand Paris. While these projects are motivated by the construction of the Grand Paris Express, they are legally separate from it and are treated as independent projects. Nevertheless, they are frequently declared to be of public utility, which makes expropriations possible.

An urban regeneration project in the suburb of Le Bourget in the northeast of Paris is an example of such a project. Le Bourget is situated close to major transport infrastructure, including an airport, three major roads and a rail line that cut off many neighbourhoods from surrounding areas. Its urban fabric is characterised by a fragmented mix of residential, old industrial and commercial land uses.

The municipality plans to use the construction of a station for the Grand Paris Express to redevelop a nearby neighbourhood that is currently isolated from surrounding areas and underdeveloped. For this purpose, it has created a so-called concerted development zone (zone d'aménagement concerté) and designated an urban regeneration area of 8ha close to the future station of the Grand Paris Express (Paris

Terres d'Envol, 2018^[46]). The project aims at creating a new centre of economic activity, improving the connections of the neighbourhood to the surrounding areas and building new housing. In total, it will create approximately 1 000 housing units and 55 000m² of office space.

At the time of the creation of the concerted development zone in 2018, the area encompassed by it was used for light industry and diverse commercial activities. The process to declare the public utility of the project to enable expropriations was initiated the same year. At the time of writing, the process is ongoing and the formal declaration of public utility for the project has not been made. While no expropriations have taken place, there is little doubt that they will eventually take place (Lieures, 2019^[47]).

Servitudes instead of expropriations for land crossed by tunnels

No expropriations have to take place for land that is crossed by the tunnels of the Grand Paris Express as long as the land aboveground is not affected by it. A reform in 2015 has created the possibility to place servitudes on lands that require landowners to tolerate the construction of tunnels for rail transport on their land (Loi n°2015-992 du 17 août 2015 - art. 52 (V)). The servitudes require tunnels to be at least 15m below ground and do not create unreasonable disturbances for affected landowners. Compensation for any associated loss of value from servitudes has to be paid. Servitudes can be imposed by the organisation in charge of developing the project (e.g. the Société du Grand Paris).

Lessons from the case study

Expropriations are an important instrument for infrastructure development and urban development in France. While the administrative and judicial process is complex, it is clearly defined and offers public authorities significant scope for expropriations. If it is followed carefully, public authorities can expropriate land with relatively little difficulty.

Expropriations are facilitated not only by a clear and accommodating legal framework, but also by the public acceptance of expropriations as a necessary instrument of public policy. Media reports on the topic are rare, which indicates that expropriations are not considered newsworthy in most instances. Likewise, transcripts from public hearings on expropriations show that the need for expropriations is generally not questioned (Préfecture des Hauts-de-Seine, 2019^[42]). As a consequence, it is not surprising that there is little political resistance to the use of expropriations.

For the construction of the Grand Paris Express, expropriations have been a crucial tool. For the western and southern half of the project alone, an estimated 3300 properties are potentially subject to expropriations. It is unlikely that a project of this magnitude could be realised if authorities could not resort to expropriation to acquire the necessary land.

Value capture mechanisms for the construction of Crossrail 1 in the United Kingdom

Crossrail 1 (Elizabeth Line)

Crossrail is a new railway under development in the United Kingdom. Formally known as the Elizabeth Line, Crossrail (more commonly referred to as Crossrail 1, as opposed to the newly planned Crossrail 2) stretches over 100 kilometres from Reading in the far west to Shenfield to the far east, with two shorter branches reaching Heathrow and Abbey Wood. The entire line is expected to serve an estimated 200 million passengers across its 41 stations annually.

In 2001, Transport for London (TfL) and the Department for Transport (DfT) created a 50/50 joint venture called Cross London Rail Links (later known as Crossrail Ltd) to promote the construction of Crossrail, and

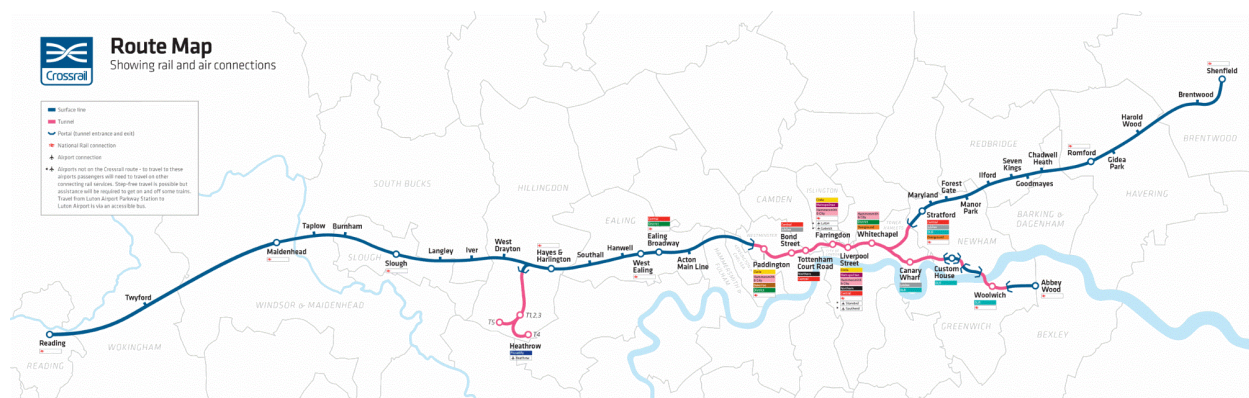
the funding package was agreed in 2007. With the governance structure and funding arrangements in place, Crossrail Ltd was tasked with the construction of Crossrail in December 2008 (Greater London Authority, 2010^[48]). At the same time, Crossrail Ltd also became a fully owned subsidiary of Transport for London, and will be run by it as part of London's integrated transport network once construction is complete.

Authorised by the *Crossrail Act* in July 2008, construction of the project began in May 2009 on the central section and connections to the existing lines. The main features included the building of the twin tunnels, each spanning 21 kilometres below the streets of London connecting Paddington to Stratford and Canary Wharf, and the construction of 10 new tunnelled stations as well as the upgrading of existing stations on the surface line. Once operational, Crossrail will increase rail capacity in central London by 10%. The benefits of Crossrail include the reduction of journey time, easing of road congestion, and the improvement of connectivity. Furthermore, it was perceived that the project would bring about the development of 90,000 new homes and 4.4 million square metres of commercial space by 2021. By 2026, the total uplift in property values within 1 kilometre of a station are estimated to amount to £20.1 billion (\$26.7 billion USD), bringing in 180,000 new residential units (GVA; Crossrail Ltd, 2018^[49]).

Funding breakdown

Jointly sponsored by the national government through Department for Transport, and the Great London Authority through Transport for London, an initial funding envelope of £15.9 billion (\$21.1 billion USD) was decided upon in 2007 for the construction of Crossrail. The agreed funding package would come from three main sources: tax payers (via contribution from central government), businesses in London (through the Business Rate Supplement and developer contributions), and borrowing against fares paid by future passengers of Crossrail. The Great London Authority intends to partly finance their agreed contributions from income generated by several land value capture mechanisms such as the Crossrail Business Rate Supplement (£4.1 billion or \$5.4 billion USD), Section 106 Agreements (£300 million or \$398 million USD), Mayoral Community Infrastructure Levy (£300 million or \$398 million USD), and sale of surplus land and properties for over-site development (£550 million or USD 730 million USD).

Figure 4.6. Route map of Crossrail 1



Note: Tunnel lines are depicted in pink; surface lines are in blue

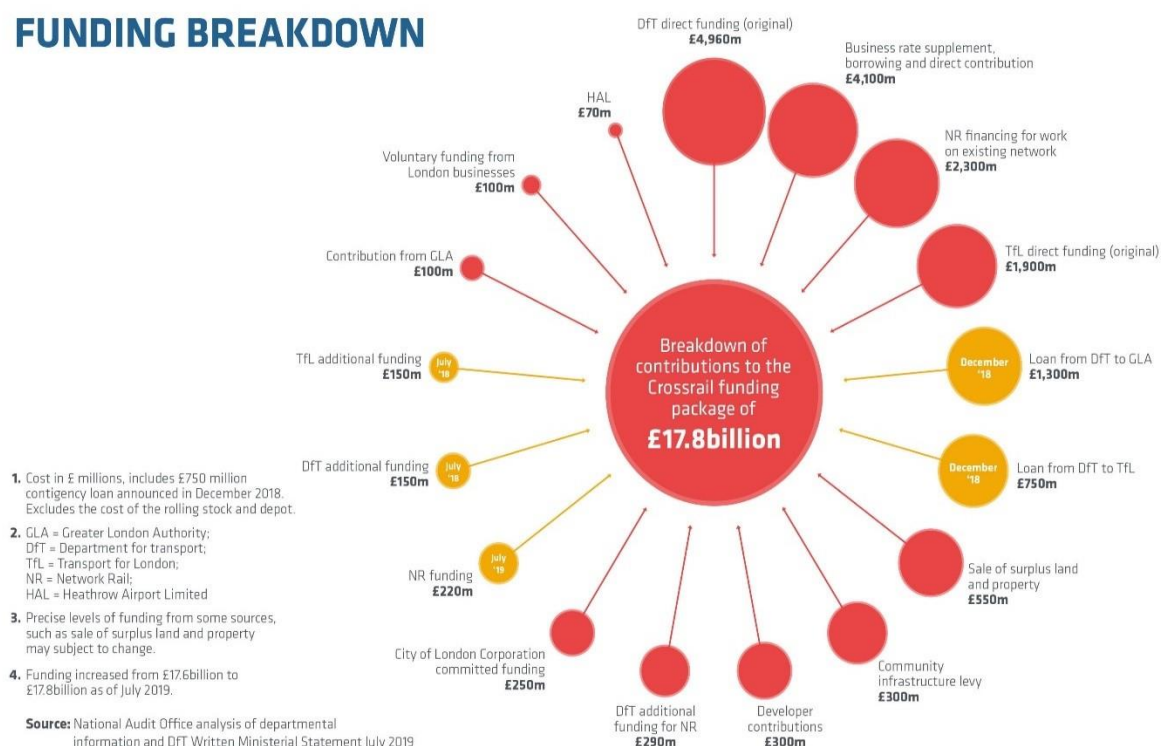
Source: (Crossrail Ltd, n.d.^[50])

Following the project delay announcement in August 2018, the funding package was increased to £17.6 billion (\$23.3 billion USD) in December 2018. In addition to another £100 million (\$133 million USD) cash contribution, the GLA agreed to borrow up to £1.3 billion (\$1.7 billion USD) from Department for Transport, which would be repaid through the existing Crossrail Business Rate Supplement and Mayoral Community

Infrastructure Levy (previously earmarked from 2019 for a new north-south scheme called Crossrail 2) (Plimmer and Pickard, 2018^[51]). Meanwhile, Department for Transport would grant Transport for London up to £750 million (\$994 million USD) of loan facility, replacing the £350 million (\$464 million USD) loan provided by the government in October of the same year. The latest funding revision took place in July 2019 where the funding envelope increased to £17.8 billion (\$23.6 billion USD) to fulfil additional funding requirements from Network Rail. The total project cost is currently 12% over the 2007 estimate. According to the latest assessment, the entire Elizabeth Line will only be ready in the first half of 2022 and may require addition funding of up to £1.1 billion (\$1.5 billion USD) above the Financing Package agreed in December 2018 (MacLennan, 2020^[52]).

Figure 4.7. Funding breakdown for the construction of Crossrail (as of July 2019)

FUNDING BREAKDOWN



Source: (Crossrail Ltd, n.d.^[53])

Business Rate Supplement

In 2010, the Greater London Authority introduced Crossrail Business Rate Supplement, a betterment tax aimed at generating £4.1 billion (\$5.4 billion USD) for the project. The levy was planned to provide a direct contribution of £600 million (\$796 million USD) for construction costs and raise an additional £3.5 billion (\$4.6 billion USD) to finance and repay borrowing by the Greater London Authority (at a presumed interest rate of 6%). In line with standard practice for major infrastructure projects, the principle sum is not expected to be repaid until after the end of the construction.

According to the final prospectus, the Business Rate Supplement will be levied for a period of between 24 and 31 years, with a targeted end date of 2037–2038 (Greater London Authority, 2010^[48]). The total sum expected to be raised (before debt repayment) would not be more than £8.1 billion (\$10.8 billion USD). Under the *Business Rate Supplement Act* of 2009, the Greater London Authority was granted the power

to impose a business rate supplement on all non-domestic properties with a rateable value of more than £55,000 (\$73,000 USD) in the Greater London area. The rate (called multiplier) was set at 2% per pound of rateable value. Based on 2010 rateable values, the threshold of £55,000 would lead to the exemption of over 83% non-domestic properties, ensuring that the burden of this levy does not fall on the vast majority of small and medium businesses (Greater London Authority, 2010^[48]). In 2017, the Mayor increased the rateable value threshold from £55,000 to £70,000 (\$93,000 USD), while maintaining the multiplier at 2%, meaning only around 15% of non-domestic properties are required to pay the levy (Greater London Authority, n.d.^[54]).

The tool has performed better than expected, generating a cumulative amount of £1.83 billion (\$ 2.48 billion USD) by 2018, or around £225 million (\$299 million USD) per annum (Sepe, 2019^[55]; Buck, 2017^[56]). Its success can be attributed to several factors. While taxes and levies are often unpopular among business, betterment levies are tied specifically to the delivery of a (new) infrastructure project. As the business rate supplement seeks to capture the value uplifts and other related economic impacts thanks to improved accessibility, it is perceived as an equitable and necessary levy. The various studies pointing to value uplifts in land and properties as well as increase in economic activities around the Crossrail stations also helped to reduce resistance from affected businesses (GVA; Crossrail Ltd, 2018^[49]; Knight Frank, 2017^[57]; CBRE, 2016^[58]).

The high threshold of rateable value also means that only a small number of larger non-domestic properties are affected. Based on the 2010 rating list and the initial threshold of £55,000, this represented only 17% of properties across London. The final prospectus also forecasted that more than 37% of income from this tool (based on the 2010 rating list) was expected to be generated from properties with a rateable value of over £1 million (\$1.33 million USD), which accounted for only 1% of all non-domestic properties in London (Greater London Authority, 2010^[48]). The threshold was strategically set to exempt most of small to medium businesses, and can thus be thought to play a role in redistribution by levying greater taxes on larger businesses to fund infrastructure development.

In addition, the total amount of levy is relatively small, amounting to an average of only 5% of total business rates. For example, a London business with a rateable value of £100,000 (\$133,000 USD) must pay £50,400 (\$66,800 USD) in business rates before any relief in 2020. The same business only needs to pay an additional £2,000 (\$ 2,600 USD) in business rate supplement. As a typical business in London with a rateable value of £50,000 (\$66,300 USD) is expected to earn an average revenue of roughly £1.1 million (\$1.46 million USD), the maximum annual amount payable is insignificant for affected non-domestic properties, considering the positive economic impacts generated from Crossrail.

Moreover, the administrative system for the collection and enforcement has been efficiently streamlined. On behalf of the Greater London Authority, the Crossrail Business Rate Supplement is collected by the 32 London boroughs and the Common Council of the City of London. Where applicable, the levy appears on the same tax billing as a supplement to the National Non-Domestic Rate (i.e. standard business rate). It is therefore collected in parallel with standard business rate, where the same enforcement procedures have been put in place. The local billing authorities will then transfer the Business Rate Supplement to the Greater London Authority instead of the central government.

While the flat rate makes calculation transparent and simple, its uniform application across different boroughs and business sectors questions its role as a land value capture instrument. The Business Rate Supplement is levied on all eligible properties in the Greater London area, instead of those within the proximity of the Crossrail stations. One of the arguments for this city-wide application is that transport infrastructure projects such as Crossrail tend to have far-reaching benefits throughout the city. However, businesses closer to Crossrail stations such as those in central London and Canary Wharf would benefit directly and disproportionately from increased accessibility. The mismatch between beneficiaries and those eligible for this levy calls into question the efficiency and equity of Business Rate Supplement, as well as the fact that it should not be considered as a value capture instrument. As the Business Rate Supplement

levies taxes on commercial properties far away from the impact areas, it can be arguably considered to be more of a general tax used to fund infrastructure development rather than a value capture instrument. In that regard, implementing differential tax rates proportional to received benefits have been proposed, yet the required legislative changes and administrative burden make these proposals implausible in the case of the UK (Thomas, 2018^[59]).

Mayoral Community Infrastructure Levy

Under the *Planning Act 2008*, local authorities (including the Mayor) in England and Wales are authorised to introduce planning charges in the form of Community Infrastructure Levy to help deliver infrastructure projects in their area (UK Government^[60]). The Community Infrastructure Levy came into force nationally in 2010. The procedure for establishing this levy can be found in the Community Infrastructure Levy Regulations 2010, involving two rounds of consultation and one round of public examination before approval of the charging schedule (Greater London Authority, 2016^[61]).

In 2012, the Mayoral Community Infrastructure Levy (also known as MCIL1) was introduced in London to raise £300 million towards the construction cost of Crossrail 1. The charging schedule was revised in 2019, and proceeds from the revised levy (also known as MCIL2) are slated for use to fund both Crossrail 1 (the Elizabeth line) and Crossrail 2. The Mayoral Community Infrastructure Levy is charged on all uses except for health and education related uses (see Table 4.9). During the planning application process, developers must submit necessary information to help the local planning authority determine the applicable amount. Developers may be eligible for a number of exemptions and/or reliefs such as minor development exemption, self-build exemption (for a whole house or a residential annexe/extension), charitable relief, and social housing relief. The total amount is payable within 60 days of the commencement of development, with the local planning authority being responsible for collection (Greater London Authority^[62]). The total amount is then be transferred to Transport for London, responsible for receiving and accounting for the levy.

When conducting viability study, the Mayor adopted a relatively simple approach of considering residential house prices as a proxy for viability. The assumption was that the highest value areas would likely to be most robust areas in terms of development viability. While some critics advocated for a more differentiated approach of independently testing viability for other land uses (instead of adopting a proxy approach), they did not produce any evidence that their propositions would lead to a substantially different result. Given the complexity of big city such as London where a wide array of land uses might result in vastly different values, the proxy approach linking viability with 2010 house prices was considered logical and reasonable.

The three charging bands in the MCIL1 were based on the April 2010 average house prices in each borough. The three bands approach is relatively subjective and simplistic, without taking into consideration the spatial differences below the borough level. It was argued that a more detailed approach would require more robust and consistent data, and could result in as many as 65 to 96 different charging zones (The Planning Inspectorate, 2012^[63]). In London, the charging rates (more specifically the previous ones when the three bands were first formulated) would result in an average charge of 0.87% of the value of a house. The three bands meant that most boroughs would end up with a charge relatively close to an average of 0.87% (The Planning Inspectorate, 2012^[63]). In concluding his examination of the draft MCIL1 schedule, the report by Examiner Keith Holland issued in January 2012 stated that “the charge proposed by the Mayor would represent a very small part of the cost of development and hence would not seriously threaten the economic viability of development across London.” (The Planning Inspectorate, 2012^[63])

Applied city-wide and set in £ per square metres rather than based on the increments in land value, the Mayoral Community Infrastructure Levy is not always considered a value capture tool, despite its intention to capture the unearned increments from development gains. Revised in 2019, the latest charging bands for all development in the Greater London (except for the rates for office, retail and hotel in Central London

and the Isle of Dogs) can be seen in Table 4.7.² In line with Regulation 40 of the Community Infrastructure Levy Regulations 2010, the chargeable amount for each development can be calculated by multiplying the relevant rate (R) by the deemed net area of development chargeable (A), taking into account the ratio of the index figure for the year in which planning permission was granted (I_P) over the index figure for the year in which the charging schedule containing rate R took effect (I_C). For more detailed information, see Calculation of chargeable amount for the Mayoral Community Infrastructure Levy (Greater London Authority, n.d.^[64]).

Table 4.7. MCIL2 charging rates for all development in London

MCIL2 charging band	London Boroughs and Mayoral Development Corporations	MCIL2 charging rates (£ per m ²)	
Band 1	Camden, City of London, City of Westminster, Hammersmith and Fulham, Islington, Kensington and Chelsea, Richmond-upon-Thames, Wandsworth	80	
Band 2	Barnet, Brent, Bromley, Ealing, Enfield, Hackney, Haringey, Harrow, Hillingdon, Hounslow, Kingston upon Thames, Lambeth, Lewisham, Merton, Redbridge, Southwark, Tower Hamlets, Waltham Forest, London Legacy Development Corporation (LLDC), Old Oak & Park Royal Development Corporation (OPDC)	60	
Band 3	Barking and Dagenham, Bexley, Croydon, Greenwich, Havering, Newham, Sutton	25	

Note: For planning permissions granted after 1 April 2019. Except for the rates for office, retail and hotel in Central London and the Isle of Dogs (see Table 4.8)

Source: Adapted from (Greater London Authority^[64])

Table 4.8. MCIL2 charging rates for office, retail and hotel in Central London and Isle of Dogs

Land use	MCIL2 charging rates (£ per m ²)
Office	185
Retail	165
Hotel	140

Note: For planning permissions granted after 1 April 2019.

Source: Adapted from (Greater London Authority^[64])

Table 4.9. MCIL2 charging rates for health and education in London

Land use	MCIL2 charging rates (£ per m ²)
Development used wholly or mainly for the provision of any medical or health services except the use of premises attached to the residence of the consultant or practitioner	NIL
Development used wholly or mainly for the provision of education as a school or college under the Education Acts or as an institution of higher education	NIL

Note: For planning permissions granted after 1 April 2019.

Source: Adapted from (Greater London Authority^[64])

After a slow start during the period of 2012–2015, the mechanism has managed to generate more than £100 million annually since 2015. As of 2018, £490 million was generated from this levy (Greater London Authority^[65]).

² For more information on the viability study conducted for the MCIL2, please consult the “Viability Evidence Base for the Mayoral Community Infrastructure Levy 2: Preliminary Draft Charging Schedule” prepared in June 2017 by JLL for the Mayor of London and Transport for London, https://www.london.gov.uk/sites/default/files/md2123_mcil2_pdcs_-_annex_1_viability_evidence_base.pdf.

Crossrail Section 106

The Greater London Authority also intends to raise another £300 million (\$398 USD) using planning obligations under Section 106 of the *Town and Country Planning Act 1990*. Section 106 agreements are negotiated on a project-specific basis where developers are obliged to contribute either in kind or cash to offset the impact of their development. Under Section 106, developers and local planning authorities enter into legally binding planning agreements as a condition to being granted planning permission. In 2010, the Mayor decided to apply planning obligations only in development areas or uses significantly leading to congestion on the railway network. This includes:

- retail, hotel and office development in central London (except for the Vauxhall Nine Elms Battersea, the Waterloo and the Elephant and Castle opportunity areas) and Isle of Dogs with a net increase in floor space of more than 500 square metres
- retail and office development in the rest of London (except for Woolwich Arsenal) within a radius of 1km from Crossrail stations

In order to avoid double-charging developers on the same development, the Mayor has decided to treat the Mayoral Community Infrastructure Levy as an “offset” against the Section 106 contributions. Where the amount sought under the planning obligations is equal to, or less than the amount sought under Mayoral Community Infrastructure Levy, developers only need to pay the latter amount. Where the amount sought under the planning obligations is more than the amount sought under Mayoral Community Infrastructure Levy, developers need to pay the latter amount, plus any difference so that the total payments would be equal to the amount sought under the Section 106 planning obligations. By the time £600 million were raised from developer contributions, most of the revenue would come from Mayoral Community Infrastructure Levy instead of the 50/50 split between them as initially projected.

Table 4.10. Indicative level of Crossrail Section.106 charge (per m²) by land use and location

Land use	Central London		Isle of Dogs		Rest of London	
	Including approximate 1 km indicative radius outwards around Paddington and Liverpool Street Stations		Including approximate 1 km indicative radius outwards around the proposed Canary Wharf station at West India Quay inclusive of and south of the Poplar DLR lands		Including approximate 1 km indicative radius outwards around the proposed Canary Wharf station at West India Quay north of the Poplar DLR lands as well as such radii around all other stations outside the Central Contributions Areas apart from Woolwich Arsenal	
	£ per m ²	\$ per m ²	£ per m ²	\$ per m ²	£ per m ²	\$ per m ²
Office	140	186	190	252	31	41
Retail	90	119	121	161	16	21
Hotel	61	81	84	111	NIL	NIL

Source: Adapted from (Greater London Authority, 2016^[61])

Over-site development

As a value capture mechanism, over-site development of properties above and around Crossrail stations is expected to generate more than £500 million, forming an important part of the core Crossrail funding strategy. Crossrail Ltd. has integrated the designs for 12 major property developments above and in the vicinity of its central stations, covering more than 278,000 square metres of high-quality office, retail and residential development. The company is currently working with six development partners and has secured planning consent for ten development schemes (Crossrail Ltd^[66]).

The earlier over-site development was conducted via a number of Collaboration Agreements. Across 12 major sites, five were exclusively owned by private companies with expertise in property development (Lindsay and Hopson, 2020^[67]). In order to retain an interest in these sites, the companies entered into Collaboration Agreements that saw Crossrail Ltd compulsorily purchase their land. These former landowners were then given an opportunity to work on the design of these sites and to jointly secure a planning permission. Crossrail Ltd agreed to cover up to 7.5% of total development cost or £6 million (\$8 million USD), whichever was lower. Once completed, these companies had the right of first refusal to buy the sites at its post-development market value and on a 125 year lease, in exchange for a 17.5% developer's priority return (Lindsay, 2018^[68]). The Collaboration Agreements allowed Crossrail's Land and Property team to gain access to the skills and expertise of UK's top property development firms in delivering profitable and well-integrated projects. Crossrail Ltd also retained control over design of these sites, ensuring coherent development around these stations. However, the initial commercial terms were considered over-generous, which led the railway company to explore a range of other agreements for its remaining seven sites (Lindsay, 2018^[68]).

Besides these 12 major sites, value capture also took place at other sites where private companies such as Canary Wharf Group and Berkeley Homes independently developed their real estate and then secured direct access to Crossrail stations. In exchange for integration to the Elizabeth Line, Canary Wharf Group offered to design and build the Canary station box for a fixed price of £500 million (\$664 million) and contributed £150 million towards the costs of the new Crossrail station (\$200 million USD) (MacLennan, 2015^[69]). The two deals from these companies are expected to generate an additional £300 million (\$398 million USD), on top of the £500 million (\$664 million) from the major sites (Lindsay and Hopson, 2020^[67]).

Land acquisition for Crossrail

The construction of Crossrail entails one of the most complex and intricate land acquisition processes in the UK. As previously mentioned, compulsory purchase (also known as expropriation) is not a land value capture instrument in itself, however it is an important tool for authorities to assemble land for transport projects. Land value capture may be incorporated into compulsory purchase where purchased land is used for over-site development. The Crossrail Act 2008 provides the legal basis for the powers of compulsory purchase of land within limits of deviation for the construction and operation of the new railway line. Crossrail Ltd on behalf of the Secretary of State, undertook the acquisition of over 150,000 square metres of surface land and 10 million cubic metres of subsoil from more than 1500 individuals or organisations with an ownership interest in affected land (Crossrail Ltd^[70]). The Act also provided a statutory window of five years to exercise compulsory acquisition powers. The narrow time limit was deemed as one of the constraints for such a convoluted process. The former Land & Property Director at Crossrail admitted that a more generous timeframe could have resulted in cost-savings "by involving contractors more fully in the design process and by having funds early to assist all occupiers to mitigate the impact of dispossession" (Lindsay, 2018^[71]). The total cost of land acquisition was estimated at £860 million (\$ 1.14 billion USD).

The powers of compulsory purchase were only to be exercised on the basis that Crossrail Ltd would acquire no greater amount of land than reasonably required in the detailed design of the scheme. The use of compulsory purchase powers was proportionately exercised with self-restraints. Crossrail Ltd would prioritise the acquisition of a smaller lot of land if such acquisition would not practically jeopardise the project delivery and long-term operation in a timely and fiscally acceptable manner (Crossrail Ltd, 2007^[72]). While the powers of compulsory purchase were authorised in the public interest, the project adopted a rather strict interpretation, which prevented itself from assembling a larger tract of land especially in the outer areas for other purposes such as capturing the uplifts in land value (Lindsay, 2018^[71]). Together with further restrictions in the form of over 4,000 undertakings and assurances given from the Secretary of State during the passage of the *Crossrail Bill*, the project ended up with a smaller than expected area in several construction sites. It was argued that this may have led to less than economically optimal situations for some construction sites (Lindsay, 2018^[71]).

Compensation for land compulsorily acquired for Crossrail followed the guiding principles and general procedures of the National Compensation Code, which is a collection of various enactments such as the *Land Compensation Act 1961*, the *Compulsory Purchase Act 1965*, and the *Land Compensation Act 1973* (Crossrail Ltd, 2007^[73]). Crossrail Ltd enlisted the experience of the Compulsory Purchase Order team at Transport for London to ensure compensation was consistently paid to more than 1,600 claimants. The amount payable is established based on the open market value of acquired land at a certain valuation date, ignoring the fact that said land may be used for the development of infrastructure project and that the purchase is compulsory. The valuation process also takes into consideration the alternative development potential (not related to the Crossrail project) of purchased land.

Where a landowner is physically dispossessed from the compulsory purchase of land, they may be entitled to a payment in respect of disturbances that covers the cost of removal and relocation as well as losses stemming from the dispossession. Likewise, businesses displaced due to compulsory purchase would also be compensated for disturbances. Where only a portion of land owned is compulsorily acquired, landowners may also be entitled to a payment in respect of severance and injurious affection (e.g. reduction in the market value of retained lands). On top of compensation for losses, the Code also allows for certain additional top-up payments for inconveniences linked to compulsory purchase.

The National Compensation Code also provides compensation to landowners whose land is not compulsorily purchased, yet land value may be diminished or the enjoyment of their land may be interfered, either permanently or temporarily, due to the construction and operation of public works. Following a year after the operation of the Crossrail, landowners may also be eligible for compensation on the ground of land devaluation due to noise and vibration from the operation of the railway. Furthermore, where land is occupied temporarily (as authorised by Schedule 5 of the *Crossrail Act*), compensation is payable to landowners and occupiers for any loss associated to temporary acquisition.

Acquisition of subsoil

The *Crossrail Act 2008* grants Crossrail Ltd the powers of compulsory purchase of subsoil, within the defined vertical and horizontal limits for the construction of the tunnels and other below ground infrastructure. “Subsoil” refers to the part of land immediately below the surface land. English property law recognises the freehold ownership of land, including the unlimited depth of ground right below the surface land. 10 million cubic metres of subsoil was purchased to make way for the construction of 21 kilometres corresponding to the twin tunnels in the central section of the Elizabeth Line.

The compulsory acquisition of subsoil follows a General Vesting Procedure, a statutory process that gives Transport for London the right to take over ownership of the subsoil. First, a Notice of Intention is sent to affected landowners, requesting a confirmation of interest in the affected land. Then, a second notice is sent out, informing them that the acquiring authority has made the General Vesting Declaration (GVD) and that the affected subsoil would be automatically transferred to said authority on a specific date, at least 28 days later. Affected freeholders or leaseholders must confirm whether they wish to accept the compensation offered. Finally, the title to subsoil is registered to Transport for London. The entire process of subsoil acquisition takes around three months to complete (Crossrail Ltd^[74]).

Crossrail follows a fixed value compensation scheme for subsoil acquisition that is widely adopted by other recent railway projects. Compensation, in principle, is determined based on the market value of compulsorily purchased subsoil. As subsoil has little value to landowners or occupiers, the compensation payable to claimants (either freeholders or leaseholders) is a fixed sum of £50 (\$ 66 USD) for the perceived value of subsoil (regardless of the amount), and £250 (\$ 332 USD) for professional fees that claimants may incur during the process of acquisition (Crossrail Ltd^[74]). The acceptance of this amount of compensation payable is not mandatory. During the period of second notice, affected property owners may choose to either accept the fixed compensation, or pursue a formal claim for compensation, in which case

affected property owners must submit a compensation claim. The professional fees incurred during such process constitute part of the final payable compensation amount.

Lessons from the case study

Despite the relative success of Crossrail Business Rate Supplement and Mayoral Community Infrastructure Levy in generating the funding for the railway project, these tools are not always considered land value capture mechanisms due to their city-wide application as well as the fact that charges are not levied based on the unearned increment. Nevertheless, the city-wide application has been instrumental in keeping the rates low and generating a stable income stream for project funding. It also ensures that the tax burden would not fall on residential property owners, which would have been politically controversial to introduce. The case study of Crossrail also points to the importance of sustained institutional support for value capture mechanisms. The Greater London Authority has always acknowledged the potential of land value capture in financing not only transport investments but also affordable housing associated with these new infrastructures. The government has always felt a sense of missed opportunity in their initial value capture targets for Crossrail 1 (Thomas, 2018^[59]). This partly explains Transport for London's ambitious intention in making land value capture mechanisms a core part of the alternative funding sources for future projects such as Crossrail 2. Through a combination of both tax-based and development-based approaches, the government can employ various value capture instruments in a more strategically consistent and systematic manner (Transport for London, 2017^[75]). Besides the institutional willingness to leverage these mechanisms, the increasing fiscal authority and autonomy afforded by local authorities also played a role in introducing local instruments such as the Crossrail Business Rate Supplement and Mayoral Community Infrastructure Levy (Thomas, 2018^[59]).

The good performance of these mechanisms is dependent on social support, which requires extensive communication between the government and relevant stakeholders. While the evident linkage between levies/contributions and the tangible benefits of a new infrastructure project may account for little social resistance, the authorities have also commissioned numerous studies to demonstrate the direct and wider benefits of Crossrail. In cases where several mechanisms may apply to the same development such as the Mayoral Community Infrastructure Levy and Section 106, the authority needs to clarify their relationship to ensure that double-taxation would not occur.

The process of land acquisition for Crossrail also offers some learning points. In minimising the amount of land compulsorily purchased and strictly safeguarding rights holders' interests, the legal frameworks arguably provided less than optimal conditions for project implementation. Additional legal constraints in the form of five-year windows for compulsory purchase or specific land disposal policy may have increased the cost of land acquisition (Lindsay, 2018^[71]). According to the former director of Land and Property in Crossrail, a broader interpretation of Crossrail as both a transit and regeneration project could have allowed the project to effectively leverage land value capture from the larger tracts of land acquired.

Annex A. Calculation of chargeable amount for the Mayoral Community Infrastructure Levy

Extract from the Community Infrastructure Levy Regulations 2010 (as amended)

PART 5 – CHARGEABLE AMOUNT

Regulation 40 (calculation of chargeable amount)

(1) The collecting authority must calculate the amount of CIL payable (“chargeable amount”) in respect of a chargeable development in accordance with this regulation.

(2) The chargeable amount is an amount equal to the aggregate of the amounts of CIL chargeable at each of the relevant rates.

(3) But where that amount is less than £50 the chargeable amount is deemed to be zero.

(4) The relevant rates are the rates, taken from the relevant charging schedules, at which CIL is chargeable in respect of the chargeable development.

(5) The amount of CIL chargeable at a given relevant rate (R) must be calculated by applying the following formula—

$$\frac{R \times A \times I_p}{I_c}$$

where—

A = the deemed net area chargeable at rate R, calculated in accordance with paragraph (7);

I_p = the index figure for the year in which planning permission was granted; and

I_c = the index figure for the year in which the charging schedule containing rate R took effect

(6) In this regulation the index figure for a given year is—

(a) the figure for 1st November for the preceding year in the national All-in Tender Price Index published from time to time by the Building Cost Information Service of the Royal Institution of Chartered Surveyors; or

(b) if the All-in Tender Price Index ceases to be published, the figure for 1st November for the preceding year in the retail prices index.

(7) The value of A must be calculated by applying the following formula—

$$G_R - K_R - \frac{(G_R \times E)}{G}$$

where—

G = the gross internal area of the chargeable development;

G_R = the gross internal area of the part of the chargeable development chargeable at rate R;

K_R = the aggregate of the gross internal areas of the following—

(i) retained parts of in-use buildings, and

(ii) for other relevant buildings, retained parts where the intended use following completion of the chargeable development is a use that is able to be carried on lawfully and permanently without further planning permission in that part on the day before planning permission first permits the chargeable development;

E = the aggregate of the following—

(i) the gross internal areas of parts of in-use buildings that are to be demolished before completion of the chargeable development, and

(ii) for the second and subsequent phases of a phased planning permission, the value E_x (as determined under paragraph (8), unless E_x is negative,

provided that no part of any building may be taken into account under both of paragraphs (i) and (ii) above.

(8) The value E_x must be calculated by applying the following formula—

$$E_P - (G_P - K_{PR})$$

where—

E_P = the value of E for the previously commenced phase of the planning permission;

G_P = the value of G for the previously commenced phase of the planning permission; and

K_{PR} = the total of the values of K_R for the previously commenced phase of the planning permission

(9) Where a collecting authority does not have sufficient information, or information of sufficient quality, to enable it to establish that a relevant building is an in-use building, it may deem it not to be an in-use building.

(10) Where a collecting authority does not have sufficient information, or information of sufficient quality, to enable it to establish—

(a) whether part of a building falls within a description in the definitions of K_R and E in paragraph (7); or

(b) the gross internal area of any part of a building falling within such a description, it may deem the gross internal area of the part in question to be zero.

(11) In this regulation— “building” does not include—

(i) a building into which people do not normally go,

(ii) a building into which people go only intermittently for the purpose of maintaining or inspecting machinery, or

(iii) a building for which planning permission was granted for a limited period; “in-use building” means a building which—

(i) is a relevant building, and

(ii) contains a part that has been in lawful use for a continuous period of at least six months within the period of three years ending on the day planning permission first permits the chargeable development;

“new build” means that part of the chargeable development which will comprise new buildings and enlargements to existing buildings;

“relevant building” means a building which is situated on the relevant land on the day planning permission first permits the chargeable development;

“relevant charging schedules” means the charging schedules which are in effect—

- (i) at the time planning permission first permits the chargeable development, and
- (ii) in the area in which the chargeable development will be situated; “retained part” means part of a building which will be—
 - (i) on the relevant land on completion of the chargeable development (excluding new build),
 - (ii) part of the chargeable development on completion, and
 - (iii) chargeable at rate R.

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